

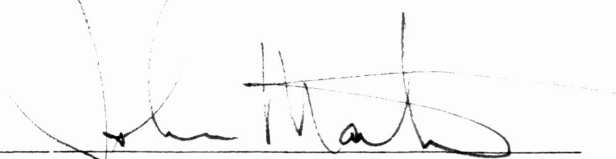
A SURVEY OF LEASE PURCHASE
MODELS USED BY LESSORS

by

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Submitted in Partial Fulfillment of the Requirements of the
University Undergraduate Fellows Program
1979-1980

Approved by:

A handwritten signature in black ink, appearing to read "John Martin", is written over a horizontal line. The signature is cursive and somewhat stylized.

DR. JOHN MARTIN

April 1980

TABLE OF CONTENTS

	<u>PAGE</u>
I. THE PROBLEM.....	1
i. Introduction to Research.....	3
ii. Purpose.....	3
iii. Limitations.....	5
II. NATURE OF LEASING.....	5
III. LEASING DEFINED.....	10
IV. TYPES OF LEASES.....	12
i. Financial.....	12
ii. Operational.....	13
iii. Sale and Leaseback.....	14
V. ECONOMIC ADVANTAGES OF LEASING.....	16
VI. OPERATING ADVANTAGES OF LEASING.....	19
VII. QUESTIONABLE ECONOMIC ADVANTAGES OF LEASING..	23
VIII. LEASE ADVANTAGES - A SURVEY.....	26
IX. ESTABLISHING A LEASE QUOTE.....	30
X. LEASING MODELS - AN ANALYSIS.....	40
XI. SURVEY DESIGN.....	58
XII. SURVEY RESULTS AND CONCLUSION.....	61
APPENDIX	
FOOTNOTES	
BIBLIOGRAPHY	

LIST OF TABLES

	<u>PAGE</u>
1. CASH FLOW COMPUTATIONS FOR SETTING LEASE RATES...	36
2. LEVEL OF RESPONDING DEPARTMENT WITHIN THE COMPANY.....	61
3. TYPE OF ASSETS LEASED BY THE FIRM.....	61
4. FISCAL YEAR 1978 ASSET VOLUME OF FIRMS.....	62
5. TYPES OF LEASING PROVIDED BY FIRMS.....	62
6. TYPES OF LEASE SERVICES PROVIDED BY FIRMS.....	62
7. SURVEY RANKING OF MOST PERSUASIVE ECONOMIC ADVANTAGES USED BY LESSORS.....	63
8. NUMBER OF RESPONDING FIRMS REPORTING USE OF FORMAL MODEL IN SETTING LEASE RATES.....	63

LIST OF MODELS

	<u>PAGE</u>
1. NET PRESENT VALUE.....	43
2. NET ADVANTAGE OF LEASING (BASIC).....	45
3. DIFFERENT VALUE OF LEASING.....	46
4(A).CONVENTIONAL NAL MODEL (LESSEE).....	48
4(B).CONVENTIONAL NAL MODEL (LESSOR).....	50
5(A).WESTON AND BRIGHAM MODEL, 1972 (LESSEE).....	50
5(B).WESTON AND BRIGHAM MODEL, 1972 (LESSOR).....	52
6. BOWEN, HERRINGER, WILLIAMSON MODEL (LESSEE).....	52
7(A).MARTIN-ANDERSON MODEL, 1979 (LESSEE).....	54
7(B).MARTIN-ANDERSON MODEL, 1979 (LESSOR).....	55
8. INTERNAL RATE OF RETURN.....	55

A SURVEY OF LEASE PURCHASE
MODELS USED BY LESSORS

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Paul F. Anderson, "Financial Aspects of Industrial Leasing Decisions" (PHD Dissertation, Michigan State University, 1977).

THE PROBLEM

Since the middle fifties, great interest has developed in capital budgeting and allied considerations.¹ Included in this development is leasing which has become an important tool in the marketing of industrial equipment. Unfortunately, few contemporary writers have been able to recognize either the importance of leasing as an individual tool or the significance of the financial analysis techniques employed. It is very evident that scholarly work on the subject of lease marketing has not kept pace with the growth of leasing in industry.²

In the past few years various articles have been published concerning economic and non-economic aspects of leasing versus purchasing capital equipment. The majority of these publications have viewed leasing from only the Lessee's perspective. Paul F. Anderson, in his doctoral dissertation on the subject of lease marketing, emphasizes the qualitative factors in the Lessee's decision to lease or purchase.³ There has been a definite shortage of publications of the lease versus sell alternative of the Lessor, who must acquire or produce the asset to lease.

Although leases are being used in many markets, it is still an area that is difficult to analyze. Many who have written on the subject fail to universally agree on certain economic factors. This has led to a myriad of financial models which are used in industry. Despite the growth of leasing, the field of marketing continues to be "transfer-of-title" oriented.⁴ Additionally, many modern textbooks give very little mention of leasing and many contemporary writers characterize the lease as a "Pricing Arrangement" to consume capital.⁵ Most of all, there is a lack of literature concerning the methodology and analytical technique used by the Lessor in his lease-sell decision process.

INTRODUCTION TO RESEARCH

It is significantly evident that there is a need for more lease marketing literature, especially since little has been written concerning the economic aspects of leasing from a Lessor's perspective. While a model is one of the first steps in analyzing the economic aspects of leasing, most models are oriented toward the Lessee. However, the Lessor, too, is interested in financial models, for they provide theoretical basis for forming a lease market strategy. Such a model enables both Lessee and Lessor to determine various economic advantages of leasing over buying (selling). For the Lessor, a model provides a basis for determining lease payments or "pricing" the lease. Whereas the Lessee uses a lease-purchase model to compare the relative merits of leasing versus purchasing.

PURPOSE

It is evident that the lease versus purchase (sell) problem is both complex and multi-faceted. Thus, the purpose of the study was to analyze one basic aspect of the problem -- the lease models being used by lessors in

pricing and marketing their financial leases.

The proposed study focused on the following research questions:

- (1) What are the economic and non-economic benefits of leasing from the standpoint of the lessor?
- (2) What type of decision process is used by the lessor in analyzing leases?
- (3) What analytical methods are used in making lease versus sell decisions?
- (4) What factors are most influential in the lessor's decision process?

A majority of the research questions will be answered using data from secondary sources. A majority of this project will emphasize questions (3) and (4). In addition to the secondary sources of data, a survey questionnaire will be sent to 75 leasing companies selected out of Standard and Poors "Million Dollar Book". The survey design and methodology are described in the final section.

This study will emphasize industrial leases. The second major objective of the research is to identify the means by which lessors market their leases.

LIMITATIONS

The major limitation of this study relates to the potential response bias resulting from the use of mail survey data. The sample data will consist solely of the responses received and since individual responses are voluntary, the returns are indeterminate both in terms of their number and any potential bias which the respondents might reflect.

NATURE OF LEASING

A lease represents an agreement conveying the right to use some asset for a certain period of time.⁶ Leases were employed as early back as the Roman Era.⁷ Sales contracts in the railroad industry developed into the first leases in the United States.⁸ The leasing industry grew very slowly at the start of the twentieth century, but has grown almost explosively since World War II.⁹ John Clark estimates the growth rate to have been 30 percent during the 1950's, 15% to 30% during the 1960's, and 15% during the 1970's. The value of assets leased in 1975 was expected to be \$100

10
billion, compared to \$75 billion at the end of 1973.
Leonard Rochwarger went on to estimate that total revenues
received by lessors, including manufacturers, captive
leasing companies, independent leasing companies, banks, and
bank holding companies increased by 20% annual rate from
1964 to 1974 and in 1975 would total some \$30 million.¹¹ It
has been estimated that 1/5 of all new capital equipment in
1980 will be leased.¹²

The first major independent leasing company, "The
United States Corporation",¹³ was established in 1952.
Following in the late 1950's, manufacturers such as IBM,
Remington Rand, Pitney-Bowes, and the National Cash Register
Company started to use leasing as a marketing tool in the
"Business Equipment Industry". This spurred the outgrowth
of leasing to all industrial areas.

Real estate still constitutes the largest single cate-
gory of leased items, but numerous types of equipment, such
as airplanes, railroad cars, ships, specialized equipment
for farming, textile and oil industries, and computers, are
being leased.¹⁴ Within the consumer sector leasing of
durable goods, such as automobiles, washers, dryers, re-
frigerators, televisions, furniture, and similar items has
also been increasing rapidly.¹⁵

There are approximately 1,800 to 1,900 financial institutions and subsidiaries of industrial firms involved in industrial leasing.¹⁶ Today's leasing market consists of three categories. These include "Manufacturer Lessors", which consist of the bulk of industrial leasing. Examples of assets leased are machine tools, oil well equipment, transportation equipment, communications equipment, and construction equipment.¹⁷ Manufacturers have used leasing as a new way to market their products. In many cases manufacturers can produce items at "economies of scale"; they will pass on this lower production cost as savings on to the lessee. The manufacturer also provides many services such as repairs, maintenance, and management at lower effective costs. Additionally, the manufacturers' position in the secondary market may allow him to attain a higher residual value, when selling the used leased equipment, thus enabling him to pass on to the lessee a lower rate. The crux of this research is based upon how a manufacturing lessor uses the above factors in setting lease terms.

