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ANALYZING THE LEASE VERSUS PURCHASE FINANCIAL DECISION

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ABSTRACT

ANALYZING THE LEASE VERSUS PURCHASE FINANCIAL DECISION

By

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Leasing is playing an increasingly important role in the financing of agricultural equipment. This paper analyzes the recent changes in the IRS guidelines for leasing under the Economic Recovery Tax Act of 1981.

The objectives of this paper are to evaluate the effects of these guideline changes, to discuss the effects these changes have on lease agreements, and to demonstrate a method for analyzing leasing versus purchase as an alternative financing decision. To accomplish this an extensive literature review was conducted, individuals involved in the leasing industry were interviewed, and case examples were developed.

It was found that much uncertainty still exists over the so-called "Safe Harbor" guidelines. This is partially due to the unfamiliarity with the guideline changes, but more importantly because agriculture has always preferred outright ownership. The increased use of leasing as a more economical financing decision depends upon educating investors that leasing is simply an alternative to a purchase. Investors must be further educated to consider all relevant variables involved in the decision, and then choose the most economical method of financing.

ACKNOWLEDGMENTS

Several people deserve special recognition for assisting me in completing this study. I would like to express thanks to Dr. Gerry Schwab, my major professor, who spent many hours not only assisting and encouraging me through my thesis, but my entire graduate program.

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INTRODUCTION

A. "Safe Harbor" Lease Agreement

The Economic Recovery Tax Act of 1981 is intended to stimulate capital investment and productivity by increasing the tax incentives for businesses to invest in capital assets. Congress and the Administration in 1981 passed legislation to liberalize the leasing rules to facilitate the "sale" of tax benefits from businesses that were unable to use them to those that could. The apparent interest of the change in law was to stimulate capital investment by more businesses and facilitate recovery for the economy.

The Tax Act of 1981 provides a "Safe Harbor" rule under which, if certain requirements are met, tax motivated leases will effectively transfer the tax attributes of the leased property from the lessee to the lessor. The Act allows the transfer of tax benefits by means of a "phantom sale and leaseback"[1] that will be recognized solely for tax purposes.

1. What Constitutes a "Safe Harbor" Lease?

Under prior law three-party financing leases, so-called "leveraged" leases were widely used to transfer tax benefits from lessees, who

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[1]Main Hordman CPA's, "'Tax Leases' Under the Economic Recovery Tax Act of 1981," Washington Tax Letter, November 1981, p. 2.

didn't have enough tax liability to absorb them, to lessors who could. Congress and the Administration, however, thought that "leveraged" leases were somewhat restrictive as to their availability and use.

The new law establishes a "Safe Harbor" for leasing transactions that provides an exception to prior judicial and administrative guidelines controlling them. It guarantees that a transaction will be characterized as a lease for purposes of allowing investment tax credits and accelerated cost recovery allowances to the lessor, provided the following conditions are met:

a) The leased asset must be new section 38 property (i.e., property eligible for ITC);

b) The lessor must be a corporation (excluding subchapter S);

c) The property may not be used predominately outside of the United States;

d) The property is not personal use property.

A lessor with the above requirements may then receive accelerated cost recovery allowances and investment tax credits on the qualified leased property. Lessees may receive a very significant portion of the benefits of these tax breaks through reduced rental charges for the leased property, or alternatively the lessee may receive cash payments and/or rental expense deductions in the case of a "phantom sale-leaseback" transaction--(to be discussed in Chapter II).

2. Economic Development Corporations

Since 1974, the Economic Development Corporations Act has worked to promote the State's economic development by creating incentives which have improved the health of the business climate in Michigan. Many communities have established Economic Development Corporations to promote

projects, primarily through issuance of tax-exempt revenue bonds and participation in federal economic development programs.

The EDC Act No. 338, Public Acts of 1974 has now been amended as of January 22, 1981 to include EDC authorization for financing agricultural and forestry projects, as well as leasehold improvements.

With the use of this low-cost tax-exempt financing combined with a leasing agreement, lessors may be able to offer Michigan farmers lower rental rates than possible without the use of tax-exempt financing. EDCs will be discussed in greater detail in Chapter III.

B. Need for the Study

"Provisions with respect to leasing in the Economic Recovery Tax Act of 1981 will result in the greatest changes in leasing since modern tax-oriented leasing began in the 1950s."[2]

Leasing, although no new subject, is one that many businesses, especially farmers, have neglected, preferring outright ownership. With the new "Safe Harbor" guidelines, the cost advantages can be such that leasing is a financial alternative that should not be overlooked. For those farmers who cannot take advantage of the ACRS deductions or the ITC, leasing, whether a strict two-party lease agreement or a "phantom sale-leaseback" agreement, should be evaluated as an alternative method to control the service of capital assets.

Because no two financial transactions are entirely the same, a careful analysis of all financing alternatives is important in each case. The basic objective assumed is to identify the least-cost method of controlling the asset's services during a defined planning horizon. It is the

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[2]Peter K. Nevitt, "Effect of the Economic Recovery Tax Act of 1981 upon Leasing," article written for PLI, August 17, 1981.

opinion of the author that leasing arrangements will undoubtedly become more prevalent under the "Safe Harbor" guidelines, but again, careful analysis is needed, and no individual or firm should enter a lease agreement without first considering all possible means of financing.

1. Estimated Past and Future Volume of Leasing

Although there exists no substantial data on the past and future volume of agricultural leasing, a national survey of equipment lessors was conducted by the Federal Reserve Bank of Kansas City in 1981.[3] A total of 131 leasing companies were surveyed and asked to indicate: 1) the current magnitude of lease-financing by agricultural producers; and 2) the expected future growth of lease financing in this sector of our economy. The survey results are summarized in Table 1.1.

They found that the total amount of agricultural leases, in 1980, outstanding for the firms responding to the survey were $628 million. This $628 million represents a 141 percent increase over the level of leasing for 1979. The lessors responding to the survey expect their net agricultural lease receivables to reach $874 million by the end of 1981 and $2.1 billion by the end of 1985.

One can expect these figures to be on the low side since the survey was conducted prior to the enactment of the Economic Recovery Tax Act of 1981. In fact, in past years, tax-oriented leases have been limited by available tax capacity. As a result of the new "Safe Harbor" guidelines, substantial new tax capacity will become available through the

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[3]Adair, A. L., J. B. Penson and M. Duncan, "Monitoring Lease-Financing in Agriculture," Economic Review, Federal Reserve Bank of Kansas City, June 1981, Vol. 66, No. 6, pp. 16-27.

Table 1.1 Characteristics of the Agricultural Leasing Industry[4]

(Based on Survey Results*)

	Involvement in Leases by All Responding Lessors	Involvement by Any Individual Lessor	
		Minimum	Maximum
Total Net Lease Receivables in 1980 (Millions $)	2459.9	.015	523.2
Net Agricultural Lease Receivables in 1980 (Millions $)	627.7	.015	133.2
Percentage Net Agricultural Lease Receivables are of Total Net Lease Receivables in 1980	25.5%	—†	—
Net Agricultural Lease Receivables in 1979 (Millions $)	260.6	.036	58.1
Percentage Increase in Net Agricultural Lease Receivables From 1979 to 1980	140.9%	—	—

	All Responding Lessors	Minimum	Maximum
Estimated Level of Net Agricultural Lease Receivables (Millions $)			
In 1 Year	874.3	.054	337.1
In 5 Years	2097.8	.057	830.1
Percentage Increase Expected From 1980 in the Value of Net Agricultural Lease Receivables			
In 1 Year	39.3%	—	—
In 5 Years	234.2%	—	—

	Average	Minimum	Maximum
Length of Leases (Years) (Mean Value)	5.6	3.5	7.6
Estimated Residual Value (Per Cent of Original Purchase Price) (Mean Value)	14.2%	5.0%	36.1%

	Percentage of Leases Accounted For by Type of Equipment	Highest Percentage of Total Lease Business by Type of Equipment for an Individual Lessor
Types of Equipment Leased (%)		
Tractors	14.3	85.0
Autos	0.8	31.0
Trucks	4.3	100.0
Irrigation Equipment	26.8	100.0
Grain Storage and Handling Equipment	9.1	80.0
Harvesting Equipment	11.6	100.0
Livestock Buildings and Equipment	5.3	40.0
Livestock	14.4	100.0
Implements and Other Machinery	7.9	100.0
Non-Production Items	5.6	100.0
	100%	

*The figures presented in this table are a summary of survey responses, which are not a randomly distributed sample.
†Not applicable.

[4] Ibid., pg. 24.

development of so-called "nominal lessors" (corporations acting as lessors, solely for tax purposes).

2. Leasing, an Alternative Financing Decision

In analyzing the leasing decision, the first screening test is whether or not, from a capital budgeting standpoint, the property passes the investment decision. The second question is then whether leasing or some other method of financing is the least costly method of financing the investment. Cash flow differences are another relevant consideration. The point that should be understood about lease financing is that it is simply another financing alternative.

Although the Economic Recovery Tax Act of 1981 "Safe Harbor" guidelines may make leasing a less costly decision for one firm, it does not mean it may be the best for all firms. What the new law has done to leasing has made it more closely resemble lending.

C. Purpose of the Study

There are many misconceptions about "Safe Harbor" lease agreements, since it is such a new, unfamiliar topic. Therefore, the purpose of this study is to serve as an educational tool to increase awareness of the potential benefits and drawbacks associated with leasing.

It is intended that this study will be used as a guide in the coordination of future lease agreements under the Economic Recovery Tax Act of 1981 "Safe Harbor" guidelines. Readers should be aware of any tax changes that may occur after the publishing of this document. Since this subject is so new, IRS has not ruled on many of the provisions, and future rulings may eliminate or restructure the "Safe Harbor" guidelines.

D. Objectives

The overall objective of this study is an analysis of the Economic Recovery Tax Act of 1981 "Safe Harbor" guidelines, and to determine the effect it may have on agricultural leasing. Within this broad objective, several specific objectives can be identified. These specific objectives are:

1) To define and explain the basic differences between the old IRS guidelines and the new "Safe Harbor" guidelines;

2) To determine the features that should be considered by all parties involved in a lease agreement;

3) To ascertain the relative advantages and disadvantages of leasing versus purchasing property;

4) To demonstrate through the use of hypothetical case examples, the identification and evaluation of certain key variables in the leasing decision.

It is intended that a study of these objectives will give individuals a greater insight into the importance of leasing as an alternative financial decision.

E. Procedure and Methodology

This study consists of two parts:

1) Assembly and analysis of data dealing with leasing from both prior and current laws. Much of the data came directly from interviews and discussions with individuals involved in the leasing industry. Other data was collected from government document sources and other forms of literature;

2) In the hypothetical case studies section several lease versus purchase options are analyzed. Both three-year and five-year recovery period property are considered and certain variables are altered for each alternative. Both a break-even and sensitivity analysis are performed to demonstrate the optimal lease rates in order to equate the lease with the purchase decision. These case examples are not intended to apply to all situations. However, the examples should increase the reader's understanding in this particular subject area.

CHAPTER II

LEASING PROVISIONS OF ECONOMIC RECOVERY TAX ACT OF 1981

This chapter begins with a discussion of the three major types of lease agreements. The last of the three, a "Phantom Sale-Leaseback," will be discussed further through the use of an example. Then the specific requirements that must be met in order to have a valid lease will be looked at from both the "old" IRS "guidelines" under Section 168(f)(8) and the "new guidelines" as a result of the Economic Recovery Tax Act of 1981. The basic differences will be discussed, and reasons shown why a new type of lessor, along with a new type of lease transaction will emerge.

A. Types of Leases

Leases take several different forms, the most important of which are operating, capital, and "Phantom Sale-Leaseback."

1. Operating

An operating lease can be characterized as a short-term rental arrangement. The lease can include both financing and maintenance services. Some manufacturers of computer hardware have long used operating lease arrangements. The leases ordinarily call for the lessor to maintain and service the leased equipment, and the costs of this maintenance are either built into the lease payments or contracted for separately.

An operating lease is frequently not fully amortized. In other words, the payments required under the lease contract are not sufficient to recover the full cost of the equipment. Such a lease contract would be written for a shorter time period than the expected useful life of the leased equipment. The lessor expects to recover the cost either in subsequent renewal payments or on disposal of the equipment. Most operating leases may also contain a cancellation clause, when the lessee has the right to cancel the lease and return the equipment prior to the expiration of the lease agreement. This factor is a major benefit to the lessee if technological advances render the equipment obsolete.

2. Capital

A capital lease or (two-party lease) is one that does not provide for maintenance services, is not cancellable, and normally contains a buy-out option. In most situations a lessee (user) either negotiates his best price with a manufacturer or distributor, then finds either a leasing company or financial institution who will purchase the asset and lease it to him, or the user simply leases direct from the manufacturer or distributor. The lease payments would fully amortize the cost of the asset, less any buy-out, and would allow the lessor to make a return on his investment.

3. "Phantom Sale-Leaseback" Transactions

The easiest way to demonstrate the modus operandi of a "phantom sale-leaseback" agreement is through the use of an example. (The figures in the example are based upon an illustration in the Financial

Accounting Standards Board Exposure Draft).[1] Following the example is a flow-chart demonstrating the transfers from one party to the next.

Suppose company (A) buys a new item of machinery for $100,000. Because of a large loss carryover it has no income tax liability and is currently unable to use the ITC, or reduce taxable income by deducting accelerated cost recovery deductions (hereafter referred to as ACRS deductions). Thus company (A) enters into the following agreement with corporation (B):

(A) "sells" the machinery to (B) for $100,000. (B) pays a $22,000 (22 percent) cash downpayment and issues a note for the remaining $78,000, with interest at 12 percent payable in ten equal annual installments of $13,805. (See Table 2.1).

(A) then "leases" the machinery back from (B) for a term of ten years. The annual lease payment is exactly equal to the annual installment payment on the note (i.e., $13,805).

At the end of the lease term, (A) has an option to purchase the machinery from (B) for $1. Legal ownership of the machinery is retained by (A), and no further cash payments are made between (A) and (B); only book entries reflect rent and interest payments.

The machinery has a five-year ACRS life. (B)'s marginal tax rate is 46 percent, and the transaction meets all the "Safe Harbor" requirements discussed previously.

In the foregoing example, the lessee or company (A) has, in effect, traded the ITC and ACRS allowances for $22,000 cash and rental expense deductions spread over ten years. These deductions can be used to

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[1]Main Hurdman CPA's "'Tax Leases' Under the Economic Recovery Tax Act of 1981," Washington Tax Letter, November 1981, p. 3.

Table 2.1

Tax Consequences to Company (A) Lessee

Year	(1) Down Payment	(2) Interest "Income"	(3) Rental "Expense"	(4) Net Tax Deduction
1	$22,000	$9,360	$13,805	$4,445
2		8,827	13,805	4,978
3		8,229	13,805	5,576
4		7,560	13,805	6,245
5		6,811	13,805	6,994
6		5,971	13,805	7,834
7		5,031	13,805	8,774
8		3,978	13,805	9,827
9		2,799	13,805	11,006
10		1,484	13,805	12,321
Totals	$22,000	$60,050	$138,050	$78,000

(4) = (3) - (2)

Tax Consequences to Corporation (B) Lessor

Year	(1) Down Payment	(2) Rent "Income"	(3) Interest "Expense"	(4) ACRS Deduct.	(5) Taxes Saved (Paid)	(6) Cumulative Cash Inflow or (Outflow)
1	$22,000	$13,805	$9,360	$15,000	$14,855*	($7,145)
2		13,805	8,827	22,000	7,830	685
3		13,805	8,229	21,000	7,095	7,780
4		13,805	7,560	21,000	6,787	14,567
5		13,805	6,811	21,000	6,443	21,010
6		13,805	5,971		(3,603)	17,407
7		13,805	5,031		(4,036)	13,371
8		13,805	3,978		(4,520)	8,851
9		13,805	2,799		(5,063)	3,788
10		13,805	1,484		(5,668)	(1,880)
Totals	$22,000	$138,050	$60,050		$20,120	

(5) = (3) x 46% + (4) x 46% - (2) x 46%

*Includes $10,000 investment tax credit

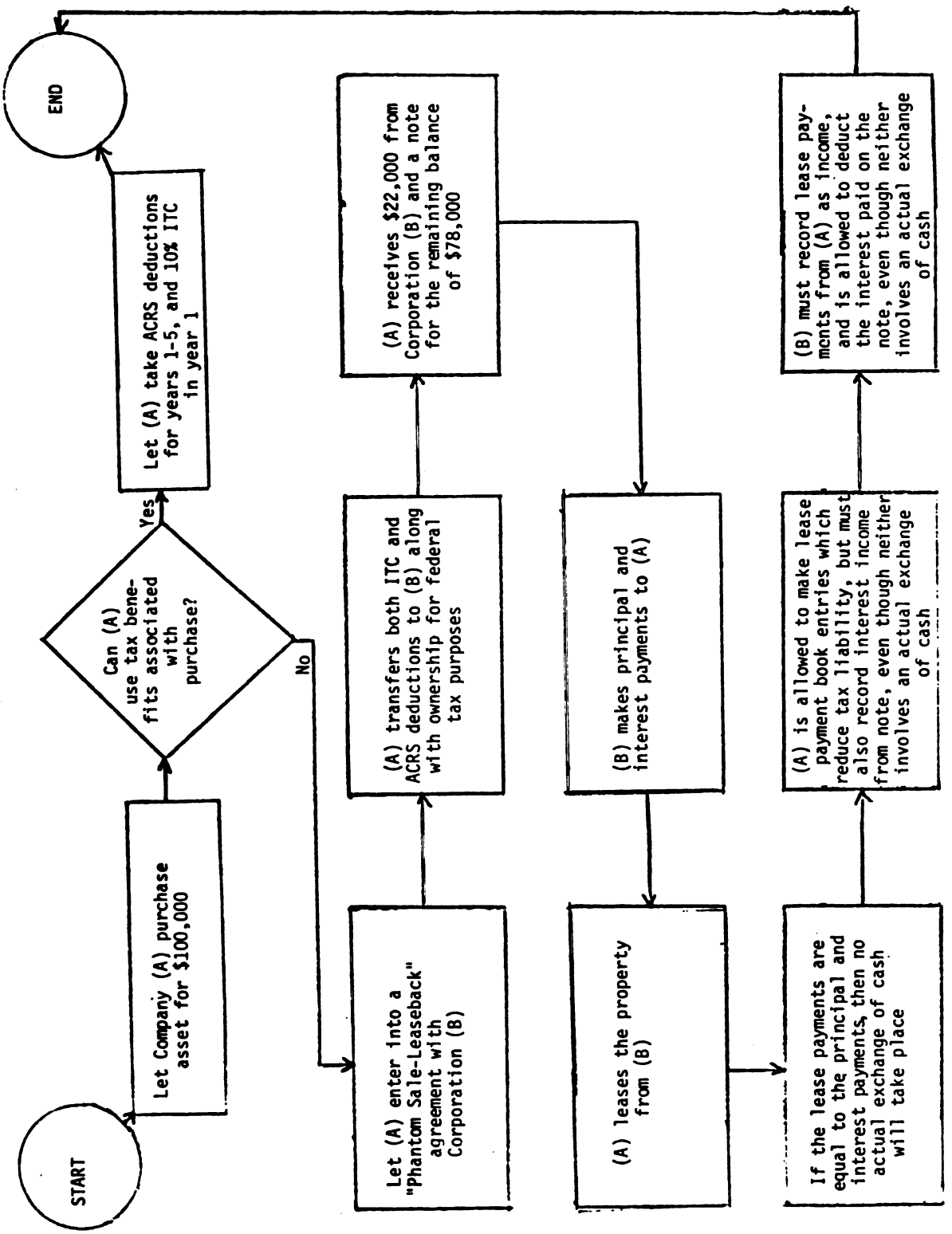

Figure 2.1 "Phantom Sale-Leaseback" Flowchart

reduce taxable income once the loss carryforward has been used up. Although (A) must recognize "interest income" from corporation (B)'s promissory note, this income is more than offset by the "rent expense" deduction.

The transaction permits the lessor or corporation (B) to defer payment of taxes from the early years of the lease to the later years.

Whether or not this particular transaction would be economically attractive to corporation (B) depends upon the rate of return that (B) is able to make on the deferred taxes, reduced by the net amount of the downpayment. Company (A), the lessee, should simply view the transaction as a form of financing and compare it with other alternative means. The considerations of both the lessor and the lessee will be discussed in further detail in the next chapter.

B. Changes in IRS "Guidelines" for Leasing

1. The "At Risk" Rules

The first major change from the old IRS guidelines is that the lessor must only maintain a minimum "at risk" investment of not less than 10 percent of the adjusted basis of the property. Under the previous IRS guidelines at all times during the lease and at the time the equipment was first placed in service, the lessor had to have a minimum "at risk" investment in the equipment of at least 20 percent of the adjusted basis of the property.[2] There is some difficulty in interpreting the 10 percent "at risk" requirement. For example, consider a lessor using maximum leverage (i.e., finances 90 percent of the asset cost through borrowed

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[2]Exec. Order No. 205, 46 Fed. Reg. 51907 (1981).

capital). After using the first year 10 percent investment tax credit (for five-year recovery property) to recoup the entire out-of-pocket costs, how much capital is "at risk"?

