# THE LEASE - PURCHASE PHENOMENON IN THE CAPITAL GOODS MARKET

by

MARVIN G. KIRBY

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Signature redacted

Signature of Author..... .....
Alfred P. Sloan School of Management

Signature redacted

Certified by..... .....
Thesis Supervisor

Signature redacted

Accepted by.....
Chairman, Departmental Committee on Graduate Students

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## ABSTRACT

Once a firm has decided to acquire a capital good, the lease - purchase question becomes an important financial and economic issue. This study reviews the various types of lease and purchase alternatives, along with the qualitative and quantitative considerations which enter into the lease or purchase decision. Those considerations, believed to be the most important to the decision, are given detailed consideration. This includes a detailed review of the functions performed by the lessor, the effects upon the corporate financial statement, accounting practices, and tax considerations.

A review is made of the various methods available for analyzing the lease or purchase decision. A methodology is presented to assist in the solution of this problem, along with a discussion of the sensitivity of factors, such as methods of depreciation, residual value, and useful life.

The results of interviews with a number of users (of capital goods), manufacturers, and banks, indicated the primary consideration in the lease or purchase decision centered around the questions of obsolescense and short term financial considerations. The methods used to evaluate lease or purchase, and the quality of the decisions, while improving over the past few years, still leave a great deal to be desired in many cases. It appears that the leasing industry, while undergoing many changes, will continue to grow in size and importance in the capital goods market.

Thesis Supervisor: Edward H. Bowman
Title: Professor of Management

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# INTRODUCTION

## Background

Signs reading "Buy or Lease" are a familiar sight on vacant lots and buildings. But in recent years the choice expressed in these words has become more than just the lure used by real estate agents to attract prospective clients. It has become an issue of great importance to the top management of companies in almost every industry, with implications reaching to the highest levels of corporate financial policy. And as the controversy over the relative merits of the alternatives has mounted, billions of dollars have been wagered on both sides.

Within the last two decades the very old method of financing-leasing appeared on the American financial scene. The concept of the lease in an ancient one, English common law was developed on the subject by 1800[1]. The definition of a lease is a simple one: the grant of one party to another of a right to use property for a period of time which is less than that of the owners right[2].

Leasing of real estate has been used in this country since its beginning. However, the use of equipment without ownership while

[1] Vincent J. Barry, Equipment Leasing, Management Bulletin 69, "Taking Stock of Leasing: A Practical Appraisal", American Management Association, 1965, p. 8.

[2] Barry, op. cit., p. 8.

certainly not a new idea, having been used by Bell Telephone since 1877[3], has had its major growth since World War II and is relatively new in terms of professional lessors.

The statistical growth of the equipment leasing industry has been impressive enough to interest all the finance companies and commercial banks. While there are no complete industry figures available, it has been estimated that well over $10 billion of equipment is under lease, about half of which is computers. Much larger yet is the value of real estate, ships, airplanes, or other major facilities under lease. Some studies have indicated that approximately 15-20 percent of all capital good in the United States are leased[4] -- truly a figure to be reckoned with.

## The Problem

The lease or purchase alternative has been well established for many years. However, in the United States it has only been since the early 1950's that this has become an important issue in the procurement of capital goods. How does management make this important financial and economic decision?

## Purpose of the Study

3 Barry, op. cit., p. 8.

4 Kenneth S. Axelson, "Needed, A Generally Accepted Method for Measuring Lease Committments", Financial Executive Magazine, July, 1971.

The purpose of this study is to explore what factors are considered important, by the user, in making the lease or purchase decision. As a better understanding of the problem is gained, it becomes clear that in most cases the answer to the lease or buy question is neither simple or obvious. It is the purpose of this study to present an objective, systematic approach to this problem. Once an understanding of this decision is gained, the conclusion of this review will be an attempt to determine the future importance of the lease - purchase phenomenon in the procurement of capital goods.

## Importance of the Study

As leasing becomes a more and more important source of capital, and a recognized method of financing, management must have a clear understanding of the advantages and disadvantages to be gained from its use. The lease or buy decision is fundamentally an economic decision. Each situation must be analyzed on its own quantative facts, and non-quantitative factors before a decision is made. This study will attempt to review the relative importance of each of these factors as well as the methodology needed for the analysis.

## Scope of Study

In preparing for this study a review of the current literature was made. In addition, interviews were conducted with a number of lessees, lessors, manufacturers, and financial institutions. While this study will provide a general review of the subject, no attempt has been

made to cover all types of leasing arrangements, nor all of the factors that might be peculiar to a particular industry or business. A brief review of the current tax and accounting practices is given, but this area is so complex and is changing so rapidly that it should only be considered as a reminder. Lastly the conclusions reached are purely my own and may or may not come to pass.

## Organization of the Remainder of the Thesis

In order to establish a basic groundwork from which to start, Chapter II provides a brief discussion of the various methods of purchase available, the basic types of leases and some of their variations, and a summary of who is in the leasing business.

Chapter III gets into the heart of the matter with a discussion of the lease - purchase decision and the advantages and disadvantages to be gained from either lease or purchase.

This is followed in Chapter IV by a closer look at some of the more important considerations such as functions performed by the lessor, the effects upon the corporate financial statement, accounting practices, and tax considerations.

This leads to an overview in Chapter V of the various methods available to analyze the quantitative factors involved in the decision. This is followed in Chapter VI with a recommended methodology which involves a more detailed look at the discounted cash flow method, and a method for comparing alternatives.

The results of the interviews which were done are discussed in Chapter VII both from the viewpoint of the user and the manufacturer with additional comments from financial lessors. Chapter VIII provides a summary as well as an attempt to draw some conclusions about the future of the lease - purchase phenomenon.

# Chapter II

## ACQUIRING THE CAPITAL ASSET

Once a company has made the decision to acquire a capital good the question of "how to acquire" must be answered. In deciding on either lease or purchase there are a number of alternatives.

### Purchase

#### Cash

The company may elect to pay cash. This of course will depend on the size of the investment and the availability of cash within the company.

#### Borrow

The company may elect to borrow the money either through establishing lines of credit or through such instruments as bonds, equipment trusts, etc.

#### Equity

If the acquisition is of sufficient size the company may elect to go to the equity market to raise the funds through the sale of stock.

#### Installment Purchase

Some types of equipment are available on installment purchase plans. Under this arrangement, by making a down payment followed by monthly payments, title passes upon the final monthly payment. There is usually an interest charge on the outstanding balance.

Lease with Option to Buy

The company may be offered a lease with an option to buy the equipment for a nominal sum at the end of the lease period. It is generally considered that such a transaction is not a bona fide lease but is an installment purchase[1].

## Lease

All equipment leasing plans may be categorized as either operating leases or financial leases[2].

Financial Lease

A financial lease, sometimes called a full payout lease, is a noncancellable contractual commitment on the part of a lessee to make a series of payments to a lessor for the use of an asset. The lessee acquires most of the economic value associated with outright ownership of the asset, even though the lessor retains title to it. With the

[1] Joseph D. Coughlan and William K. Strand, Depreciation Accounting, Taxes and Business Decisions, The Ronald Press Company, New York, p. 134.

[2] Richard F. Vancil, Leasing of Industrial Equipment, McGraw-Hill, N. Y., 1963, p. 8.

financial lease, the lease period generally corresponds to the economic life of the asset[3]. In addition, the total payment the lessee agrees to make exceeds the purchase price of the asset[4].

Operating Lease

Operating leases, sometime called non-full payout leases, may be defined as all other leasing contracts and typically, are cancellable by the lessee upon giving due notice of cancellation to the lessor[5].

Operating leases can be divided into two general types; full service leases and other.

Full Service Leases

Full service leases or rental leases provide a wide range of services such as maintenance, insurance, taxes, technical advice, etc. as part of the monthly payment.

Other non-full payout leases do not provide any service other than assuming the risk of obsolesence.

3 James C. Van Horne, Financial Management and Policy, Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1971, p. 563.

4 Richard F. Vancil, "Lease or Borrow", Leasing Series, Harvard Business Review, p. 79.

5 Vancil, op. cit., p. 8.

## Sale and Lease Back

Sale and lease back is a term often used to describe a particular type of financial lease. Under a sale and lease back arrangement, a firm sells an asset it owns to another party, and this party leases the asset back to the firm. Usually the product is sold at approximately its market value. The firm receives the sale price in cash, which can be employed in other parts of the business. In addition it receives the economic use of the asset during the basic lease period. In turn, the firm contracts to make periodic lease payments and gives up the title to the asset[6].

## Direct Lease

Under direct leasing, a company acquires the use of an asset it did not own previously. This type of leasing arrangement may be directly with the manufacturer or through a "third party" leasing company. There are a wide variety of direct leasing arrangements available to meet various needs of a firm.

## Leveraged Lease

The leveraged lease is a special type of financial lease that is used in leasing very large assets (usually $25 million and up). This type of lease has several interesting aspects. First, the lease

6 Van Horn, op. cit., p. 564.

is set up as a trust in which the lessor may have as little as 20% participation, thereby leveraging his investment. Secondly, it is possible for participation in the trust to be negotiable, and third while this is a full payout lease, the payout is based upon the discounted cash flow rather than on the monthly payments, making it possible for the total payment to be less than the purchase price.

A financial lease is primarily a device for permitting the acquisition of a piece of equipment without paying cash for it. The chief purpose of an operating lease is to permit the lessee to use a piece of equipment without running the risk of ownership. Obsolescence is borne by the lessee under a financial lease; it is shifted to the lessor under an operating lease. The distinction between a financial lease and an operating lease rests upon the type of commitment assumed by the lessee[7]. Or to put it another way, the distinguishing feature is cancellability.

## Who Are the Lessors

Speaking in broad terms, lessors fall into four general categories: manufacturers, independent leasing companies, financial institutions, and private investors.

### Manufacturers

There are a wide variety of both capital and consumer goods

[7] Vancil, op. cit., p. 9.

available today on a lease basis from the manufacturer. The most common type of lease offered by the manufacturer is the full service operating lease. The manufacturer is in the best position to offer the full range of services required by this type of lease. He also, most likely, has the marketing capability to place the equipment with another party at the end of the lease period. The terms of this type of lease vary considerably, however, the most common is thirty to ninety day cancellability and is rarely over one year. In some cases a manufacturer will offer a full payout financial lease, however, there are usually some services associated with it.

Independent Leasing Companies

Almost any durable good can be obtained through a leasing company. There are a number of leasing companies providing for the financing of a wide variety of products. However, the tendency in recent years has been toward special purpose leasing companies, who confine their operations to certain types of assets. Computer leasing companies, for example, mainly lease computer hardware and peripheral equipment. Leasing compnies may offer both operating and financial leases. The great majority of the business, however, is non-full payout operating leases. These are usually "net" leases with little or no services included in the lease. Again, while the terms of the lease vary, the minimum term is usually one year. This type of lease is normally more expensive than a full payout lease, but less expensive than a full service lease, since the lessor retains the risk of obsolescence. Leasing companies usually

maintain marketing organizations to handle the second placement of equipment and will often sell this service to manufacturers who do not operate their own leasing activities.

## Financial Institutions

Virtually every major finance company and bank in the country is in the leasing business. Since 1963, commercial banks have been allowed to engage directly in the leasing business, in addition to their normal role of providing financial leverage to the leasing industry[8]. In general, financial institutions deal only in full payout or financial leases. This method of financing is on a "net" basis with all of the risk of ownership being transferred to the lessee.

## Limited Partnerships

A small but growing factor in the leasing industry has been the limited partnership. Under this arrangement individuals in high tax brackets establish limited partnership to lease an asset. These are normally "net" financial leases which have the advantage of lower cost to the lessee while providing an excellent tax shield to the partnership. It is estimated that in the computer industry alone this type of arrangement has provided well over $100 million in financing.

8 Van Horn, op. cit., p. 565.

# Chapter III

## THE NATURE OF THE LEASE PURCHASE DECISION

In an interview with a large Mid-Western bank, it was stated that any acquisition of equipment, either lease or purchase, has four parties: (1) the equipment supplier, (2) the equipment user, (3) the funds supplier, (4) the risk taker of residual value. It was further pointed out that, depending upon the type of lease or purchase arrangement, one party might assume one or more of these roles. As we proceed it may be helpful to keep these four roles in mind.

In talking with a number of equipment users, a wide array of answers was given to the question, "Why do you lease or purchase?" For example:

> "We are in the shoe manufacturing business not the machine business. We prefer to lease no matter how the figures look."
>
> "We always purchase. Our accountant told us it was cheaper."
>
> "We never buy an important machine. A new and better machine might come on the market tomorrow, and then where would we be?"
>
> "We like to keep a balance between lease and purchase. This gives us maximum flexibility at the least cost."

Though somewhat confusing, these are all legitimate answers, but perhaps not the entire answer. In the remainder of this chapter we will look at the most generally claimed advantages of lease and purchase which should be considered.

## Leasing Considerations

Freeing working capital for more productive use is the most common reason used for justifying leasing equipment. It is the basis of any economic argument for leasing and implies that not only the magnitudes of the resultant cash flow, but also the timing over the economic life of the equipment are important. It assumes that the freed working capital will, in fact, be invested in those more productive opportunities[1].

Leasing provides a source of credit outside the normal channels and may be available when other sources are not. Leasing may in some cases increase the aggregate amount of credit available[2].

Leasing affords the firm flexibility with respect to the financing of relatively small asset acquisitions that occur spasmodically over time. Piecemeal financing through debt may be both expensive and difficult to arrange. The larger the acquisition, of course, the less valid this argument[3].

The protective-covenant restrictions imposed under a loan agreement or bond indenture usually are not found in a lease arrangement.

1 The Diebold Research Program - Management Series, "Lease or Buy: How to Evaluate the Methods of Acquiring ADP Equipment", The Diebold Group, Inc., 1967, p. 14.

2 Donald R. Gant, "Illusion in Lease Financing", Leasing Series, Harvard Business Review, p. 10.

3 James C. Van Horn, Financial Management and Policy , Prentice-Hall Inc., Englewood Cliffs, N. J., 1971, p. 565.

Moreover, even under existing loan agreements and indentures, leasing sometimes is not restricted[4]. Thus making possible additional unrestricted sources of credit.

Lease financing permits the firm to acquire the use of an asset without having to make a down payment or initial equity investment. If the firm purchased the asset and then sought to borrow against the collateral value of the asset, it would not be able to borrow 100% of the cost[5].

In bankruptcy, the maximum claim of a lessor is one years lease payment; in reorganization, the maximum claim is three years lease payment. In either case the trustee must reject the lease[6].