The second participant in today's leasing market is the "Independent Leasing Company". There are three basic types of independent leasing companies.¹⁸ The first is the

financial leasing company, which acts as a financial in-
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termediary between capital asset leases. This inter-
mediary will purchase an asset for a lessee and have it
delivered without physically handling the equipment. These
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financial lessors are usually highly leveraged. The next
has been termed "Specialized Leasing Companies". These
lessors provide other various services, such as maintenance,
insurance, license fee and taxes, along with basic lease
21
financing. Automobiles, tools, and furniture are the main
types of equipment leased by a specialized lessor. The
22
third independent lessor is called a "Lease Broker".
Lease brokers bring together a lessor and lessee to a lease
contract. They help set terms, obtain financing, and
counsel lease contracts. They are involved with all types
of equipment and property leases.

The last independent leasing company is called a "Bank
23
Lessor". Commercial banks play a major role in most lease
contracts. Large banks have become increasingly interested
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in lease financing. Either directly or through a lease
holding company, a bank will make arrangements to purchase
equipment and lease it to a customer. Banks have been

involved in "direct leasing" since 1964, when the Comptroller of the Currency ruled that "direct lease transactions -- constitute legal and proper activities for National Banks".²⁵ Direct bank lessors contract with a potential lessee to purchase the asset and deliver it at their discretion. The lessee then assumes a payout contract along with all of the ancillary costs and liabilities associated with the use of equipment.²⁶ The lease contract²⁷ is considered the major security for the loan.

Overall, leasing fits into many various market areas. Almost any piece of equipment which can be purchased or manufactured can also be leased. Additionally, the terms of the lease will depend on both the type of asset and the lessor and lessee involved.

LEASING DEFINED

A lease represents a commitment by one party - called "The Lessor" - to turn over to another party - called "The Lessee" - the use of some asset in return for some consideration.²⁸ In the Financial Accounting Standards Board Statement No. 13, a lease is defined as "An agreement conveying the right to use property, plant, and equipment for a stated period of time".²⁹ A lease contract is considered to be executory - or from a legal standpoint - "That which is yet to be performed".³⁰ From a business standpoint, a lease payment is an allowable expense under the Internal Revenue Code (Section 162(a)(3)).³¹ However, it should be noted that a lease contract not meeting certain IRS criteria will be classified as a conditional sale and a depreciable asset to the purchaser. There is not a general rule that can be given, and each case must be decided on its own facts. In general, in the absence of evidence of true rental, agreements for the lease of property will be treated as purchases and sales if one or more of the following conditions are present:³²

Portions of periodic payments apply specifically
* to an equity to be acquired by the lessee.

* Lessee will acquire title on payment of a stated amount of "rent" which must be paid in any event.

* Total amount that Lessee must pay for a relatively short period of use is very large compared with the amount needed to transfer title.

* Periodic payments materially exceed current fair rental value.

* Property may be bought under an option at a price that is (a) nominal in relation to value of property at the time option may be exercised, or (b) relatively small compared with total required payments.

* Part of the "rent" is specifically designated interest, or is easily recognizable as interest.

* Total rental payments plus option price approximates price at which property could have been bought plus interest and carrying charges.

The fact that the agreement does not provide for transfer of title does not prevent the contract from being a sale of an equitable interest in the property. Thus the agreement is a sale if: (1) total rents over a relatively short period approximate the price at which the property could have been bought plus interest and carrying charges, and (2) the lessee may continue to use the property over its entire useful life for relatively nominal or token payments, even if there is no provision for passage of title.

As a result of these rules, leasing institutions are very cautious when constructing lease contracts; and in some cases advance rulings from the IRS will be obtained.³³

Leasing offers a firm an alternative to long term debt financing. The firm borrows an asset, rather than cash, and incurs a fixed obligation to make payments over an extended period of time.³⁴

TYPES OF LEASES

The types of leasing arrangements that are possible seem limited in number only by the creativity of the lessor and lessee.³⁵ However, the three general categories of leases are "Financial, Operating, Sale and Leaseback".³⁶

Financial Lease

Financial leases have assumed a major role in the financing of buildings and large equipment for American industry.³⁷ The financial lease typically is a long - or intermediate - term, noncancellable lease.³⁸ The agreement is written so that the lease will cover the service life of the asset. The lease payments will total more than the

original cost of the asset, but usually include a purchase option which the lessee may exercise at the termination of the contract.³⁹ Financial leases are most often written by financial leasing companies and banks.⁴⁰ Great care must be taken in writing financial leases in order to meet I.R.S. "Lease Requirements".⁴¹

A special type of financial lease is called a "leverage lease". In this case, the lessor borrows a portion (up to 80 percent) of the asset's cost from a third party.⁴² The ability of firms with heavily sheltered earnings to pass on tax benefits of leasing to lessors is one of the most powerful attractions of the leveraged lease.⁴³ The lease broker frequently arranges leverage leases.⁴⁴

Operating Lease

Operating leases are prominent in the areas of automotive, office, and small industrial equipment. An operating lease has two characteristics which differentiate it from a financial lease. First, an operating lease can usually be cancelled by the lessee with proper notice.⁴⁵ Second, the lessee avoids maintenance on the asset, along with any repairs or other expenses associated with maintaining the asset at a level of efficiency. These problems

are the obligation of the lessor, or in most cases, his
agent.⁴⁶ An operating lease is a popular set-up for
acquiring relatively small equipment used by all businesses,
which would normally have to be purchased. Operating leases
are not fully amortized over their basic terms. This type
of lease provides the lessee with flexibility in that
equipment may be leased for short periods of time. An
operating lease also acts as a hedge against the risk of
obsolescence. However, because the lessor assumes operating
costs and the risk of obsolescence, lease rates may be
relatively higher.⁴⁷ Operating leases are mainly written by
manufacturers and specialized leasing companies.⁴⁸

Sale and Leaseback

A sale and leaseback arrangement is where a user firm
subsequently sells an asset, that it initially owns, to a
second party or parties and immediately leases it back.⁴⁹
The effect is the same as if the lessor had purchased the
asset from a third party and leased it to a firm.⁵⁰ Retail
stores, office buildings, multi-purpose industrial build-
ings, and even complete shopping centers are frequently
financed with this method.⁵¹ Most sale and leasebacks are
on a "net-net" basis, or that the lessee pays all maintenance

expenses, property taxes, insurance, along with the lease
52 payment. In some cases, the lease arrangement will allow

a lessee to repurchase the property at the termination of
53 the lease. One primary benefit a company may gain from a

sale and leaseback is when a lease payment takes over an
54 "exhausted" depreciation tax shelter. The substantial
returns from leveraged leases available to investors in high
tax brackets have encouraged industrial firms to enter into
the private capital market.

ECONOMIC ADVANTAGES OF LEASING

From a marketing standpoint, a lease may be viewed as a package of economic and noneconomic benefits. Potential economic advantages of leasing have been recognized as the major reason for its growth in American industry.⁵⁵ Advantages from leasing may be viewed from either a lessor's or a lessee's perspective viewpoint. One advantage occurs from the fact that the lessor may be able to obtain an asset at a lower effective cost due to quantity discounts or by manufacturing the asset.⁵⁶ The lessor, in turn, will pass the savings on to the lessee in the form of lower lease rates. By purchasing lease equipment, a lessor may obtain additional savings -- in the form of investment tax credits,⁵⁷ accelerated depreciation, and a more favorable tax position. In addition to the investment credit "pass through", lessees with large loss carry-forwards may be able to benefit by allowing the lessor to take the tax shields associated with the capital outlay.⁵⁸

Another economic advantage may arise if the lessor is able to depreciate the asset over a shorter period of time than the lessee. In a competitive leasing market, lessors using accelerated depreciation for assets leased may pass

59

some of their high near tax savings to lessees. This could also occur if the lessor uses a shorter economic life in calculating depreciation on the asset.

A third possible economic advantage to leasing may occur if the tax rate of the lessor is lower than the lessee's tax rate.⁶⁰ Although a lower rate reduces taxes, it also reduces the potential for tax credit shelters. The lower rate also reduces the tax which must be paid on the lease revenue and the asset's salvage value when sold.⁶¹ Some of the tax savings enjoyed by the lessor may be passed on, under competitive pressure, to lessees in the form of lower lease payments.⁶² From a lessee's point, a higher tax rate allows greater tax savings from the lease payments.

In some instances, it is possible for the lessor to assume a portion, or in the operational lease, all, of the asset's operating cost. This is a fourth possible economic advantage of leasing. Through economies of scale, a lessor may be able to service, maintain, repair and provide management services for an asset at a minimal cost.⁶³ This too may be passed on to the lessee by a lower lease contract rate.