There are further complications with interpreting the "at risk" rules for closely-held corporations. A closely-held corporation is defined as one which during the last half of its taxable year, more than 50 percent in value of its outstanding stock is owned directly or indirectly by five or fewer individuals. A corporation falling within that definition may deduct losses from an activity only for the amount of actual investment in that activity plus the amount of any recourse indebtedness (guaranteed debt) for which it is liable. Consider the case of a "Phantom Sale-Leaseback" agreement involving a closely-held corporation as the lessor. There is some question whether the amount of the lessor's indebtedness to the lessee will be considered "at risk," since payment on the installment note will generally be contingent upon the lessee's payment or rent.

Closely-held corporations may also encounter difficulty entering into a "Phantom Sale-Leaseback" agreement as a lessee. Under the temporary regulations, a lessor (even though not a closely-held corporation) is not permitted to claim any greater deductions than the lessee could have claimed.[3] Consequently, if the closely-held corporation purchases new equipment financed by nonrecourse debt, they will probably have difficulty in finding a prospective lessor if they desire to enter into a "Phantom Sale-Leaseback" agreement.

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[3]Ibid., p. 51913.

2. Length of the Lease

The term of the lease is the next major change in the IRS guidelines. With the new "Safe Harbor" guidelines the term of the lease cannot exceed the greater of 90 percent of the useful life of the property under section 167, or 150 percent of the asset depreciation range (ADR) present class life ("midpoint") of such property, applicable as of January 1, 1981." The old IRS guidelines stated that the remaining useful life of the property at the end of the lease term must be the greater of one year or 20 percent of its originally estimated useful life.[4] The IRS defines "useful life" to mean "the period when the leased asset can reasonably be expected to be economically useful in anyone's trade or business." "Such term does not mean the period during which the lessor expects to lease the property."[5] IRS goes further to state that "any option to extend the term of the lease, whether or not at fair market value rent, must be included in the rental agreement." "If several different pieces of property are the subject of a single lease, the maximum allowable term for such a lease will be measured with respect to the property with the shortest life."[6] An example here may be the easiest way to show the differences in the maximum allowable term for leased property. Corporation (A) and corporation (B) elect to enter into a lease which will be treated under "Safe Harbor" guidelines section 168(f)(8). The property in question has a useful life of ten years and an (ADR) "midpoint" life of five years. Under the old

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[4]Ibid., p. 51910.

[5]Ibid.

[6]Ibid.

guidelines the maximum allowable lease term would be such that the greater of one year of the remaining useful life must still exist or 20 percent of its total useful life must still exist. In this example since 20 percent of ten years is two years, and two is greater than one year, the maximum allowable lease term would be eight years. In contrast with the Economic Recovery Tax Act of 1981 "Safe Harbor" guidelines, the lease term cannot exceed the greater of 90 percent of the useful life, which is nine years, or 150 percent of the (ADR) "midpoint" life which in the example would be 7.5 years. Thus with the new guidelines, the lease term may actually be extended by one year from eight to nine years. This does not mean that lease terms will lengthen under the new guidelines, with the possible exception of when the lessee provides his own funding. In fact, lease terms will tend to be for shorter terms since with the introduction of ACRS, lessors will take advantage of much faster write-offs than were possible under the old depreciation rules.

The IRS has also put a minimum lease term on property that is qualified for section 168(f)(8) "Safe Harbor" guidelines. The term of the lease must be at least equal to the class life of such property under ACRS.[7] For example, if property is in the five-year recovery period, the lease agreement must have a minimum term of five years.

3. Leasing Solely for Tax Purposes

Under the old IRS guidelines the lessor had to prove the transaction was entered into for a before-tax profit, distinct from tax benefit considerations. With the new tax act, deriving a profit or favorable cash

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[7]Ibid., p. 51910.

flow from the transaction that depends upon tax benefits of ownership is irrelevant.[8] What this means is that any qualified corporation can act as a leasing company solely for the purpose of tax benefits. Corporations with federal income tax liability can become "nominal" lessors on a fairly risk-free basis. They are simply equity investors in a leveraged lease using non recourse debt in which a "nominal" lessor's risk is confined to being able to obtain, in a relatively short time, tax benefits in excess of his equity investment.

4. Ownership

The major benefit of this change in the IRS guidelines applies to "Phantom Sale-Leaseback" agreements. With the old law, the lessor had to own the leased property at the time it was placed in service to be eligible for tax benefits.

With the new law, the lessor has a three-month lag period after the property was placed in service to be designated as the owner.[9] This allows an individual who purchases new section 38 property a 90-day grace period to enter into a "Phantom Sale-Leaseback" agreement with a third party.

5. Fixed Price Purchase Option

This provision is probably the most important to the functioning of a "Safe Harbor" lease agreement. Under the old law the lessee could not have a contractual right to purchase the property at less than its fair market value, nor may the lessor have a contractual right to require any

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[8]Ibid, p. 51908.

[9]Ibid.

party to purchase the asset.[10] This simply meant that with a capital lease (lessee purchases equipment at the end of the lease period) the lessee had to purchase the property at its fair market value. However, with the new "Safe Harbor" guidelines, at the end of the lease period, the lessee may have a purchase option at a fixed price, and the lessor may have a put (i.e., an option to sell within a specified time, at a fixed price) to the lessee. The purchase option or put may be at more or less than fair market value of the property.[11]

It is this provision that allows tax benefits to be sold with very little difficulty, since the buy-out can be fixed at $1 or any agreed upon amount between the lessor and the lessee. This provision also makes it easier for lessors to calculate what their rental rate should be since the purchase price is known. In the past the fair market value was estimated and included into the rental charges. Since this variable was an unknown, it may have been either beneficial or harmful to either party depending on whether the proposed market value of the property suffered appreciation or depreciation during the lease period.

6. Financing of the Property Purchase

Again, this particular provision further clarifies and makes possible the so-called "Phantom Sale-Leaseback" agreement. The old law stated that the lessee may not furnish any part of the purchase price of the asset nor have loaned or guaranteed any indebtedness created in connection with the acquisition of the property by the lessor. With the new law the lessee or a related party may provide financing or guarantee

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[10] Ibid., p. 51908.

[11] Ibid.

financing for the transaction.[12] This allows an individual to finance property from one party and then enter into a "Phantom Sale-Leaseback" agreement with a third party solely for tax purposes. Under the old law the "third party" would be required to finance the property and then lease it to the individual or firm.

7. Limited Use Property

This provision makes it possible for certain property which has a limited use (valuable only to the lessee) to qualify for a true lease under the "Safe Harbor" guidelines, which was not possible under the old law.

8. Leasing a Percentage of Property

Under the old law it was not clear whether a lessor could lease a percentage of property (i.e., a lessee holds property as tenants in common). The new law states that qualified leased property may include undivided interests in property regardless of whether it is considered separate property under state or local law.[13]

The new guidelines state if any party with an economic interest in the property (other than the lessor or lessee) claims ACRS deductions or ITC with respect to the leased property, an election under section 168(f)(8) with respect to such property shall be void as of the date of the execution of the lease agreement.[14]

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[12]Ibid., p. 51908.

[13]Ibid., p. 51912.

[14]Ibid., p. 51908.

9. Bankruptcy of Lessee

Under the old law, both recapture of ITC and depreciation resulted from a bankruptcy of lessee and disposition of the equipment.

With the "Safe Harbor" guidelines, if the lessee (or any subsequent transferee of the lessee's interest) sells or assigns his interest in the lease or the property, whether voluntarily or involuntarily (i.e, a foreclosure), the agreement will not cease to be characterized as a lease, and no recapture will occur as long as the following occurs. The transferee furnishes to the lessor within 60 days following the transfer, the transferee's written consent to take the property subject to the lease, and the transferee and lessor file a statement with their income tax returns for the taxable year in which the transfer occurs.[15]

10. Actual Cash Exchange

It is important to keep in mind that a "Phantom Sale-Leaseback" is a paper transaction entered into only for tax purposes. Legal ownership of the property is not transferred (except for Federal Income Tax purposes), nor is there any alteration of the legal relationship between the lessee and any third party, such as a lending institution or a manufacturer. If the lessee has borrowed to finance the initial purchase of the property, the "Phantom Sale-Leaseback" will have no effect on that acquisition's indebtedness. (The indebtedness is not assumed by the lessor.) The lessee would continue to make the principal and interest payments to the lender and is still entitled to deduct the interest portion as an expense.

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[15]Ibid., p. 51909.

The only cash that will actually change hands in a "Phanton Sale-Leaseback" agreement will be the amount the lessor pays upfront, in cash, for the right to utilize the tax benefits. All subsequent "installment payments" from the lessor to lessee, and "rental payments" from lessee to lessor will merely be offsetting book entries. Nevertheless, these bookkeeping entries will be recognized for tax purposes.

Under the old law the lessee had to make cash rental payments to the lessor or its assignee, which could not be offset against leveraged debt as book entries.

C. Summary

Up to this point the emphasis has been on what actually constitutes a "Safe Harbor" lease agreement, and the relative changes that were made by Congress and the Administration in section 168(f)(8) to make possible this "Safe Harbor."

In the next chapter the focus will turn to the individual contract considerations that both a lessor and a lessee must consider prior to entering into a "Safe Harbor" lease agreement.

CHAPTER III

CONSIDERATIONS BY LESSOR AND LESSEE

This chapter deals more specifically with some of the types of things both a lessor and lessee should consider before entering into a lease agreement. The first section describes the requirements that a typical lessor would have of a prospective lessee and how a lessor would analyze the information. This is an important section and one that is often overlooked by parties in the leasing industry. Too many leasing companies enter into agreements without substantially analyzing the credit worthiness of the lessee. If the lessee defaults on the rental payments, the leasing industry's reputation is tarnished by the perception that almost anyone can still lease even if all other forms of debt financing are exhausted. It is because of these reasons, as the leasing industry grows, lessors must carefully analyze the relative credit risks associated with each prospective lessee.

In the next section some of the more misunderstood contract provisions will be discussed. Although the details can be unique to each contract, it is important for leasing companies and for lessees to incorporate necessary provisions into a contract to protect both parties.

The next section briefly discusses some of the concerns prior to entering into a lease agreement specifically from a lessee's viewpoint. Such concerns as tax liability, annual percentage rate and some other

key factors are looked at. Discussion of Michigan Public Act 501 (EDCs) and the implications of tax-exempt financing to a prospective lessee is then presented.

The last section discusses some possible advantages to leasing versus buying. Not all of these advantages will apply to any one party, but some suggestions as to what may prompt an individual or firm to lease are discussed.

A. Credit Worthiness of Lessee

Just as in any loan agreement, a lessor must carefully evaluate the strong and weak factors in a lease request, to assess whether the lessee can meet the rental payment obligations. Lessors should attempt to:

1) Identify and collect relevant data describing the potential lessee's financial situation;

2) Analyze the financial data to determine the solvency and the liquidity situation;

3) Weigh the strengths and weaknesses of each credit factor;

4) Consider the strengths and weaknesses of all credit factors in relation to each other and as a whole;

5) Analyze the probable performance of the lease, and;

6) Make the lease decision based on technical knowledge, their lease policy and past experience.

In general a lessor's decision to lease can be based on five factors: 1) human/management factors; 2) financial position; 3) the payment capacity; 4) collateral; and 5) lease purpose.

1. Human Factor

Satisfactory lease payments largely depend on the lessee's willingness and ability to perform in accordance with the terms of the lease

agreement. The lessee's attitude toward the lessor is significant, since willingness to cooperate and accept the lessor's advice forms the basis for mutual respect that will benefit both parties. If individuals are leasing for the first time, lessors should check with local suppliers, purchasers, other farmers, and previous sources of credit as to the lessee's honesty and reputation. In analyzing the human factor, lessors should consider the following:

1) Does the lessee make a full and accurate disclosure of financial data, particularly in listing all debts owed and realistically estimating asset values?

2) Does the lessee have any past financial problems?

3) Does lessee have attitude problems with other creditors?

4) How do other creditors rate the performance of the proposed lessee?

5) Does the lessee have a useful purpose for the property in question?

6) Has the lessee been involved in any speculative financial ventures, (i.e., non-farm business)?

7) Has he been overly optimistic in his projected estimation of profit and cash flow?

8) Is the lessee reluctant to allow the lessor to visit his operation?

9) Has the proposed lessee borrowed previously from many sources? and,

10) Does the lessee frequently overdraw bank accounts?

If the lessee "passes" these criteria, the next step in the human factor evaluation is to evaluate the lessee's overall management ability. The lessor should determine whether the manager has utilized feedback and benefited from previous decisions, has the ability to solve problems, and that financial progress has been made throughout his years involved with the business.

2. Financial Position

The primary way a lessor can evaluate a lessee's financial position is through examining the net worth or balance sheet. The lessee, as a minimum, should provide the lessor with an updated year end balance sheet. The lessor should be careful that the balance sheet includes any accrued liabilities (i.e., accrued real estate taxes, accrued income taxes, and accrued interest), and/or contingent liabilities. Contingent liabilities are potential liabilities such as the guarantee of the debts of others. Although these may only be footnoted on the balance sheet, it is important that both the lessor and lessee recognize their existence. The lessor should inquire about any other existing lease agreements and be sure these are capitalized or footnoted on the balance sheet accordingly.

The lessee's net worth provides a measure of risk-bearing capacity. It represents funds which would become available to the lessor in the case of a loss. Increasing net worth over time is the principal indicator of good financial progress. Lessors should evaluate the ability of lessees to handle risk by the amount of debt relative to net worth or what is known as the leverage ratio. For example, if one's debts were $200,000 and net worth $400,000, the ratio would be .5. This ratio is usually considered good, a ratio of 1.0 would be fair, and anything over 1.0 may be cause for alarm. One must remember that agriculture, being a seasonal business, will have firms whose "seasonal" borrowing peak may exceed its net worth without disrupting the financial soundness of the business.

The type of business the proposed lessee is involved in may also influence the risk-bearing capacity. A well diversified business may

get by with a lower net worth because it is less vulnerable to a downturn in prices than a specialized operation. Whether diversification lowers the risk of doing business depends on the relationship between the separate enterprises.

The lessee's liquidity position is a measure of whether sufficient cash can be generated to meet the lease payment obligations as they come due without disrupting the ongoing business. One indicator of liquidity is the current ratio, i.e., current assets (cash and assets which will be converted to cash within one year) to current liabilities (amounts due to others within one year). A ratio of 2.0 is usually considered good, while 1.0 is only fair. A very high ratio indicates a very liquid business situation but also a very conservative position. Probably more important to the lender is the trend of this ratio over time, and the composition of assets (how liquid are the assets).

3. Repayment Capacity

The lessee's repayment capacity is primarily determined by cash flow projections. The lessor should weigh the realism of the borrower's projections and the consequences of alternative outcomes (e.g., price change for crops harvested). Lessor should request the lessee to prepare both monthly and annual cash flows. Comparison should be made of the lessee's projections with past performance record. The lessor should then determine the realism of the projections and make sure the lessee has a well thought out plan for the business as a whole.

4. Collateral

Although lessors are concerned with repayment capacity, liquidity, and trends in financial position, they still need security to cover the

lease in the case of default. The lessor has to consider what is available as collateral, and whether another institution also has a security interest in the property. Lessors must use caution in preparing a collateral agreement to be specific as to: 1) the location of the asset; 2) the identity; 3) what grants them possession; 4) repair and maintenance provisions to minimize deterioration in the asset; and 5) the value of the asset at end of lease period. A lessor should require the lessee to carry adequate casualty and liability insurance to protect the value of both the leased asset and the collateral. In many cases sufficient collateral may just be the leased asset itself. However, if a lessee should forfeit on his rental payments, and the lessor recovers the property, the property is no longer eligible for "Safe Harbor" treatment, and if sold, recapture of both ITC and ACRS deductions by the lessor will occur.

5. Loan Purpose

A lessor should classify the asset in terms of a necessity, need, or a want. A necessity is essential for the continuing operation of the business. Needs could be postponed. Wants can be foregone while the operation continues to function normally.

A lessor must also consider the effect the lease may have on the profitability of the business. Ideally, a good lease is one which enables the lessee to increase income by an amount significantly greater than the total lease cost.

Probably the most important factor in any lease agreement, is that both parties involved fully understand the terms of the agreement. Lessors must use caution to protect themselves through the use of a

written lease agreement. The next section will discuss some of the provisions normally included in a lease agreement but are often misunderstood and/or questioned.

B. Contract Concerns for Lessor

Once the lessor has evaluated the credit worthiness of the lessee, several other factors that should be considered are:

1. Early Termination

What if the lessee decides to buy out the equipment prior to the termination of the lease period? If this occurs and the lessor has not fully depreciated the property, he will lose the ACRS deductions, and recapture of both ITC and ACRS deductions will occur. The lessor should include in his contract a prepayment clause which would make the lessee liable to reconcile any such recapture amounts. The lessor may also be liable to its creditor for prepayment, if borrowed funds are repaid prior to the termination date. This should also be included in the prepayment clause.

2. Default

A provision should be included in a leasing contract stipulating what happens due to the occurrence of any of the following:

a) If lessee fails to comply with or perform any of the terms and conditions of the lease agreement;

b) If lessee becomes insolvent, or files a petition for Bankruptcy Court relief;

c) If lessee is in default in any other indebtedness;

d) If lessor should at any time find itself insecure.

If the lessee should default due to any of the above, the lessor should include in the provision several stipulations which will protect their asset from other creditors or insure that they receive the remaining rental payments. Without this provision, even though the lessor is the legal owner, it may lose possession of the asset. The provision should specifically state that the lessor has the right to possess (without a court order), or sell, or release the asset. In the event that the lessor repossesses the property, he may be subject to ITC forfeiture and depreciation recapture if sold. Therefore, the provision should further state that the lessee is responsible for all expenses of recapture incurred due to the default. If the lessor should choose to continue the lease agreement with another party, he may do so without violating the "Safe Harbor" guidelines as long as the transferee furnishes to the lessor within 60 days following the transfer the transferee's written consent to take the property subject to the lease. The lessor then must notify IRS and no recapture will occur.

3. Warranties

In many two-party lease agreements, a user may go to the manufacturer and make his best deal on an asset. He may then go to his local credit institution and persuade them to purchase the asset and lease it to him. The lessee may feel that the lessor is in some way obligated to provide a warranty. A contract should include a provision that states who is responsible for warranty work and waive other parties from any claims the lessee may have on them.

4. Indemnity for Loss of ITC and ACRS Deductions

Since there is the possibility of section 168(f)(8) of the Internal Revenue code of 1954 to be amended retroactively, lessors should include a provision that would protect them against any loss in tax benefits due to such guideline changes. The lessee should have to pay within a specified time period any such "loss" to federal, state or local taxing authorities, plus the amount of any interest or penalties for which the lessor may be liable.

5. Repairs and Alterations

With a "Safe Harbor" lease agreement, the lessee has the option at the end of the lease period to either purchase the property or return it to the lessor. During the term of the lease the lessee should be responsible for any repairs or possible alterations needed by the asset to maintain its working ability. A lessor should be careful to include a provision which entitles them to be contacted about any such repairs or alterations, and states that the repairs and alterations become a part of the asset under the lease agreement.

6. Licensing, Registration and Taxes

A provision should be included that clearly states who is liable for any licensing and registration fees, plus any taxes due on the property.

7. Insurance

This provision should specify the satisfactory amount and type of insurance for which the lessee and/or lessor are responsible. In most cases the lessee is required to maintain insurance against the loss or theft of or damage to the property. The provision should be specific

towards what happens to any insurance settlement; i.e., who has legal claim for it.

The considerations of the lessor will vary from firm to firm and from one agreement to the next. Lessor's should be careful to identify risk factors involved in the lease, cover those which are beneficially insured, and make sure the agreement is well documented.

C. Contract Concerns for Lessee

There are no restrictions by the IRS as to who may qualify as a lessee. Any individual, partnership, corporation, estate, or trust may enter into a lease agreement as long as a prospective lessor can be located.

The lessee, much the same as the lessor should consider a variety of factors before entering into a "Safe Harbor" lease agreement. Of course, there are many factors considered by the lessor (i.e., regular ACRS or ACRS straight line) which influence the amount and length of the lease payments. However, there are certain factors which are relevant to the lessee's decision-making process. Following is a brief discussion of these factors:

1. Tax Liability

This is a very crucial factor for the lessee. It is the forecast of current and future income and associated tax liability that is the most decisive factor in the lease versus buy decision. Before even contemplating whether to lease or buy, a lessee should consult with his accountant or tax advisor to determine current and projected tax liability. If the firm expects future profits, it can take advantage of the

tax benefits (ITC, ACRS) associated with a purchase. If it expects low profitability or even losses, the firm is probably better off leasing or entering into a "Phantom Sale-Leaseback" agreement. The point to remember is that tax benefits are only beneficial to a profitable firm that can use them.

2. Annual Percentage Rate

When an individual or firm finances property with a purchase, the initial cost, the periodic payment of principal and interest, and the annual percentage rate of interest charged for use of the debt capital should all be known.