Leasing usually provides a greater tax shield than is possible under purchasing. This is true because lease payments, which are expense, are usually greater than depreciation and other charges incurred under purchasing. The investment tax credit may also be passed through to allow for additional tax deductions. When the lessor retains the investment tax credit it usually results in lower payments.

Also, property tax paid on leased equipment is usually less than that for purchased equipment. This occurs because some laws permit the property tax on rental equipment to be based upon manufacturing

4 Van Horn, op. cit., p. 566.

5 Van Horn, op. cit., p. 566.

6 Van Horn, op. cit., p. 566.

costs. If the equipment is purchased, however, the tax is based on the much higher purchase price.

The lessee encounters no problem or loss in the disposition of equipment. He can simply return it to the lessor upon the expiration of his lease.

Under the provisions of the Armed Services Procurement regulations, interest costs cannot be charged to government contracts. Depreciation and leasing costs are allowable. If we consider the cost of leasing to be the sum of depreciation and interest cost, the government in effect is being charged interest cost if the contractor leases his equipment[7].

If the term of the contract covers a span of many years, its fixed nature will provide a hedge against inflation, provided the lessor has not accurately taken this into account in setting his rate.

The term of a lease contract can often be tailored to suit the lessee's needs. The length of lease, whether payments should be uniform, declining, or staggered, taxes, maintenance, insurance, and extra use are items which can be negotiated with the lessor to best suit the user's needs.

Leasing offers the user flexibility in the use of his equipment. It allows him to increase or decrease his processing capacity, shift from one type of equipment to another and move from outdated to

7
Diebold, op. cit., p. 18.

improved machinery[8].

The question of whether to lease or purchase is often based upon intuition rather than fact. This is not surprising since technological change can obsolete a forecast overnight[9]. Operating leases provide acceptable protection against the risk of obsolescence.

For certain companies, one of the principle attractions of leasing is the fact that they can acquire the use of an asset without having the lease obligation appear on their balance sheet as a liability. If the asset were purchased and financed by debt, both the asset and the debt incurred would be shown. At present a lease obligation is generally disclosed in a footnote to the audited financial statement[10]. This claim may also apply to a division of a company being measured on ROI by the corporate office.

In many cases leases do not require the same level of approval within the firm as purchases. Therefore approval can be obtained with greater ease. Also leasing companies will execute a master lease which can then be supplemented to include additional equipment as needed without requiring additional paperwork.

8 Henry G. Hamel, "Negotiating a Lease", The Conference Board Record, V, April, 1968, p. 38.

9 "Buy or Lease That Computer", Industrial Research, X, December, 1968, p. 30.

10 Van Horn, op. cit., p. 567.

## Purchase Considerations

Purchasing offers several financial advantages. One of the primary ones is that the dollar cost of purchasing is generally less than that of leasing. This is true because the interest costs associated with purchasing are usually lower than those for leasing. Also, under purchasing no costs are paid toward the lessor's profit margin as in the case of leasing.

Purchasing can demonstrate a more favorable cash flow. This will occur when the term of financing (length) under purchasing is nearly equal to or longer than the lease contract. In this situation the sinking fund or other payment will be smaller than the lease payment made under leasing[11].

A fundamental assumption in most present value cash flow analysis is that there are always profitable alternative uses for free working capital. If these alternatives are less attractive or not present, the comparative cash flow analysis breaks down, and leasing just becomes more expensive[12].

From time to time a firm may have excess cash on hand, and more than a few companies maintain large cash reserves as a matter of policy. For such a corporation it is pointless to pay interest, especially high lease interest, when idle cash can be converted to a fixed asset at a low cost.

11 Diebold, op. cit., p. 11.

12 Diebold, op. cit., p. 12.

A business may realize a substantial gain by selling or trading in equipment with high residual value. It should be remembered that the net present value of a gain may considerably reduce the effective cost of purchasing[13]. Despite the risk of obsolescence, the residual value for many types of equipment has remained high. This is because either more sophisticated equipment has not been developed, or as it has been developed, less demanding or less sophisticated users are creating a market for used equipment[14].

Purchasing enables the firm to select any reasonable method and term over which to depreciate its equipment. This offers considerable flexibility in planning the most desirable tax shield and resulting cash flows.

Leases on some types of equipment have an extra usage charge for uses over a specified number of hours or over a specified production quantity. The purchasers enjoy unlimited use of their equipment. Firms which utilize their equipment heavily may save substantially with regard to this point.

In many regulated industries rates are set upon the fixed asset base. Purchase adds to this base.

While it is extremely difficult to quantify pride of ownership, it never the less is a very important consideration to many firms.

13 Howard M. Felt and Donald T. Barsky, "Purchasing vs. Lease", Management Accounting, LI, October, 1969, p. 29.

14 Richard A. Kaiman and Eugene F. Drzyeimski, "Third Party Leasing", Data Management, VII, January, 1969, p. 36.

## Summary

The considerations generally associated with lease and purchase were presented in this chapter to familiarize the reader with the advantages claimed for both lease and purchase. No attempt was made to make the list totally comprehensive or to weigh the merits of the points discussed.

The list, while incomplete, is long -- almost over-whelming. It is obvious that all of the factors are not equally important. Some of the "advantages" listed may be of overriding importance to one firm and of no significance at all to another.

Faced with so many factors, how should the decision be reached? A fairly typical answer is: "There are no pat answers to the question, 'should I buy or lease?' To make the best choice between the available alternatives, you will have to judge how the different factors for and against leasing work out in your particular case". Essentially this suggests that the proper decision can be reached by (1) listing all the advantages and disadvantages that are pertinent to the company's specific situation and (2) weighing the factors objectively to determine whether the advantages are greater than the disadvantages, or vice versa. The danger in this procedure is that the decision maker's "scale" may be faulty -- he may do a poor job of trying to evaluate the relative importance of various factors and end up by making the wrong decision.

The acquisition of equipment by purchase or lease is clearly related to the ordinary capital budgeting procedure employed by many

companies. In fact, while the inter-related questions, "How much money, if any, should be raised?" and "How should we invest the available money?" are usually answered as independent questions; in decisions concerning the use of leasing, these two questions are often answered simultaneously. Confusion, and poor decisions, can easily result unless carefully thought out analytical procedures are employed[15]. In Chapter V and VI some of these analytical procedures and methodologies will be reviewed.

15 Vancil, op. cit., p. 15.

# Chapter IV

## IMPORTANT CONSIDERATIONS

In Chapter III a long list of claimed advantages for leasing was reviewed. In this chapter we will look in more detail at some of the other important considerations involved in making the leasing decision.

### Functions Performed by Lessor

In almost every decision involving a choice between buying or leasing a piece of equipment, a prospective lessee can readily observe that the sum total of all of his payments will probably be greater than the purchase price less the salvage value of the equipment acquired. Nevertheless, many lessees find that leasing is more attractive than purchasing. There are a number of services performed by a lessor which make leasing more attractive than buying, even though it apparently costs more than buying[1].

A detailed list of these services might be very long, but in a general way we can group all of the functions performed by the lessor into four broad categories:

1. Granting Credit
2. Absorbing Risk
3. Packaging
4. Effective Use of Tax Credits.

[1] Richard F. Vancil, "Lease or Borrow - New Method of Analysis", Leasing Series, Harvard Business Review, p. 80.

In examining each of these services it is well to keep in mind that, since the performance of a function by the lessor usually entails a cost for the lessee, we must be sure to recognize what the lessee's direct cost of performing those same functions would be when computing the cost of acquisition by outright purchase.

One of the most distinguishing characteristics of the leasing plan is that it permits the lessee to avoid paying the full purchase price of a piece of equipment on the date that it is acquired. Thus, at a minimum, lease payments must provide enough revenue to the lessor to cover not only the cost of the equipment but also the lessor's interest expense while he is waiting to recover his money, and to compensate the lessor for running the risk that he may not be able to collect the amounts due him from the lessee.

In all operating leases the credit function is performed by the lessor; the very nature of the operating lease contract, its cancellability, reduces its usefulnees as collateral that the lessor can use in obtaining capital. In such situations, the lessor may mortgage his equipment as security for his loan but, because financial institutions are usually unwilling to loan 100% of the cost of a specific asset, the lessor usually provides the balance of the capital requirements with equity funds[2].

In many financial leases, where the credit rating of the lessee is sound, the lessor is able to assign lease payments to a bank in return for the full amount of the purchase price. In this type of

[2]Vancil, op. cit., p. 81.

transaction, the lessor's function is something other than that of granting credit. However, the lessor may also give credit under a financial lease contract in circumstances where the credit worthiness of the lessee is inadequate to support a conventional loan for the full value of the equipment. Here again, the lessor may assign the lease payment to the bank that is supplying a major portion of the capital for the transaction, but the balance of the capital is provided by the lessor's own equity funds[3].

A second major function that is often performed by the lessor involves another kind of risk taking. This is not the risk of granting credit but the risk of early obsolescense of the equipment. One of the most important estimates which is made by a prospective purchaser of a piece of equipment concerns the technological or market life of the equipment, i.e. for how long a period will the continued use of the equipment be more advantageous than replacing it or discarding it?

Particularly in industries where the rate of technological change is rapid, the prospective purchaser may feel a great deal of uncertainty about the economic life of the machine that he is considering acquiring. Wrong decisions in this area can be very expensive. Faced with what appears to be a high probability of making the wrong decision, many firms prefer not to purchase such equipment outright but to lease it from someone who will absorb the risk of early obsolescence for them[4].

[3] Vancil, op. cit., p. 81.

[4] Vancil, op. cit., p. 82.

Probably the most familiar example is in data processing equipment, where the rate of technological change is almost breath-taking and where leasing plans are offered by most of the equipment manufacturers.

In situations in which the lessor is the equipment manufacturer, a good argument can be made that both parties benefit from an operating lease under which the equipment manufacturer bears the risk of obsolescense, on the grounds that the manufacturer is in a better position to estimate when outmoding will occur, and is also in a better position to recondition and dispose of used equipment turned in by the original lessee.

The extent to which the risk of obsolescense is absorbed by the lessor is determined by the terms of the lease contract. In all operating leases the lessor absorbs this risk to some extent. Under financial lease contracts the situation is different. The lessee's commitment to make payments that exceed the purchase price of the equipment has the effect of placing on him most of the risk of obsolescense in much the same way as if he had actually purchased the equipment.

The third function performed by the lessor is often described as "packaging". That is, the function of accumulating into a single total various costs associated with ownership and recovering then through a stream of periodic lease payments. These costs are of two types (1) operating costs and (2) financing costs. The lessor may perform all or part of these functions depending upon the individual lease contract.

Under the broad heading of operating costs would be included such things as maintenance charges, operating costs of the equipment

itself, general management of the leased equipment, federal exise tax, local sales and use tax, personal property tax, and insurance premiums.

Typically, financial costs which are packaged are: legal fees, administrative and clerical costs, the cost of arranging the financing, commitment fees, and the cost of maintaining a compensating balance.

While individually, many of the costs are relatively small, in total they may add up to a substantial amount, and when included as part of the lease will increase the cost of the lease.

In many cases the lessee, due to his financial circumstances, is not able to make maximum use of tax credits available to him when purchasing equipment. The lessor may perform the function of utilizing this tax credit and pass along some of the savings in the form of reduced lease payments. Since the ability to utilize tax credits is a limited resource there is usually some charge made for this service. The whole subject of investment tax credit is taken up in more detail later in this chapter.

## The Effects Upon the Corporate Financial Statement

In looking at the effect of leasing upon the corporate financial statement there are two areas which we will consider. First the effect upon corporate credit, and second the effect upon financial ratios.

What effect does lease financing have on a corporation's borrowing power? As a practical matter, the effect of financial leases

on corporate credit policies cannot be stated categorically; it is a matter of the judgment of the individuals both inside and outside the corporation. When management sets its own limitation on the use of corporate credit, the limitation must be a reflection of the degree of risk which management feels it is prudent to assume. In such a case, financial leases, which are simply another way of gaining leverage, probably should be considered as quite similar, if not equivalent to debt. For companies operating under an internally imposed "debt" restriction, it seems safe to conclude that financial leases do not offer the advantage of permitting the corporation to use more of its credit than it could use directly in the form of debt[5].

In other situations, the judgment of the financial institutions about the appropriate amount of leverage may be more restrictive than management's judgment. Here financial leases may offer an advantage over debt by either (1) providing new sources of debt type funds or (2) opening up a new "layer" of credit that had not previously been utilized. New sources might be willing to provide funds even though old sources might be reluctant to increase the amount of funds they had provided, the "compartmentalized" risk is spread over a larger number of investors[6]. The more fundamental question therefore is: what is the capacity of the company to assume incremental fixed cash outflows?

5 Richard F. Vancil, Leasing of Industrial Equipment, McGraw-Hill Book Company, Inc., New York, p. 33.

6 Vancil, op. cit., p. 33.

The same analysis should be employed for a prospective lease contract decision, as for a prospective debt contract decision[7].

"Debt smears the balance sheet facade that is such a large part of management's reputation"[8]. This fact gives added attraction to getting capital by leasing assets instead of purchasing them, since in leaseholds neither the assets or the liabilities is shown on the balance sheet. The omission of the lease obligation on the balance sheet can have a favorable, and deceptive, effect upon the financial condition of a firm, as depicted by financial ratios, over what would be the case if the asset were purchased and financed with debt. Consider a firm with the balance sheet shown in the first column of Exhibit I. In this column, we assume that the company has acquired an asset costing $2 million and has financed its acquisition with $2 million in long term debt. In the second column of the table, we assume that the asset has been leased instead of purchased and that the lease obligation does not appear on the balance sheet. Suppose that the asset acquired has a 20 year economic life, which is also it's depreciable life, and that annual depreciation charges are $100,000. We assume also that annual lease payments are $210,000 for twenty years and that the interest on the long term debt is 7%[9].

[7] Gordon Donaldson, Corporate Debt Capacity , Harvard University, 1961.

[8] Joel Dean, Capital Budgeting, Columbia University Press, 1956.

[9] James C. Van Horne, Financial Management and Policy, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, p. 568.

The effect of leasing on various financial ratios is also shown in Exhibit I. As can be seen, the decision to lease instead of purchase the asset and to borrow results in a significant improvement in certain financial ratios. Close analysis of the financial statement, however, shows that the improvements in financial ratios is an illusion. The lease payments represent just as much a contractual obligation on the part of the company as does the payment of principle and interest on debt. The present controversy over how leases should be accounted for is discussed in detail at a later point, it suffices to say at this point that it is doubtful that any good financial analyst would be deceived by this approach.