A fifth economic advantage to leasing may result from different expectations between the lessor and lessee.⁶⁴ If

for some reason a lessor anticipates a higher salvage value than the lessee, a lower lease rate could result. Additionally, because the lessor is familiar with the market for second-hand (used) equipment, he will have a more accurate estimate of salvage value. A lessor may also be able to stretch the useful economic life of a piece of equipment through expert maintenance and marketing.⁶⁵

A final economic advantage of leasing may occur due to competition in the leasing market. A lower lease rate may be one factor in a lessor's competitive strategy.⁶⁶ It could also result from a lessor attempting to capture a portion of the market by underpricing competitors.

Most of the advantages to leasing which have been discussed have resulted from cash flow savings available to the lessor. He, in turn, passes these savings on to the lessee through lower lease rates. Through the years many lists of economic advantages have been developed - some without material basis. These will be discussed later.

OPERATING ADVANTAGES OF LEASING

Aside from the financial question, many other considerations are important when reviewing the overall operating advantages of leasing. Additionally, a majority of the operational advantages, compared to general economic advantages, of leasing are associated with the lessee. For example, it has been determined that leases provide an alternative source of obtaining facilities and equipment for firms that have limited capital budgets.⁶⁷ Leasing provides wide visibility with respect to capital acquisitions when selecting the most profitable combination.

Frequently, equipment may be leased over a longer period than would be available through conventional financing.⁶⁸ Equipment loans usually run for a period that is substantially shorter than the economic life of the asset, whereas leases can be obtained for nearly the total length of the asset's life.⁶⁹ This allows the cost to be spread over a longer period of time.

Leases are generally quoted at fixed rates which avoid the short or intermediate-term financing.⁷⁰ Since short term notes carry a floating interest rate, leasing will allow greater flexibility by avoiding this high cost of

"piecemeal financing" of relatively small asset acquisitions. This would be very beneficial to an expanding firm adding small amounts of capital at regular intervals.

It has been argued that leasing increases a firm's borrowing capacity by conserving existing sources of credit. Normally, lease contracts do not appear on the balance sheet as debt. Also, unlike term loan agreements or bond indentures, lease contracts generally do not contain protective covenant restrictions. This allows some firms, which are unable to obtain capital due to marginal credit standing, the ability to lease.

Quickness and flexibility of lease contracts, as opposed to debt financing, are other operational advantages. Also, lease terms and options can be tailored to the specific need of the lessee. In some cases, lease payments may be arranged to match certain cash flows of the lessee. This is an option rarely available with debt financing.

Another operational advantage of leasing is that in some cases no substantial down payment is required. This, from a certain aspect, could imply that leasing provides 100 percent financing. Especially since most of the front end charges, including sales tax, delivery, installation,

and others are added to the lease payments.⁷⁸ Thus, leasing avoids any heavy initial outflow of capital that is common in debt financing.

With regard to the convenience aspect of leasing, it is argued that bookkeeping may be simplified since⁷⁹ lease payments are constant over the term of the lease. Also, the fixed nature of lease rentals allows more⁸⁰ accurate forecasting of cash needs. In addition, there is no need to keep depreciation and interest records with lease contracts. Overall, leasing allows the firm to avoid many of the consequences associated with ownership. The lessor, rather than the lessee, must deal with problems of ownership. This allows the lessee to concentrate on its primary line of business.

Another assumed operating advantage of leasing is that it shifts the risk of obsolescence from the user to the owner, or, from lessee to lessor.⁸¹ This has tended to make leasing more attractive in high technology industries, (i.e., calculators, copy machines). However, only in the operational lease does the lessor bear the risk of obso-⁸² lescence. In the financial lease,⁸³ the risk of obsolescence is passed on to the lessee. When comparing lease

rates between operational and financial leases, the risk of obsolescence borne by the lessor in an operational lease is reflected by a higher lease rate.⁸⁴

In summary, there are unlimited operational advantages and disadvantages due to leasing. These advantages and disadvantages will vary depending on the type and terms of the lease, along with each prospective lessor and lessee.

QUESTIONABLE ECONOMIC ADVANTAGES TO LEASING

Over the past few years, many economic advantages to leasing have been reported by various writers. However, many of these advantages do not hold up after close observation.

It has been argued that leasing in itself will take a company out of the business of handling the type of asset it leases.⁸⁵ This is true only for the operational type leases. In most financial and sale-leaseback leases, the burdens of ownership, maintenance, insurance, and taxes are borne by the lessee.⁸⁶

Another proposed benefit of leasing is the argument that a lease arrangement shifts the risk of obsolescence from the lessee to the lessor.⁸⁷ With the exception of the operating lease, this is invalid. The lessee pays for services provided by the lessor. If risk taking is one such service, the lessee will pay higher leasing payments, and in the case of the financial lease, in which the contract is non-cancellable,⁸⁸ the lessee bears the risk of obsolescence.

Some analysts have suggested that leasing frees funds from financing fixed assets, which have a low

turnover, to invest the funds in current assets, which
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have a high turnover. Unfortunately, this claimed
advantage of leasing has a serious flaw. To conduct its
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business, a firm needs both current and fixed assets.
The optimal mix is set largely by technical factors and
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is not a matter in which management has wide discretion.
In general, a company's earnings are generated by all the
assets, not just the current assets.

One of the most widely used arguments in favor of
leasing is that it provides the firm with 100 percent
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financing. The avoidance of an initial cash outlay
may or may not be an advantage to leasing over buying.
The validity of this argument depends upon the financial
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position of the firm. If the firm is able to borrow,
it could attain additional financing to cover the
initial down payment, thus attaining 100 percent
financing.

Another highly debated argument for leasing is that
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it provides the firm with "off balance sheet financing".
In the past, the lessee had to disclose leases only as foot-
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notes to the audited financial statements. However, in
November of 1976 the Financial Accounting Standards Board
issued Statement No. 13 which requires the capitalization

of most types of financial leases.⁹⁶ Since 1977, only operating leases and a few financial leases remain uncapitalized. The omission of leases from the lessee's balance sheet tended to improve various ratios used by financial analysts.⁹⁷ As a result, the lessee's ability⁹⁸ to raise additional funds at lower rates was enhanced. However, it is highly unlikely that many financial analysts are fooled by the "off balance sheet" nature of leases.

One final argument for leasing is that tax savings enjoyed by lessors may be passed on to lessees, who have a lower tax rate.⁹⁹ In general, tax rate differentials between lessees and lessors may be a real leasing advantage, but not sufficient to guarantee leasing to be preferable to buying.¹⁰⁰ Also, there is no guarantee that the lessor will pass on this tax saving to the lessee through lower lease rates.

Many of the questionable economic advantages of leasing are the same ones stated in the economic advantages of leasing. This could imply that either many economic advantages assumed by firms are false or that many economic advantages depend on each individual type of firm.

LEASE ADVANTAGES - A SURVEY

From the viewpoint of the lessee, there may be many advantages to leasing. This section will consider the various benefits perceived by lessees. The data is derived from a 1975 study by Dr. John Martin and Dr. Paul F. Anderson. The sample consisted of two hundred of the largest industrial firms in the United States listed by Fortune Magazine.¹⁰¹ These firms represented a major segment of the potential market for industrial leases. The research instrument consisted of a lease case problem and a questionnaire. Respondents were asked to analyze the case problem using a methodology they would normally employ for financial lease decisions.¹⁰² The accompanying questionnaire was designed to develop data for a respondent profile and to obtain¹⁰³ information relevant to case analysis.

There were a total of 63 responses to the survey questionnaire. The following were the highest rated benefits of leasing as perceived by lessees.¹⁰⁴

Benefits received by lessees; Ranked in order of preference:

1. Leasing provides 100% financing.
2. Leasing provides long term financing without diluting control.
3. Leasing frees working capital for other uses.
4. Leasing avoids the problem of disposing of second-hand equipment.
5. Leasing allows piecemeal financing for small equipment.
6. Leasing protects the company against obsolescence of its equipment.
7. Leasing has a lower after tax cost.
8. Leasing allows the lessor to pass tax credits.
9. The tax deduction of lease payments increases cash flow.
10. Leasing leaves normal lines of credit undisturbed.

After analyzing the survey responses, it appears that most benefits are cash flow related. It should also be noted that many of the benefits listed were discussed previously in the "Questionable Economic Advantages of Leasing" portion of this paper. It can be detected that there is a discrepancy between the benefits which lessees

perceive and those which actually may be realized from lease transactions.

One factor that comes to light from Martin-Anderson's research is that many companies may not be aware of the true potential economic advantages of leases. This may be the result of a lack of knowledge on the part of the respondents. On the other hand, industry as a whole may be unaware of the sources of potential economic advantages of leasing.

The Martin-Anderson survey also demonstrated that most lessees used some form of lease-purchase model in making leasing decisions. Fifty-seven respondents indicated that they employed a formal financial analysis methodology in making lease versus purchase decisions. The traditional IRR and conventional NPV models were by far the most popular approaches among the respondents. The survey also indicated that many respondents performed two analyses; one to determine if the asset is worth acquiring, and the second was, should the asset be purchased or
105
leased.