With leasing, most lessors have precalculated a percentage rate of the total cost of the asset which is paid periodically as the lease payment. This predetermined rate considers all tax benefits the lessor may receive, plus any transaction and closing costs, buy-out prices, and a respectable rate of return to the lessor. In most cases the lessor quotes the lessee a rate on the lease payments which they feel is comparable to an interest rate on debt capital. The problem is that many lessors are failing to evaluate this rate considering all factors involved in the lease (i.e., security deposit, fixed price buy-out) and are simply determining it based on the amount of the periodic lease payments. A lessee should be careful to have the lessor quote an Annual Percentage Rate which evaluates the total cashflows involved with the investment. A lessee should be hesitant to accept so-called "implicit rates" from lessors.

3. Other Considerations

In many lease agreements lessors require a certain percentage of the asset value to be paid up front as a security deposit. The deposit will normally then be applied towards the fixed price buy-out at the end of the lease period. In some cases, lessors are offering interest income on the security deposits again at a set percentage rate. The interest earning, although taxable, is normally compounded and also applied to any buy-out that exists at the end of the lease.

Also of importance to the lessee is the timing and frequency of payments. If the advice of this text is followed and "Net Present Value" analysis conducted, whether or not the payments are made in the beginning of the period or the end, and whether they are monthly, quarterly, semi-annual, or annual is of utmost importance. This will be shown through the use of an example in Chapter IV, which demonstrates how important the time-value of money is in determining the cost of controlling the asset's services.

In leaving this section, the last word of advice for the lessee is to fully understand all of the terms and provisions of the lease agreement. A few extra dollars spent for legal advice when entering into an agreement could mean tremendous savings in the event that the contract should become void.

D. Financing with EDC Bonds

With the passage of Michigan Public Act 501, low cost financing is now available to Michigan farmers and foresters for acquiring machinery, equipment, land and buildings.

The EDC Act provides for the creation of public corporations by local units of government for the purpose of issuing tax-exempt status to qualified institutions for the benefit of private businesses.[1] The corporation has no liability for repayment of any such tax-exempt bonds. They issue the bonds to a creditor of the user's choice and then transfer the repayment obligation to the user. The EDC acts solely as an intermediary.

1. Who Qualifies

The bill exempts agricultural and forestry projects from the project plan requirements stipulated for other types of projects. For an individual or firm to achieve tax-exempt status, he must issue to the corporation established in the municipality of the proposed project the following:

a) A statement of intention regarding project objectives;

b) A general description of the kinds of buildings, improvements, storage facilities, restorations, machinery, equipment, furnishings, and leasehold improvements to be financed, and their incidental costs;

c) A statement on project length and the maximum amount to be financed over the life of the project;

d) A statement must be issued by the EDC to the local unit of government that no zoning change or eminent domain proceedings would be necessary to implement the project; and

e) A description of the processes to be followed in implementing the individual transactions which comprise the project.[2]

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[1] H.R. 5385, 80th Cong., Reg. Sess., Sec. 1 (1980).

[2] Ibid., Sec. 9.

Once the individual or firm meets all the above agreements, and the EDC's board of directors (which consists primarily of residents from the municipality) has approved the project, the individual or firm may use the tax-exempt capital to enter into lease agreements, lease purchase agreements, installment sales contracts, or loan agreements with any other party they feel is qualified.

2. Benefit to Lessee

Because the interest income earned by the bondholder is tax free, the lender (bondholder) is willing to loan money at 65 percent or 70 percent of conventional (prime) interest rates. A lessor can use this capital to purchase machinery, equipment, etc., and enter into lease agreements. These lease agreements must be included in the proposed project plan issued to the EDC. The lessor may offer lower rental payments to the lessee since his costs of financing are less with the use of EDC bonds. This is simply an alternative form of financing. The rental payments offered may or may not be less depending on the cost of funds to the lessor.

Normally, under the EDC Act legal and financing expenses started at about $60,0000 per project. Mr. Richard Allen, President, Allen Consultants, Inc., feels that "by creating the possibility for standardizing documents and speeding up local approval of projects, that tax-exempt financing could be made available for projects needed by smaller creditworthy companies."[3] As this form of financing grows farmers and foresters with good credit may be able to sell bonds themselves and

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[3]Richard Allen, "Economic Development Corporation Financing for Agriculture and Forestry," Summary of Michigan Public Act 501, January 1980.

finance their own machinery and equipment needs. The problem farmers are faced with is finding a buyer for the bonds since they assume all liability.

E. Primary Advantages of Leasing

Thus far the focus of attention has been towards the defining of what constitutes a "Safe Harbor" lease agreement and the relative guideline changes. Both the considerations by the lessor and the lessee have been discussed and a few of the primarily qualitative advantages to leasing have been mentioned. In the remainder of this chapter some of the primary advantages of leasing compared to a purchase agreement will be looked at.

1. Leasing Offers Potential Savings

The potential lower cost may come from two distinct and not mutually exclusive causes. First, a firm, as mentioned previously, may not be able to take full advantage of the tax benefits obtained with a purchase. Second, due to the lower overall risk posture of a lessor, the cost of capital (both equity and debt), may be significantly less than to an operating firm. This is almost always the case since only the most creditworthy firms have access to the issuing side of the commercial paper markets. Furthermore, many leasing companies are subsidiaries of banks, and have access to funds at lower costs than would be available to even bank customers qualifying for prime rate.

2. Leasing Provides an Alternative Source of Capital

For firms that have limited funds for capital investments, leasing may provide a viable alternative to increasing the firm's capitalization.

At the limit, when the firm's capitalization may no longer be increased, leasing may be the only means for expansion and/or replacement.

3. Leasing Provides Constant Cost Financing

Leasing for the most part, unlike some other forms of debt financing, allows uniform payments over the length of the lease. However, with the enactment of the "Safe Harbor" guidelines many leasing companies are offering lessees, both fixed and variable rate terms.

4. Leasing Allows More Flexible Cash Budgeting

Many intermediate-term loans have balloon repayment features where the bulk of the principal is due at the end of the loan. Then, if the firm has maintained its credit rating, this outstanding principal forms the basis for a new loan. Such refinancing exposes the firm to additional risk if either interest rates or the availability of capital changes. The uncertainty of refinancing necessitates a more conservative liquidity position. These possible changes make cash budgeting more difficult with a purchase agreement, and also negatively affect the firm's financial risk position.

5. Leasing Provides Total Financing

Unlike debt financing, which requires some equity investment, leasing may permit 100 percent financing. However, in most cases, payment may be required in advance (at the beginning of the period) or a security deposit may be required. These factors will affect the cash flow budget and the timing of cash flows.

6. Leasing May Provide Financing for Acquisition, Plus Related Costs

The total acquisition cost, including sales taxes, delivery, stock requirements and installation charges may be included as a part of the total lease package and spread over the life of the lease. These front-end costs may be substantial and thus result in heavy initial cash outflows if assets are purchased.

7. Leasing Provides a Hedge Against Inflation

Leasing may provide a hedge against inflation, since lease payments will be made with "cheaper" dollars if inflation continues. This same line of reasoning can apply to amortized loan payments, as long as the interest rate is not tied to the prime rate.

Prior to the "Safe Harbor" guidelines, there was a strong agreement supporting purchases, since purchase options at the end of the lease period were required to be in terms of fair market value. Thus, if the leased asset appreciated during the term of the lease, the lessee ended up paying more for the asset than originally anticipated. With the fixed price buy-out, the inflation hedge has now switched from the lessor to the lessee.

8. Leasing Provides Fast, Flexible Financing

Leasing tends to be faster to arrange and more flexible than borrowing funds. In addition to not containing many of the typical restrictive convenants found in loan agreements, lease payments may be tailored to the specific need of the lessee (i.e., on an annual basis after crops are sold).

9. Leasing Simplifies Bookkeeping

For tax accounting purposes strict two-party lease agreements often avoid the necessity of establishing ACRS schedules and accounting for ACRS deductions and interest expense. Again, with a "Phantom Sale-Leaseback" agreement book entries must still be made even though no actual exchange of cash takes place.

There may be several advantages to leasing compared to a purchase agreement. Again, every individual decision must be analyzed, since no two people or firms are identical. In the next chapter a technique known as "Net Present Value" will be discussed. This technique is used to analyze the quantitative side of the lease versus purchase decision.

CHAPTER IV

LEASE VERSUS PURCHASE ANALYSIS

The important data prerequisites of performing a lease versus purchase analysis were presented in the previous chapter. The emphasis has primarily been towards the qualitative factors involved in the evaluation of feasible alternatives. In this chapter the focus will shift towards quantitatively evaluating lease versus buy decisions. The evaluating process will incorporate the "Net Present Value" (NPV) concept on an after-tax basis.

The goal of this chapter is to demonstrate the practical use of this NPV method in evaluating a lease versus purchase decision. This is in support of the overall goal of analysing changes in the IRS leasing guidelines under the Economic Recovery Tax Act of 1981. This discussion is not meant to be a treatise dealing with the area of capital investment. Readers with greater interest in this area may wish to refer to one of the referenced texts (Aplin, 1977; Stevens, 1979; Weston, 1981).

This chapter is organized into three sections. The first section is a brief introduction to the NPV method. Next is a discussion on the determination of costs of capital, to be used as the discount factor in the NPV analysis. In the last section the relevant cash flows are discussed for a purchase agreement, leasing agreement, and a "Phantom Sale-Leaseback." Following the cash flow discussion for each agreement is

an example to demonstrate the discounting of the after-tax cash flows to arrive at the Net Present Value.

This chapter is intended to facilitate understanding of the case examples which will be demonstrated in the next chapter.

A. The Net Present Value Method

As conceptual flaws were discovered in simple methods of evaluating an investment (e.g., payback period), new investment analysis techniques were developed to recognize that a dollar received immediately is preferable to a dollar received at some future date. This recognition led to the development of discounted cash flow techniques to take account of the time value of money. One such discounted cash flow technique is called the New Present Value method.

The NPV method involves two main steps. First, the determination of the after-tax cash flows involved with an investment. Second, to estimate a cost of capital for the user, which reflects some minimum acceptable rate of return and considers all relevant potential risk with the investment. This cost of capital is then used to discount the cash flows to put all future flows in terms of present value. Once in terms of present value, the discounted after-tax inflows and outflows should be summed to determine the Net Present Value of the investment. Let's first look at the second step, determining the cost of capital.

B. Determining the Cost of Capital

In most financial decisions, such as the lease versus purchase, there is a great deal of argument for using a so-called "Weighted Average Cost of Capital," since it is felt that most firms use several sources of funds for capital expenditures. Firms not only employ debt capital,

which represents capital funds obtained through loans from outside sources not involved with the business, but also employ equity capital. This capital source is generated by the owners injecting more of their own funds into the business, either through retained earnings, or the sale of stock.

The reason the controversy over using the "weighted average cost of capital" came about is that most firms feel an investment made through borrowed funds is simply a flow to debt and no equity is involved. This may be true in the early years of the investment agreement, however, in later years the project will be subject to some equity financing in order to balance out the debt-equity ratio and retain the firm's sound capital structure. Therefore, the most logical approach is to use the weighted average since it reflects the costs of all forms of financing the firm uses.

To compute a weighted average cost of capital there are two variables that must be determined: 1) The cost of capital funds from each source employed by the business; and 2) The weights to be given each source of capital in computing the weighted average. Again, let's take the second problem first.

1. Weighing Each Source

The appropriate set of weights to use in computing the weighted average cost of capital (WACC), is the relative proportion of each type of capital in the firm's desired capital structure. The weights should be the marginal proportions, not the cost of capital to the firm as a whole, since we are only interested in the incremental cash flows involved with the investment being considered. The weights should also

reflect the proportions of financing that the firm intends to employ in the future.

The determination of these weight proportions is not simple, especially when operating capital is used for part of the financing. However, the firm must estimate to the best of its knowledge the relative proportions of all sources of debt capital and the amount of equity capital invested.

Once the proportions have all been estimated the next problem is to estimate the cost of capital from these various sources.

2. Calculating the Cost of Debt Capital

Debt capital may be in the form of loans from banks, lease agreements, insurance companies and any other outside source of capital. To demonstrate the calculation of the cost of debt capital a simple example will be used involving a loan, the most typical form of debt.

Calculating the cost of a loan is based on two considerations: 1) determining the "effective rate" (what is actually being paid), of interest; and 2) consideration of income taxes. The determination of the "effective rate" can be a difficult, time-consuming job. One must determine all other factors involved with the issuance of the loan, such as service or finance charges, flotation costs, new money fees and others. These costs must be added to the quoted rate, to determine what is actually being paid for the use of the funds.

There are tax consequences involved with all loans, since businesses are subject to income taxes. For example, if a business is in a 20 percent tax bracket, $1.00 of interest paid will reduce taxes by $.20. This makes the effective rate of interest after-tax 80 percent of the

effective rate before taxes. Let's assume a business has determined their before-tax "effective rate" of interest to be 11 percent. The following example will help to clarify the tax consequences.

Table 4.1 Calculating After-Tax Effective Interest

Assume: 20% marginal tax rate
After-tax interest cost = Before-tax effective rate X (1 - Marginal Tax Rate)
or:
After-tax interest cost = 11.0% X (1 - .20)
= 11.0% X .80
= 8.8%

3. Calculating the Cost of Equity Capital

Determining the cost of equity capital is much more difficult than debt capital since equity capital has no explicit cost, that is, no interest paid. This section will deal specifically with the cost of equity capital to business forms other than corporations. The determination of corporate equity capital is a more detailed procedure, and the interested reader should refer to the previously mentioned references.

When more capital is put into the business by the owners, they deny themselves the use of those funds for other purposes. There is an "opportunity cost" attached to the use of this equity capital. Thus the real cost of equity is the return on these funds that could be earned by investing them elsewhere, either in another section of the business, or in outside sources, in an investment of comparable risk. If the funds put into the business could have been invested elsewhere with a return of 12 percent, then the cost of equity should be viewed as 12 percent.

A problem still exists with trying to measure this "opportunity cost" and hence the cost of equity. There is no one best method to determine the cost of equity capital. Therefore, the determination remains somewhat a matter of judgement. There are, however, two guidelines which prospective investors can follow to guide them in placing a value on equity capital: 1) The cost of equity capital should be significantly higher than the cost of debt capital; and 2) The cost of equity capital differs from one business to the next.

The reason equity capital should have a higher cost than debt capital is because suppliers of debt assume a lot less risk than suppliers of equity capital. Lenders have first claim on earnings, and normally a lien or first mortgage on property. In the case of a business loss or failure, they are covered. On the other hand, owners benefit from returns greater than the cost of their investment. If there are no returns, they receive no benefits.

The cost of equity capital will differ from one business to another since the opportunity cost of owner's capital will differ among individuals even in the same industry. This is due to: 1) differences in their knowledge and ability to find alternative investment possibilities; 2) differences in their ability to manage capital in other places; and 3) each business has a different degree of risk involved.

Therefore, a firm must use caution in the employment of either debt or equity capital. With greater use of debt capital one can argue that the WACC will be lowered, but that extreme use of debt capital, or a highly levered firm, may raise the WACC. This is because the cost of borrowing can rise with excessive leverage. Beyond a certain point of leverage, we can expect firms to pay increasingly higher interest rates

on borrowings. The greater the leverage, the lower the coverage of fixed charges and the more risky the loan.

Little more can be said about determining the cost of equity capital. Again, it is a judgmental decision. The important thing for firms to recognize is that equity capital is not costless. In fact, it should be viewed as a relatively expensive source of capital.

4. The Weighted Average Cost of Capital

Once the proportions and costs of both debt and equity are known for each investment decision, the next step is to use this information in determining the weighted average cost of capital. This weighted average will then be used as the appropriate discount rate in calculating the "Net Present Value" of an investment. The following example will be used to demonstrate how this information is used in the calculation.

Table 4.2 Calculating WACC

Source	(1) Amount Used	(2) Proportion from Each Source	(3) Before-Tax Cost	(4) Marginal Tax Rate	(5) (3) X 1 - (4) After-Tax Cost	(6) (2) X (5) Weighted Cost
Bank Loan	$50,000	50%	11%	20%	8.8%	4.4%
Equity Capital	50,000	50%	13%	20%	10.4%	5.2%
	$100,000	100%				9.6%

In the above example there are two sources of capital. The first source, debt capital, is a loan for $50,000 at a before-tax "effective rate" of 11 percent. Multiplying the before-tax rate times one, minus the marginal tax rate, gives an after-tax "effective rate" of 8.8 percent

on debt capital. To determine the weighted average cost, you simply multiply this after-tax rate times the proportion debt capital represents to the total investment. In this case debt represents 50 percent of the total investment, hence the after-tax weighted average cost of capital for debt is 4.4 percent.

The "opportunity cost" in this example was estimated to be 13 percent. The owners felt by employing the $50,000 in another investment of similar risk, a before-tax return of 13 percent could be received. The 13 percent before-tax cost of equity capital is then converted to an after-tax cost using the same method as the debt capital. The after-tax cost of 10.4 percent is then multiplied times the 50 percent, which represents the proportion of the total investment from equity. This gives an after-tax weighted average cost to equity of 5.2 percent. The last step is to add both the after-tax weighted average cost to debt and equity to determine the overall after-tax weighted average cost of capital, or 9.6 percent.

C. Determining Cash Flows

The next step in the "Net Present Value" method of evaluating an investment involves four steps: 1) determine all the relevant cash flows; 2) adjust the cash flows for taxes; 3) discount the after-tax flows, using the appropriate cost of capital; and 4) sum the discounted after-tax cash flows to determine the "Net Present Value."

Each of these steps will be demonstrated through the use of a purchase option, a strict two-party lease agreement and a "Phantom Sale-Leaseback" agreement. Careful attention should be given to the

development of these after-tax flows since in future chapters minimum detail will be presented as to how these figures were derived.

A further word of caution is that in all of these lease versus buy analyses, primarily outflows of cash are dealt with, with the exception of some tax benefits and residual values of property. Consequently the superior decision under the NPV method is that which minimizes the present value of the cash outflows, i.e., the least-costly decision.

1. Cash Flows for Purchase

With a purchase agreement there are seven major cash flows involved:

1) Initial Down Payment
2) Residual Value of Asset
3) Principal Payments
4) Interest Payments
5) ACRS Deductions for Tax Savings
6) Investment Tax Credit
7) Opportunity Cost of Down Payment

The initial down payment is made prior to receiving the property. This is a cash outflow already on an after-tax basis, since it is considered a principal payment which is deducted from after-tax income.

The second is any residual value or worth of the asset at the end of its useful life. This is a cash inflow. There may be ACRS recapture on this residual amount if the asset is sold for a value exceeding what is carried on the books.

The next, an outflow, is the principal paid periodically on the installment sale. The periodic amount should be calculated considering the amount financed, the rate of interest and the length of the financing

period. Again, principal for the same reason as the down payment has no tax effects.

Along with principal go the periodic interest payments. These cash outflows are treated as a business expense and are subject to tax effects.

The next two cashflows are non-cash inflows. The first is the ACRS deductions allowed each year. This deduction depends on the class life of the property and whether one chooses to extend the normal class life through the use of straight line ACRS. With reference to a ACRS deduction schedule, the percentage deductions can be found and incorporated into the analysis. Because these deductions are a non-cash expense, the after-tax amount is the savings in income taxes to the firm by deducting this non-cash expense. This is found by multiplying the before-tax deduction times the marginal tax rate for the investment.

The next inflow is the Investment Tax Credit allowed with the purchase of capital assets. The ITC permits investors to deduct 10 percent of the asset's cost basis directly from their income tax liability for property with a recovery period of five years or greater. A 6 percent deduction may be taken on three-year recovery property. For example, a firm with a $10,000 income tax liability may deduct $5,000 from this amount for a five-year recovery property asset which cost them $50,000.

The only remaining outflow is an "opportunity cost" applied to the initial down payment. This cost is different than the previously discussed "opportunity cost" of capital which represented the cost of equity. This cost is not included in the WACC. It is a separate expense which represents the costs of tying up the down payment funds for the length of the finance period. This cost is a non-cash expense, there are no tax consequences, and the relative amount is added to other after-tax costs.

Once all the relevant cash flows have been calculated and placed on an after-tax basis, the inflows and outflows for each period must be summed. Once the total accumulated after-tax flows have been determined the next step is to discount these figures, using the appropriate after-tax weighted average cost of capital. To demonstrate this technique further, an example is provided. The basic assumptions are the following:

Number of Years = 8
Income Tax Rate = 10%
Option selected is BUY VERSUS LEASE

List of BUY Option Information

Initial Cost of Asset	=	$10,000
ACRS Property Class	=	3 years
Depreciation Method - Accelerated Cost Recovery System		
Include Investment Tax Credits		Yes
Percent Debt Financed	=	70%
Debt Retirement Period	=	3 years
Debt Interest Rate	=	20%
Down Payment Opportunity Cost Rate	=	5%
Asset Useful Life	=	8 years
Resale Value	=	$2,000

The first step is to determine the before-tax principal and interest payments. This example assumes a $10,000 asset, 70 percent financed with amortized payments annually at 20 percent interest for three years. Reference to an amortization table will give the equal payments of principal and interest for each period. In this example, the annual payment equals $3,323. Table 4.3 lists a breakdown of the principal and interest payments for each year on a before-tax basis. To calculate these amounts, first determine interest for the first year which in this example is $7,000 x .20 = $1,400. This amount is subtracted from the gross annual payment of $3,323 to determine the first year's principal

Table 4.3 Principal and Interest

Year	Principal	Interest	Principal Outstanding
0			$7,000
1	$1,923	$1,400	5,077
2	2,308	1,015	2,769
3	2,769	554	0

payment of $1,923. This procedure should be carried out through year 3, simply by deducting the principal paid each year from the remaining balance, determining the interest portion first and then subtracting the interest from the gross annual payment to determine the amount of principal due.