Exhibit I

Balance Sheet and Income Statement (000's)[10]

| | Financing Alternatives | |
|---|---|---|
| | Borrowing | Leasing |
| **Balance Sheet** | | |
| Current Assets | $ 4,000 | $ 4,000 |
| Fixed Assets Net | 6,000 | 4,000 |
| Total Assets | $10,000 | $ 8,000 |
| Current Liabilities | $ 2,000 | $ 2,000 |
| Long-Term Debt | 3,000 | 1,000 |
| Total Debt | $ 5,000 | $ 3,000 |
| Net Worth | 5,000 | 5,000 |
| Total Liabilities and Net Worth | $10,000 | $ 8,000 |
| **Income Statement** | | |
| Sales | $12,000 | $12,000 |
| Operating Income Before Depreciation, Interest, and Lease Payments | 2,000 | 2,000 |
| Depreciation | 500 | 400 |
| Interest on Long-Term Debt (7%) | 210 | 70 |
| Lease Payment Expense | - | 210 |
| Net Income Before Taxes | $ 1,290 | $ 1,320 |
| Taxes (50%) | 645 | 660 |
| Net Income After Taxes | $ 645 | $ 660 |

Effect of Leasing Upon Certain Financial Ratios

| | Financing Alternatives | |
|---|---|---|
| | Borrowing | Leasing |
| Turnover of Assets (Times) | 1.2 | 1.5 |
| Return on Assets (Earning Power | 6.5% | 8.3% |
| Debt to Net Worth | 1.0 | 0.6 |
| Times Interest Earned (Before Taxes and Interest) | 7.1 | 19.9 |

[10]Van Horne, op. cit., p. 569.

## Delegating Authority for Leasing Decisions

Many firms that have stringent capital expenditure controls do not have explicit policy about the authority to enter into leasing contracts[11]. The result is that, while capital expenditure can be made only with the approval of top management, many lesser executives have the apparent authority to acquire equipment by means of leasing. The need for a corporate policy on the subject of leasing is obvious. Failure to have a policy about leasing means that top management loses its effective control over capital expenditures. Because there are two significantly different types of leases, two policy statements are called for.

Top management may safely delegate to subordinate executives the authority to enter into operating leases for the same reasons that authority over other current operating expenditures may be delegated; all operating expenses, including payments under operating leases, are subject to continuing review and adjustment[12]. Simply because this authority may be delegated, however, does not mean that top management has less responsibility for reviewing the actions of its subordinates. The fact that the firm is using a certain piece of equipment under an operating lease is prima facie evidence that the need for the equipment exists, and top management should attempt to ensure that the capital

11 Vancil, op. cit., p. 9.

12 Vancil, op. cit., p. 11.

funds invested in other items of equipment do not earn a lower rate of return than could be achieved if the leased equipment were purchased.

Corporate policy regarding financial leases is more complex because the decision to be made is not subject to subsequent revision. Therefore, the policy for entering into a financial lease should be the same as that for any other capital expenditure, with the addition of the lease purchase analysis which is described in detail in Chapter VI.

## Accounting Considerations

The pertinent authoritative accounting literature is Accounting Principles Board Opinion #5, "Reporting of Leases and Financial Statements of Lessee", and Accounting Principles Board Opinion #7, "Accounting for Leases and Financial Statements of Lessors". Both opinions contain the same idea regarding the substance of leases; that is, provisions of some lease contracts result in transactions with substantially the same economic effects as purchases or sales of similar property that are paid for in installments and financed by the seller or third party. The opinions attempt to describe the substance that distinguishes those leases that are in effect installment purchases of property and those that are in effect installment sales or financing for leases.

The Accounting Principles Board Opinion #5 can be summarized as follows: Leases which are clearly in substance installment purchases of property should be so recorded. The property should be recorded on the balance sheet as an asset; that is, that portion of the rental which

constitutes payment for property rights (not the portion applicable to services and other current costs such as maintenance, insurance, taxes and so forth) should be discounted for interest. The liability should also be so recorded.

True lease arrangements should not be recorded as assets and liabilities.

All material lease arrangements should be footnoted, giving the reader sufficient information concerning the lease to enable him to assess the effect of the lease commitment.

In the area of sale and lease back arrangements, the Accounting Principles Board feels that material gains or losses from the sale of properties, together with the related tax effect, should be amortized over the life of the lease as an adjustment of the rental cost[13].

Broadly speaking, Opinion #7 emphasizes the nature of business activities of lessors and the party who holds the risk or rewards of ownership. It has been stated that financial institutions -- for example, lease finance companies, banks, insurance companies, and pension funds -- should, with some exceptions, use the financing method of accounting for leases, but the operating method of accounting for leases is appropriate for enterprises in which leasing activities are an integral part of manufacturing, marketing or other activities, because revenue and expenses of leasing are intertwined. The lessor usually

13 Opinion #5, "Reporting of Leases in Financial Statements of Lessee", Accounting Principles Board, American Institute of Certified Public Accounts, 1964.

should account by the financing method for leases that pass all or most of the usual ownership risks or reward to the lessee and generally limit the recovery of the lessor to his investments at a reasonable rate of interest; a lessor usually should account by the operating method for leases in which he retains the usual risk or reward of ownership[14].

Accounting under the two methods is as follows: Under the financing method of accounting for leases (in substance the risks of ownership have been passed to the lessee), rental payments collected are recognized partly as recovery of an investment and partly as interest revenue at a level rate on the unrecovered investment. The entire lease transaction is treated as a financing arrangement and the only portion of the cost of leased equipment which is shown as such in the lessors balance sheet is the unrecovered cost of the lessor's investment. Under the operating method of accounting (in substance the risk of ownership is retained by the lessor), aggregated rentals are reported as revenue over the life of the lease. The equipment is carried as an asset by the lessor, and its cost is depreciated over its useful life[15].

As stated earlier, both Opinion #5 and Opinion #7 contain the same idea, however, Opinion #7 expresses the idea of substance broadly, and Opinion #5 defines it narrowly. Interpretations of the opinions

14
Opinion #7, "Reporting of Leases in Financial Statements of Lessor's", Accounting Principles Board, American Institute of Certified Public Accounts, 1966.

15
Opinion #7, op. cit.

have varied and, as a result, the reporting of leases in financial statements has not been consistent from company to company.

The Accouting Principles Board held a public hearing last October regarding proposed changes in the opinions on accounting by lessees and lessors. The study resulted from problems in applying Opinions #5 and #7 and from some seeming inconsistencies between the two opinions.

The Board has stated that it does not contemplate rescinding or changing the fundamental conclusions of Opinions #5 and #7. However, upon completion of study of various questions which have been raised, the Board may be expected to issue a clarifying opinion. Due to the great deal of interest which has been shown by both the Securities Exchange Commission and the accounting profession it is expected that this opinion will be issued some time in late 1972.

## Tax Considerations

The Internal Revenue Service reserves the right to categorize leases, for federal income tax purposes, under guide lines which are more detailed than those used for financial accounting, although, generally speaking, an operating lease would probably be considered a true lease and a financing lease would be considered a sale. The balance of this discussion will serve to illustrate the income tax consequences of leases since the certainty of tax treatment can be of paramount importance. In a true lease, the lessor receives the income which will be off set by depreciation and perhaps interest expense. The lessee will receive a

deduction for rental expense. On the other hand, if the lease is treated as a sale, the lessor will have income from the sale which may or may not be capital gains income and which may or may not be eligible for installment reporting. Also, there may be imputed interest income under Section 483 of the Internal Revenue Code, under which the portion of the proceeds representing the interest factor is taxed as ordinary income. The lessee will receive a depreciation deduction and also a deduction for interest expense.

The Internal Revenue's position is that whether an agreement which in form is a lease, is in substance a conditional sales contract depends upon the intent of the parties as evidenced by the provisions of the agreement, in light of the facts and circumstances which existed at the time the agreement was executed.

The principle guidelines used by the Internal Revenue Service in examination of leases are contained in revenue ruling 55-540, 1955-2 cum. bull. 39. The ruling defines the problem of whether or not the lessee has acquired any equity. It recognizes that "intent" of the parties is the controlling factor. "Intent" may be inferred from the presence of any of the six factors the ruling summarizes from litigated cases. Under the ruling there is a presumption that a purported lease transaction will be treated as a sale (i.e., a financial lease) if one or more of the following conditions are present:

(1) Portions of the periodic payments are made specifically applicable to an equity to be acquired by the lessee.

(2) The lessee will acquire title upon the payment of a stated amount of rentals which under the contract he is required to make.

(3) The total amount which the lessee is required to pay for a relatively short period of use constitutes an inordinately large portion of the total sum required to be paid to secure the transfer of title.

(4) The agreed rental payments materially exceed the current fair rental value. This may be indicative that the payments include an element other than compensation for the use of the property.

(5) The property may be acquired under the purchase option at a price which is nominal in relation to the value of the property at the time when the option may be exercised, as determined at the time of entering into original agreement, or which is a relatively small amount when compared with the total payments which are required to be made.

(6) Some portion of the periodic payments is specifically designated as interest or is otherwise readily recognizable as the equivalent of interest.

Of course, in practice the factual situation is seldom clear.

However, for planning purposes these tests should be utilized. Also several additional guidelines have been used by the Internal Revenue ruling 60-122, 1960-1 com. bull. 56, the importance of the relationship between the useful life of the property and the life of lease was considered. The ruling points out that if the lessee may use the property for a period substantially shorter than its useful life, with no right to retain possession through a renewal option, the transaction will be accorded lease treatment. If the lessee may use the property for the entire period of its useful life, on the other hand, a sale is indicated. In probate rulings, the Internal Revenue Service usually insists that the lessor tax payer represent that the useful life of the property is at least two years longer than the lease term, or 10% longer than the lease term whichever is greater.

Also in issuing private rulings, the Internal Revenue Service has looked to the portion of the original value which, it is estimated, will remain at the end of the lease term. If at the beginnings of the term it appears that the property will have only a nominal value at the end of the lease, the Internal Revenue Service will hold that the transaction is a sale. It has been the Internal Revenue Services's position that it will not rule that a transaction qualifies as a lease for tax purposes unless it can be realistically projected that at the end of the lease term the residual value of the property will be not less than 15% of its original cost. In this connection the parties to the lease should provide for an acceptable method for establishing a fair market value at the end of the lease term. Representation should be obtained either from

manufacturers or other qualified sources as to the useful life of the properties and the estimated fair market value at the end of the lease term. Such representation should be obtained at the beginning of the lease.

All of these "tests" encourage the lessor to assume the risk of ownership, such as the risk of obsolescence or that the property may be worth less than its anticipated value at the end of the lease. Lease provisions which shift the risk of ownership to the lessee would probably result in the Internal Revenue Service classifying the transaction as a sale.

As a result of the restoration of the investment tax credit by the Revenue Act of 1971, leasing transactions are again subject to an additional consideration.

It was obvious to Congress that to encourage expansion and investment it must allow this credit not only to purchasers of qualified property but also to those who use such property through lease arrangements. Therefore, a special provision was included to cover leased property. This provision allows a lessor to pass the credit through to the lessee in lieu of claiming it himself. This pass through is elective; unless he consents to transfer the credit to the lessee, the lessor must claim it.

The investment tax credit is generally allowed on acquisitions of new or used tangible personal property or certain other tangible property (except buildings and their structural components) which is subject to depreciation and has a useful life of four years or more.

However, the only leased property that qualifies is property that is new to the lessor and would be new to the lessee if the lessee were to purchase it.

Some taxpayers will not be in a position to use the credit currently or even in the future because of the income limitations. In such cases it is possible to indirectly receive the benefit of the credit by entering into a lease arrangement rather than purchase. The lessor would keep the 7% credit, and the lessee's rent payment would be reduced to give him the benefit of the credit. From the standpoint of cash flow, this would result in a greater advantage to the lessor. If it is intended to pass the cash flow advantage down to the lessee, this reduction could be effected in the first purchase of equipment. For example, assume rental payments over a ten year period amount to $14,000 annually for equipment worth $100,000. A $7,000 credit would be available to the lessor. This credit, at a 50% tax rate, is worth $14,000 of rental income. Thus the first year payment could be eliminated.

The credit allowance to the lessor is based upon the cost of the property. If the credit is passed through, lessee's basis for computing the investment tax credit is the fair market value on the date possession is transferred. Since the lessee, in those cases where the fair market value is greater than the lessor's basis, can get a larger credit than the lessor, he can be given the benefit of the credit and may be willing to pay a higher rent.

The credit is based upon the useful life of the property, which is normally the useful life to the lessor regardless of the terms

of the lease. This concept of useful life to the lessor can create tax problems in leasing. No longer can a lessee ignore a lessor's tax problem in regard to useful life, because the lessee's credit will be determined by the lessor's ability to substantiate a given useful life.

The lessor must affirmatively elect to pass the credit to the lessee. This election may be made on a property by property basis or as a general election for all property leased to a given lessee in a particular year. In either case, the election must be made within sixty days of the transfer of possession by filing a statement with the lessee.

While the laws governing personal property tax vary from state to state, generally personal property tax on leased equipment can be paid either by the lessor or the lessee of the equipment. The lease agreement should contain provisions as to which taxpayer is to pay the property tax.

There are distinct business, economic, and tax advantages applicable to the lessee and the lessor in the leasing of equipment and real property. However, the trends in accounting practices and the tax rules must be understood if the lessee's and the lessor's objectives are to be met. The intent of the last two sections was to acquaint the reader with some of the current trends and considerations. However, this is such an important aspect of any lease purchase decision that professional assistance should be sought in any particular situation.

# Chapter V

# ANALYSIS AND EVALUATION

## Introduction

Several of the most important factors listed in Chapter III related to the cost of leasing or purchasing. Even some of the factors that seem intangible (the advantages of freeing working capital, the disadvantages of losing residual value) can in fact be quantified with sufficient accuracy to eliminate the need for subjective evaluation.

The purpose of this chapter is to review the various methods available for analyzing the quantitative factors in the lease purchase decision. By selecting a suitable analytical method to measure the quantitative factors, and thereby reduce the number of factors that must be weighed subjectively, better and easier to reach decisions should be made.

## Pay Back Method

Pay back should be included in any discussion of lease purchase analysis, not because of its' merit, but because of its common usage. Pay back is simply a measure of the time required for the rental payment from a project to equal the purchase price. The principal way of figuring the so called pay back period is to divide the investment by the annual rent to get the pay back period. Pay back does not take into account cash flows after the investment is recovered.

The pay back formula is a quick way of estimating whether a proposed investment is obviously good or obviously poor. However, this formula is not adequate as a means of measuring the worth of really difficult investment proposals, such as those involved in the buy or lease area. It, therefore, should not be considered a proper method of analysis.

Present Value Concept

The reason that a dollar today is worth a different amount than a dollar to be recovered next year lies in the existance of interest. If one has a dollar today, he can lend it and get more than a dollar back next year. The interest rate enables us to measure receipts at different dates and find the value of a series of cash flows.