Finally, the survey suggested that an opportunity may exist for lease marketers to educate industrial firms to lease-purchase models which more accurately
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reflect the financial advantages to leasing. Most

of the respondent firms which employ methods of analysis do not properly adjust for risk element in the decision. This, in turn, underestimates the true economic advantages of leasing. Again, this survey helps confirm that there is a derived inconsistency in the lease market.

ESTABLISHING A LEASE QUOTE

The results from the Martin-Anderson survey indicate that there is potential in pursuing a lease marketing strategy focused on buying shortages of the lessee. Here it would be desirable for the marketing financial analyst to have the capability of adapting to the specifics of the situation. Many lessors may find the marketing financial analyst approach to be highly relevant to their sphere of operations. The use of highly trained marketing financial analysts would allow lessors to introduce potential customers to more advanced lease analysis models. Thus, a properly presented financial analysis made which accurately portrays the economic benefits of leasing could have a major impact on a firm's lease-or-purchase decision. Market analysts could make presentations stressing certain specific economic benefits relevant to each individual lessee. Included in this presentation would be the many services available in a lease package. Various services (previously mentioned) such as maintenance, financing, equipment disposal, and other related services could be stressed. Along with the various services, the lessor may offer the lessee contracts in two basic forms.

The first is called the "straight (level rental plan) lease", which obligates a firm to make a series of identical payments over the life of the asset.¹⁰⁷ This lease agreement simplifies bookkeeping and allows a more accurate estimate of future cash flows.

The second type of lease contract offered is called a "modified lease". This contract provides several options to the lessee. The "option-to-terminate" plan allows the lessee to gain a release from the lease agreement prior to its expiration date.¹⁰⁸ As a result of this option, rental payments may be affected in two ways: (1) the total rental amount may be increased as a cost of providing an option to terminate, or (2) the lease agreement may provide for acceleration of payments. By accelerating the lease contract, a substantially large "balloon payment" would be incurred by the lessee upon terminating the contract.¹⁰⁹ The second possible option available under a modified lease contract is an "option-to-purchase" plan. This option gives the lessee the right to purchase the asset at a declining price after each year of the lease period.¹¹⁰ In most cases, the rental payments are neither increased nor accelerated.

Also, the longer the lessee waits before exercising the option, the greater the total cash outlay for the asset.¹¹¹ It also should be noted that extreme care must be exercised in setting up this type of lease contract; the "option-to-purchase", in many cases, turns a lease contract into a purchase contract for both taxing and financial reporting purposes.

Pricing represents a unique problem for the lessor. For some manufacturers, both a sales price and a lease rate must be determined for the same product.¹¹² In many instances, a lessor will establish a lease quote by negotiating a lease in such a manner that the present value of the lease payments plus the present value of the residual equals or exceeds the cost of the equipment.¹¹³ John J. Clark lists several observations that a lessor should make in developing a lease quote:¹¹⁴

- (1) A higher expected residual value lowers the minimum acceptable rental, and vice versa.
- (2) The residual value is discounted at a higher rate due to the uncertainty attached to the estimate. This uncertainty is greater with a long life asset.
- (3) If the lessee assumed the operating, maintenance, or insurance, the lessor might lower his bid.

- (4) If the lessor has tax advantages, economies of large-scale operations, or lower financing charges, some portion might be passed to the lessee in the form of lower lease payments.
- (5) The timing of the lease payment, whether at the beginning or end of the period, whether monthly or quarterly, affects the amount of the payment.
- (6) Many items are negotiable and depend on the positions of both lessor and lessee.

Another determinate of lessor's lease quote is the business cycle. During periods of tight money, firms may find it attractive to lease equipment rather than to finance its purchase with costly debt capital. During periods of recovery, lessors may be able to take advantage of changes in the investment tax credit. This change usually encourages additional capital investment. The tax savings from this increased investment may be passed to the lessee by lower lease rates.

As noted, the distinguishing feature of a tax oriented financial lease is that a substantial portion of the return to the lessor accrues from the income tax benefits associated with legal ownership of the leased asset. Such benefits include tax deductions for depreciation during the life of the asset and the investment tax credit on certain assets. An additional benefit from ownership is, of course, the return obtained by selling

the asset at the end of the lease term. The lessor must consider these ownership benefits in determining the lease payment necessary to provide the desired after tax return on the investment. Dr. Edward Dyl states in his article that to determine the size of lease payment required in a particular situation, four steps are required. The lessor must:

1. Determine the after tax rate of return desired on the investment;
2. Compute the present value of cash flows attributable to ownership of the asset; (i.e., tax benefits and residual value)
3. Compute the amount of the remaining principal and other costs that must be recovered through payments by the lessee;
4. Compute the after tax cash flow required from the lease payments and, thus, the before-tax lease payment required.

Using Dyl's approach, we will now attempt to establish a lease quote:

Assume that an independent lessor has purchased an asset to lease. The asset costs \$200,000, has a 10 year useful life and a 5% salvage value. The lessor uses sum-of-the-years digits depreciation and has a marginal tax rate of 48%. This example uses a financial lease, with annual payments for 10 years.

The effective interest rate on the loan, considering compensating balances is calculated using the formula:

$$I_E = \frac{I}{1 - C}$$

Where I_E is the effective earnings rate, I is the contract interest rate on the loan, and C is the compensating balance. The effective before-tax interest rate is:

$$I_E = \frac{14}{1 - .10} = 0.160; \text{ or } 16\%$$

The after-tax interest rate can be calculated by using the following formula:

$$I_{AT} = .16(1 - .48) = 0.08; \text{ or } 8\%$$

This indicates that the minimum after-tax return acceptable on the lease is 8%. Otherwise, the lessor would lose by leasing instead of selling. This example assumes that three types of ownership benefits accrue to the lessor; tax deductible depreciation, investment tax credits, and gain from the residual value. The computation of the present value of cash flows attributable to ownership are described in table 1.

TABLE 1

YEAR	(1) DEPRECIATION	(2) DEPRECIATION TAX DEDUCTION	(3) INVESTMENT TAX CREDIT	(4) RESIDUAL VALUE	(5) TOTAL CASH FLOW	(6) PRESENT VALUE FACTOR 8%	(7) PRESENT VALUES OF CASH FLOWS
1	\$36,363	\$17,454	\$20,000	0	\$27,454	.92593	\$25,421
2	32,727	15,709	0	0	15,709	.85734	13,468
3	29,090	13,963	0	0	13,963	.79383	11,084
4	25,454	12,218	0	0	12,218	.753503	9,206
5	21,818	10,473	0	0	10,473	.68058	7,128
6	18,181	8,727	0	0	8,727	.63017	5,450
7	14,545	6,982	0	0	6,982	.58349	4,074
8	10,909	5,236	0	0	5,236	.54027	2,829
9	913	438	0	0	438	.50025	219
10	0	0	0	7,920	7,920	.46319	3,668
					TOTAL		<u>\$82,547</u>

The book value in year 10 will be \$10,000; however, we assume that the estimated market value is not likely to equal the assets book value at the end of the lease term. Although a figure is hard to determine, the lessor estimates a sales price of \$6,000; this results in a \$4,000 book loss. Thus the value of the tax loss benefit will be \$1,920 ($\$4,000 \times .48$). This results in a total cash flow from the residual value of the asset of \$7,920 ($\$6,000 + \$1,920$). The Lessor used an 8% discount rate to cover the 8% required after-tax rate of return.

In addition to the primary cost (\$200,000), the lessors must add any direct costs associated with the lease agreement (i.e., legal fees, bookkeeping, etc.). Direct costs have been estimated at \$1,000, making the total cost \$201,000.

By subtracting the initial costs recovered through ownership of the asset \$82,547, from the total asset cost \$201,000, the sum that must be recovered from the lessee from lease payments \$118,453 can be determined.

The lessor's after-tax cash flows from lease payments must provide \$118,453 plus the 8% required rate of return. Thus, the annual lease payment can be computed by the following formula:

$$\$118,453 = L_{AT} + L_{AT} \sum_{t=1}^9 (1+I_{AT})^{-t}$$

where L_{AT} is designated as the required annual after-tax proceeds and I_{AT} is the required after-tax return (8%). Because the initial payment is assumed to occur at the beginning of the lease, it is not discounted. Thus, the new formula appears as:

$$\$118,453 = L_{AT} + L_{AT} \sum_{t=1}^9 (1+I_{AT})^{-t}$$

where $\sum_{t=1}^9 (1+I_{AT})^{-t}$ is the present value of an annuity for 9 periods at interest rate I per period. Substituting this value into the formula, L_{AT} can be solved as follows.

$$\$118,453 = L_{AT} + L_{AT} (6.7472)$$

$$L_{AT} = \frac{\$118,453}{(7.7472)} = \underline{\underline{\$15,290}}$$

Because income tax deductions have already been considered in determining this value, the lease payments will be taxed at the marginal rate 48%. Therefore, the before-tax lease payments that the lessor must receive are:

$$L_{BT} = \frac{L_{AT}}{1-T} ; \quad L_{BT} = \frac{15,290}{1-.48} = \underline{\underline{\$29,403}}$$

The 10 annual lease payments of \$29,403 will provide the 8% rate of return required by the lessor.