The next step is to determine the before-tax ACRS deductions allowed each year for the asset. As assumed, this $10,000 asset has a three-year recovery period. Under the ACRS system, the annual percentage deductions are the following:

Three-Year Property ACRS Deductions

Year	Percent
1	25
2	38
3	37
	100

In year 1 for this $10,000 investment, a $2,500 deduction is allowed with a $3,800 deduction in year 2, and $3,700 in year 3.

The remaining cash flows are the initial $3,000 down payment assumed to be made in period 0, the $2,000 residual value in year 8 at the end

of the asset's useful life, the $600 of ITC (6 percent of asset value, since recovery period = 3 years), and the 5 percent opportunity cost taken for the three years of the finance period. Reference to Table 4.4 lists the before-tax cash flows for each year.

Table 4.4 Before-Tax Analysis Purchase

Year	Down Payment & Residual Value	ITC	Opportunity Cost	Principal	Interest	ACRS Deductions
0	$3,000					
1		($600)	$150	$1,923	$1,400	$2,500
2			150	2,308	1,015	3,800
3			150	2,769	554	3,700
4						
5						
6						
7						
8	(2,000)					

Once all of the before-tax cashflows have been determined, the next step is to determine the appropriate after-tax amounts. There are only three flows in this analysis that have tax consequences. The first, interest expense, is placed on after-tax basis by subtracting the amount of taxes saved due to the write-off of interest as an expense. In this example, with a marginal tax rate of 10 percent, the after-tax amount for year 1 is $1,400 x .90 = $1,260.

The second flow is the non-cash ACRS deductions allowed on the asset. Being a non-cash expense the only relevant after-tax amount is the tax savings which accrue to the owner by deducting this expense. In this example, for year 1, the after-tax ACRS deduction is $2,500 x .10 = $250.

The last flow with tax consequences is the residual value. Since the owner has reduced his book value to zero with ACRS deductions, and if the asset is sold at the end of its useful life for more than book value, then the amount over book must be added to ordinary income and taxed accordingly. Therefore in the example, the $2,000 residual value cash inflow only represents $1,800 on an after-tax basis (after deducting the 10 percent tax liability). Reference to Table 4.5 shows the after-tax cash flows for each year.

Table 4.5 After-Tax Analysis Purchase

Year	Down Payment & Residual Value	ITC	Opportunity Cost	Principal	Interest	ACRS Deductions
0	$3,000					
1		($600)	$150	$1,923	$1,260	($250)
2			150	2,308	914	(380)
3			150	2,769	499	(370)
4						
5						
6						
7						
8	(1,800)					

The next step is to sum together all of the after-tax cash inflows and outflows (refer to Table 4.6). Once the total accumulated after-tax cash flows have been determined, an after-tax weighted average cost of capital must be chosen to act as the discount factor. This example uses an after-tax WACC of 12 percent. Reference to a present value table will list the present value factor for each year at 12 percent. These

Table 4.6 NPV Analysis Purchase

Year	Total Accumulated Cash Flows A.T.	Discount Factor 12%	NPV
0	$3,000	1	$3,000
1	2,483	.8929	2,217
2	2,992	.7972	2,385
3	3,048	.7118	2,170
4			
5			
6			
7			
8	(1,800)	.4039	(727)
		NPV =	$9,045

must be multiplied times the accumulated cash flows, and then the products summed to determine net present value. The NPV can be compared against similar projects or alternative financing schemes to determine which is least-costly.

2. Cashflows for a Lease

A two-party lease agreement normally involves six cashflows:

1) Security Deposit
2) Lease Payments
3) Interest Earned on Security Deposit
4) ACRS Deduction after Buy-Out
5) Buy-Out Price at End of Lease
6) Resale Value

Initially, most lessors require either a security deposit or payments to be made in advance (at the beginning of the period). The security deposit is similar to a down payment in a purchase agreement, except for: 1) a security deposit may earn interest income; and 2) in most circumstances the security deposit is applied towards the fixed price buy-out at the end of the lease term. The interest income earned on the security deposit is an inflow of cash and is subject to tax consequences. These will be discussed later.

The primary outflow of cash in a lease agreement is the rental payments. They are normally predetermined fixed rates quoted by the lessor. The payments are cash outflows to the lessee (user), and are deductible as a business expense for income tax purposes.

A fixed price buy-out takes place at the end of the lease term. The buy-out consists of the security deposit plus any residual amount needed to cover the predetermined amount. The buyer (user) then establishes his book value based on the buy-out price, and may take ACRS deductions based on this amount for the recovery class of the asset. (No ITC is allowed since property is retained by same user.) At the end of the useful-life of the asset, the user may sell the asset for its residual value. Again, as with the purchase agreement, if it is sold for greater than book value, the excess must be added to ordinary income and taxed accordingly.

These cashflows, as with a purchase, must be converted to an after-tax basis. Since the majority of these calculations were discussed previously, a simple example and explanation will be given here. The basic assumptions are the following:

List of LEASE Option Information

INITIAL LEASE DEPOSIT PAYMENT	=	$1,000
Interest on Initial Deposit Payment	=	10% annually
Interest Rate for Opportunity Cost	=	5%
Lease Payment Amount	=	$4,200
Total Number of Lease Payments	=	3
Frequency of Lease Payment is ANNUAL		
Lease Payments at the Beginning-of-the-Period	-	No
Useful Life of Asset	=	8 years
Resale Value	=	$2,000
Terminal Buy-Out Option Price	=	$1,000
ACRS Property Class	=	3

Depreciation Method = Accelerated Cost Recovery System

The lessee receives $100 per year of interest income for the three years of the lease term ($1,000 x .10 = $100). The lessee must make three equal payments of rent at $4,200. He makes a security deposit payment of $1,000 in year 0 and attaches an opportunity cost to that deposit of 5 percent per year, or $50. At the end of year 3 the lessee purchases the asset for $1,000 which is simply the amount of his security deposit. Thus, no residual cash is needed in year 3 to cover the fixed price buy-out. Again, the asset has a useful life of eight years and a salvage value of $2,000. Reference to Table 4.7 shows the before-tax amounts.

Once the before-tax amounts have been determined, they must be put on an after-tax basis. The interest income should be treated as ordinary income and taxed accordingly. The after-tax amount for the first year would be $100 x .90 = $90. The ACRS deductions, from the result of the fixed price buy-out in year 3, are handled the same as under the purchase agreement. In year 4 the after-tax amount is $250 x .10 = $25. The lease payments, although a cash outflow, offer some relief towards income tax liability since they are a tax deductible expense. The after-tax amount paid each year is 90 percent of the before-tax amount or

Table 4.7 Before-Tax Analysis Lease

Year	Security Deposit & Residual Value	Buy-Out	Interest Income	Opportunity Cost	ACRS Deduction	Lease Payment
0	$1,000					
1			($100)	$50		$4,200
2			($100)	50		4,200
3		0*	($100)	50		4,200
4					$250	
5					380	
6					370	
7						
8	(2,000)					

*Note: Value represents buy-out amount minus security deposit.

$4,200 x .90 = $3,780. The last flow with tax consequences is the residual value received in year 8 for the asset. This is treated the same as under the purchase option. The $2,000 must be added to ordinary income and taxed accordingly. Thus the after-tax amount is $2,000 x .90 = $1,800. Both the security deposit and the opportunity cost have no tax consequences. The security deposit is an upfront payment. It reduces the lessor's cost-basis and further reduces the required annual lease payments.

Now the same procedure is followed as explained under the purchase agreement. The annual after-tax flows are summed, then discounted by the appropriate after-tax weighted average cost of capital. The discounted total outflows and inflows are summed to determine the net present value of the investment. Reference to Table 4.8 shows the

Table 4.8 After-Tax Analysis Lease

Year	Security Deposit & Residual Value	Buy-Out	Interest Income	Oppor. Cost	ACRS Deduct.	Lease Payment	Total Acc. Cash Flows	Discount Factor 12%	NPV
0	$1,000						$1,000	1	$1,000
1			($90)	$50		$3,780	3,740	.8929	3,339
2			($90)	50		3,780	3,740	.7972	2,981
3		$0*	($90)	50		3,780	3,740	.7118	2,662
4					($25)		(25)	.6355	(16)
5					($38)		(38)	.5674	(22)
6					($37)		(37)	.5066	(19)
7									
8	(1,800)						(1,800)	.4039	(727)
								NPV =	$9,198

*Note: Value represents buy-out amount minus security deposit.

after-tax amounts, accumulated cash flows and the discounting factors used to arrive at the net present value.

3. Cash Flows for a "Phantom Sale-Leaseback"

With a "Phantom Sale-Leaseback" agreement one should recall that the user originally purchases the asset establishing his own financial terms, then, within the three-month grace period, enters into an agreement with a third party where tax benefits are exchanged for cash.

Since many of the cashflows are the same as under the purchase alternative, only an explanation of the distinct flows will proceed. The basic assumptions of this alternative are:

1) User buys property at same rates as previous purchase alternative, but then enters into agreement with third party.

2) Third party agrees to pay user 20 percent of asset value or $2,000 for use of ACRS deductions and ITC.

3) User applies this $2,000 cash towards his 30 percent or $3,000 down payment reducing his out-of-pocket cash requirement to $1,000.

4) Third party then issues user a note for the remaining $8,000 which will be paid back in three equal annual installments at a 16 percent interest rate. The amount of the installment payment is $3,562.

5) User then leases the property back on a three-year term with annual rental payments exactly equal to the installment payments of $3,562. Thus no actual exchange of cash takes place except for the $2,000 upfront. The remaining lease payments and installment payments are book entries only.

6) User buys asset at end of lease period for $1.

The difficult problem with the "Phantom Sale-Leaseback" agreement is the determination of after-tax rental expense and interest income (from the installment payments), which are recorded only as book entries by the user. Although these flows are never actually paid or received,

they still have tax consequences. For this example, the $3,562 of rental expense paid annually by the user can be written off as a business expense. Thus the tax benefit applicable to this analysis is the tax savings due to the write-off. With the 10 percent marginal tax rate, the after-tax cashflow (tax savings) from the non-cash rental expense would be $3,562 x .10 = $365.20 for each year.

The same holds true for the interest earned on the installment payments. The interest, although never actually received, must be recorded as interest income. Therefore, more taxes are actually paid than income earned. The relevant after-tax amount would be the before-tax interest earned times the tax rate. This represents the amount of taxes paid for income never actually received. Reference to Table 4.9 shows the calculation of interest before and after taxes.

Table 4.9 "Phantom Sale-Leaseback" Interest Income

Year	Before-Tax Interest	After-Tax Interest	Principal	Balance
0				$8,000
1	$1,280	$128	$2,282	5,718
2	915	91	2,647	3,071
3	491	49	3,071	0

The remaining cashflows are taken directly from Table 4.4 under the purchase alternative. The only difference is the down payment amount which represents the difference between the user's down payment for the original purchase and the cash he receives from the third party for the sale of tax benefits.

There are three major differences with a "Phantom Sale-Leaseback" option: 1) the user exchanges ACRS deductions and ITC for cash and applies it to his down payment; 2) there are tax savings with the book entry deduction of rental expense; and 3) a tax loss occurs from the interest earned on the note from the third party. References to Tables 4.10 and 4.11 shows the before-tax and after-tax cashflows with the determination of NPV. Again, the same procedure of accumulating the annual flows, discounting them, and summing the discounted values to arrive at the NPV is followed.

In this simple example, the three options are rated according to the Net Present Value method as follows:

		NPV
1 =	"Phantom Sale-Leaseback"	$7,737
2 =	Purchase	9,045
3 =	Two-Party Lease	9,198

It must be remembered that this is only a hypothetical example to demonstrate the proper technique for deriving the least-costly method of financing an investment. Even though the "Phantom Sale-Leaseback" appears to be least-costly given the assumptions, there may be other factors, as mentioned previously, that could prevent a firm from entering into this type of agreement. Readers should use caution in evaluating all alternatives. It is hoped that this chapter can serve as a guide for the techniques involved in performing this type of analysis.

Table 4.10 Before-Tax Analysis "Phantom Sale-Leaseback"

Year	Down Payment & Residual	Cash Principal	Cash Interest	Non-Cash Rent	Non-Cash Interest	Buy-Out	Oppor. Cost	Total Acc. Cash Flows	Factor 12%	NPV
0	$1,000									
1		$1,923	$1,400	$3,562	$1,280		$150			
2		2,308	1,015	3,562	915		150			
3		2,769	554	3,562	491	$1	150			
4										
5										
6										
7										
8	(2,000)									

Table 4.11 After-Tax Analysis "Phantom Sale-Leaseback"

Year	Down Payment & Residual	Cash Principal	Cash Interest	Non-Cash Rent	Non-Cash Interest	Buy-Out	Oppor. Cost	Total Acc. Cash Flows	Factor 12%	NPV
0	$1,000							$1,000	1	$1,000
1		$1,923	$1,260	($356)	$128		$150	3,105	.8929	2,772
2		2,309	914	($356)	91		150	3,107	.7972	2,477
3		2,769	499	($356)	49	$1	150	3,112	.7118	2,215
4										
5										
6										
7										
8	(1,800)							(1,800)	.4039	(727)
									NPV =	$7,737

CHAPTER V

CASE STUDIES--LEASE VERSUS PURCHASE

This chapter begins with a discussion of the various assumptions made to develop the hypothetical case examples of leasing and purchase alternatives. Most of the assumptions are based on actual statistics and personal exposure to various credit institutions offering lease and/or purchase options. It would be impossible to try and develop examples to meet everyone's needs, however, it is the opinion of the author that the chosen statistics can act as a general representation, and one that will be useful as a guide to readers in evaluating the proper financing decision.

Following the assumptions section are a series of figures reflecting how the optimal-equivalent lease payment changes with either the altering or introduction of new variables into the analysis. This payment can be thought of as the BREAK-EVEN amount that equates the net present value of the lease to the NPV of the buy, given certain assumptions. A total of 288 hypothetical case examples were developed and analyzed with the use of a microcomputer and a program originally developed by Dr. Allan Rahn of Michigan State University and revised by Ms. Rosanne McGregor and the author.[1] A listing of the program is

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[1]Extension specialist; senior programmer, Agricultural Economics programming service; and graduate student, respectively, at Michigan State University.

found in the appendix as well as a complete printout of a hypothetical case example for both three-year and five-year recovery property. Little detail about the determination of these statistics will be discussed in this chapter. Readers not familiar with Net Present Value techniques should refer back to Chapter IV.

A. Assumptions Made for Analysis

1. Types of Property

The examples are analyzed for both three-year and five-year recovery property. No specific types of assets are considered; however, for agriculture one can think of three-year recovery property as representing:

a) automobiles

b) trucks under 10,000 lbs. weight

c) hog breeding gilts

d) sows and boars

and five-year recovery property representing:

a) heavy trucks

b) semi-trailers

c) other livestock breeding animals

d) general farm machinery and equipment

e) dairy equipment

f) all single purpose agriculture and horticulture structures, such as freestall, farrowing, cattle feeding, or poultry barns

g) single purpose grain or feed storage structures such as silos

h) fruit or vegetable storages and fruit processing structures

2. Value of Assets

In this analysis the three-year recovery property is assumed to have a cost of $10,000, and the five-year recovery property a cost of $50,000. This represents the cost of purchase and the cost to the lessor.

3. Useful Life

All examples of three-year recovery property assume the asset has an eight-year useful life, and examples of five-year recovery property have a 12-year useful life. The analysis assumes that all assets are maintained throughout their useful life and sold for salvage or residual value at the end of that period.

4. Salvage or Residual Value

In the first segment of the figure analysis section, the salvage or residual value is a constant 20 percent of the asset cost. Thus, three-year recovery property has a salvage value of $2,000 and five-year recovery property $10,000. In the second segment where the desired rate of return is varied, the residual or salvage value is dropped to 10 percent of asset cost.

5. Additional Revenue and Expense

The assumption is made that whether the asset is leased or purchased, any additional revenue or operating expense which accrued to the business from the adoption of the asset is the same under either financing alternative. Therefore, no revenue or expense statistics are included in the analysis.

6. Tax Rate

Each hypothetical case example is analyzed at four distinct tax rates (0, 10, 30 and 50 percent). All cashflows with tax consequences are adjusted and put on an after-tax basis accordingly.

7. Opportunity Cost

This analysis assumes that an "opportunity cost" is applied to down payments under a purchase option and security deposits with a lease. This cost represents the income foregone by tying up those funds for either the length of the finance period or lease term. This cost has no relationship to the "opportunity cost" of capital discussed in Chapter IV. This cost is not incorporated into the discount factor but is treated as a non-cash, non-taxable expense, deducted as a cash outflow. The discount factor used in this NPV analysis represents the costs of debt and equity capital, plus relevant risks associated with the investment.

B. Additional Assumptions for Purchase

1. ITC and ACRS Deductions

Under each purchase example both the ITC and ACRS deductions are assumed taken by the buyer or user. With the five-year recovery property 10 percent of the asset's value, or $5,000, is taken in year 1 as a direct write-off from tax liability for ITC. The percentage and before-tax ACRS deductions are the following:

Table 5.1 ACRS Deductions--Five-Year Recovery Property

Year	Percent Deduction	Before-Tax Amount
1	15	$ 7,500
2	22	11,000
3	21	10,500
4	21	10,500
5	21	10,500

For three-year recovery property, only 6 percent or $600 of the asset's value is to be deducted from tax liability for ITC (under the Economic Recovery Tax Act of 1981). The percentage and before-tax ACRS deductions are the following:

Table 5.2 ACRS Deductions--Three-Year Recovery Property

Year	Percent Deduction	Before-Tax Amount
1	25	$ 2,500
2	37	3,700
3	38	3,800

The analysis assumes no carry-forward for unused ITC, but simply treats it as an after-tax inflow for year 1 and discounts it appropriately.

2. Finance Period

Both classes of property are assumed to be 70 percent financed with annual amortized payments made at the end of the period (in arrears).

The three-year recovery property is financed for three years, and five-year recovery property for five years.

It is assumed the down payment is made in year 0, prior to the beginning of the amortized period. Reference to Tables 5.3 and 5.4 shows the before-tax down payment amounts, plus the amortized payments of principal and interest for both classes of property. The tables are for 10, 15 and 20 percent interest on debt, which are the three variable interest rates used in the analysis.

Table 5.3 Amortized Payments--Three-Year Recovery Property
(Down Payment = $3,000)

Year	10% Interest	Principal	Balance
0			$ 7,000
1	$700	$2,115	4,885
2	489	2,326	2,559
3	256	2,559	0
Year	**15% Interest**	**Principal**	**Balance**
0			$ 7,000
1	$1,050	$2,016	4,984
2	748	2,318	2,666
3	400	2,666	0
Year	**20% Interest**	**Principal**	**Balance**
0			$ 7,000
1	$1,400	$1,923	5,077
2	1,015	2,308	2,769
3	554	2,769	0

Table 5.4 Amortized Payments--Five-Year Recovery Property
(Down Payment = $15,000)

Year	10% Interest	Principal	Balance
0			$35,000
1	$3,500	$5,733	29,267
2	2,927	6,303	22,961
3	2,296	7,631	16,024
4	1,602	7,631	8,394
5	839	8,394	0
Year	**15% Interest**	**Principal**	**Balance**
0			$35,000
1	$5,250	$5,191	29,809
2	4,471	5,970	23,839
3	3,576	6,865	16,974
4	2,546	7,895	9,079
5	1,362	9,079	0
Year	**20% Interest**	**Principal**	**Balance**
0			$35,000
1	$7,000	$4,703	30,297
2	6,059	5,644	24,653
3	4,931	6,773	17,880
4	3,576	8,127	9,753
5	1,951	9,753	0

C. Additional Assumptions for Lease

1. ITC and ACRS Deductions

With both three-year and five-year recovery property, it is assumed that the lessor takes both the ITC and ACRS deductions.

2. Lease Term

The lease term for three-year recovery property is three years, and for five-year recovery property is five years. The analysis further assumes all lease payments are due annually at the end of the period (in arrears).

3. Security Deposit and Buy-Out

In this analysis three different types of lease agreements are considered. First, assume that no security deposit or buy-out amounts are included. The relevant cash flows for the lease option are simply the lease payments and the residual or salvage value.

Second, a 10 percent (of asset cost) security deposit is made prior to the beginning of the lease (year 0). The security deposit reduces the cost basis from which the lessor determines his lease payments. For example, with three-year recovery property, the $1,000 security deposit is paid prior to the beginning of the lease. The lessor will retain the $1,000 reducing his out-of-pocket costs for the asset to $9,000. In other words, the security deposit can be thought of as an upfront payment. The analysis assumes all security deposits earn interest income of 10 percent annually paid by the lessor. The income earned by the lessee is treated as ordinary income and taxed accordingly. For purposes of this analysis, it is assumed that the 10 percent interest income is not compounded. The lessee receives a payment for such amount from the lessor for each year of the lease term. Security deposits are treated the same way for five-year recovery property; however, the 10 percent amount is $5,000.