We know the amount we are going to receive at some future date and are interested in knowing the present sum to which it is equivalent. If one dollar is going to be worth (1 + r) dollars after a year we need only 1/1 + r dollars today to have a dollar a year from now. This amount is called the present value of a dollar due in a year at r percent. The process of finding present value is sometimes referred to as discounting, and the interest rate r as the discount rate.

This same method applies to cash outflows, that is a dollar spent today is worth more than a dollar spent a year from now in that the dollar spent a year from now can be earning interest until such time as it is spent.

Net present value is defined as the present value of benefits

minus the present value of cost at a given discount rate. Present value is used as a common yardstick to resolve conflicts between present and future profits and present and future costs.

Present Value Cash Flow Analysis

Under this method the purpose is to determine which alternative (lease or purchase) has the lowest present value cash flow over the expected life of the equipment. The following equation summarizes the lease or buy question:

| LEASE | | BUY |
|---|---|---|
| (P.V. of net after tax rental cost) | > = < | (P.V. of either intial cash outlay or after tax principle repayments and interest) |
| | - | (P.V. of reduction in federal tax from depreciation and interest) |
| | - | (P.V. of after tax residual value) |

If the present value of the net after tax rental cost of leasing equipment is less than the right hand side of the equation, then the lease is the proper economic decision. If the equation is in fact an equality, then the analysis is indifferent to the lease or buy question. If the equation indicates that the buy side of the equation is the low side, then the buy alternative is the correct economic alternative. This can

be illustrated with the following example. Suppose a firm has decided to acquire an asset costing $200,000 and having an expected life of ten years with no residual value. If leasing is used, the lessor requires that the cost of the asset be amortized over the ten year period and that it yield a 9% return, giving an annual lease of $28,600. Using straight line depreciation and a discount factor of 10%, the present value of the leasing alternative is $105,441, while the present value of the borrowing alternative is $88,041, making borrowing more attractive in this case.

The present value cash flow analysis or discounted cash flow, as it is sometimes called, is the most widely used method of analyzing the quantitative factors in the lease or buy decision and will be discussed in more detail in Chapter VI.

Effective Yield Analysis of Loan Equivalents

Instead of computing the present value of cash outflows for the two financing alternatives it is possible to compute the effective interest cost. This approach avoids the problem of having to choose a rate of discount. For the lease alternative, the effective interest cost is determined by solving for the rate of discount that equates the cash outflows after taxes with the adjusted purchase price of the asset. The adjusted purchase price employed is the original purchase price multiplied by one minus the tax rate. This procedure places both the purchase price and the cash outflow on an equivalent tax basis.

Solving for the effective interest cost for the debt

alternative follows a similar procedure. First we must determine the cash outflows after taxes. Because the cash outflows are after taxes it is not appropriate to solve for the rate of discount which equates these outflows with the original amount of the loan. Instead the original amount of the loan is multiplied by one minus the tax rate. We then solve for the rate of the discount which equates the stream of cash outflows with the adjusted loan amount. We then compare the two interest costs and select the method with the lower interest cost[1]. Using the previous example, we find the leasing alternative gives an effective yield of 11% while the borrowing alternative gives an effective yield of 9.37%. Again according to this analysis borrowing is the preferred alternative.

Bower-Herringer-Williamson Method

In another approach to evaluating lease versus borrowing BHW divide the payment streams into two parts: the cash flows associated with financing and the cash flows associated with tax savings. BHW first measure the incremental financial impact of a loan by subtracting the present value of the lease payments from the present value of the loan payments where both are discounted by the debt rate this gives the "financial disadvantage" of leasing.

The next step is to determine the incremental present value

1 James C. Van Horne, Financial Management and Policy, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1971, pp. 576-577.

of the tax savings associated with leasing. When these decreases in tax payments are discounted by the cost of capital rate, we obtain what BHW call the "operating advantage" of the lease. The decision to lease or borrow is made on the basis of whether the operating advantage of the lease exceeds its financial disadvantage, if so, lease financing should be used, if not, debt financing should be employed. Using our original example, the operating advantage of the lease is -$508, and is smaller than its financial disadvantage of $7,261. Therefore, according to this analysis debt financing should be employed[2].

Basic Interest Rate Method

The Basic Interest Rate approach of Richard F. Vancil is very similar to the BHW method of analysis. Like BHW, Vancil separates the financing effect of leasing from its tax savings effect. Holding constant the amount of financing, he discounts the tax savings associated wtih the non-interest portion of the two payment streams by the cost of capital. Whichever financing alternative has the lower present values, is preferred[3].

While the four methods discussed above differ somewhat in concept they all give similar results and unless the investment is very

2 Richard S. Bower, Frank C. Herringer, and Peter Williamson, "Lease Evaluation", Accouning Review, XLI, April, 1966, p. 260.

3 Richard F. Vancil, "Lease or Borrow", Leasing Series, Harvard Business Review, p. 79.

large any one of the methods should suffice.

## Analysis When Purchase Price Differs From Cash Equivalent Price

In the methods of analysis considered so far, we have assumed that the purchase price of the asset is the same to the lessee as to the lessor. However, there are situations where the lessor and lessee work from a different cost basis. For example, the manufacturer of a capital asset, such as a computer, may be willing to sell it outright or lease it under a non-cancelable lease. The selling price for outright purchase may differ from the cash equivalent price the manufacturer used to determine the lease payments. By varying the selling price relative to the cash equivalent price or vice versa, the manufacturer can encourage or discourage leasing. Similarly, in a third party lease, the selling price by the manufacturer to the lessor may be different than the selling price to the potential lessee. To evaluate situations of the sort, the firm should determine the cash equivalent price[4] used by the lessor. Given this price the firm then can evaluate leasing versus borrowing with one of the methods described earlier.

## Analysis of an Asset That Can Only Be Leased

Occasionally the firm must evaluate an asset which can only be acquired by leasing. An alternative purchase price is not available.

[4] The Cash Equivalent Price can be found by solving the following equation for X:

$$X = \sum_{t=0}^{n} \frac{\text{Rental}}{(1 + i)t}$$

In situations of this sort, the firm does not choose between leasing or borrowing; the only decision is whether or not to lease, as a result the investing and financing decisions are intertwined.

While no method of analysis is entirely satisfactory, perhaps the best approach is to determine the merit of the project an an investment. The first step is to compute the cash equivalent price of the lease alternative. You begin by estimating an interest rate which is consistent with other current leasing arrangements. The cash equivalent price is the present value of all required lease payments discounted by this rate. The next step is to compute the present value of the expected future cash benefits associated with the project, discounted at the cost of capital rate. These benefits should be estimated only for the duration of the lease period. If the present value of the expected future cash benefits exceeds the cash equivalent price the project is worth while and the firm should enter into the lease[5].

## Comparing Alternatives

In addition to assisting the decision maker in the lease or purchase decision, once this decision has been made, the discounted cash flow analysis can also be a valuable tool in comparing and evaluating various alternatives or combinations of alternatives. In fact, once the lease or purchase decision has been made, based upon both the quantitative and qualitative factors, a quantitative analysis should be done

[5] Van Horn, op. cit., pp. 582-583.

to compare the various lease plans or methods of borrowing that are available. Chapter VI will do this to a limited extent, but will not cover the evaluation of combinations of lease and purchase.

# Chapter VI

# THE LEASE OR BUY METHODOLOGY

## A More Detailed Look

This chapter presents a systematic analysis methodology for evaluating "lease or buy" questions. It includes a discussion of the critical variables, examples of the types of calculations which should be made by "lease or buy" analysts and the various trade offs which are possible.

## The Critical Variables

The following factors can be considered to be the critical variables in any lease or buy analysis[1]:

(1) Estimates of the economic, or useful, life of the equipment;

(2) Estimates of the residual value of the equipment;

(3) Tne lessee's internal investment opportunity rate;

(4) The lesse's cost of capital;

(5) The degree of liquidity on the lessee's balance sheet; and

(6) The lessee's desire for flexibility and equipment configuration.

[1] The Diebold Research Program - Management Series, "Lease or Buy: How to Evaluate the Methods of Acquiring ADP Equipment", The Diebold Group, Inc., 1967, p. 20.

All of these factors have a distinct bearing on whether to lease or to buy equipment. Before beginning to analyze the financial facts in a given lease or buy question the analyst must obtain the correct figures, data, or policy treatment for each of the six critical variables.

## The Lease or Buy Decision Tree

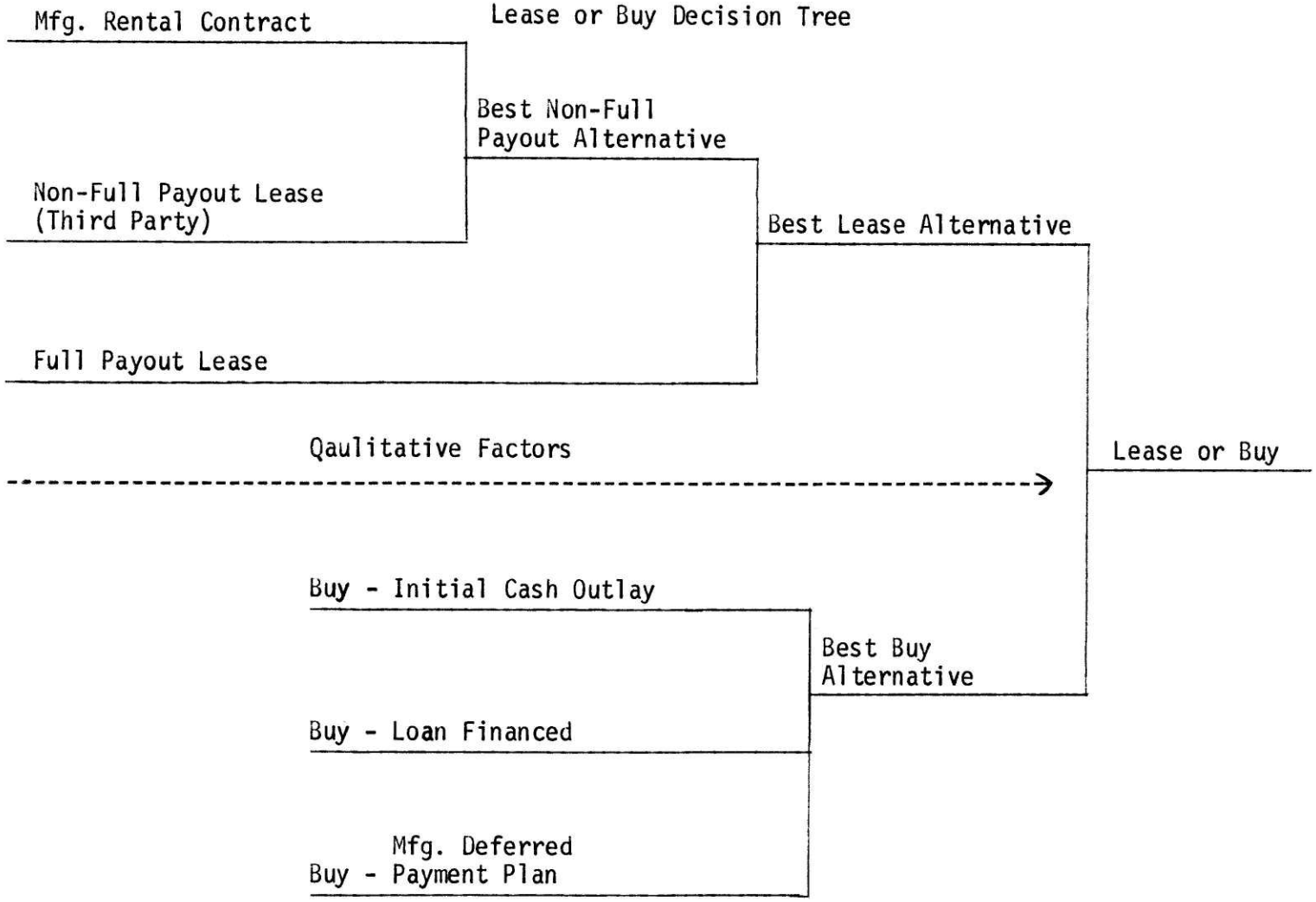
The lease or buy alternatives for equipment can be usefully represented by a decision tree. An example of such a tree is shown in Exhibit II. There are three main categories of alternatives in equipment acquisition. The user can lease his equipment on a non-full payout lease, or a full payout lease, or he can purchase the equipment on a number of purchase plans. It is recommended that the evaluation begin with the lease versus lease question, a non-full payout versus full payout analysis, determine the best lease alternative and then compare the best lease alternative with the best buy alternative. By approaching each lease or buy question as shown in Exhibit II, the user will be assured that all possible alternatives have been considered.

## Full Payout Lease Versus Non-Full Payout Lease Question

It is important for the lease or buy analyst to understand the significant trade offs and decisions to be made in a full payout versus non-full payout lease decision. Once he is aware of these factors then the lease or buy decision will become clearer.

## Exhibit II

Lease or Buy Decision Tree



The user in general will be faced with three possible leasing alternatives. First the manufacturer of the equipment will offer a rental agreement which is basically a non-full payout lease alternative. The manufacturer's rates continue at the same level for the total rental period, even beyond the time when the manufacturer has recovered the equivalent of the selling price of the equipment. The second leasing alternative available is a non-payout lease offered by an independent third party lessor. The third party lessor in most instances will be able to make available the manufacturer's equipment at a monthly rental discounted from the manufacturer's rental rates. The amount of the discount offered will depend upon how much of the risk of not obtaining the full purchase price of the equipment, through rentals, the lessor will be assuming.

The third leasing alternative is a full payout lease. In a full payout lease, as already stated, the lessee agrees to pay rental to the lessor over a period of time sufficient for the lessor to recover the cost of the equipment, his financing charges, and some margin. Because the lessee agrees to obligate himself to pay for the total price of the equipment through rentals, the lessor, in full payout alternatives, has had much of the risk he would have incurred in the non-full payout alternative removed, and will be willing to offer reductions in rentals greater than those offered in a non-payout lease. In summary, the difference between a non-full payout and a full payout lease is a trade of risks for dollars between the lessor and the lessee. If the lessee is willing to assume some of the risks

in residual value, then the lessor will be willing to offer lower lease prices.

It is easy to draw a parallel in the situation the lessee faces in residual value gambling under the full payout lease, and the lessor's position in non-full payout leasing. If the lessee is unwilling to gamble on the residual value, he will turn to a non-full payout lease leaving to the lessor the burden of the residual value. The lessor will have his own unamortized loan balances and sinking funds to meet and, therefore, in turn must look to the equipment's residual value for his coverage.