In the final analysis, the long term profitability of a lessor's leasing program will depend on how well various economies of scale are mastered. To the extent that a given lease contract results in an economic advantage to

the lessee, both parties to the transaction will benefit. The next section of this paper will analyze how various lessors and lessees analyze these various economic benefits by using financial models.

LEASING MODELS - AN ANALYSIS

A financial model is a method used by many firms in capital asset acquisition decisions. The model will usually reflect the potential benefits between two different methods of financing being used in obtaining an asset. Many models exist for evaluating lease/purchase decisions. Some evaluation models produce decisions inconsistent with other models. This reflects the fact that not all lease/purchase models consider the same factors.

In determining a lease market strategy, a lessor, either a manufacturer, or any other type, must identify the potential economic benefits which the consumer gains from leasing. The lessor must then be able to communicate these benefits to potential customers. In order to determine the potential benefits of leasing, a lessor must first understand a lessee's decision process. Thus, the initial part of this section will be devoted to lease versus purchase decision models used by lessees, then to lease versus sell.

In discussing the lease versus purchase as a financial decision, it is assumed that use of the asset is desirable

but must be accepted prior to selecting the optional mode of financing. The lease/purchase decision rests on the evaluation of different cash flows between the alternatives of leasing and purchasing. Establishing the proper differential cash flows to be evaluated requires that the firm first identify all cash inflows and all cash outflows associated with leasing rather than purchasing. Once the cash flow streams have been developed for the different alternatives, the streams should be discounted to reflect the time value of money.

To facilitate comparisons among different approaches, all of the models have been converted to equation form using a common set of variables. The following symbols and definitions will be employed throughout this section.

SYMBOLS

A_0	=	Cash purchase price of the asset.
R_i	=	Lease payment required in year i for the lessee.
$D_{i(A)}$	=	Depreciation charge for year i allowed for tax purposes.
I_i	=	Interest on a loan or loan equivalent in year i (primes indicate different methods of computing the equivalent loan).
$O_{i(A)}$	=	Total pretax operating costs expected to occur in year i (estimated by the lessee).

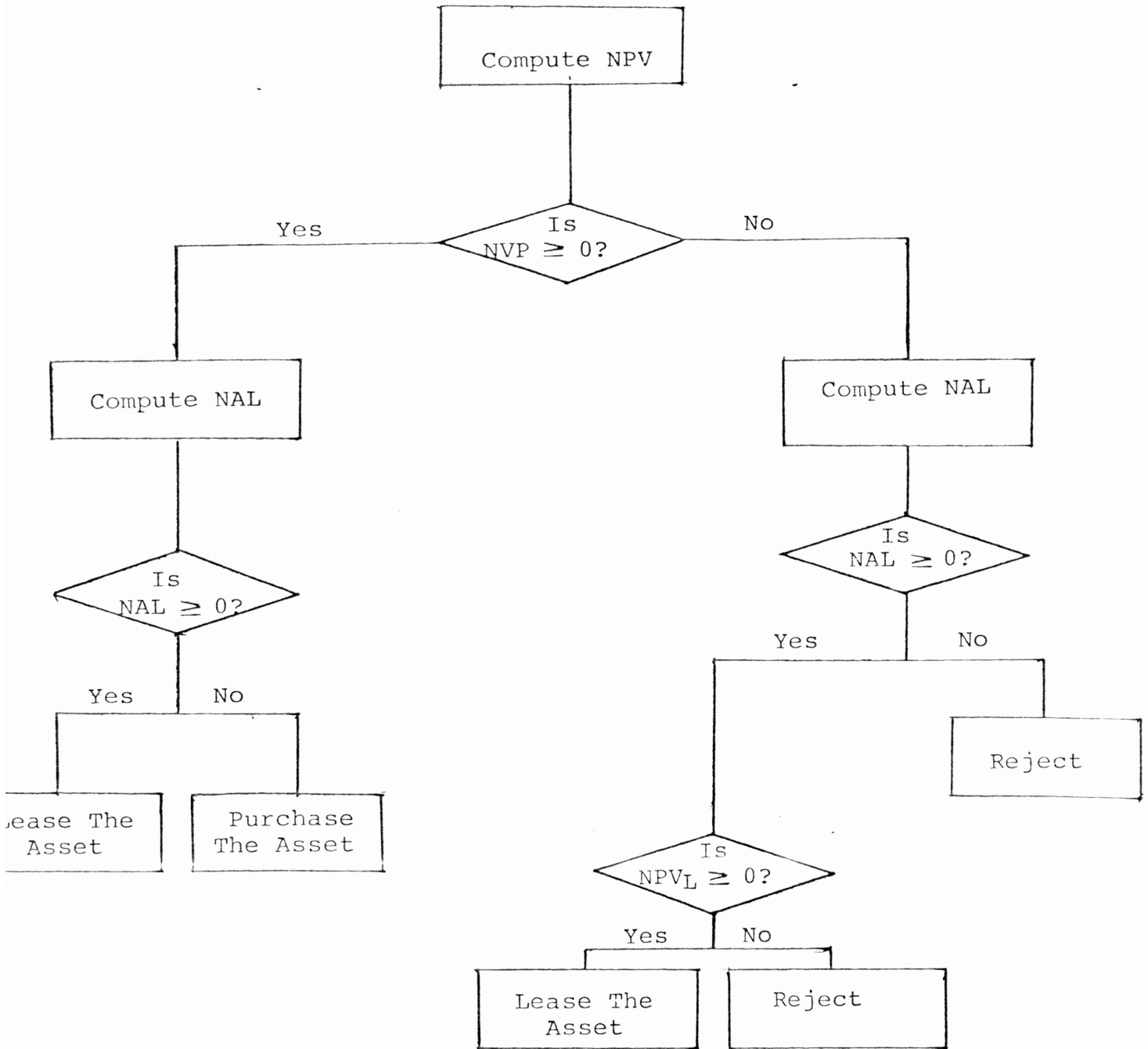
$O_{i(B)}$	=	Total pretax operating costs expected to occur in year i (estimated by the lessor)
$D_{i(b)}$	=	Depreciation charge for year i allowed for tax purposes for the lessor.
$V_{N(A)}$	=	Lessee's estimated after-tax salvage value of the asset at the end of year M .
$V_{N(B)}$	=	Lessor's estimated after-tax salvage value of the asset at the end of year M .
B_i	=	Proportion of debt used to finance the asset.
L_i	=	Payment of principal and interest on a loan or loan equivalent in year i .
N	=	Useful economic life of the asset in years.
t	=	Corporate average and marginal tax rate on ordinary income.
K_t	=	After-tax weighed average cost of capital for the firm.
r	=	Pre-tax interest rate on intermediate term debt.
r_t	=	$r(1-t)$; after-tax interest rate on intermediate term debt.
I_i	=	The interest on the debt that must be repaid if the asset is leased to maintain the firm's desired capital structure.
K_s	=	Discount rate used to find the present value of V_N .
NAL	=	Reflects the cost saving associated with leasing net of the opportunity costs if not purchased.

Probably the most frequently used discount cash flow model for determining if the proposed project is profitable is the Conventional Net Present Value Model (1). The basic formula for equation (1) NPV appears as:

$$\text{NPV} = -\text{IO} + \sum_{i=1}^N \frac{A^N}{(1+k)^N} \quad (1)$$

This model employs a technique of establishing after-tax net cash flows A^N attributable to a specific project occurring in a future time period (N). These cash flows are then discounted back to time 0 by the $(1+K)^N$; where N is the specific time period; and K is the discount rate and required rate of return, or the cost of capital. The projects NPV gives a measurement of the absolute value of the proposed project. If cash inflows are greater than the initial outlay [IO], making NPV positive, the project is profitable and in most circumstances should be accepted. The NPV model develops a "yes" or "no" answer, whereas the Internal Rate of Return Model (IRR) (discussed later) indicates the yield or return on the project. After calculating the NPV (1) for a project, the most profitable method of financing must be obtained. Figure A contains a flow chart that can be used

FIGURE A



in performing lease purchase analysis. Tracing the chart, an analyst first calculates NPV. If NPV is positive, then NAL (Net Advantage of Leasing) is computed. The NAL is the factor which determines the most profitable method of financing for obtaining the asset. If NAL is positive then leasing is preferred to normal debt-to-equity financing. The NAL formula is based on the difference between cash flows from different methods of financing. In more general terms the NAL could be expressed as a ΔV factor in the following lease decision model:

$$\Delta V = NAL = NPV_L - NPV_P \quad (2)$$

here NPV_L is the net present value to leasing, NPV_P is the net present value to purchasing, and ΔV is the change in value on NAL. This model can be implemented into a series of steps leading to a lease/purchase decision.