The third type is that no security deposit is required, but the agreement includes a fixed price buy-out of 10 percent of asset cost at the end of the lease term. As discussed in Chapter IV, the lessee is allowed ACRS deductions on the buy-out amount since this becomes his new cost basis for the property. The deductions are taken in the following three or five years after the termination of the lease depending whether it's three-year or five-year recovery property.

In the next section a series of figures are displayed depicting the optimal-equivalent lease payments on a before-tax basis. This BREAK-EVEN payment is the annual amount which equates the NPV of the lease option with the NPV of the buy option. In other words, at all points along the BREAK-EVEN lines, an individual is just as well off to lease as to buy, given the assumptions so stated. One must remember that these annual payments are given in before-tax dollars, but the analysis is conducted on an after-tax basis.

After a brief introduction, the section discusses the interpretation of the figures as well as some of the effects the variables have on each series of figures (i.e., tax rate, opportunity cost and interest on debt).

D. Figure Analysis

This section is divided into two segments. The first is a series of figures displaying the optimal-equivalent lease payments holding the desired rate of return or after-tax weighted average cost of capital constant at 12 percent. It is felt that the 12 percent rate is very commensurate with the current economic condition. It represents an average yield one can expect to receive on both short-term and long-term

current market securities. Although a higher rate would be more consistent with what investors desire as a return, it is felt that the 12 percent rate will act as a realistic benchmark in the next three to five years, with the expectation of deficits decreasing and interest rates beginning to fall.

The variables for each figure are tax rate, opportunity cost, security deposit, buy-out, interest rate on debt and property class according to the conditions of the buy and lease agreements being analyzed.

The second segment displays a series of figures which assume 0 opportunity cost, with no required security deposit or buy-out for the lease agreement. The desired rate of return is variable at 12, 16 and 20 percent to allow some flexibility not given with the previous figures. The interest on debt is again left variable at 10, 15 and 20 percent.

The reader may assume that all assumptions discussed in the previous section are considered, and that it is purely a judgmental decision on his or her part to select the figure which most appropriately considers the factors involved with their desired asset. The figures are not meant to serve as the sole decision criteria, but are simply a tool to help guide the reader towards making the most economical financing decision.

Since the interpretation of the following figures is consistent for each, an explanation of the interpretation follows. After each series of figures is a discussion of the variables and their effect on these figures.

1. Interpretation

The figures offer a prospective investor an easy method of determining whether it is more economical to lease or purchase an asset. Once

all of the factors involved in the decision are known, reference to one of the following figures allows the investor an easy method of determining the proper financing decision by comparing a quoted lease payment from a prospective lessor to the optimal-equivalent BREAK-EVEN lease payment on the figures. The simplest way to explain the interpretation of the following figures is through an example. Let's assume a prospective investor has the following assumptions for a purchase or lease option.

Purchase Agreement (Three-Year Recovery Property)

Asset cost - $10,000
70% financed, amortized for 3 years at 10% annual interest
Receives ITC in year 1
Takes ACRS deductions in years 1-3
Useful Life = 8 years
Salvage = $2,000
Opportunity Cost = 5%

Lease Agreement (Three-Year Recovery Property)

Annual Lease Payments = $4,100
Security Deposit = $0
Buy-Out = $0
Salvage = $2,000

The proper choice of figures in this example is Figure A.1. Reference to this figure shows if the investors tax rate is about 34 percent or less, the BREAK-EVEN lease payment is less than the quoted lease payment, thus the decision is to buy. At any tax rate above 34 percent, the BREAK-EVEN rate is above the quoted rate, therefore, the correct financing decision is to lease.

A total of 24 figures is included in the analysis representing three-year and five-year recovery property. The reader should choose the figure which best considers all factors involved in his decision.

The question is, how can these figures be put to use if the asset costs more or less than $10,000 for three-year property and $50,000 for

five-year recovery property? This represents no major problem. It simply calls for a conversion of asset cost from the quoted rate of the decision maker, to an equivalent rate which can be analyzed with the use of this figure representation. Again, an example here should help clarify how to convert these costs, however, there are some important characteristics which should be discussed first.

After reading the assumptions of this chapter, it should have been noticed that both security deposits and buy-outs, when applied for the leasing alternative, are consistently 10 percent of the asset cost. After evaluating several actual lease agreements, and discussing terms offered with leasing companies, it was found that these 10 percent figures are very typical for the leasing industry. Not only are the figures typical, but this fact allows for easy conversion in the case of differing asset costs. Furthermore, the assumptions made under the purchase alternative are also typical of what types of agreements both manufacturers and dealers are offering. With this in mind, it is hoped that the chosen statistics for this analysis will be typical for a large portion of lease versus purchase decisions, and the only factor warranting change will be the cost of the asset. One must remember that this analysis is only an approximation to the correct decision. To accurately determine the proper financing decision, it is recommended to analyze each example employing Net Present Value techniques as discussed in Chapter IV.

All that is necessary for the reader choosing to use this analysis is to determine what proportion the desired asset is valued above or below the analysis cost of the asset. Then one can adjust the quoted lease payment accordingly so it may be compared against the BREAK-EVEN

rates on the figures. First, let's consider the case of a desired asset valued greater.

Assume that an investor can either lease for $5,500 annually or purchase a $13,500 asset. Further, assume that both transactions meet all of the assumptions stated previously in this chapter, and that the lease has the characteristics of Figure A.1 as used in the interpretation example. The first step is to determine what percent the $10,000 asset is of the $13,500 asset. This is found by dividing the $13,500 into the $10,000, or:

$$\$10,000/\$13,500 = 74\%$$

Since the desired asset has a higher cost than the $10,000 asset used in the analysis, the quoted lease payment from the lessor must be adjusted downward to reflect the additional cost of the desired asset. This adjustment is based on what percent the $10,000 analysis asset is of the desired asset (as determined above). The lease payment is adjusted by multiplying this amount times the relative percentage, or:

$$\$5,500 \times 74\% = \$4,070 = \text{adjusted annual lease payment}$$

This adjusted payment can be compared to the BREAK-EVEN amounts at the given tax rates and levels of opportunity cost. Reference to Table 5.5 shows the financing decision for all combinations of tax rates and levels of opportunity costs. The table demonstrates that leasing is the most economical way to finance the asset given the quoted lease payment of $5,500 except at tax rates of 20 percent and less, and a 5 percent opportunity cost. Although this analysis makes many assumptions, and there may be other outside factors preventing the investor from leasing, the use of these figures offers a quick estimate of which alternative is more economical. They are simply a time-saving device.

Table 5.5 Least-Costly Financing Decision
(for Assumptions Consistent with Figure A.1)

TAX RATE (%) \ OPPORTUNITY COST (%)	5	10	15
0	Buy	Lease	Lease
10	Buy	Lease	Lease
20	Buy	Lease	Lease
30	Lease	Lease	Lease
40	Lease	Lease	Lease
50	Lease	Lease	Lease

The second possibility is the desired asset is valued at less than the analysis asset. This process is the reverse of the previous. In this situation the lease payment must be adjusted upward to reflect the proportional differences between the desired asset and the cost of the analysis asset. Again, an example will help to clarify.

Assume an investor can either lease for $3,200 annually or purchase a $8,000 asset. Again, assume that both transactions meet all of the assumptions stated previously in this chapter. Assume that the property in question is three-year recovery property and, as previously, has all the characteristics consistent with Figure A.1. A five-year recovery property example could just have easily been used since the same adjustment process should be used for either class of property. First, determine what percent the desired $8,000 asset is of the $10,000 analysis asset. This is found by dividing the $10,000 into the $8,000, or:

$$\$8,000/\$10,000 = 80\%$$

Since the desired asset has a lower cost than the $10,000 analysis asset, the quoted lease payment must be adjusted upward to reflect the additional cost of the analysis asset. This is calculated by multiplying the quoted lease payment times one minus the percentage that the desired asset is of the analysis asset plus one, or:

$$\$3,200 \times [(1 - .80) + 1] = \$3,840 = \text{Adjusted Annual Lease Payment}$$

Reference to Figure A.1 shows at any tax rate or level of opportunity cost, the most economical financing decision is to lease since the adjusted quoted rate is always below the optimal-equivalent BREAK-EVEN rates.

Now that the interpretation and use of this figure analysis has been explained, the next section displays the figures divided into various

series based on whether security deposits or buy-outs are included in the lease agreement. Each series includes a figure for the three variable rates of interest on debt for both three-year and five-year recovery property. Reference to Tables 5.6 and 5.7 shows the breakdown of each series and the assumptions for each figure. Before each series of figures is a brief explanation of the variables and their effects on the figures' appearance.

The figures have been grouped in this manner to help minimize the analysis of variables. Reference to series A shows the similarity between the figures as long as the security deposit and buy-out amounts remain constant.

Table 5.6 Figure Series--Segment I
Rate of Return = 12%

Figure Series A
Security Deposit = $0 Buy-Out = $0 Interest on Debt = 10, 15, 20% Opportunity Cost = 5, 10, 15% 3-Year Recovery Property--Figures A.1 - A.3 5-Year Recovery Property--Figures A.4 - A.6
Figure Series B
Security Deposit = $1,000 or $5,000 Buy-Out = $0 Interest on Debt = 10, 15, 20% Opportunity Cost = 5, 10, 15% 3-Year Recovery Property--Figures B.1 - B.3 5-Year Recovery Property--Figures B.4 - B.6
Figure Series C
Security Deposit = $0 Buy-Out = $1,000 or $5,000 Interest on Debt = 10, 15, 20% Opportunity Cost = 5, 10, 15% 3-Year Recovery Property--Figures C.1 - C.3 5-Year Recovery Property--Figures C.4 - C.6

Table 5.7 Figure Series--Segment II
Rate of Return = 12, 16, 20%

Figure Series D
Security Deposit = $0 Buy-Out = $0 Interest on Debt = 10, 15, 20% Opportunity Cost = 0% 3-Year Recovery Property--Figures D.1 - D.3
Figure Series E
Security Deposit = $0 Buy-Out - $0 Interest on Debt = 10, 15, 20% Opportunity Cost = 0% 5-Year Recovery Property--Figures E.1 - E.3

-- Figure Series A

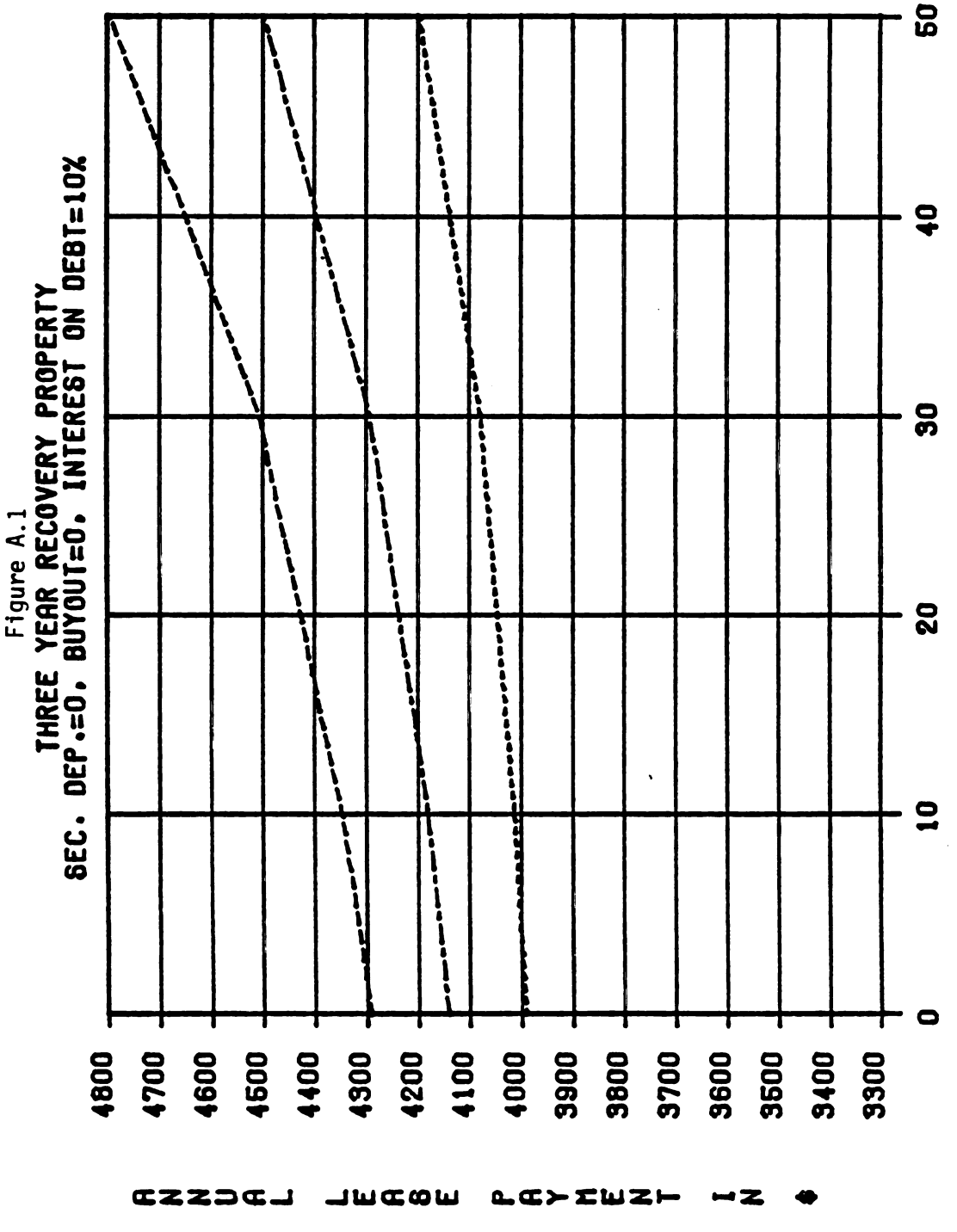
With this series of figures as the tax rate increases, the NPV for the buy option is less negative (less costly). Referring to the figures shows the BREAK-EVEN lease payments increasing as the tax rate increases. One would expect the opposite since the buy option becomes increasingly attractive as the tax rate increases, however, an investor can afford to pay higher lease payments (in before-tax dollars) since the payments are tax deductible. Reference to Figure A.1 shows the BREAK-EVEN payment increasing from roughly $4,000 to $4,200 at a 5 percent opportunity cost and from a 0 to 50 percent tax bracket.

These figures assume no security deposit is required for the lease option. Thus, the opportunity cost is only applied towards the down payment under the purchase option. This additional cost reduces some of the tax savings under the purchase option and causes the BREAK-EVEN lines to have a steeper slope.

Again referring to Figure A.1 one can see that as the opportunity cost is increased from 5 to 10 to 15 percent, the BREAK-EVEN lines shift upward. The lines shift upward because the buy option becomes more costly (less attractive) as the opportunity cost is increased. Thus, the annual lease payments must increase to equate the two options.

One should notice that the vertical axes are adjusted upward as the interest on debt capital increases (refer to figures). This is because as interest increases, the buy option becomes more costly (less attractive), ceteris paribus. The lease payments must increase to equate the two options.

Figure A.1


THREE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=0, INTEREST ON DEBT=10%
ANNUAL LEASE PAYMENT IN $
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
3300
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

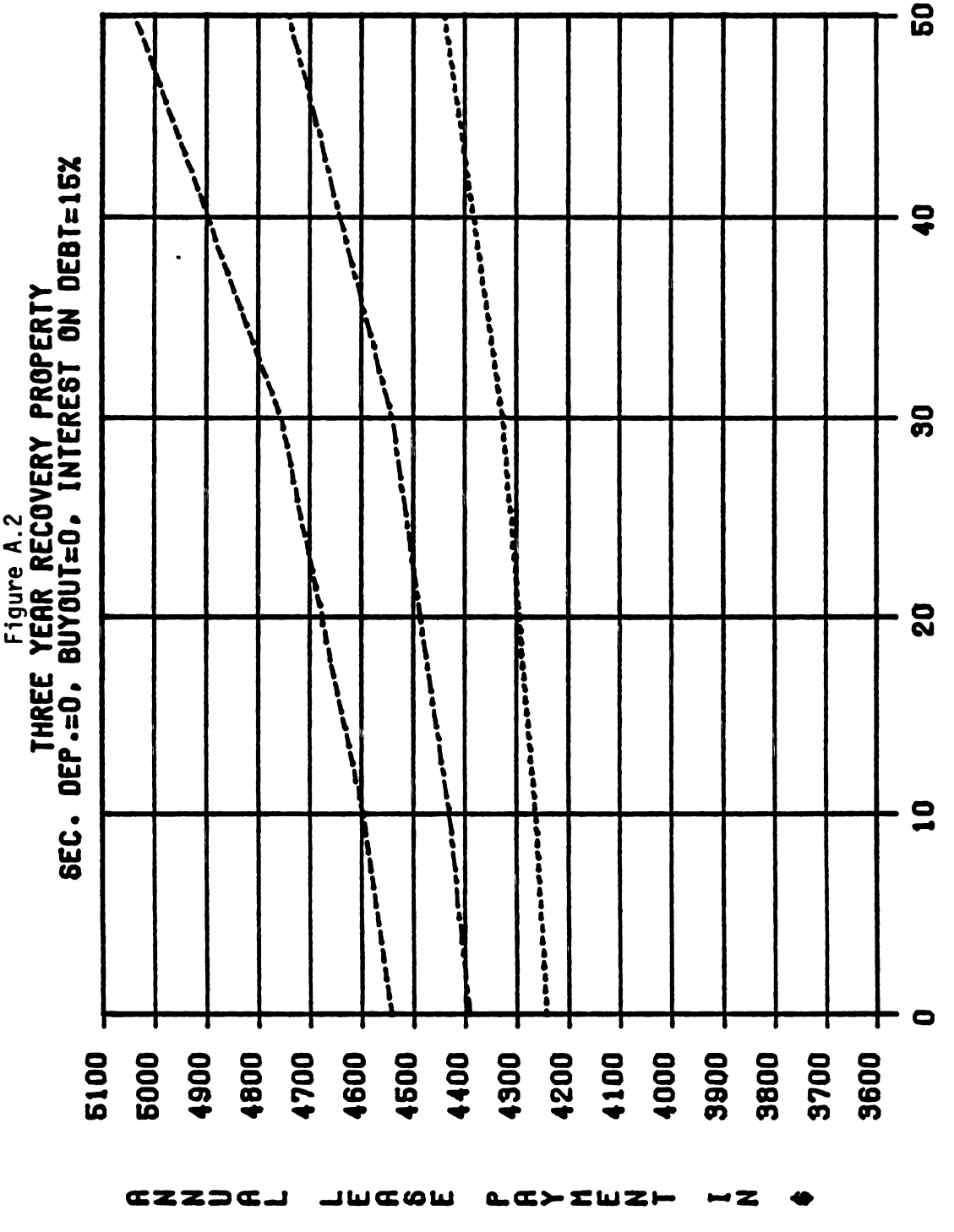
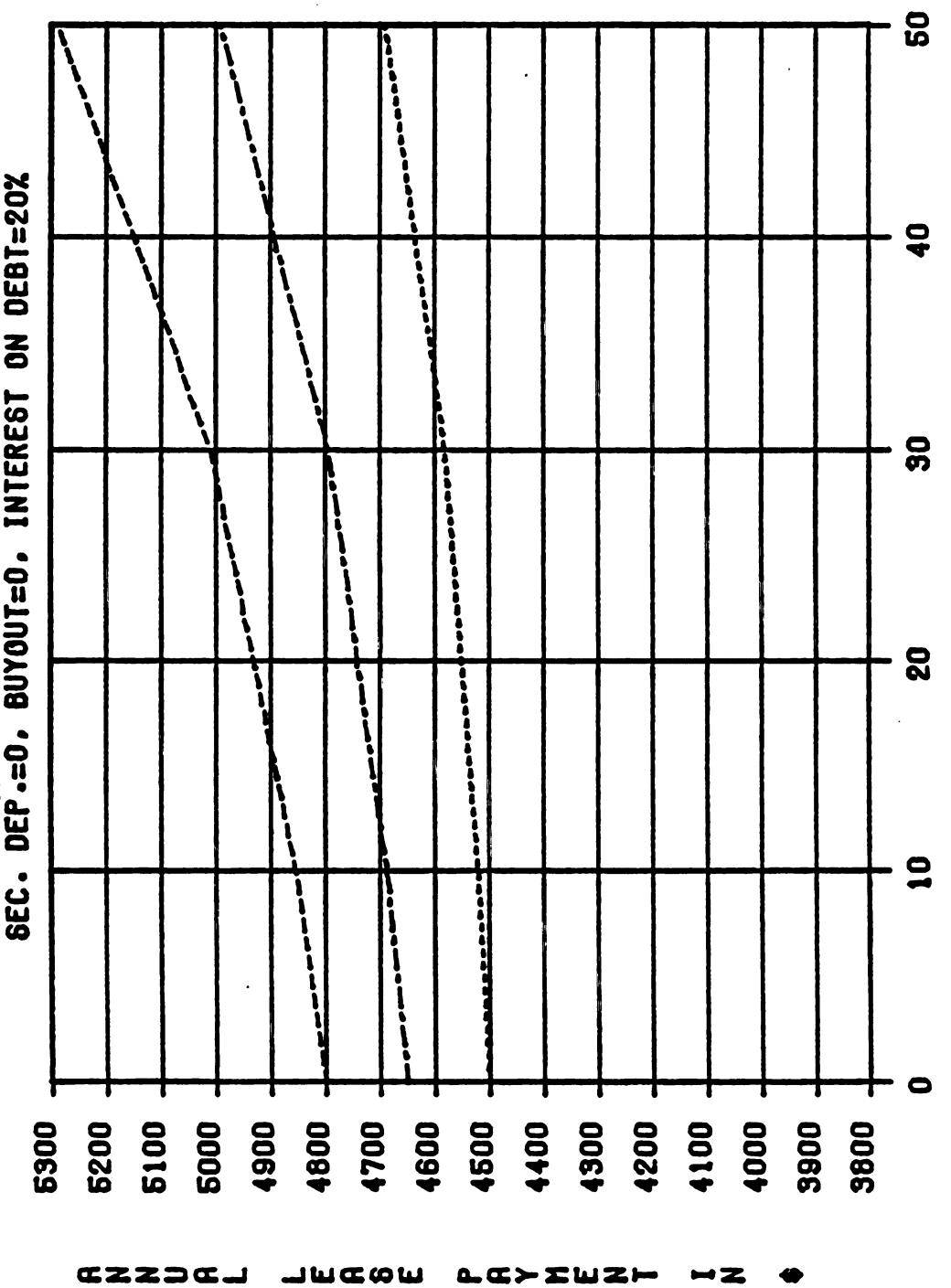