In summary it can be stated that by leasing on a full payout basis, the lessee is trading off greater potential savings against the risk that residual value may fall and eliminate those savings. If the lessee is unwilling to risk residual values, he should lease on a non-payout basis. A non-payout leasing decision usually results from desires for flexibility, short life, and other non quantitative factors. The next step in the lease or buy decision tree is to compare leasing and buying the equipment directly.

## The Lease or Buy Question

To evaluate the lease or buy question it is most useful to compare the full payout lease alternative (the most economical lease alternative) with other methods of financing the equipment. In a previous section it was shown that, in the lease versus lease question, non-full payout leasing was the result of the lessee's decision not to

gamble on the residual value of equipment, and to value qualitative considerations such as flexibility of configuration, and hedging against obsolescense more than the greater savings realizable under full payout leasing. Full payout leasing alternative will therefore include the relevant economic or quantitative considerations of the non-full payout lease alternative. The problem to be analyzed is then whether full payout leasing is more desirable than alternative financing.

Generally, the actual dollar cost of leasing equipment will exceed that of ownership. Usually the term of the lease will be longer than the term of any short term bank financing used to finance the equipment indicating more payments and interest. In addition, the lessor's margin will also create a cost differential. However, as was indicated in Chapter V, not only the total dollar cost of the financing alternatives but also the timing of the cash flows resulting from an alternative is important. Thus, the relevant element in a lease or buy decision is a potential possibility of freed working capital. It is my belief that the most widely accepted method to use in comparing lease financing with other methods of financing is present value cash flow analysis. Briefly, this means comparing the cash outlay and cash in take from one alternative with the cash outlay and in take from another and assigning a time value to the flow.

In appraising the lease or buy issue, it may be assumed that the cash input from sales and the cash outlay for other expenses from

operating equipment will be the same, whether the equipment is leased or owned. In other words, the net cash input resulting from profitable use of the equipment is constant and the problem reduces to an evaluation of the net cash outlay for the use of the equipment under various methods of financing.

The net cash outlay under leasing consists of: rental payments made, less the reduction in federal tax payments at the going tax rate (for simplicity, we will use 50%). For purposes of comparison, outlays for insurance, taxes, freight, operator wages, and general plant over head are presumed to be the same whether equipment is owned or leased and are not considered in a subsequent analysis. The analyst should be aware, however, that often taxes do differ for purchase and lease and it depends upon the individual lease agreement as to whether the lessee or the lessor bears the expense of insurance, taxes, and freight.

The net cash outlay under ownership consists of: an initial cash outlay, or repayments of principle to the lender, plus payment of interest on the money borrowed, less reductions in federal taxes resulting from allowable depreciation, less the after tax residual value of the equipment, i.e. the time adjusted cash which may be obtained upon the expiration of the period of use, less any tax which must be paid on these proceeds.

A comparison of the cash outlay under leasing with the cash outlay under ownership will present the relative merits of each alternative which involves the lowest cash outlay is to be preferred.

However, substantial differences may occur in the timing of the cash outlay, i.e. there is a difference between one dollar to be paid today, a dollar to be paid one year from now, and a dollar to be paid ten years from now. To evaluate these timing differences it is necessary to compute the present value of the cash outlay. By discounting all future dollars back to the present value it is possible to make a meaningful comparison of, say, a payment ten years from now and a payment one year from now.

No matter what the term of the lease or the financing arrangement may be, the comparison between lease and ownership should always be made over the depreciable life of the capital asset or longer. This period of time represents the government's best estimate of the useful life of the equipment and thereby represents a useful parameter. Any shorter period would have to take into account the possible loss of depreciation and deductions.

With any present value cash flow analysis, the analyst must determine what discount rate is the proper rate to use in discouting the cash flows. In general, there are two categories of proper rates[2]. The minimum rate applicable to any capital investment decision (and the lease versus buy question can be looked at as an extension of the capital investment problem), is a rate equal to the corporation's cost of capital. It is argued that any investment returning a rate greater

2 G. David Quirin, The Capital Expenditure Decision, Richard D. Irwin, Inc., Homewood, Illinois, 1967.

than the cost of capital will increase the profitability of the firm. Any investment of a lower rate will cost more to finance than it will earn. Most authorities[3] agree that the correct cost of capital is the after tax composite costs of capital which is a weighted average of the cost of debt, preferred stock, and common stock. A number of references discuss the method of deriving the composite cost of capital for a specific corporation[4], the details are peripheral to a lease or buy discussion.

The second category of correct rates is called the target rate of return on investment opportunity rate. In general, the well managed firm's after tax return on invested capital should exceed its cost of capital. A growing firm may have a target rate of return below which it will not invest in any project. If the corporation has many projects all of which have expected yields higher than the target rate of return, the corporation will have a higher investment opportunity rate at which it can invest all freed working capital. In such an instance, the corporation is capital limited, not opportunity limited, if leasing frees working capital during the early years of a lease as has been argued, this capital can be invested at the investment opportunity rate to return profits to the firm, in excess of

3 Pearson Hunt, Charles W. Williams, Gordon Donaldson, Basic Business Finance, Third Edition, Richard D. Irwin, Inc., Homewood, Illinois, 1966, and Franco Modigliani, Merton H. Miller, "The Cost of Capital, Corporation Finance and Theory of Investment", American Economic Review, June 1958.

4 Hunt, Modigliani, op. cit.

those which might have been earned under ownership.

In a lease or buy present value cash flow analysis, either rate may be used. A practical approach would be to choose a rate and stick with it and not worry whether the rate is 10.3% or 10.7%. The conservative corporation will use the cost of capital rate while the more dynamic firm will discount the cash flow at some investment opportunity rate or target of return. In general, the higher the discount rate the more important freed working capital in the early years of a lease will become. In our examples we will be conservative and use an 8% factor. We will also use a 12% factor to illustrate trends. Any higher factor will only serve to emphasize the conclusions drawn.

## Some General Conclusions

Prior to a detailed methodology discussion, some general conclusions about lease or buy analysis are appropriate:

(1) Financing the equipment through long term loans will be the least expensive method of acquisition in almost all cases.

(2) The longer the term of ownership, considering the residual values, the more favorable buying will become.

(3) The higher the discount rate used the more favorable the leasing opportunity becomes. With low rates, the interest rate takes precedent over the

(3) (Continued)

timing of the cash flows. At higher rates the timing of the flows become more important than the interest rate.

(4) The most expensive method of acquisition usually will be the manufacturer's rental contract, but of course, there may be qualitative circumstances favoring that form of leasing.

(5) Assuming that the residual value remains with the lessor in a full payout lease, proceeds from residual value can make all buy alternatives more attractive than lease alternatives on a present value basis.

(6) The key question in any lease or buy analysis becomes how much is the lessee willing to pay for the added flexibility leasing or renting equipment may offer.

The Cash Flow Analysis

For purposes of our analysis we will use an asset with a purcahse cost of $736,660. Exhibits III through X show a present value cash flow analysis of the seven primary alternatives. In these exhibits, the following assumptions have been made:

(1) Residual value equals zero.

(2) The useful life for the equipment is eight years.

(3) The depreciation, useful life, and the lease term

(3) (Continued)

are equivalent.

(4) The tax rate is assumed to be 50%.

(5) Depreciation is based on the sum of the years digits method.

(6) Discounting is performed at the end of each fiscal year.

(7) The constant level full payout lease is based upon a lease rate of 8%.

(8) The non-full payout lease rentals are based on a typical declining scale for each renewal period.

(9) The manufacturer's deferred payment contract is based upon a 25% down payment, with a four year principle payout at 7.5% interest rate.

(10) For all purchase alternatives and the full payout lease alternative, the full 7% investment tax credit is passed through to the lessee. For the manufacturer's rental contract one-third of the 7% investment tax credit is passed through, and for the non-full payout lease alternative no investment tax credit is passed through.

(11) Two discount rates are used. 8% and 12% to obtain a trend.

Exhibit III, the analysis summary, in which the alternatives

are ranked in order of increasing present value costs, indicates that even when the residual value equals zero, the long term financing alternative has the lowest total present value cost. Any additional income due to the residual value of the equipment would emphasize this conclusion. The length of the loan, ten years, was purposely chosen close to the length of the full payout lease to indicate that any longer loan term would only cause the long term financing alternative to become even more attractive. The exhibit further shows that the full payout lease alternative is more attractive than all buy alternatives other than the long term financing one. This conclusion is deceptive, for if a residual value of greater than 21.4% of the initial cost is assumed in the 8% case, or greater than 65.2% of initial cost in the 12% case, all the buy alternatives become more favorable than the most advantageous lease alternative.

It is easy to see the disadvantage of utilizing an initial cash outlay to purchase equipment if more profitible alternatives for the use of the working capital exist within the firm. The first column in the summary chart indicates the out of pocket cost of each of the alternatives. For a company with an excess of working capital the least expensive method of acquiring the equipment is through an initial cash outlay. However, using a present value cash flow analysis, as the discount rate rises from 0-8-12%, this alternative quickly becomes one of the worst alternatives for a company to pursue. Moreover extrapolating to a 15% rate, the initial cash outlay will be the worst alternative.

## Exhibit III

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Price - $736,660

SUMMARY

| | ALTERNATIVES | $ Cost | P.V. $ Cost @ 8% | P.V. $ Cost @ 12% | Lease - Buy Break Even Residual Value 8% | 12% |
|---|---|---|---|---|---|---|
| (1) | VI Long-Term Bank Financing | $466,037 | $351,186 | $310,672 | N/A | N/A |
| (2) | IX Full Payout Leasing | 533,353 | 368,530 | 311,640 | N/A | N/A |
| (3) | VII Mfg. Deferred Pay Contract | 408,519 | 374,063 | 358,683 | 1.85% | 21.1% |
| (4) | V Bank-Term Financing (5 Years) | 427,141 | 390,140 | 372,123 | 7.24% | 28.0% |
| (5) | IV Initial Cash Outlay | 366,217 | 432,419 | 457,214 | 21.40% | 65.2% |
| (6) | X Non-Full Payout Leasing | 609,405 | 478,178 | 414,779 | N/A | N/A |
| (7) | VIII Mfg. Rental Contract | 762,836 | 543,072 | 467,218 | N/A | N/A |

The timing of the tax savings from depreciation over the expected life of the equipment is a definite disadvantage when compared with the timing of the cash flows from the other alternatives, for as the discount rate increases, the importance of the savings during the last four years of the term decreases rapidly.

Exhibit IV is a sample calculation for an initial outlay of cash. It is assumed that the outlay is made in year zero and this outlay is off set by the 7% investment tax credit and the tax savings due to depreciation. A maintenance contract expenses is included to equalize the basis of the alternative conclusions. Since the initial outflow is not discounted, the lower the present value of the future savings, the greater the present value of the cost, hence, the present value cash outlay rises as the discount rate increases from 8% to 12%.

Exhibits V and VI are the sample calculations for the short and long term bank financing alternatives. In this example, the outflows are spread over a period of years and consist primarily of the principle repayments and after tax interest costs which are offset by the tax savings from depreciation of the equipment. A compensating balance of 20% is included for the life of the loan and returned at the conclusion. 7% full investment tax credit is also assumed. These calculations show that as the term of the financing approaches or exceeds the term of the lease, the economic decision will switch from a lease decision to a buy decision.

Exhibit VIII is a sample calculation of a manufacturer's

Exhibit IV

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Cost - $736,660

INITIAL CASH OUTLAY ($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Cash Outlay | 736,660 | | | | | | | | |
| Depreciation (SYD) | | (163,686) | (143,207) | (122,801) | (102,322) | (81,843) | (61,364) | (40,958) | (20,479) |
| Maintenance | | 12,384 | 12,384 | 12,384 | 12,384 | 12,384 | 12,384 | 12,384 | 12,384 |
| Pre-Tax (Savings) Cost | | (151,302) | (130,823) | (110,417) | (89,938) | (69,459) | (48,980) | (28,574) | (8,095) |
| After-Tax (Savings) Cost | | (75,651) | (65,412) | (55,209) | (44,969) | (34,730) | (24,490) | (14,287) | (4,048) |
| Investment Tax Credit (7%) | (51,647) | | | | | | | | |
| Annual (Savings) Cost | 685,013 | (75,651) | (65,412) | (55,209) | (44,969) | (34,730) | (24,490) | (14,287) | (4,048) |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .538 | .540 |
| P.V. Cost | 685,013 | (70,053) | (56.058) | (43,836) | (33,052) | (23,651) | (15,429) | (8,329) | (2,186) |
| Total P.V. Cost @ 8% | 432,419 | | | | | | | | |
| Total P.V. Cost @ 12% | 457,214 | | | | | | | | |

Exhibit V

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Price - $736,660

BANK TERM FINANCING ($'s)

5 Years @ 6.5%

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Compensating Balance | 147,332 | | | | | | (147,332) | | |
| Principle Repayment | | 147,332 | 147,332 | 147,332 | 147,332 | 147,332 | | | |
| After-Tax Interest | | 21,746 | 16,958 | 12,170 | 7,381 | 2,593 | | | |
| Tax (Savings) From Depreciation | | (81,843) | (71,603) | (61,401) | (51,161) | (40,921) | (30,608) | (20,479) | (10,240) |
| After-Tax Maintenance Expense | | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 |
| Total After-Tax Cost | 147,332 | 93,427 | 98,879 | 104,293 | 109,744 | 115,196 | (171,748) | (14,287) | (4,048) |
| Investment Tax Credit (7%) | (51,647) | | | | | | | | |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .540 |
| P.V. Cost | 95,685 | 85,513 | 84,739 | 82,809 | 80,662 | 78,448 | (108,201) | (8,329) | (2,186) |
| Total P.V. Cost @ 8% | 340,140 | | | | | | | | |
| Total P.V. Cost @ 12% | 372,123 | | | | | | | | |

Exhibit VI

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Price - $736,660

LONG TERM BANK FINANCING
10 Years @ 6.5%

($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compensating Balance | 147,333 | | | | | | | | | | | (147,333) |
| Principle Repayment | | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | 71,666 | |
| After-Tax Interest | | 22,748 | 20,354 | 17,960 | 15,567 | 13,170 | 10,777 | 8,383 | 5,989 | 3,595 | 1,200 | |
| Tax (Savings) From Depreciation | | (81,843) | (71,603) | (61,401) | (51,161) | (40,921) | (30,608) | (20,479) | (10,240) | | | |
| After-Tax Maintenance Expense | | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | |
| Investment Tax Credit (7%) | (51,647) | | | | | | | | | | | |
| Total After Tax Cost | 95,685 | 18,763 | 26,609 | 34,417 | 42,264 | 50,108 | 58,027 | 65,762 | 73,607 | 75,261 | 72,866 | 147,333 |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .540 | .500 | .463 | .429 |
| P.V. Cost | 95,685 | 17,375 | 22,804 | 27,327 | 31,064 | 34,124 | 36,557 | 38,339 | 39,748 | 37,631 | 33,737 | 63,205 |
| Total P.V. Cost @ 8% | 351,186 | | | | | | | | | | | |
| Total P.V. Cost @ 12% | 310,672 | | | | | | | | | | | |

deferred payment contract. This alternative is a mixture of the present value advantages of a short term full payout lease and the disadvantages associated with an initial outlay of 25% of the purchase price. Additional calculations should be made to consider selling the equipment in the 6th, 7th, or 8th year of ownership under the manufacturer's deferred payment plan to determine if this alternative may not be more attractive than it appears.