ΔV can also be expressed in more general terms such as:

$$\Delta V = \text{Present value of cash inflows} - \text{Present value of cash outflows}$$

A complete specification of the different value of leasing (ΔV) appears as:

$$\Delta V = A_0 + \sum_{i=1}^N \frac{(1-t)O_i}{(1+k_t)^i} - \sum_{i=1}^N \frac{(1-t)R_i}{(1+r_t)^i} - \sum_{i=1}^N \frac{tD_i}{(1+r_t)^i} - \sum_{i=1}^N \frac{tr_t B_i}{(1+r_t)^i} - \frac{V_n}{(1+k_t)^n} \quad (3)$$

A review of equation (3) shows that the first two variable cash inflows associated with leasing rather than purchasing. A_0 , the initial cash outlay for the asset if purchased at time 0, and $(1-t) O_i$, the after tax costs, for maintenance and repairs are both incurred if the asset is purchased. For the operating lease, the lessor rather than the lessee, assumes the maintenance cost, therefore, this factor represents a cash inflow if the asset is leased. The discounting factor K , the firm's cost of capital; used to discount the maintenance O_i and salvage value V_N variables assumes that these cash flows are riskier than the other variables which are discounted by r , the firm's cost of debt. If an analyst was considering a financial lease, the lessee would incur all the maintenance cost and the O_i term would be zero, thus dropped from the equation.

The last four factors of equation (3) represent cash outflows to the lessee. The first $(1-t)R_i$ implies that the full lease payment is tax deductible, therefore, the actual cash flow forgone by the lessee is after-tax. This is followed by the tD_i variable which represents

the depreciation tax subsidy attributable from ownership. These periodic depreciation charges offer a tax shelter which is forgone when the asset is leased rather than purchased. The next variable $tr_i B_i$, is the interest expense tax subsidy forgone when a firm leases an asset instead of using debt financing. Letting B represent the proportion of debt used to finance the asset and r_i the interest rate charged on the outstanding debt, the cash flow forgone can be calculated by multiplying it by the firm's marginal tax rate t , or $tr_t B_i$. Note that these three variables are discounted using r_t , the firm's cost of debt financing. This shows the relative certainty of these cash flows. The final cash outflow variable V_N , is the after-tax salvage value of the asset when sold at time period N . The present value of this forgone cash flow is determined the discount factor K , the firm's cost of capital.

The decision rule for this type of model is to lease if ΔV is positive. If ΔV is negative, the firm acquiring the asset would lose money by leasing rather than using debt financing. From the standpoint of developing financial models, all are similarly related.

While a number of problems were alleviated in the prior discussion of the ΔV (3) model, its purpose was to build a base for further discussion of more lease/purchase models.

124

The Conventional NAL MODEL

$$\begin{aligned}
 \text{NAL} = & \sum_{i=1}^N \frac{Li}{(1+k_t)^i} - \sum_{i=1}^N \frac{Ri}{(1+k_t)^i} - \sum_{i=1}^N \frac{tDi}{(1+k_t)^i} + \sum_{i=1}^N \frac{tRi}{(1+k_t)^i} - \\
 & \sum_{i=1}^N \frac{tIi}{(1+k_t)^i} + \sum_{i=1}^N \frac{Oi(1-t)}{(1+k_t)^i} - \frac{Vn}{(1+k_t)^n} \quad (4A)
 \end{aligned}$$

This model is the best known for the conventional approach; especially in the late 1960's. One major difference from the previous model is that 100% financing (Li) is assumed rather than a cash purchase price (A_0). However, the conventional model still uses the after-tax cost of capital k_t as the appropriate discount rate. A number of criticisms have been leveled against the conventional methodology. One such criticism is the conventional model reflects the intermingling effects of the tax shields and the amount of financing provided by each alternative. In other words, alternative means of financing are always available to the firm, so the lease or buy decision should focus on the differential tax effects of the two alternatives and should

not be influenced by the amount of financing provided
¹²⁵
 by each plan. Another criticism is the assumption
 of 100% financing L_i for the purchase alternative. Most
 financial institutions require the borrower to put forth a
 portion of the asset's cost. The three principal cash
 inflows for the lease alternative are: The payment of
 principal and interest L_i and the operating costs O_i for-
 gone by leasing instead of purchasing; and the savings
 from the tax deductible lease payments tR_i . The cash
 outflows are the actual lease payment R_i ; the lost depre-
 ciation tax subsidy tD_i ; the tax deductible interest
 expense from the debt tI_i , and the lost cash from selling
 the salvaged asset V_n . The major difference between the
 ΔV model (3) and the conventional NAL model is that the
 conventional model uses k , the firm's cost of capital
 to discount all cash flows. The decision criteria for
 the NAL model is lease if NAL is positive and purchase
 if NAL is negative.

By altering the positions of addition and subtrac-
 tion signs, the NAL Model (4A) can be converted for use
 by a lessor:

$$\begin{aligned}
 \text{NAL} = & - \sum_{i=1}^N \frac{L_i}{(1+k_t)^i} + \sum_{i=1}^N \frac{R_i}{(1+k_t)^i} + \sum_{i=1}^N \frac{tD_i}{(1+k_t)^i} - \sum_{i=1}^N \frac{tR_i}{(1+k_t)^i} + \\
 & \sum_{i=1}^N \frac{tI_i}{(1+k_t)^i} - \sum_{i=1}^N \frac{O_i(1-t)}{(1+k_t)^i} + \frac{V_n}{(1+k_t)^n} \quad (4B)
 \end{aligned}$$

Equation (4B) can be used by a lessor in determining if the leasing alternative will be beneficial. The same variables are used in equation (4A). However, the differences in NAL between equation (4A) and (4B) arise from the difference between the lessor's and lessee's: depreciation method; tax rate; cost of debt; estimate of operating and maintenance costs; estimate of residual salvage value; and most of all, the discounting factor (k). The lessor, too, uses the same decision criteria as the lessee; lease if NAL is positive and sell if NAL is negative.

126

Weston and Brigham Model (1972)

$$\begin{aligned}
 \text{NAL} = & \sum_{i=1}^N \frac{L_i}{(1+r_t)^i} - \sum_{i=1}^N \frac{R_i}{(1+r_t)^i} - \sum_{i=1}^N \frac{tD_i}{(1+r_t)^i} + \sum_{i=1}^N \frac{tR_i}{(1+r_t)^i} \\
 & - \sum_{i=1}^N \frac{tI_i}{(1+r_t)^i} + \sum_{i=1}^N \frac{O_i(1-t)}{(1+r_t)^i} - \frac{V_n}{(1+k_t)^n} \quad (5A)
 \end{aligned}$$

This equation was listed as one of the most popular used
in industry today by the Martin-Anderson Survey.¹²⁷ The
major difference between the Weston and Brigham model (5A)
and the Conventional model (4A) is that r_t has replaced
the cost of capital k_t as the discount rate in order to
adjust for the "relative certainty" of the cash flows.¹²⁸
Note that the after tax salvage value V_n is still discounted
by the firm's cost of capital k_t . This assumes that the
salvage value is as risky as the other assets in the firm.
Probably the biggest criticism from this model is because
it assumes 100% debt financing (like equation 4A). Also,
the different debt structures between firms will effect
the discount factor r_t , thus, giving different results
for comparison purposes. Finally, the use of r_t as a
discount factor implies the relative cash flows are vir-
tually risk free - not always true in todays financial
atmosphere. Like equation (4A), the Weston Brigham equa-
tion (5A) can be altered to reflect the decision process
of the lessor rather than the lessee. Equation (5B)
shows equation (5A) from the lessor's viewpoint:

$$\begin{aligned}
\text{NAL (LESSOR)} = & - \sum_{i=1}^N \frac{Li}{(1+r_t)^i} + \sum_{i=1}^N \frac{Ri}{(1+r_t)^i} + \sum_{i=1}^N \frac{tDi}{(1+r_t)^i} - \\
& \sum_{i=1}^N \frac{tRi}{(1+r_t)^i} + \sum_{i=1}^N \frac{tIi}{(1+r_t)^i} - \sum_{i=1}^N \frac{Oi(1-t)}{(1+r_t)^i} + \frac{Vn}{(1+k_t)^i}
\end{aligned} \tag{5B}$$

As with equation (4B) the Weston and Brigham equation (5B) is the same as the lessee's models (2A) and (3A) except the addition and subtraction signs are changed. And again, if NAL lessor is positive, it is profitable to lease rather than to sell. Only if NAL is positive for both lessor and lessee will a lease transaction take place. As with the Conventional Model, the difference in tax subsidies, costs, and value estimates between the lessor and lessee enable a collusion which is beneficial for both.

129

Bowen Herringer, Williamson Model

$$\begin{aligned}
\text{NAL} = & A_0 - \sum_{i=1}^N \frac{Ri}{(1+r_t)^i} - \sum_{i=1}^N \frac{tD}{(1+k_t)^i} + \sum_{i=1}^N \frac{tRi}{(1+k_t)^i} - \\
& \sum_{i=1}^N \frac{tIi}{(1+k_t)^i} + \sum_{i=1}^N \frac{Oi(1-t)}{(1+k_t)^i} - \frac{Vn}{(1+k_t)^n}
\end{aligned} \tag{6A}$$

The Bowen, Herringer, Williamson Model (6A), referred to as the BHW model is almost identical to the change

in value model (equation 3). The only difference lies in the calculation of the equivalent interest tax shield (marked by double primes). Both equations use r_t as the discount rate for the lease payments in recognition of the greater certainty of this contractual cash flow. This indicates that recognition of the differential risk of the cash flows involved in the leasing analysis requires the use of different risk adjusted discount rates.¹³⁰ The other cash flows in this equation are discounted by k_t to indicate relative risk equal to the firm. However, one criticism contends that operating expenses O_i , too, are fixed charges subject to little uncertainty, yet they are discounted by k .