THREE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=0, INTEREST ON DEBT=15%
ANNUAL LEASE PAYMENT IN $
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure A.2

Figure A.3


THREE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=0, INTEREST ON DEBT=20%
ANNUAL LEASE PAYMENT IN $
6300
6200
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

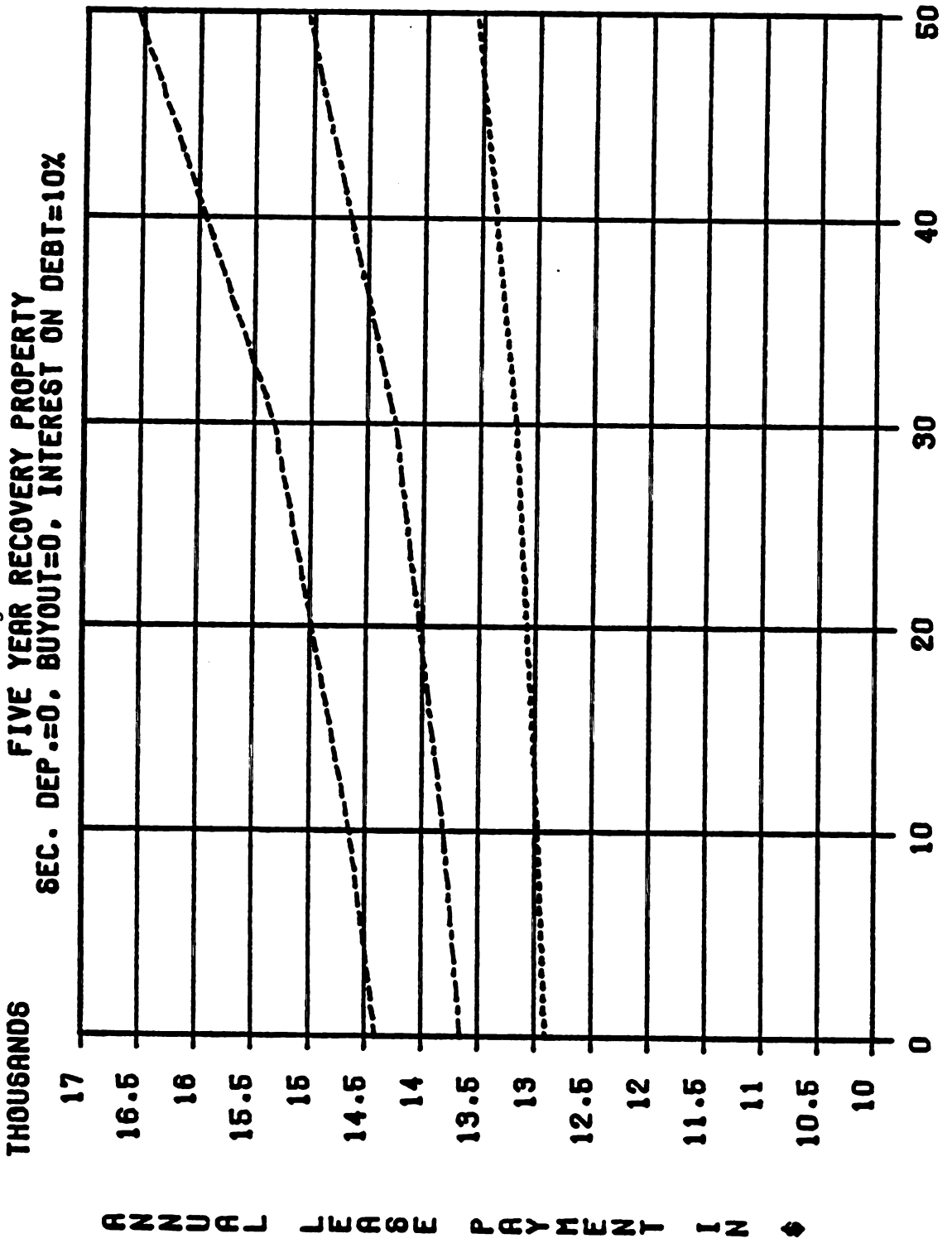

FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0. BUYOUT=0. INTEREST ON DEBT=10%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
10.5
10
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure A.4

Figure A.5

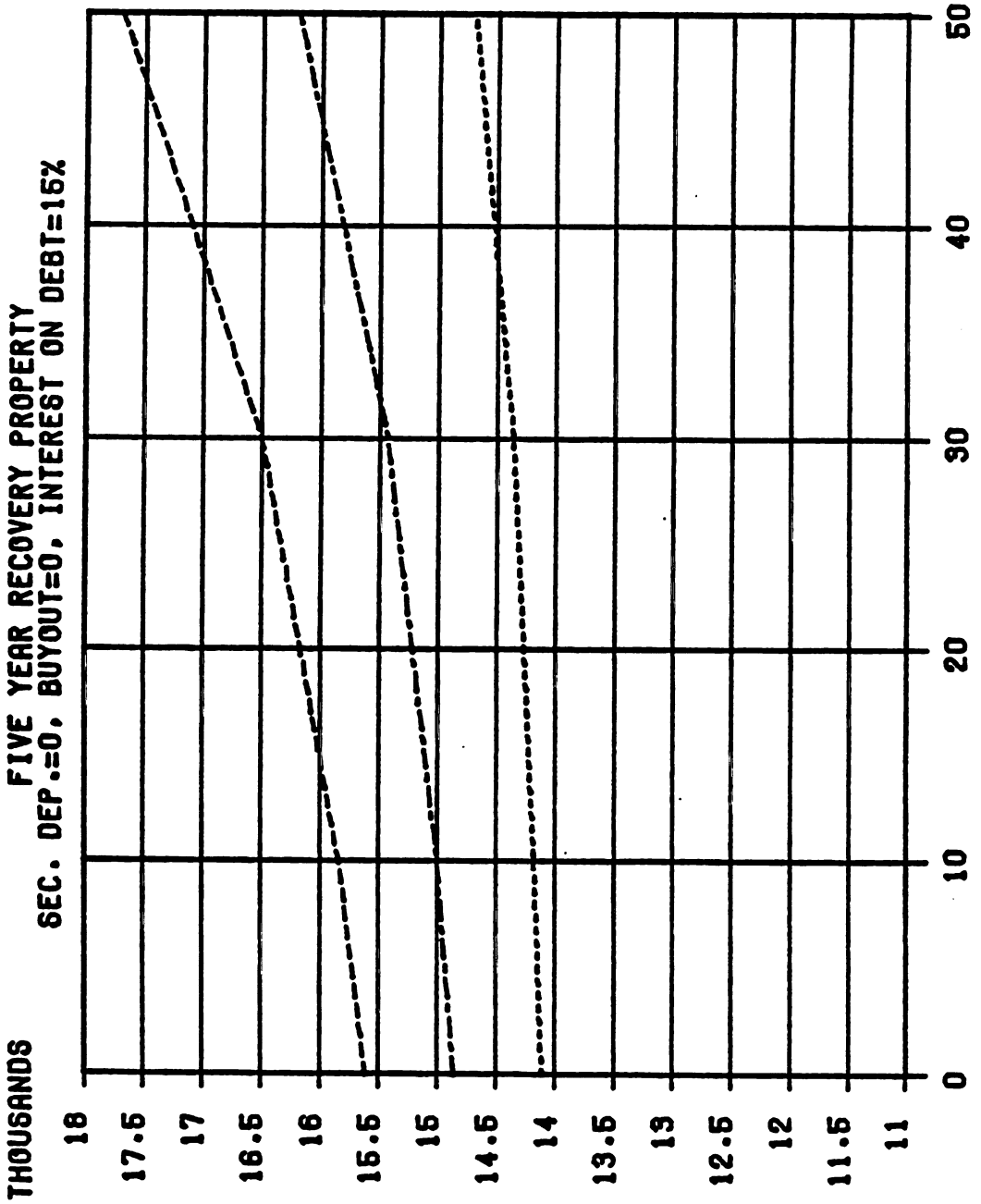
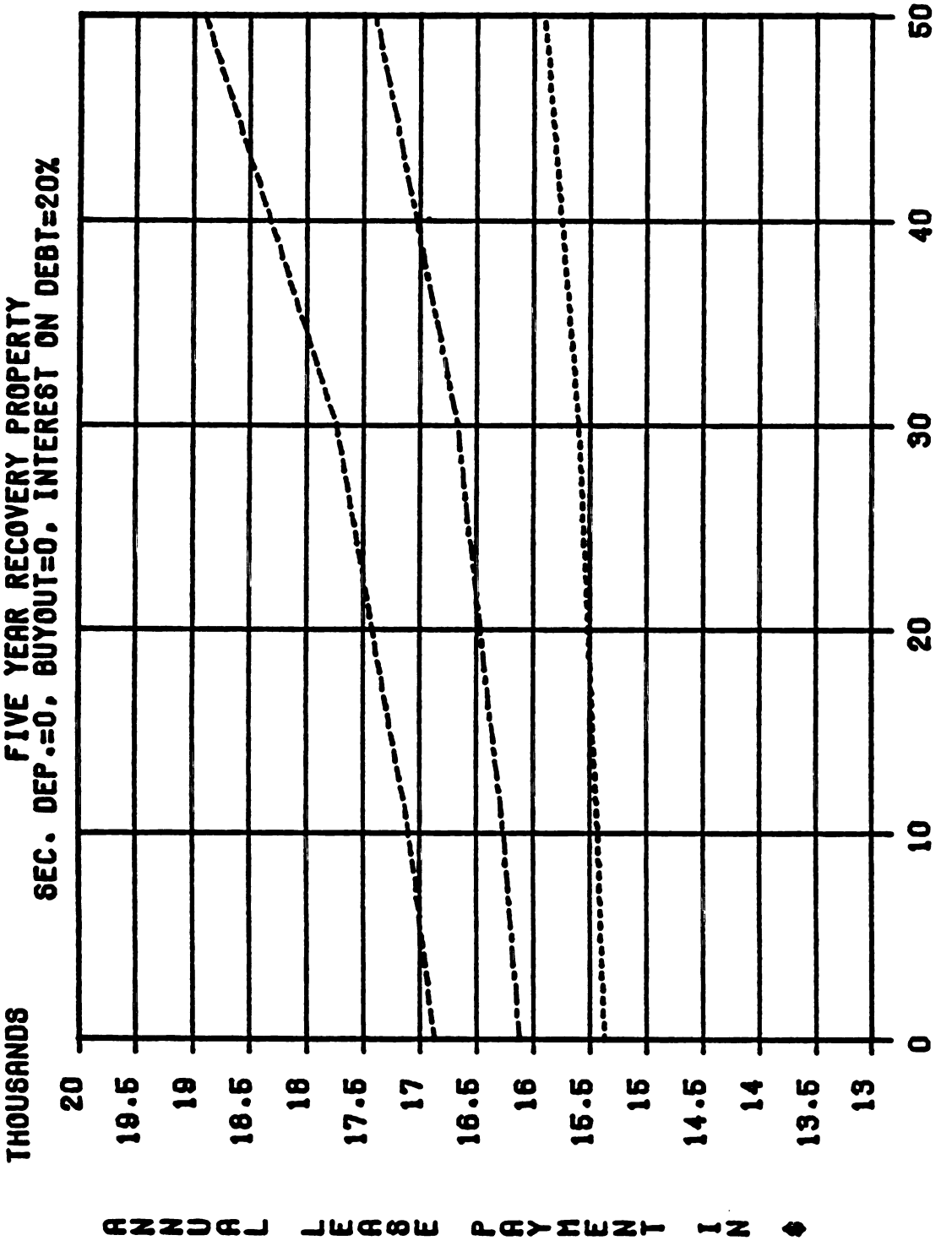

FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=0, INTEREST ON DEBT=15%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure A.6


FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=0, INTEREST ON DEBT=20%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
20
19.5
19
18.5
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

-- Figure Series B

With the introduction of a 10 percent security deposit into the analysis, the BREAK-EVEN lines are negatively sloped (refer to figures). As the tax rate increases, ceteris paribus, the NPV for the buy option decreases. Much of the tax savings which occurred in Series A is lost since the security deposit reduces the basis from which the lease payments are determined. Therefore the BREAK-EVEN lease payments decrease to equate the two options. At a 5 percent opportunity cost the BREAK-EVEN payment for three-year recovery property at 10 percent interest on debt is reduced by about $240 from 0 to 50 percent tax rate (Figure B.1).

The security deposit is capital required upfront prior to entering into the lease term. As stated previously an opportunity cost is applied to this amount for the term of the lease agreement. These two factors further reduce the BREAK-EVEN lease payment as the tax rate increases.

As with Series A, as opportunity cost increases the purchase option becomes more costly, and the lease payments must increase to equate the NPV's. Referring to the figures, this series appears to have an interaction between the security deposit, tax rate, and when the opportunity cost is set at 15 percent.

The BREAK-EVEN line is relatively flat thus the lease payment is fairly constant at any tax rate. The tax savings from the deduction of rental payments are offset by the loss of interest income and the opportunity cost applied to the security deposit as the tax rate increases.

As with the previous series, as more interest is paid with a purchase option, the lease payments must increase to equate the two alternatives. Again, referring to the graphs the vertical axis are adjusted upward for each figure as interest on debt increases.

Figure B.1

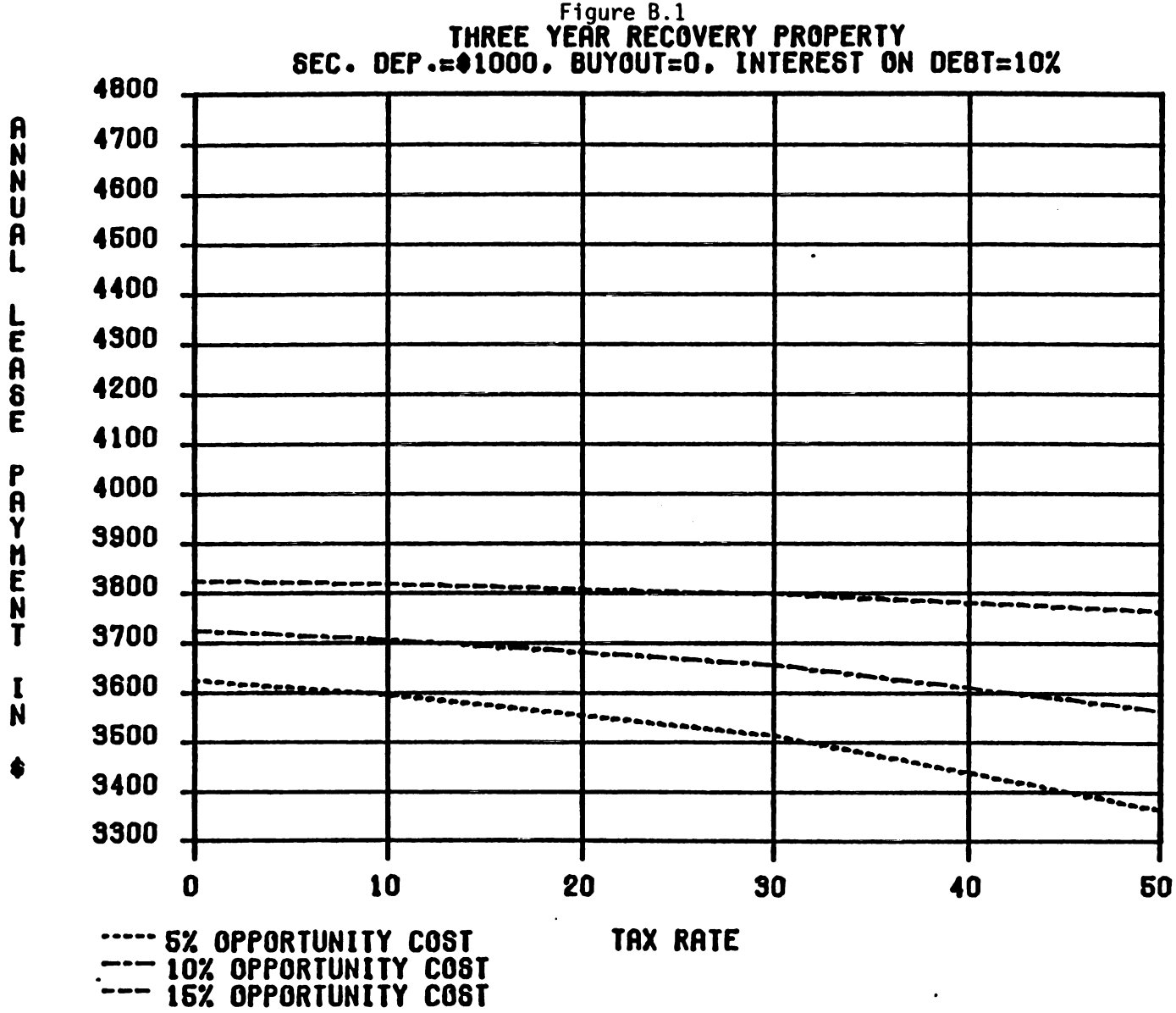
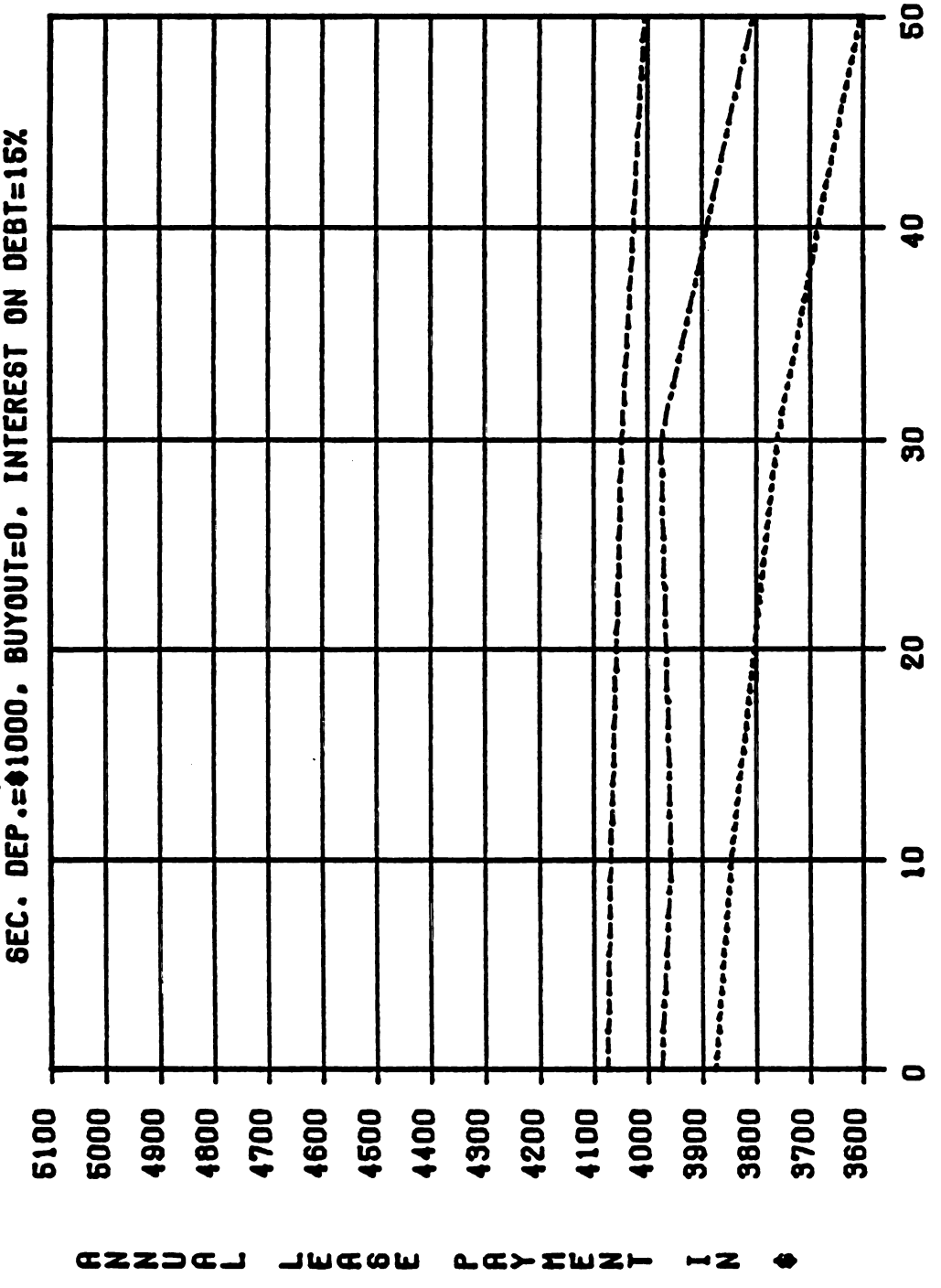