On the leasing side of the equation, Exhibit VIII shows a sample calculation for the manufacturer's rental contract alternative. The relevant cash flow consists of the after tax rentals, inclusive of maintenance, which will remain constant over the period of usage. Since the manufacturer elects to depreciate his equipment over only four to five years, he will only pass through to the user a two and one third percent investment tax credit. In most cases, this alternative will be close to the most expensive.

Exhibit IX is a sample calculation for the full payout lease. Again, the level after tax rentals are the relevant cash flows, however, the full payout lessor will more often than not pass the 7% investment through to the lessee. The reader should note that by spreading the rental payments equally over the life of the lease, the lessor can make a full payout lease a very attractive present value cash flow alternative for a lessee with a high internal discount rate. It is obvious that the higher the discount rate, the more insignificant equal future outflows become. High discount rates will decrease the present value cost.

Exhibit VII

Present Value Cash Flow Analysis of Alternative
Methods of Fianancing An Asset
Purchase Cost - $736,660

MANUFACTURE DEFERRED PAY CONTRACT ($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Down Payment (25%) | 184,000 | | | | | | | | |
| Principle Repayment | | 138,124 | 138,124 | 138,124 | 138,124 | | | | |
| After-Tax Interest | | 18,343 | 13,164 | 7,985 | 2,807 | | | | |
| Tax (Savings) From Depreciation | | (81,843) | (71,603) | (61,401) | (51,161) | (40,921) | (30,682) | (20,479) | (10,240) |
| After-Tax Maintenance Expense | | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 | 6,192 |
| Investment Tax Credit (7%) | (51,647) | | | | | | | | |
| Total After-Tax Cost | 132,518 | 80,816 | 85,877 | 90,900 | 95,962 | (34,729) | (24,490) | (14,287) | (4,048) |
| P. V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .542 |
| P.V. Cost | 132,518 | 74,836 | 73,597 | 72,175 | 70,532 | (23,651) | (15,429) | (8,329) | (2,186) |
| Total P.V. Cost @ 8% | 374,063 | | | | | | | | |
| Total P.V. Cost @ 12% | 358,683 | | | | | | | | |

Exhibit VIII

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Cost - $736,660

MANUFACTURE RENTAL CONTRACT ($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Pre-Tax Rental Including Maintenance | | 195,000 | 195,000 | 195,000 | 195,000 | 195,000 | 195,000 | 195,000 | 195,000 |
| After-Tax Rental | | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 |
| Investment Tax Credit (2.33%) | (17,164) | | | | | | | | |
| Total After-Tax Cost | (17,164) | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 | 97,500 |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .540 |
| Present Value Cost | (17,164) | 90,285 | 83,558 | 77,415 | 71,662 | 66,398 | 61,425 | 56,843 | 52,650 |
| Total P.V. Cost @ 8% | 543,072 | | | | | | | | |
| Total P.V. Cost @ 12% | 467,218 | | | | | | | | |

Exhibit IX

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Cost - $736,660

FULL PAYOUT LEASE

($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Pre-Tax Rental Including Maintenance | | 146,250 | 146,250 | 146,250 | 146,250 | 146,250 | 146,250 | 146,250 | 146,250 |
| After-Tax Rental | | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 |
| Investment Tax Credit (7%) | (51,647) | | | | | | | | |
| Total After-Tax Cost | (51,647) | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 | 73,125 |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .540 |
| Present Value Cost | (51,647) | 67,714 | 62,668 | 58,061 | 53,747 | 49,798 | 46,069 | 42,632 | 39,488 |
| Total P.V. Cost @ 8% | 368,530 | | | | | | | | |
| Total P.V. Cost @ 12% | 311,640 | | | | | | | | |

The last sample calculation covers the non-full payout lease, and is shown in Exhibit X. In this example re-rental rates are incrementally decreased from 90% of the manufacturer's rental to 79.5% or an average 8 year reduction of 15.25%. The relevant cash flows, as in all leasing alternatives, are the after tax rentals. On a year to year non-full payout lease it is not common for the lessor to pass through the investment tax credit, and therefore it has not been done in this example. The main advantage of the non-full payout lease is that it is a discounted leasing alternative to a manufacturer's rental contract when the lessee wants flexibility and is unwilling to gamble on the residual value of the equipment.

## Useful Life Versus Obsolescense

As was stated at the beginning of this chapter the estimates of the economic, or useful, life of the equipment is of primary importance. The importance of this factor along with the risk of obsolescense can be illustrated using our previous examples by adding to the cumulative present value costs for each year the balance sheet items which would be affected, assuming obsolescense in that year. The mechanics of this are illustrated in Exhibit XI where the balance sheet items for the long term bank financing case have been added. As can be seen from this exhibit the value of the tax net book value for each year has been added to the principle outstanding to arrive at a net liability and the present value of this liability has been taken for each year. The present value of the net liabilities are then

Exhibit X

Present Value Cash Flow Analysis of Alternative
Methods of Financing An Asset
Purchase Price - $736,600

NON-FULL PAYOUT LEASE ($'s)

Lease Rental Schedule As % of Mfg. Rental Dollars

| Year | % | Year | % |
|---|---|---|---|
| 1 | 90.0% | 5 | 84.0% |
| 2 | 88.5% | 6 | 82.5% |
| 3 | 87.0% | 7 | 81.0% |
| 4 | 85.5% | 8 | 79.5% |

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 |
|---|---|---|---|---|---|---|---|---|---|
| Pre-Tax Rental Including Maintenance | | 175,500 | 172,575 | 169,650 | 166,725 | 163,800 | 160,875 | 157,950 | 155,025 |
| After-Tax Rental | | 87,750 | 86,288 | 84,825 | 83,363 | 81,900 | 80,438 | 78,975 | 77,513 |
| Investment Tax Credit (7%) | -0- | | | | | | | | |
| Total After-Tax Cost | -0- | 87,750 | 86,288 | 84,825 | 83,363 | 81,900 | 80,438 | 78,975 | 77,513 |
| P.V. Factor @ 8% | 1.000 | .926 | .857 | .794 | .735 | .681 | .630 | .583 | .540 |
| Present Value Cost | -0- | 81,257 | 73,949 | 67,351 | 61,272 | 55,774 | 50,676 | 46,042 | 41,857 |
| Total P.V. Cost @ 8% | 478,178 | | | | | | | | |
| Total P.V. Cost @ 12% | 414,779 | | | | | | | | |

added to the present value of the cumulative costs to give a present value of cost plus liabilities assuming termination at the end of any year. Exhibit XII is a summary of the present value of cumulative costs plus liabilities for each year for each of the seven cases we examined earlier. It becomes quickly apparent by examining this summary that long term bank financing is the best alternative only if the equipment remains useful for the full 8 years. By examining the figures in any column you can pick the best alternative, assuming obsolescense in that year, by picking the lowest present value. As would be expected the non-full payout leases appear more attractive in the earlier years. What may be surprising is the manufacturer's deferred payment contract becomes very attractive during the early and middle years. As will be discussed later in this chapter residual value also becomes key when considering an early termination. For example, in Exhibit XII assuming termination at the end of the fifth year the non-full payout lease is the most attractive alternative. However with a residual value of only .06% of the original value of the equipment, the manufacturer's deferred payment plan becomes a break even proposition with a non-full payout lease. And of course with any higher residual value it would be a more attractive alternative.

Depreciation

In our examples, we have assumed sum of the year's digit depreciation. If the firm uses a more accelerated depreciation such as double declining balance it obtains a greater tax shield in the early

Exhibit XI

Effect of Present Value of Cumulative Cost
Plus Liabilities for Each Year With
Long Term Bank Financing ($'s)

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Balance Sheet Items | | | | | | | | | | | | |
| Value of Tax Net Book Value | | (286,487) | (214,884) | (153,483) | (102,322) | (61,401) | (30,719) | (10,240) | | | | |
| Principle Outstanding | | 644,994 | 573,328 | 501,762 | 429,996 | 358,330 | 286,664 | 214,998 | 143,332 | 71,666 | | |
| Net Liability | | 358,507 | 358,444 | 348,179 | 327,674 | 296,929 | 255,945 | 204,758 | 143,332 | 71,666 | | |
| P.V. Factor @ 8% | | .926 | .857 | .794 | .735 | .681 | .635 | .583 | .540 | .500 | | |
| P.V. of Net Liability | | 331,977 | 307,186 | 276,454 | 240,840 | 202,208 | 162,520 | 119,374 | 77,399 | 35,833 | | |
| P.V. Cost (Exhibit V) | 95,685 | 17,375 | 22,804 | 27,327 | 31,064 | 34,124 | 36,557 | 38,339 | 39,748 | 37,631 | 33,737 | (63,205) |
| P.V. Cumulative Cost | | 113,060 | 135,864 | 163,191 | 194,255 | 228,379 | 264,936 | 303,275 | 343,023 | 380,654 | 414,393 | 351,186 |
| P.V. of Cumulative Cost Plus P.V. Net Liability | | 445,037 | 443,850 | 439,645 | 435,095 | 430,587 | 427,456 | 422,649 | 420,422 | 416,487 | 414,393 | 351,186 |

Exhibit XII

Effect of Present Value of Cumulative Cost
Plus Liabilities for Each Year

SUMMARY

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Long-Term Bank Finance | 445,037 | 443,050 | 439,645 | 435,095 | 430,587 | 427,456 | 422,649 | 420,422 | 416,487 | 414,393 | 351,186 |
| Full Payout Lease | 490,063 | 454,743 | 427,102 | 405,530 | 389,738 | 379,278 | 371,673 | 368,530 | | | |
| Mfg. Deferred Pay Contract | 325,927 | 333,670 | 341,061 | 348,451 | 358,193 | 365,071 | 370,279 | 374,063 | | | |
| Short Term Bank Finance | 462,629 | 461,572 | 461,844 | 463,490 | 467,042 | 381,148 | 386,356 | 390,140 | | | |
| Initial Cash Outlay | 349,673 | 374,746 | 393,200 | 406,807 | 416,549 | 423,427 | 428,635 | 432,419 | | | |
| Non-Full Payout Lease | 81,257 | 155,206 | 222,557 | 283,829 | 339,603 | 390,279 | 936,321 | 478,178 | | | |
| Mfg. Rental Contract | 73,121 | 156,679 | 234,094 | 305,756 | 372,154 | 433,579 | 490,422 | 543,072 | | | |

years and a lower one in later years. As a result, cash outflows after taxes in early years are reduced relative to cash outflows in later years, and the present value under the borrowing alternative is increased. By contrast if straight line depreciation had been used the tax shield would be equalized over the depreciable life of the equipment. Thus accelerated depreciation makes borrowing more attractive than it is with straight line depreciation. It should be pointed out, however, that a lessor also, is able to use accelerated depreciation. In turn, the lessor may pass off some of the benefits innerent in its use to the lessee in the form of lower lease payments.

## The Importance of Residual Value

Becasue of its pivotal role, the estimated residual value is as important to the lease or buy analysis as the yearly cash flow. High estimated residual values may influence management to change the lease or buy criteria into more non-economic or qualitative criteria.

The above analysis indicates that if the residual values are assumed to be equal to zero, there are circumstances when it will be more advantageous from an economic standpoint to lease equipment rather than to buy. However, if the constraint, residual value equals zero, is removed, it is useful to determine: (1) what residual value constitutes a break even residual value in order to change a potential lease decision to a buy decision; (2) what monthly rental would be equivalent to owning the equipment with borrowed money; (3) the effect of residual values as the discount rate is changed.

In the analysis summary chart, Exhibit III, columns 4 and 5 show the break even residual value necessary to make the unfavorable buy alternatives equal to the full payout lease alternative. If the estimated residual value is greater than the stated percentages, then a buy situation will exist. In a lease or buy analysis, the analyst must make a break even residual value calculation for each alternative in order to complete his analysis and present management with a complete lease or buy picture.

For a company with a fixed cost of capital or a target discount rate it is also useful to construct a chart showing the monthly (for different lease terms) equivalent to owning the equipment on borrowed money as a percent of the purchase cost. An example of such a chart is shown in Exhibit XIII. The rental period in years is shown vertically on the left,the percentage residual is shown across the top, and the monthly rental equivalent is shown in the center. The usefulness of a rental equivalent chart is that for various estimates of residual value for equipment, the analyst can determine an equivalent rental prior to receipt of a bid for any length of lease. If the rental offer is beneath the stated equivalent for a given estimated residual value, the analyst knows that the offer is economically feasible. If it is above, he can quickly determine what residual value is required to make the offer feasible. The chart serves as a good screening tool for the quick evaluation of leasing offers.