The major computational difference between the BHW model (6A) and the other previously discussed models concerns the calculation of the interest tax shield t_i .¹³¹ The loan payments in the BHW model are proportional to the lease payments. This proportion is calculated by dividing the required loan by the present value of the lease payments. Thus, in most cases the BHW (6A) creates a larger interest tax shield. Like the previously discussed models, the BHW (6A) can be converted to reflect the cash flows from a lessor's perspective. The same characteristics listed above would still be true, with the exception that now the lease receipts (for the lessor) would be proportional to the loan payments (if purchased by the lessor).

MARTIN-ANDERSON MODEL (1979)

$$\begin{aligned}
 \text{NAL} &= \sum_{i=1}^N \frac{O_i(1-t) - R_i(1-t) - tI_i - t \cdot I_i - tD_i}{(1+r_t)^i} - \\
 &\frac{V_n}{(1+k_s)^1} + A_0
 \end{aligned} \tag{7A}$$

This model has been noted for both its simplicity and its effectiveness. Although this model is quite similar to other models in context, it emphasizes the leverage effects of leasing. This is represented by the variable I_i , the lost interest tax shield on the debt "displaced" by the lease. Since leasing involves 100% levered financing, the firm uses up more than the leased asset's allotment of leverage. To adjust, the firm will retire a proportional part of its debt in order to maintain its target debt-equity ratio. With the exception of V_n , the cash flows are discounted by the firm's new interest rate on borrowed funds. The argument for using the firm's borrowing rate to discount these tax shelters is based upon the high degree of certainty. However, two possible sources of uncertainty with regard to these tax shelters are: (1) the possibility of a change in the firm's tax rate; and (2) the possibility of bankruptcy.

Like the other NAL models, equation (7A) can be written to express the NAL decision process for a lessor.

$$\begin{aligned}
 \text{NAL} = & \sum_{i=1}^N \frac{-O_i(1-t) + R_i(1-t) + tI_i + t \cdot I_i + tD_i}{(1+r_t)^i} + \\
 & \frac{V_n}{(1+k_s)^i} - A_0
 \end{aligned} \tag{7B}$$

Equation (7B) represents the cash inflows and outflows viewed by the lessor. The presence of O_i , the cost of maintenance, implies an operational type lease. The lessor will use this model to determine if the lease alternative is more beneficial than the purchase alternative and again, a positive NAL will be the decision factor.

135

Internal Rate of Return Model

$$\begin{aligned}
 0 = & A_0 - \sum_{i=1}^N \frac{R_i}{(1+P_t)^i} - \sum_{i=1}^N \frac{tD_i}{(1+P_t)^i} + \sum_{i=1}^N \frac{tR_i}{(1+P_t)^i} + \\
 & \sum_{i=1}^N \frac{D_i(1-t)}{(1+P_t)^i} - \frac{V_n}{(1+P_t)^n}
 \end{aligned} \tag{8}$$

The proponents to internal rate of return point to the avoidance of selecting an appropriate discount rate. In addition, survey results (in Martin-Anderson) have

indicated the IRR models are more easily interpreted by practitioners who are making financial decisions. Equation (8) represents a lessor's return model which is designed to calculate the effective yield on a lease to the lessor.

Although there are varied forms of IRR models, the majority are simply variations of the traditional approach above (8). The IRR model solves for P_t , the after-tax cost of leasing. The decision rule is to lease if $P_t < r_t$, where r_t equals the after-tax interest rate on a similar amount of intermediate-term debt.

Overall, equation (8) calculates the discount rate which equates the present value of lease cash flows with the purchase cash flows. The resulting factor is determined to be the interest cost of leasing or the implicit interest charge incurred by the lessee. If this rate is below the firm's debt cost, it is less expensive to lease than it is to purchase the asset with borrowed funds.

SUMMARY

It has been demonstrated that there is a good deal of similarity among lease/purchase and lease/sell decision models. It was noted at the beginning that a lessor's

analysis model is largely the reverse of the lessee's analysis model. For the lessee, the decision to lease or purchase an asset begins by computing the differential value of leasing over purchasing. This computation values the differential cash flows between the alternatives of leasing and purchasing. The same process is generally true for the lessor. For NAL methodologies, the decision to lease or purchase (sell) is based upon NAL value, if positive - lease; if negative - buy (assuming the project is feasible). Based on the different cash flow estimates (i.e., maintenance, depreciation, debt, tax credits, salvage value) between the lessor and the lessee, both can have a positive NAL. When this happens, a lease transaction (rather than sale) will benefit both the lessor and lessee. Also, the cost of debt r and cost of capital k used to discount the cash flows, will cause a variance in the NAL value for the lessor and lessee. Overall, a positive NAL insinuates a good possibility of a leasing transaction to occur. However, it should be noted that in some instances a lessee or lessor might consider other factors of leasing, such as convenience, over a positive or negative NAL in the final decision. For this reason, lessors should emphasize other factors other than lease/purchase models when marketing leases.

SURVEY DESIGN

The purpose of this survey is to determine what financial analysis methodologies currently are employed by industrial firms in establishing lease quotes and to make lease-vs-sell decisions. The sample consisted of 75 medium sized industrial firms listed in Dun and Bradstreet's Million Dollar Directory Vo. I. A wide variety of various leasing firms was attained from this sample. A majority of the sampled firms could be categorized in transportation, oil equipment, construction equipment, manufacturing equipment and industries.

A major concern of this study was the attainment of a reasonable response rate. It was believed that firms operating in competitive industries would be leery about exposing their market techniques. But it was also determined that because of the nature of a competitive market, those firms would tend to have a greater interest in the survey results. Therefore, a reasonable response rate should be expected.

The research instrument consisted of a personal title letter explaining the survey, a four page questionnaire, and a final page defining financial, operating,

and sale-leaseback leases. (A survey questionnaire is located in the Appendix.) Respondents were asked to answer the appropriate survey questions. The questionnaire was designed to develop data for a respondent profile and to obtain information relevant to the lease title. The profile questions focused on such things as the respondents position within the firm, the type of assets leased by the firm, the industry classification of the company, the services provided, the dollar value of annual lease commitments, the type of leases offered by the firm, and the total lease revenue in 1978. The respondents were also asked to rank a list of eight economic advantages of leasing emphasized when negotiating lease contracts with lessees. In addition, the respondents were asked to indicate the decision methodology used in setting lease rates. They were also asked the source of their analytical technique. If no current formal methodology was being used, the respondent was asked to disclose what other factors were used in setting lease rates.

Since a low response rate was anticipated, various techniques were employed in an effort to increase the number of returns. One such technique was the simplicity

of the questionnaire, which required very little time to complete. Another method was an appendix defining the various leases and characteristics of each. Respondents were also asked to enter their name and address if they desired a copy of the results. All correspondence with the firms was personalized in the belief that this would have a favorable effect on the response rate.

Overall, it was hoped that both the simplicity and the personal approach would initiate a higher response rate.

SURVEY RESULTS AND CONCLUSION

Returns were received from eighteen companies, a response of 25 percent. The following tables present a profile on the characteristics of the respondents as received from the survey questionnaire:

2. Level of Responding Department within the Company

<u>Department</u>	<u>Number of Firms</u>
Corporate headquarters	18
Division	0
Subsidiary	0
	<hr/>
TOTAL	18

3. Type of Assets Leased by the Firm

<u>Asset</u>	<u>Number of Firms</u>
Manufacturing, construction	6
Agriculture, forestry	0
Mining, petroleum refining	4
Transportation	3
Communication	2
Computer, software	1
Office equipment	2
	<hr/>
TOTAL	18

4. Fiscal Year 1978 Asset Volume of Firms

<u>Volume</u>	<u>Number of Firms</u>
500 Million - Over	0
100 Million - 500 Million	1
50 Million - 100 Million	8
1 Million - 50 Million	9
Less than 1 Million	0
TOTAL	18

5. Type of Leasing Provided by Firms

<u>Lease Type</u>	<u>Number of Firms</u>
Operational only	5
Financial only	3
Operational and financial	7
Sales/Leaseback	2
Other (Net Net Lease)	1
TOTAL	18

6. Types of Lease Services Provided by Firms

<u>Type</u>	<u>Number of Firms</u>
Maintenance and service	16
Finance	5
Others* (see below)	6
TOTAL	27

*Six firms stated that they provided a field analyst to help the lessee choose the best type (size, etc.) of equipment.