THREE YEAR RECOVERY PROPERTY
SEC. DEP.=$1000, BUYOUT=0, INTEREST ON DEBT=10%
ANNUAL LEASE PAYMENT IN $
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
3300
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure B.2


THREE YEAR RECOVERY PROPERTY
SEC. DEP.=$1000. BUYOUT=0. INTEREST ON DEBT=15%
ANNUAL LEASE PAYMENT IN $
6100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

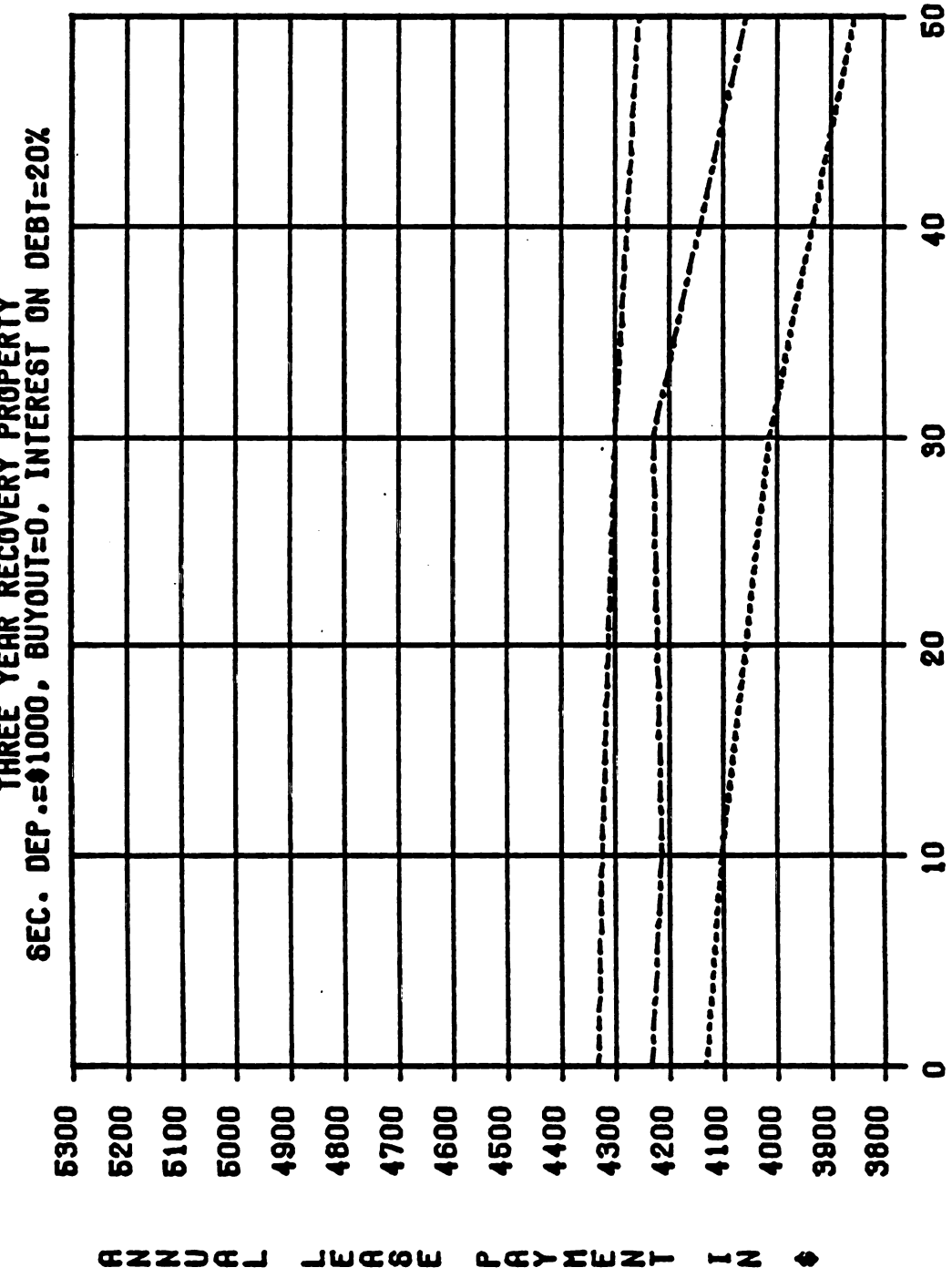

THREE YEAR RECOVERY PROPERTY
SEC. DEP.=$1000, BUYOUT=0, INTEREST ON DEBT=20%
ANNUAL LEASE PAYMENT IN $
5300
5200
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
0
10
20
30
40
50
TAX RATE
----- 5% OPPORTUNITY COST
--- 10% OPPORTUNITY COST
--- 15% OPPORTUNITY COST

Figure B.3

Figure B.4

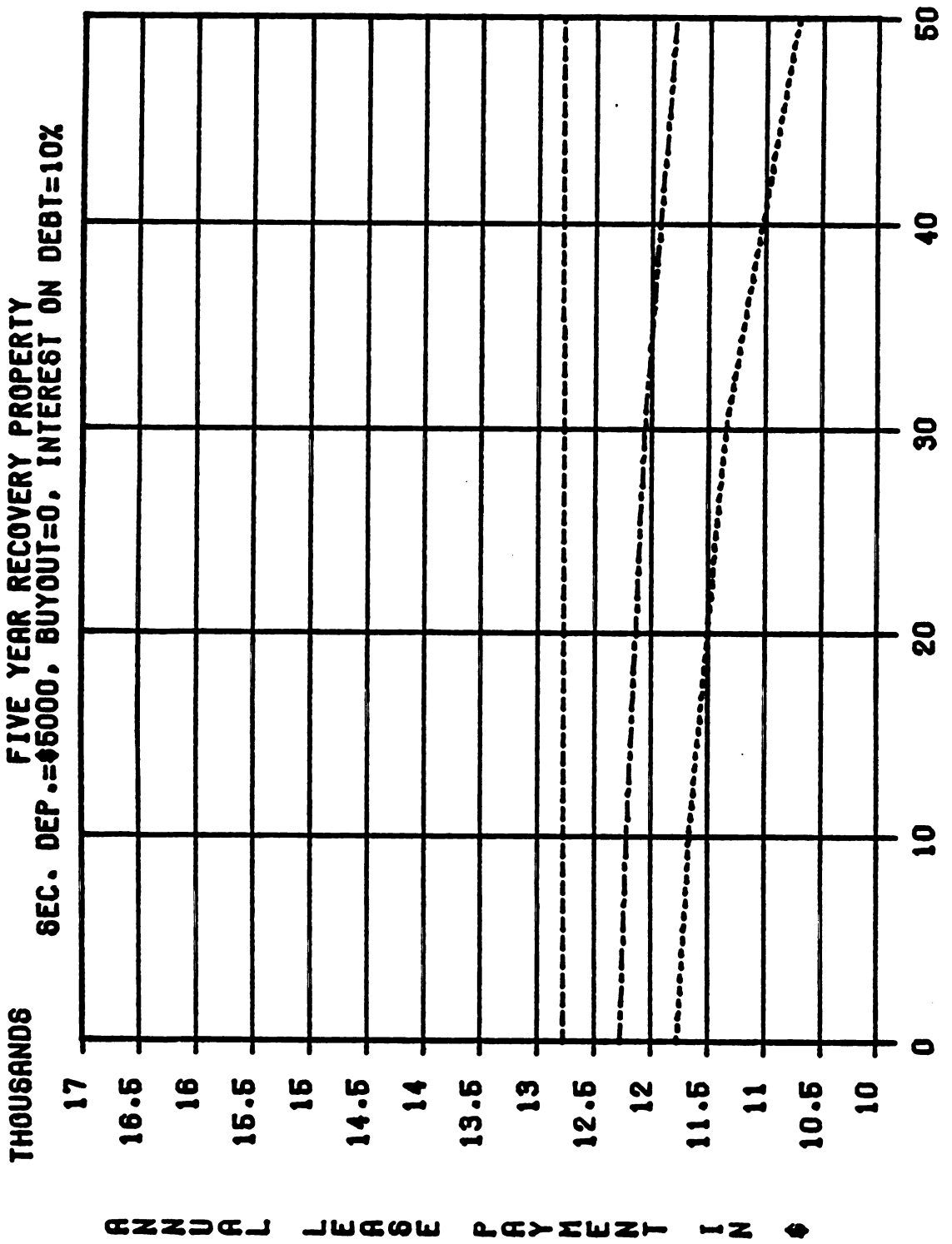

FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=$6000, BUYOUT=0, INTEREST ON DEBT=10%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
10.5
10
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure B.5

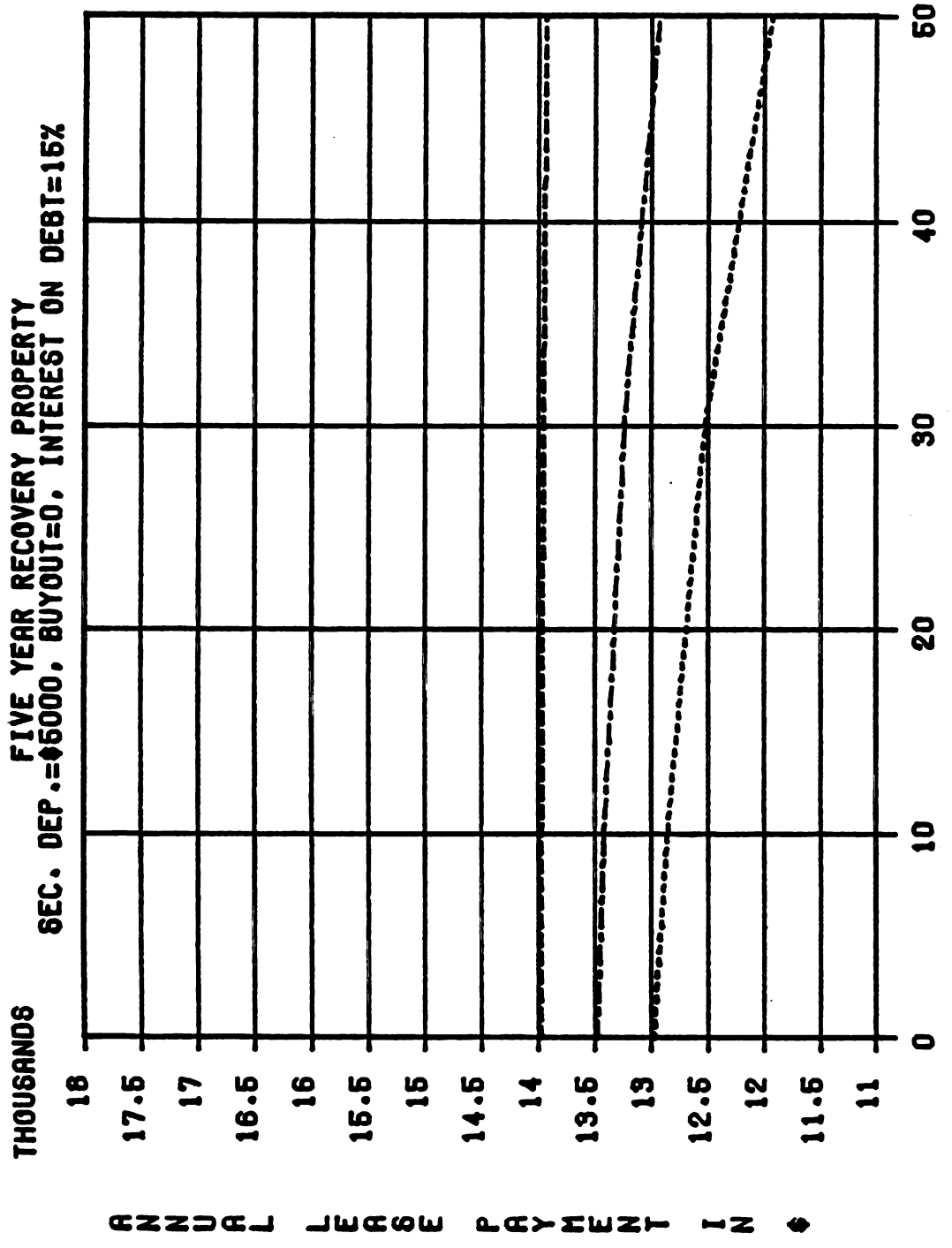
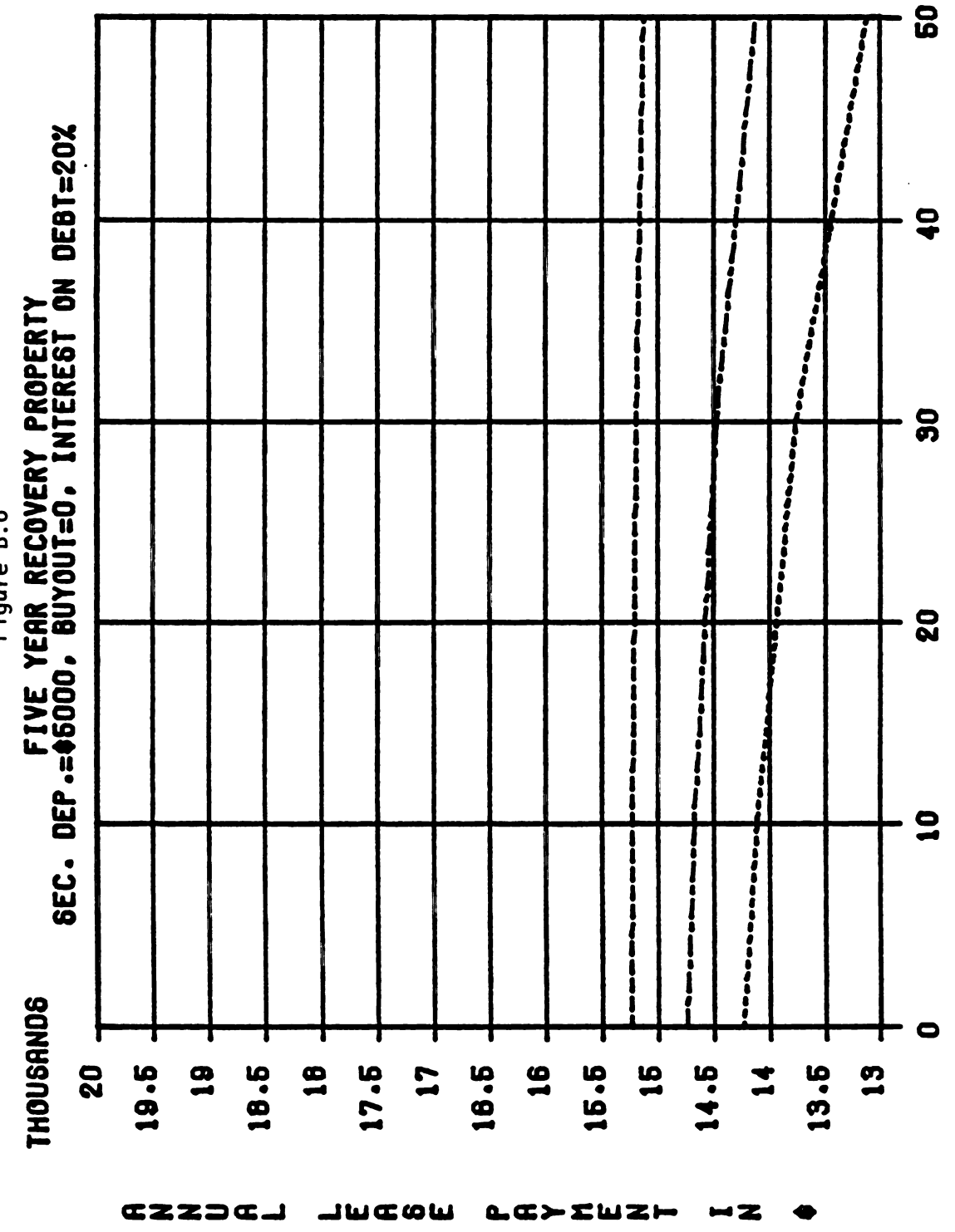

THOUSANDS
FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=$6000, BUYOUT=0, INTEREST ON DEBT=15%
ANNUAL LEASE PAYMENT IN $
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
0
10
20
30
40
50
TAX RATE
---- 5% OPPORTUNITY COST
--- 10% OPPORTUNITY COST
--- 15% OPPORTUNITY COST

Figure B.6


FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=$6000, BUYOUT=0, INTEREST ON DEBT=20%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
20
19.5
19
18.5
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

-- Figure Series C

Referring to Figures C.1 - C.3, one can see that the BREAK-EVEN lines are not consistently positive- or negative-sloped. The BREAK-EVEN lines at a 5 percent opportunity are negatively sloped. The tax savings from the ACRS deductions taken after the buy-out override the opportunity cost applied to the purchase down payment.

The buy-out amount has the same effect as the security deposit in Series B. It reduces the basis from which the lessor determines lease payments. To see this point compare the starting point at 0 percent tax rate for the BREAK-EVEN lines in Figure C.1 to the starting point for the BREAK-EVEN lines in Figure A.1.

The BREAK-EVEN lines for three-year property at 10 and 15 percent opportunity cost and all the lines for five-year property (Figures C.4 - C.6) are positively sloped. Again, as in Figure Series A, one can afford to pay more for the lease as the tax rate increases (in before-tax dollars), since the lease payment is tax deductible.

Again an increase in opportunity cost forces the BREAK-EVEN line upward illustrating that the buy option is more costly, or that one can afford to pay more for a lease when a higher value is placed on the equity capital required for a purchase.

The vertical axis are again increased to reflect the needed increase in lease payments to equate the two options as interest on debt increases.