The effect of residual value on the lease or buy decision will also change as the discount rate varies. A graphic technique can

## Exhibit XIII

Monthly Rental Equivalent to Owing With Borrowed Money, As % of Purchase Cost

(Discount Rate = 2.5%)

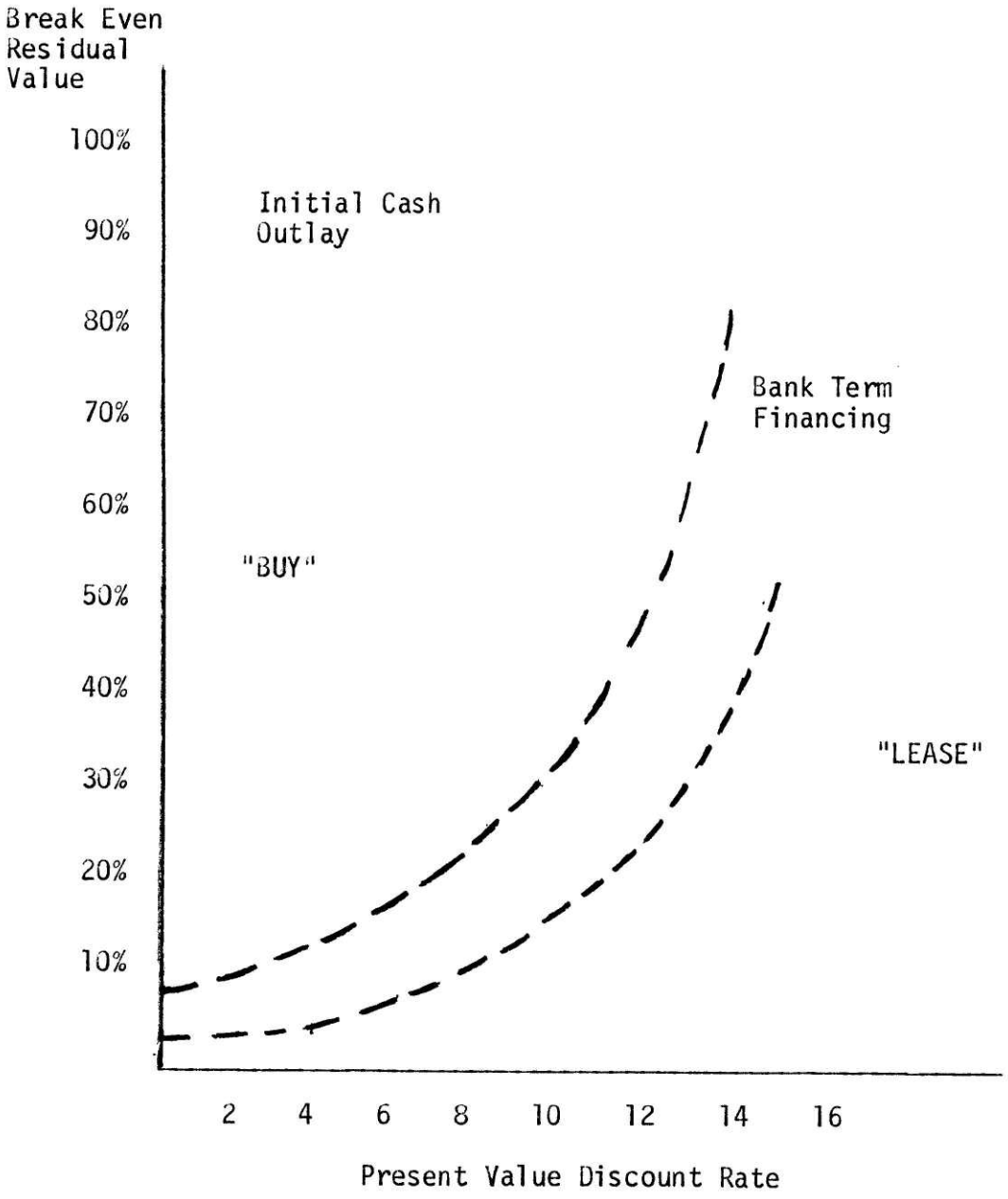
SAMPLE CHART

% Residual Value

| Rental Period In Years | 100% | 90% | 80% | 70% | 60% | 50% | 40% | 30% | 20% | 10% | 0% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 1.157 | 2.875 | 4.594 | 6.313 | 8.032 | 9.750 | 11.469 | 13.188 | 14.906 | 16.625 |
| 2 | | .315 | 1.165 | 2.016 | 2.866 | 3.716 | 4.566 | 5.416 | 6.267 | 7.117 | 7.767 |
| 3 | | .055 | .615 | 1.176 | 1.736 | 2.297 | 2.858 | 3.418 | 3.979 | 4.539 | 5.100 |
| 4 | | | .353 | .769 | 1.185 | 1.601 | 2.017 | 2.433 | 2.849 | 3.265 | 3.681 |
| 5 | | | .206 | .536 | .865 | 1.194 | 1.523 | 1.852 | 2.182 | 2.511 | 2.840 |
| 6 | | | .117 | .389 | .660 | .932 | 1.203 | 1.475 | 1.746 | 1.018 | 2.289 |
| 7 | | | .063 | .293 | .525 | .753 | .983 | 1.213 | 1.443 | 1.673 | 1.903 |
| 8 | | | .026 | .226 | .425 | .624 | .823 | 1.022 | 1.222 | 1.421 | 1.620 |
| 9 | | | .006 | .181 | .356 | .531 | .706 | .881 | 1.056 | 1.231 | 1.406 |
| 10 | | | | .149 | .305 | .461 | .617 | .773 | .928 | 1.084 | 1.240 |
| 11 | | | | .129 | .269 | .409 | .549 | .689 | .829 | .969 | 1.109 |
| 12 | | | | .114 | .241 | .369 | .496 | .623 | .750 | .877 | 1.004 |

Exhibit XIV

Break Even Residual Value vs. Discount Rate
Buy Alternatives vs. Full Payout Lease
(Constant 8 Year Term)



be used to explore the residual value effect for each alternative and how lease or buy varies as a result of discount rate changes. Employing the break even residual value as shown in columns 4 and 5 of Exhibit II we can plot the break even residual value precent for each alternative for various changes in the discount rate, as shown in Exhibit XIV. By employing such a chart the analyst can perform the same trade offs as in the chart mentioned above, only using the discount rate as a variable instead of the term of the lease as the variable.

Summary

In this chapter we have presented a methodology for conducting an economic lease or buy analysis. It must be emphasized that each company situation will be different and the facts in each lease or buy opportunity will vary. However, the methodology shown here is generally applicable to all situations. Once the economic facts are determined in the lease or buy situation it remains for the analyst to determine how these economic facts must be traded off against the non quantitative factors, such as obsolescense and flexibility mentioned in Chapter III, to make a systematic lease or buy situation.

# Chapter VII

# A VIEW FROM INDUSTRY

## Scope

In an effort to gain a better understanding of the lease purchase phenomenon, and a greater insight into the leasing industry, a series of interviews were conducted. These interviews covered a cross section of firms who use capital equipment either on a lease or purchase basis, a group of manufacturers who offer their products on a lease or purchase basis, and a group of banks who are heavily involved in the leasing of capital goods.

Ten users of capital goods were interviewed. These firms ranged in size from a small family owned business with approximately $5 million in annual sales to a very large manufacturer with sales of over $6 billion. Both manufacturing and service industries were represented in this group. The primary thrust of the interview with these firms was to determine what they considered the most important factors in the lease or purchase decision, and what kinds of models they used in making the decision. Four manufacturers who offer their products on both a lease and purchase basis, were interviewed. The major emphasis in all these interviews was to determine how they viewed their customer's ability to make the lease purchase decision and how they (the manufacturer) tried to influence their decision.

The last group of firms to be interviewed were four large

banks who both finance leasing companies, and have active leasing operations of their own. Much of these discussions centered on the financial aspects of the leasing business, and what the future of the business looked like to these banks.

In addition to the interviewing, 32 transactions were reviewed (by questionnaire) to determine the primary reasons for the decision on lease or purchase. The results of this survey as well as the interviews will be covered later in this chapter.

## The User

There does not seem to be any single consideration that is paramount in the lease or purchase decision. The reasons for the lease or buy decision varies by industry and by size or financial condition of firms within an industry. There do seem to be several general considerations that applied in most situations, as well as some special considerations that are over-riding in specific cases.

In nine of the ten firms interviewed obsolescense was one of the major considerations. This concern was expressed in a number of ways. First in terms of useful life of the equipment. In all cases useful life meant economic life to the firm and not physical life of the equipment. In three of the cases very formal procedures had been established to provide these estimates. It is interesting to note, in at least one case, the fear of the decision maker was that the equipment would last too long, and therefore be difficult to justify, to top management, replacement in a reasonable time, if purchased. Risk

of obsolescense was also expressed in terms of residual value. Estimates of residual value, in most cases, seemed to be made on a subjective basis, and tended to be fairly conservative. Only two of the firms interviewed plotted residual value over time in order to determine the optimum time to dispose of the equipment. One of the larger firms interviewed stated, "the estimate of residual value was the most important factor in making the lease or purchase decision, and that they leased only when they felt that the lessor had over estimated the residual value". The third way that the risk of obsolescense was expressed was in terms of rapid technological change. This concern seems to be particularly prevalent in the computer field where a high percentage of the equipment is leased. As one firm, in talking about their computer, said, "we just don't know, so we lease". A more sensible approach was discussed by a large firm who view their capital assets as a portfolio. They state that "due to their size, even if all of their equipment were obsoleted by new technology, it would take several years to convert. So they try to maintain a balance between short, medium, and long term commitments".

Short term financial implications are another major factor in the lease or purchase decision. Short term in this case implies a one to three year time frame. This is true even though the life of the asset may be as much as 15 to 20 years. In nine of the ten cases this was mentioned as a consideration. This consideration was expressed in many forms which ranged from cash flow to earnings per share. The

important thing, in this case, is not the terms used to express the consideration, but the fact that so much emphasis is placed on the short term results to the firm. This is borne out later in the results of the survey that was done.

It may be somewhat surprising that a major consideration for many firms was their internal budgeting, i.e. the difficulties of getting approval of an item on the capital equipment budget versus the operationg budget. One large firm visited had a very elaborate justification procedure for any capital equipment purchase, but approved any lease equipment only in total as a part of the operating budget. This situation is most prevalent in the federal government. In theory the only reason the federal government would lease, would be due to a very high risk of obsolescense. In fact the government leases a great deal of equipment with the primary reason being the budgeting and approval procedure required.

The method of evaluation used varied a great deal among the firms interviewed. Three of the firms use no formal analysis, and at best only use some fairly crude rules of thumb. The remaining seven firms used some forms of present value cash flow analysis. In five of the seven cases this procedure was mechanized. Considering that it is generally agreed that the lease purchase decision is a financial decision, it was somewhat surprising to hear the comptroller of one medium size firm state that he did not understand or believe in the present value concept.

In every case, the firms interviewed, looked upon leasing as

a source of financing. In about half of the cases it was felt that leasing provided additional credit to the firm. Leasing as a source of credit seems to be of particular importance to the smaller firms and those firms that are in a weak financial position. This method of financing also appears very attractive to those firms or industries that are restricted as to the amount of indebtedness they can incur. Good examples of this are found among the utilities and the state and local governments.

Only one firm interviewed capitalized their leases on their financial statements. In most cases it was felt that a footnote was adequate to handle this in the financial statement. It was interesting to note that in talking with the loan officers at the four banks interviewed, they all felt that leases should be capitalized, however, none of the four banks capitalized their own leases. In no case did the firms indicate tnat off the balance sheet accounting was a reason for leasing. However, in the transportation and retail industries this would seem to be an attraction due to their debt to equity ratios.

In questioning the firms about what functions were performed by the lessor, it was apparent that this question had received very little attention. The one exception being manufacturers full service leases, where the manufacturer performed specialized services such as maintenance, technical assistance, etc. When pressed on this question, most agreed that there was a credit function performed as well as a risk taking function. One large firm responded to the question by

stating that "the lessor was the 'patsy' for the risk the firm was not willing to assume".

A Survey

To gain a better understanding of what factors influence the lease purchase decision a survey was made of 32 recent purchase decisions in the computer industry. This industry has had very rapid technological change over the past 15 years and it is estimated that approximately 70% of all data processing equipment is leased. This makes purchase transactions of particular interest. The results of this survey are shown in Exhibits XV and XVI.

Exhibit XV shows the primary reason given in each case for purchase. The obsolescense factors (term of usage and residual value) account for 47% of the purchases while short term financial considerations (cash flow, P & L statements, ITC) account for 38.6% of the purchases. This result tends to re-enforce the findings of the interviews. Exhibit XVI gives some indication of the amount of influence the vendor has on the lease or purchase decision, how much past activities influence the decision, and to what extent analysis is made and by whom. It is interesting to note that in approximately 50% of the cases the vendor had very little influence on the decision, and that in every case when analysis was made the user did his own analysis regardless of whether or not the vendor had furnished one.

The Manufacturer

The manufacturer-lessors interviewed offer their products on both a purchase and lease basis. Three of the four manufacturers offer both full service operating leases and full payout financial leases. One manufacturer offered only a full service operating lease. All four manufacturers felt that their ability to offer both purchase and lease gave them a significant marketing advantage. In each case the manufacturer stressed the use of the full service operating lease. They felt that, as manufacturers, they were in the best position to assume the risk of obsolescense, plus the fact that this is the most profitable alternative for them. Three manufacturers who offer full payout leases felt that this gave them added financial flexibility in that they could assign these contracts in times of financial need. All four manufacturers agreed, that in general, in the past, their customers had not done a very good job of lease purchase analysis and that it had only been in the past four or five years that their customers have started to become sophisticated in this area.

It was generally felt that as their customers became more proficient in making the lease purchase decision that the manufacturer would have to become more flexible in their terms and types of leases offered, and that more manufacturers would be encouraged to offer their products on either a lease or purchase basis.

Exhibit XV

Primary Reasons Why Firms Purchased

(Survey Results)

| | |
|---|---|
| Long Term Usage | 35.9% |
| P & L Statement | 24.5% |
| Residual Value | 11.1% |
| Cash Flow | 9.7% |
| Investment Tax Credit | 4.4% |
| History of Purchase | 3.1% |
| No Extra Shift | 2.8% |
| Less Rental With Third Party | 2.7% |
| Desire to Spend Ahead | 1.3% |
| Other | 4.5% |

## Exhibit XVI

Survey Analysis

| Vendor Influence on Decision | Total Systems | Customer Previous Purchase | Dollars Purchased | Lease Purchase Analysis Made By | | | |
|---|---|---|---|---|---|---|---|
| | | | | Vendor | | Customer | |
| | | | | Yes | No | Yes | No |
| 0% | 12 | 12 | $28,131,000 | 6 | 6 | 12 | 0 |
| 25% | 7 | 7 | 11,940,000 | 5 | 2 | 6 | 1 |
| 50% | 2 | 2 | 2,944,000 | 2 | 0 | 2 | 0 |
| 75% | 4 | 3 | 5,062,000 | 3 | 1 | 3 | 1 |
| 100% | 7 | 5 | 16,397,000 | 6 | 1 | 6 | 1 |
| TOTAL | 32 | 29 | $64,474,000 | 22 | 10 | 29 | 3 |

The Banks

In the past few years leasing has become respectable in the financial community, and the banks have gotten into leasing in a big way. For a number of years the major banks have provided financing to the leasing companies, either based upon the leasing companies credit or, by taking assignment of the lease contract, based upon the lessee's credit. In the past few years every major bank in the country has become directly involved in the leasing business, through a leasing department or a wholly owned subsidiary. The banks interviewed were no exception. Three of the four banks interviewed have leasing subsidiaries and the fourth is planning one. The reason for this approach is to allow flexibility in performing functions that a bank is not normally allowed to perform, and to limit the liability of the bank.