7. Survey Ranking of Most Persuasive Economic Advantages Used by Lessors (In Rank Order)

Type (Rank)

1. Leasing eliminates maintenance, service, and administrative problems.
 2. Leasing allows more flexibility and convenience.
 3. Leasing provides 100% financing.
 4. Leasing avoids risk of obsolescence.
 5. Leasing conserves working capital.
 6. Leasing preserves a firm's credit capacity.
 7. Lease payments are taxable expense.
 8. Leasing is easier than borrowing.
-

8. Number of Responding Firms Reporting Use of Formal Model in Setting Lease Rates

<u>Analysis Method</u>	<u>Number of Firms</u>
Do employ formal method	0
Do not employ formal method	18
TOTAL	18

All eighteen respondents stated that they did not employ a formal lease model to set lease rates. The questionnaire allowed respondents to comment on what methods, if any, they

did use in setting lease rates. All eighteen stated that market conditions were a major factor used in setting lease rates. Three respondents stated that market forces, elasticity of demand, and economic pressures were the basis for setting lease rates. Another respondent stated that lease rates were set three to five points above the market prime interest rate. Four others stated that they set lease rates two to three percent over the specific lessee's cost of debt.

After analyzing the following responses, it appears that leasing is more expensive than purchasing to the lessee. However, the lease rate is only one of many factors to be considered by the lessee in lease versus purchase decisions. If a lessee finds that other cash flow items such as tax saving, avoidance of maintenance, and other benefits previously discussed outweigh the high lease rate, they will lease rather than purchase. Also, the survey responses seem to imply that most firms lease assets for convenience or because they have no other alternative. It also appears that in most cases, the lessor has the superior position in negotiating lease contracts, especially during a business cycle of tight market conditions, when some businesses have difficulty in obtaining credit to buy capital

equipment. Overall, the total dollars paid to the lessor will often be quite large compared to the initial cost of the asset (see lease quote example). Payments to the lessor must include not only amounts sufficient to cover the lessor's initial investment outlay but also enough to provide a return on investment for the lessor. Also, lessors charge higher rates in operating type leases to compensate for the maintenance and service cost along with the potential risk of obsolescence. Also, in financial type leases, higher rates result from benefits such as 100% financing, preserved credit capacity, flexibility and convenience. From one point of view, this survey indicates that most lessees realize that they pay for the added benefits of leasing provided by lessors. On the other hand, it is interesting to compare the list of persuasive economic benefits with the questionable potential economic benefits perceived by lessees as discussed earlier in the paper. It can be seen that there is a discrepancy between the benefits which lessees perceive (perhaps from lessor's advertising) and those which actually may be realized from lease transactions. A question could arise that some firms may be leasing in hope of attaining illusory economic advantages. Because of the

confusion over the "true" benefits of leasing, a lessor may be in a position to take advantage of a lessee. In fact, some lessor promotional brochures do reveal that many of the questionable economic benefits (listed earlier) are employed in marketing leases.

CONCLUSION

The results of this survey and study of publishing leasing literature has made it clear that there is a wide discrepancy between leasing theory and the actual lease market. Also, after researching a magnitude of leasing material, it is clear that very little research has been conducted concerning the lessor. It is evident that in the actual market, there are many inconsistencies as to what are "true" economic benefits of leasing. This has unfolded into what could be biased promotional advertising by the lessor. On the other hand, these differences could arise due to the lessee's lack of lease benefits information.

The survey results indicate, perhaps due to a poor sample, that there is a great potential for lessors to pursue a lease pricing strategy. This strategy could include a sales force properly trained on the economic benefits of

leasing with the background and expertise to make an effective financial presentation. This type of activity may deter a lessor away from the "follow the leader" type strategy of using market conditions or business cycles as a basis for setting lease rates. Another pricing strategy could include formal leasing models such as the "NAL" discussed earlier. The use of these formal cash flow models help insure the lessor a required rate of return on the leased assets, and from the standpoint of long-term profitability. A lessor who maintains high quality service and maintenance will stretch the useful life of an asset and also receive a higher price upon its disposal.

In the final analysis, a lessor will profit based upon how well the firm markets the "economics of leasing" and how "effective" lease rate are determined. The basis of this research was to analyze the economic benefits of leasing (especially from the lessee's perspective) and to discuss possible formal methodologies lessors can use for setting lease rates based on these advantages. Overall, it can be concluded, as previously stated, that there is a vast potential for lessors to implement a marketing strategy stressing a program for promoting the economic benefits

of leasing along with some type of formal methodology for setting lease rates. If both ingredients are achieved, then both the lessor and the lessee will benefit.

- APPENDIX -

TEXAS A&M UNIVERSITY
COLLEGE OF BUSINESS ADMINISTRATION
COLLEGE STATION, TEXAS 77843
713-845-3514

Department of
FINANCE

October 30, 1979

Dear Sir,

Enclosed is a questionnaire which is designed to collect information on the pricing of financial leases. This questionnaire provides the data for a research project I have undertaken in conjunction with the University Fellows Honor Program here at Texas A & M University. (This project allows a select group of students the opportunity to propose, conduct, and report a research project.) The project I have undertaken is entitled "A Survey of Lease Purchase Models Used by Lessors".

Your cooperation in returning the enclosed questionnaire is essential to any research project's success.

Especially, I am attempting to answer the following questions in my research effort:

1. What formal models do lessors use in setting lease rates?
2. What type of services do leasing companies provide?
3. What type of persuasive tactics do lessors use in selling leases?

Any responses will be held strictly confidential. Your participation in this survey will be truly appreciated. Also, if you would like a copy of my final results, please fill out the appropriate section of the questionnaire with your name and address and I will send you a copy. Thank you for your participation.

Sincerely,

Patrick R. Gordon

TEXAS A & M UNIVERSITY
UNDERGRADUATE LEASING SURVEY
DEPARTMENT OF FINANCE

GENERAL INFORMATION

1. YOUR POSITION IN THE COMPANY _____.
2. YOUR DEPARTMENT _____.
3. YOUR DEPARTMENT LEVEL WITHIN THE CORPORATION:
 - A. Corporate headquarters
 - B. Division
 - C. Subsidiary
 - D. Other _____
4. TYPE OF ASSETS LEASED BY YOUR FIRM:
 - A. Manufacturing, construction
 - B. Agriculture, forestry
 - C. Mining, petroleum, refining
 - D. Transportation
 - E. Communication
 - F. Computer, software
 - G. Office equipment
 - H. Other (please specify) _____
5. FISCAL YEAR 1978 ASSET VOLUME OF YOUR FIRM:
 - A. 500 million--over
 - B. 100 million--500 million
 - C. 50 million--100 million
 - D. 1 million--50 million
 - E. Less than 1 million
6. TYPE OF LEASING YOUR FIRM PROVIDES (See Definitions in Appendix A)
 - A. Operational
 - B. Financial
 - C. Sales/Leaseback
 - D. Other (please specify) _____
7. 1978 ANNUAL LEASE REVENUE OF YOUR FIRM:

8. TYPE OF LEASE SERVICES SUPPLIED BY YOUR FIRM:
 - A. Maintenance and service
 - B. Financing
 - C. Others (please specify) _____

9. TYPE OF PERSUASIVE CHARACTERISTICS OF LEASING EMPHASIZED IN YOUR SELLING LEASE CONTRACTS. PLEASE RANK IN TERMS OF THEIR IMPORTANCE.

- A. Flexibility and convenience
- B. No risk of obsolescence
- C. Conservation of working capital
- D. 100% financing
- E. Tax savings
- F. Ease of obtaining credit
- G. Eliminates maintenance, service, and administration problems
- H. Preserves firms credit capacity

(Please write on the back of this paper why you ranked characteristics as you did.)

LEASE RATE ANALYSIS

10. DOES YOUR FIRM EMPLOY A FORMAL MODEL FOR SETTING LEASE RATES?

NO

YES (please specify) _____

If "NO" please specify basis for setting lease rates:

11. IF POSSIBLE, PLEASE SPECIFY THE SOURCE OF METHODOLOGY YOU USE IN SETTING LEASE RATES (Formula, Model, Manual, Textbook, Policy, Market Forces, etc.).

Source: _____

Journal or magazine (if applicable): _____

Author(s): _____

Date of publication: _____

Title of article: _____

SPECIFIC INFORMATION

12. IF YOU WOULD LIKE A COPY OF THE RESULTS OF THIS SURVEY, PLEASE FILL OUT THE FOLLOWING:

Name _____

Company _____

Address _____

SPECIAL NOTE

All information received during this survey analysis will be held strictly confidential.

Please return this questionnaire to the following address:

Mr. Pat Gordon
Department of Finance
Texas A & M University
College Station, Texas 77843

"Definitions"

- 1) Operational Lease--A cancellable contract commitment on the part of the firm leasing the asset (lessee) to make a series of payments to the firm that actually owns the asset (lessor) for use of the asset.
- 2) Financial Lease--A non-cancellable contract commitment on the part of the firm leasing the asset (lessee) to make a series of payments to the firm that actually owns the asset (lessor) for use of the asset.
- 3) Sales/Leaseback--Arrangement that arises when a firm sells land, buildings, or equipment that it already owns to a lessor and simultaneously enters into an agreement to lease the property back for a specific period under specific terms.

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