In every case the only type of leasing done by the banks was full payout financial leasing. However, the size of the leases handled varied a great deal. Only one of the four banks would take a lease for an asset valued at less than $250,000, and one of the banks would only take leveraged leases. There does not seem to be any limit on what type of asset the bank will lease, however, the banks perform the same type of credit analysis for leases that they do for making loans. The banks interviewed have taken a very conservative position on all leases taken to date, in that, they have assumed zero residual value on all assets leased. As one banker indicated on some assets

such as tankers and cargo ships the assets have actually appreciated in value. Most bankers feel that as competition increases they will be forced to take a less conservative position. Therefore the banks indicated that they are very cautious on advising their customers about a lease or purchase decision, in that, they do not want to be placed in a position of recommending one over the other. However they do point out the various advantages and disadvantages to be gained. None of the banks interviewed provide a lease purchase analysis for their customers.

To date only a few of the very large banks have aggresively sought out leasing business. However, as recent ads in the Wall Street Journal have indicated this financial service should grow rapidly among the banks in the next few years.

## Summary

There is a wide range in the degree of sophistication used in making the lease purchase decision. This range is based to some extent on the understanding of the factors involved and the implications of the decision. In some cases it is based upon the dollar size of the investment or special considerations either real or imagined.

There is general agreement that in the past few years there has been a great deal of improvement in the understanding in resulting quality of the lease purchase decision. It is felt that this improvement will continue at a rapid pace, as leasing grows in popularity.

The factors which seem to have the most influence on the lease or purchase decision are obsolescense (useful life and residual value) and short term financial results (cash flow, ITC, etc.). In specific cases considerations such as credit, allowable costs, off balance sheet financing, may be over-riding. As might be expected, leasing is found to be more popular in capital intensive industries.

The general feeling, among the firms interviewed, is that the leasing industry should continue to grow at a healthy rate over the next few years. This is due to three reasons:

(1) The user is becoming better informed of the advantages offered by leasing.

(2) More manufacturers are using leasing as a marketing tool.

(3) The financial community, through competition, is making leasing more attractive.

# Chapter VII

# SUMMARY AND CONCLUSIONS

## Summary

The various types of lease and purchase alternatives, along with the qualitative and quantitative considerations which enter into the lease or purchase decision were reviewed in this study. Those considerations believed to be most important to the decision, were given detailed consideration. This included a detailed review of functions performed by the lessor, the effects upon the corporate financial statement, accounting practices, and tax considerations.

A review was made of the various methods available for analyzing the lease or purchase decision. A methodology was presented to assist in the solution of this problem, along with a discussion of the sensitivity of factors, such as method of depreciation, residual value, and useful life. It was demonstrated that the lease alternative would be selected if:

(1) The user was generally unwilling to risk the loss associated with obsolescense.

(2) The present value cost of leasing was less than that of purchasing.

(3) The user sought flexibility in the use of his equipment.

(4) The user was unable or unwilling to obtain long term financing.

(5) Government regulations made leasing economically desirable.

The purchase alternative would be chosen when:

(1) The user would be unwilling to forego anticipated residual value.

(2) The present value cost of purchasing was less than that of leasing.

(3) Adequate investment alternatives did not appear elsewhere.

(4) Useful life exceeded the full payout period.

Present value cash flow analysis was used to evaluate seven lease and purchase alternatives. The alternatives, which are ranked in descending order of present value costs are listed below:

(1) Bank Financing - Ten Years

(2) Full Payout Leasing

(3) Manufacturer's Deferred Payment Contract

(4) Bank Financing - Five Years

(5) Initial Cash Outlay

(6) Non-Full Payout Leasing

(7) Manufacturer's Rental Contract.

The results of interviews with a number of users (of capital goods), manufacturers, and banks, indicated the primary considerations in the lease or purchase decision centered around the questions of obsolescense and short term financial considerations. The methods used to evaluate lease or purchase, and the quality of the decisions, while improving over the past few years, still leaves a great deal to be desired in many cases. The general feeling among the manufacturers and bankers interviewed toward leasing seems to be one of positive enthusiasm.

## Conclusions

The analytical tools available today to assist a firm in evaluating the lease or purchase decision are adequate to insure a correct decision, provided they are properly understood and applied. The methodology for evaluating the lease or purchase decision should be as valid in the future as it is today. However, the weight or merits of significant points may change considerably from situation to situation. The literature available to assist anyone wanting to pursue this subject is relevant, ample, and current with the exception of the areas of accounting practices and taxes. The shortage of good information in these two areas is somewhat understandable for several reasons. First, it is a rapidly changing area, second, any relevant discussion calls for opinions and conclusions that might prove professionally risky, and third, few firms are interested in publicizing their internal procedures. It is interesting to note, that despite the

apparent lack of published literature, most of the firms interviewed were more aware of the accounting and tax implications of leasing than some of the areas which are better supported by theory and published information.

A great deal of progress has been made in the past few years, in terms of user awareness of the advantages and disadvantages of lease or purchase, and the evaluation methodologies. However, a great deal more progress needs to be made to have a generally well informed public. It would appear that this education process will continue to take place at an increasingly rapid pace due to the interest and publicity being given to the subject.

It is important that the lease purchase decision be recognized as a financial decision and that these decisions be made at the proper level in the organization. Many firms make poor decisions in this area because they either fail to recognize the nature of the decision or they allow it to be made at the wrong level of authority. As mentioned in Chapter VII, in almost half of the firms interviewed the lease or purchase decision was not made by the financial officer and in many cases the lease decision could be made at a much lower level in the organization than an equivalent purchase decision. This can partially be explained by a lack of understanding of the nature of the lease purchase decision, however, I believe that it must also be explained in part by other reasons. Richard Cyert and James March in their book, A Behavorial Theory of the Firm, give some indications as

to what these reasons might be. What appears to be an emotional decision making process can be better understood if considered in the light that the firm's only or primary objective is not profit maximization. The level and method of decision making can be better understood when one understands the bargaining and trade offs that are made in establishing goals and objectives and the methods and procedures for accomplishing them. Perhaps Cyert and March best summed up the reasons when they state, "The firm is characterized as an adaptively rational system rather than an omnisciently rational system"[1]. In any case this book quite correctly describes many of the observations made during the interviews which were conducted for this thesis.

In the past the leasing industry has been made up of a small number of banks, manufacturers of specific types of products, and a highly fragmented group of independent leasing companies. It seems apparent that the industry as a whole will undergo substantial change over the next few years and as a result should experience considerable growth. As indicated earlier a better understanding and awareness of leasing is being gained. This interest is spilling over from capital goods into a wide variety of consumer goods.

The recently approved extension of the Investment Tax Credit Law will do a great deal to spur the growth of leasing. In the interviews conducted it was found that the Investment Tax Credit has only

[1] Richard M. Cyert and James G. March, A Behavioral Theory of the Firm, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, p. 99.

a minor effect upon the decision to acquire capital goods, but that it has a major effect upon how the goods are to be acquired. Particularly in times of relatively low corporate profits more firms will turn to leasing to take advantage of the investment tax credit.

It is probable that there will be a significant shake-out among the independent leasing companies. This will occur either by marginal firms failing or by merger and consolidation into larger units. There are several reasons for this:

(1) The proposed accounting changes could have significant effect on profitibility, particularly in the early years of the lease. Articles in the Wall Street Journal[2] indicate that a number of leasing companies are already changing their accounting practices at the expense of substantial losses.

(2) As more and more banks enter the leasing business less bank financing will be available to the independent leasing companies, and the cost of entry through the equity market will be considerably higher.

(3) As banks become more active in the full payout leasing market, it will be difficult for independent leasing companies to compete due to their

[2] Wall Street Jouranl, "DPA Will Accelerate Depreciation", January 5, 1972 and "Heard on the Street", March 9, 1972.

(3) (Continued)

higher cost of capital.

(4) As more manufacturers enter the full service leasing of their products, leasing companies will be forced to compete in the non-full payout market which carries more risk and less profit.

Manufacturers of a wide variety of products will use leasing as a profitable means of marketing their products in the future. As indicated earlier, the manufacturer is in the best position to offer services, assume the risk of obsolescence, and find second markets for his product. In several of the interviews it was indicated that manufacturing firms plan to start or expand their leasing activity. A recent article in the Wall Street Journal, entitled, "Maytag to Lease Products to Apartment Complexes"[3], is a good example of this.

As banks have become increasingly aware of the importance and profitability of full payout lease financing they have rushed in to fill this need, and now represent a major share of this market. A recent full page ad in the Wall Street Journal for Morgan Guaranty is representative of this activity. It is quoted in part as follows:

> "Financial officers in capital-intensive industries such as Oil, Transportation, Pulp and Paper, Utilities, are well aware of the attraction of long term

[3] Wall Street Journal, "Maytag to Lease Products to Apartment Complexes", January 25, 1972.

> leasing. Compared with the traditional means of financing capital equipment, leveraged leasing often proves to be far less expensive, especially for companies that cannot take full advantage of the tax benefits of ownership. If your corporation needs large capital equipment, or if you are a manufacturer of major equipment that might be leased, consider these facts. Drawing on years of experience, Morgan Guaranty lease-financing specialists can put together a multi-million dollar package that's precisely tailored for your company. They'll attend to all the details, fitting the lease and the long term leveraged financing to your objectives. They'll help you get maximum benefit from your investment tax credit and depreciation rules. And they will demonstrate the convenience on working directly with one financial organization which has the experience and the integrity to handle every aspect of lease financing. To talk in detail about capital-equipment leasing, either for yourself or for your customers, contact the Lease-Financing experts in Morgan's Financial Services Department. This is just one of the many corporate banking services offered by Morgan Guaranty."[4]

To date there has not been a development of a second market for trading in lease contracts. This is due primarily to the tax difficulties involved with transfer of ownership and the lack of backing for this paper. It is very likely, with the establishment of tax sheltered trusts to handle large leases, that a market will develop to trade in shares of these trusts. This would be similar to the equipment trusts now common to the railroad industry.

A new entry into the leasing business may be the large

[4] Wall Street Journal, "Morgan Guaranty", January 25, 1972, p. 17.

charitable foundations. This is likely to come about due to the following: Most banks on large full payout leases have used an accelerated method of depreciation which gives them a larger cash flow, due to the tax write offs, in the early years of the lease. At the point in the depreciation schedule where the cash flow from the lease becomes positive it may be more advantageous to donate the lease to charity, at book value, and take a tax deduction on the charitable donation. While it is not known if this procedure has been used to date, it would appear to give a substantial increase in ROI if used.

Whether or not all of the conclusions drawn from this study will come to pass, only time will tell. In any case the rapid growth and exciting changes surrounding the lease purchase phenomenon should make it of continued interest to management, whether they be lessee or lessor.

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# APPENDIX I

## Interview Guide

1. Name of Company
2. Type of Business
3. Size - Assets, sales, capital good budget
4. Do you rent or lease any capital goods?
5. What are the primary considerations in the decision to lease or purchase?
6. How do you evaluate the lease-purchase decision? Is the evaluation done on a manual basis or by computer model? Do you get assistance from vendor in making the evaluation? Do you seek help from your banker?
7. Do you use operating or financial leases? or both?
8. What rate of return do you expect from your investments?
9. What is your cost of capital?
10. How do you normally fund capital investments?
11. What function does the lessor perform? How much does his service cost?
12. Do you consider leasing a new source of credit?
13. What type of credit is it most comparable to? Short term, long term, secured, etc.
14. Do you capitalize your leases?
15. How do you compute amount to be capitalized?
16. Do you include all or part of lease payment in computing financial ratios?
17. How does your banker treat questions (14) and (16)?

18. Does the use of leasing make it possible to obtain greater amounts of credit than would be possible with only debt financing?

19. Do your debt agreements contain clauses that limit or restrict leasing?

20. Do you make a distinction between renting and leasing?

21. Do you plan to do more or less leasing in the future? Why?

22. Is most of your leasing directly with vendors? With banks? With independent leasing companies? Why?

23. What method of depreciation do you use for tax purposes? For stockholder reporting?

24. How do you determine the life of an asset?

25. How do you determine salvage value?

26. Do you account for leases in your annual report? How?

27. May I have a copy of your annual report?

28. What effect does investment tax credit have on your decision to lease or purchase? On your decision to acquire?

29. Is the investment tax credit passed through to you on your leases?

30. How many years have you been leasing?

## Additional Questions for Banks

1. How do you treat leases in considering an application for a loan?

2. Do you believe leases should be capitalized? On what basis?

3. Do leases extend the amount of credit available to a firm?

4. Do you reqire restrictive clauses with respect to leases or loans?

5. Do you provide advice and/or assistance to your customers on lease or buy decisions? What form?

6. Are you directly involved in leasing activities? How long have you been involved?

7. What type of leasing do you do?

8. Do you plan to become more or less involved in leasing in the future?

9. How do your customers go about making the lease purchase decision?

10. How do you market your leasing services?

## Additional Questions for Manufacturers

1. What terms do you offer in marketing your products? Time pay plan? Rent? Operating lease, full payout lease? etc.

2. Why did you select this approacn?

3. How do you market the various terms?

4. How does your customer make the lease-purchase analysis and decision?

5. Do you provide aids and assistance in this area?

6. How do you account for revenue from leases?

7. What do you see the future trend to be in leasing?

8. How do you handle investment tax credit on leases?

# APPENDIX II

## Purchase Survey Questionnaire

1. Company Name _____
2. Industry _____
3. Has company previously purchased? _____

   What? _____

   When? _____

4. Current system being considered _____

   _____

   Lease price _____ (per month)

   Purchase Price _____

5. Did vendor proposal contain both lease and purchase price? _____
6. Did vendor proposal list advantages of lease and/or purchase?

   _____

7. Did vendor provide lease-purchase evaluation? _____
8. Did company make independent lease versus purchase evaluation?

   _____

   Was it a computer program or manual?

   _____

8. (Continued)

What assumptions were made for:

Residual Value _____

Length of Life (Years) _____

Depreciation Method _____

Rate of Return % _____

9. At what management level was purchase decision made?

_____

10. What were the purchase advantages which influenced the decision? (Give a percentage to each item, so total equals 100%.)

| | |
|---|---|
| Residual Value Anticipation | _____ |
| Cash Flow Advantage | _____ |
| P & L Statement Consideration | _____ |
| Investment Tax Credit | _____ |
| Long Term Usage | _____ |
| No Extra Shift | _____ |
| Less Rental Through Third Party | _____ |
| Emotion | _____ |
| Other | _____ |
| TOTAL | 100% |

11. How much did vendor influence company's decision?

___0%: Company made decision on their own

___25%: Some vendor influence, but company would probably have purchased anyway

11. (Continued)

50%: Vendor exercised influence on decision -- company might not have purchased except for vendor effort

75%: Company decison strongly influenced by vendor activity

100%: Company decision to purchase based solely on vendor activity