Figure C.1

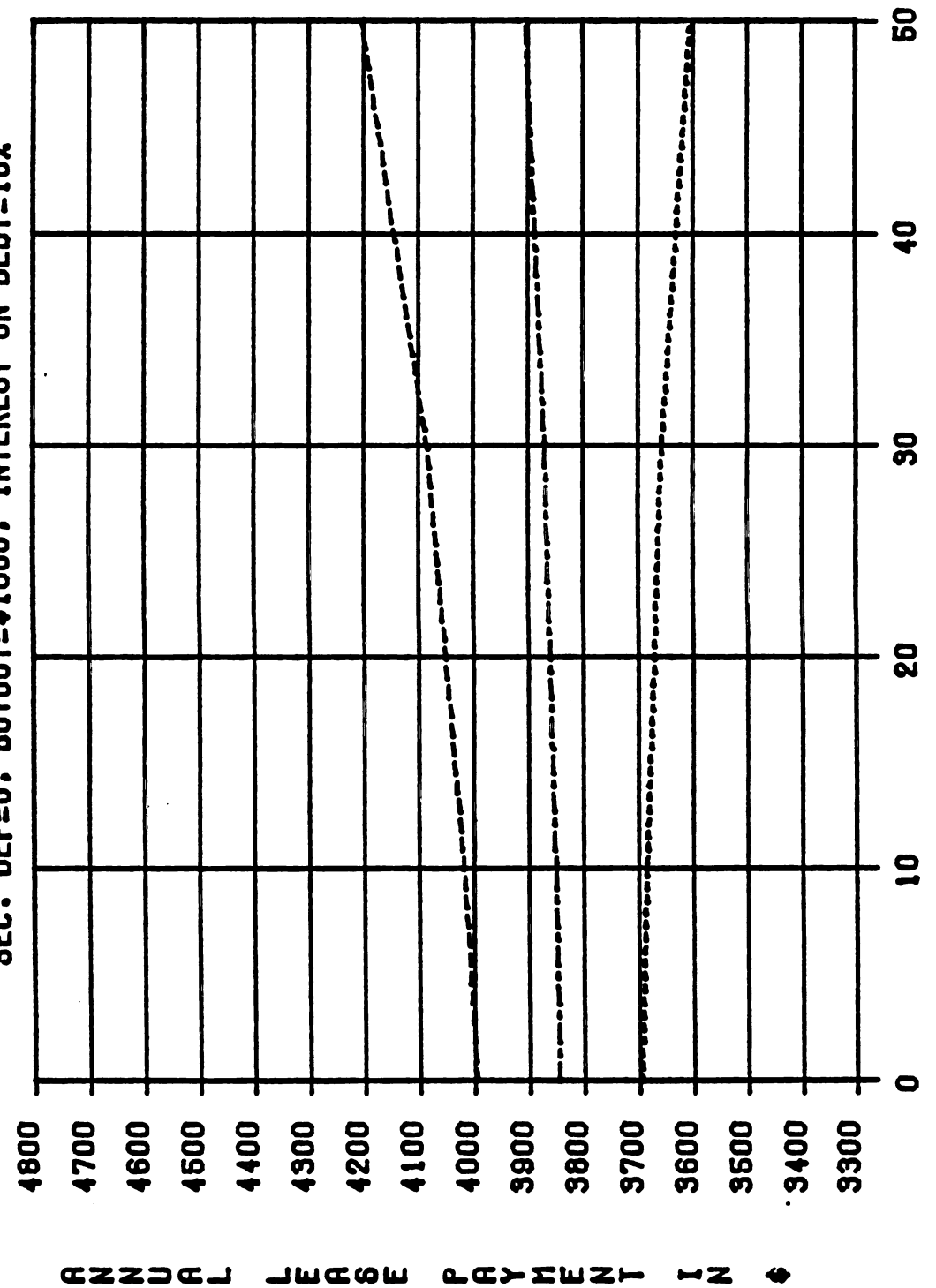

THREE YEAR RECOVERY PROPERTY
SEC. DEP=0, BUYOUT=$1000, INTEREST ON DEBT=10%
ANNUAL LEASE PAYMENT IN $
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
3300
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure C.2

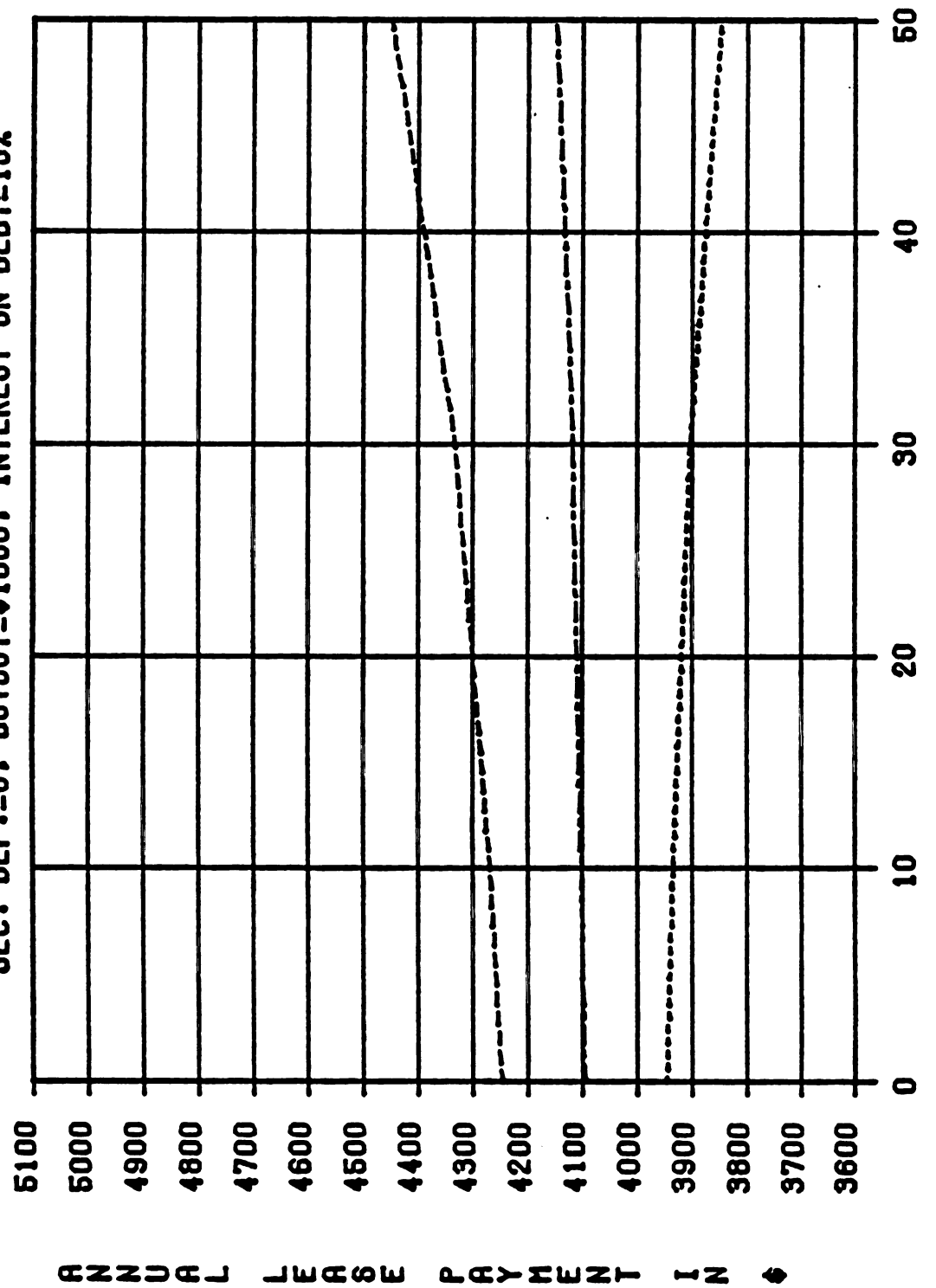
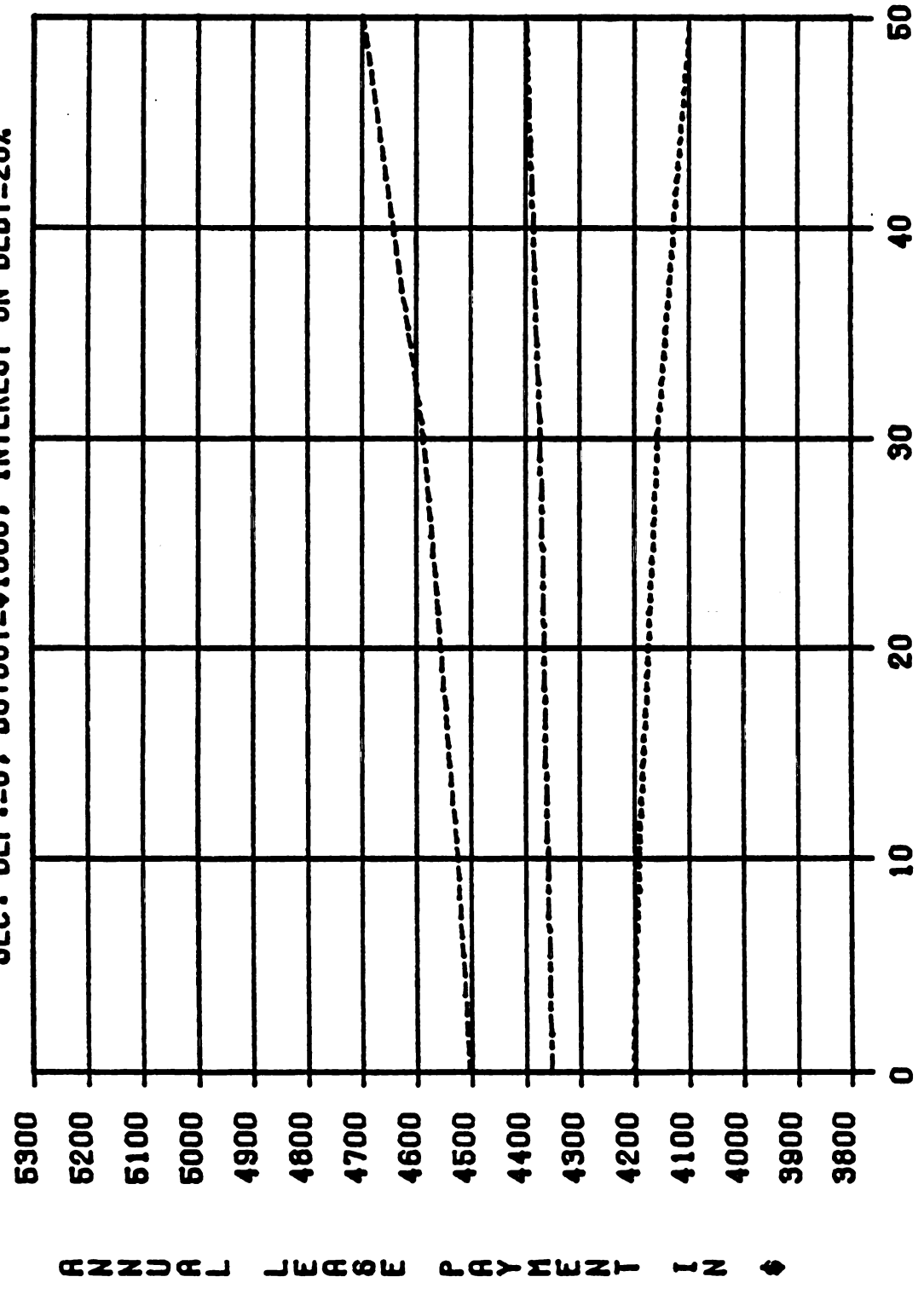

THREE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=$1000, INTEREST ON DEBT=16%
ANNUAL LEASE PAYMENT IN $
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
0
10
20
30
40
50
TAX RATE
----- 5% OPPORTUNITY COST
--- 10% OPPORTUNITY COST
.--- 15% OPPORTUNITY COST

Figure C.3


THREE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=$1000, INTEREST ON DEBT=20%
ANNUAL LEASE PAYMENT IN $
6300
6200
6100
6000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
0
10
20
30
40
50
TAX RATE
---- 5% OPPORTUNITY COST
—:— 10% OPPORTUNITY COST
--- 15% OPPORTUNITY COST

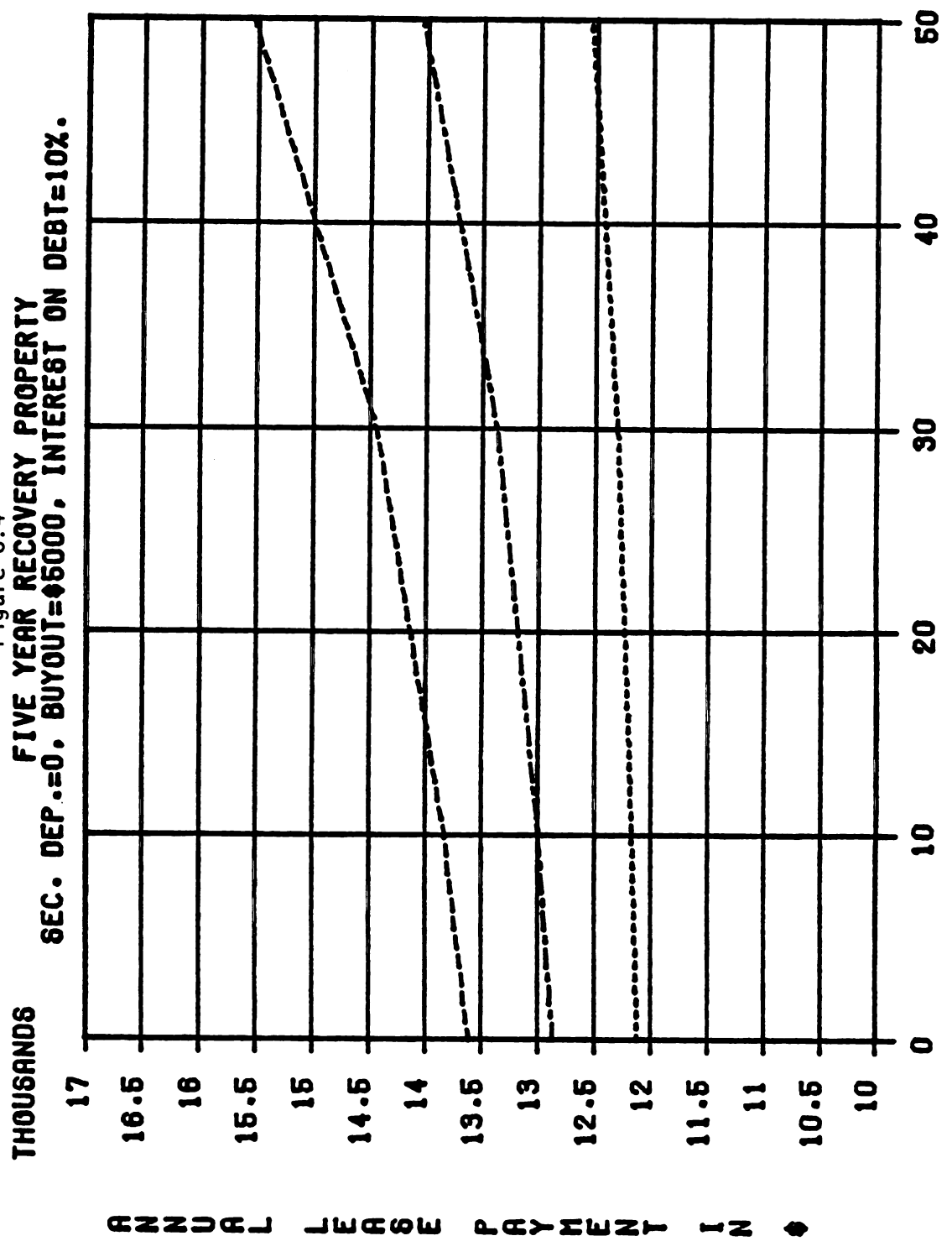

FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=$6000, INTEREST ON DEBT=10%.
THOUSANDS
ANNUAL LEASE PAYMENT IN $
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
10.5
10
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
16% OPPORTUNITY COST

Figure C.4

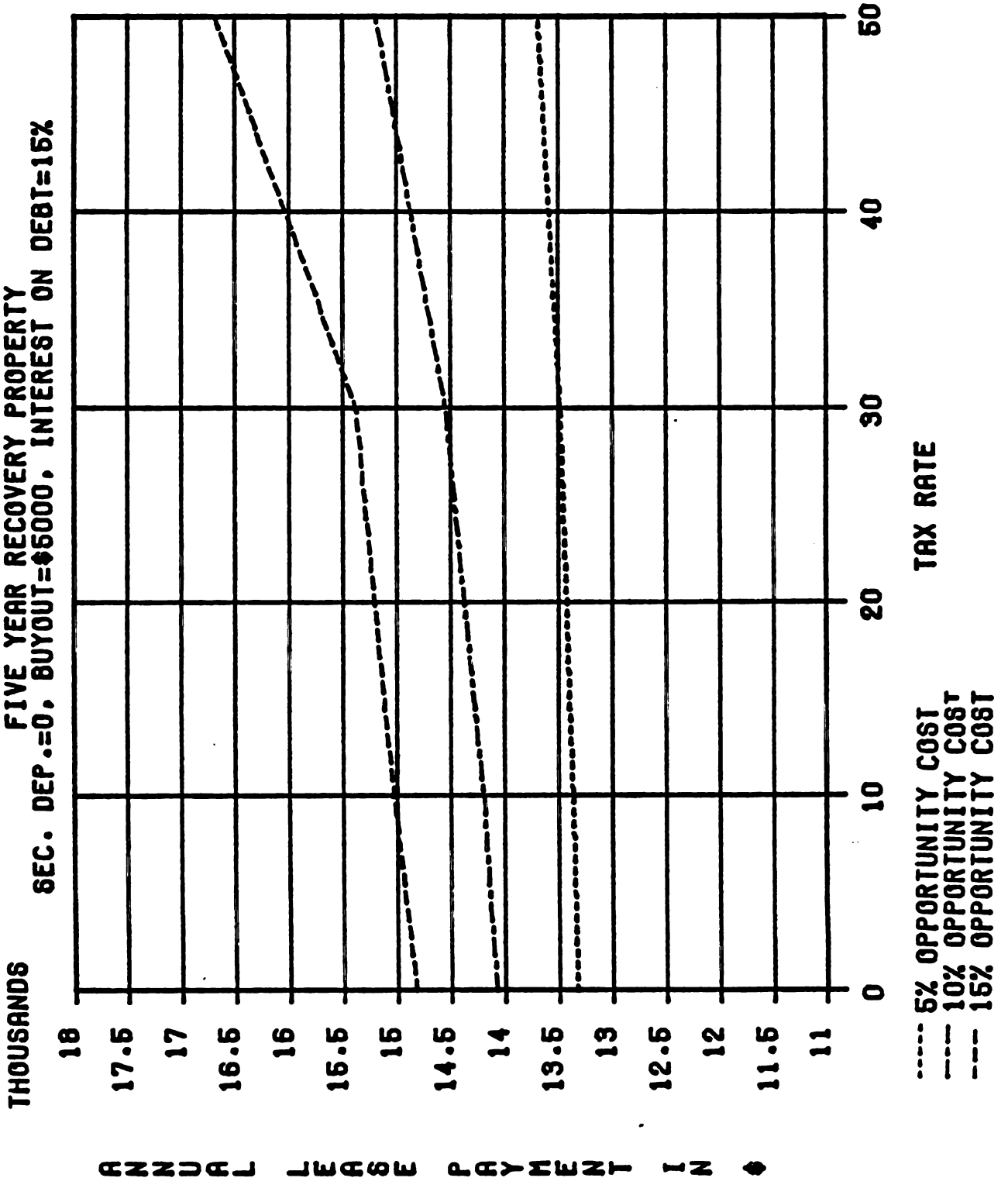
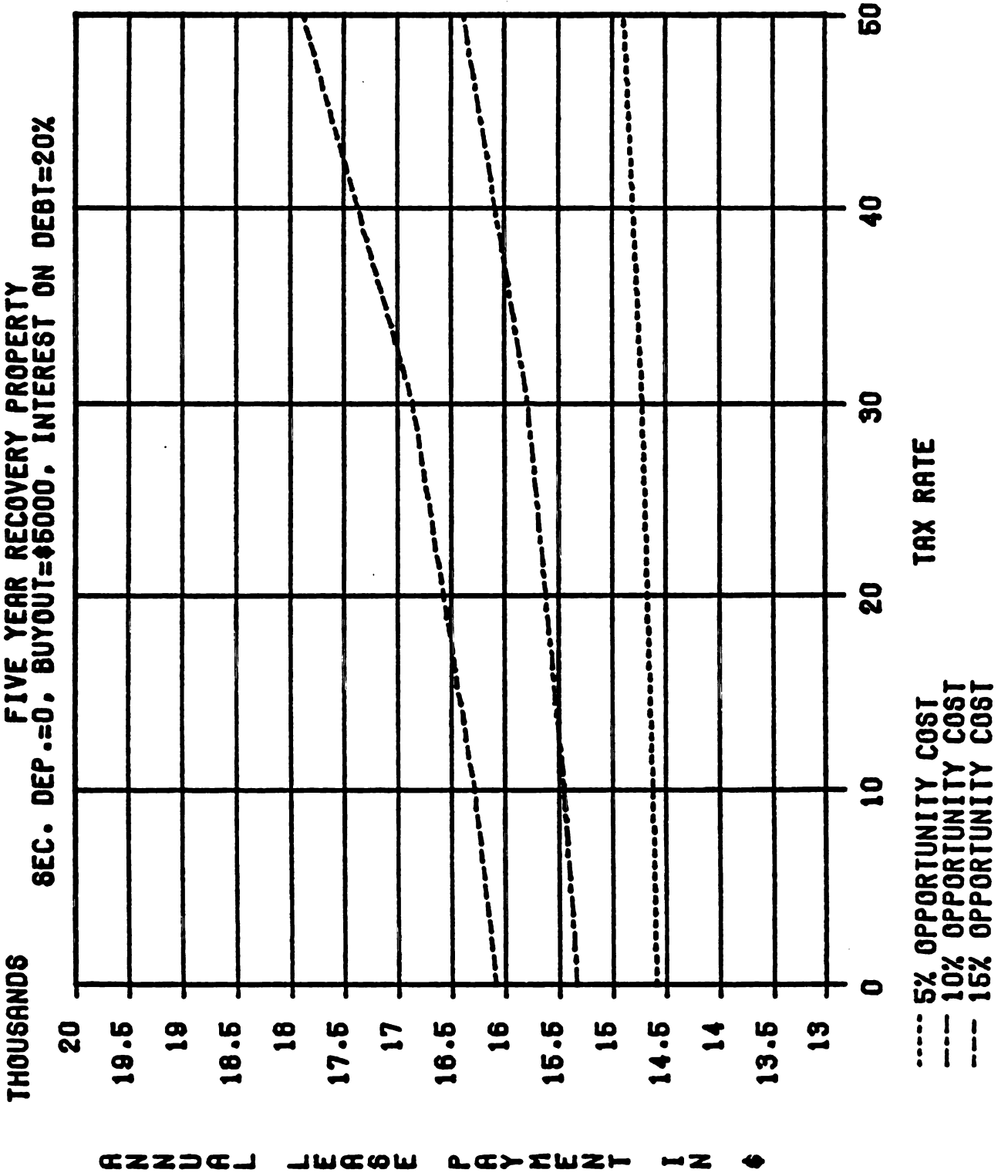


Figure C.5
FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=$6000, INTEREST ON DEBT=16%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
12.5
12
11.5
11
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

Figure C.6


FIVE YEAR RECOVERY PROPERTY
SEC. DEP.=0, BUYOUT=$6000, INTEREST ON DEBT=20%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
20
19.5
19
18.5
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
13
0
10
20
30
40
50
TAX RATE
5% OPPORTUNITY COST
10% OPPORTUNITY COST
15% OPPORTUNITY COST

-- Figure Series D

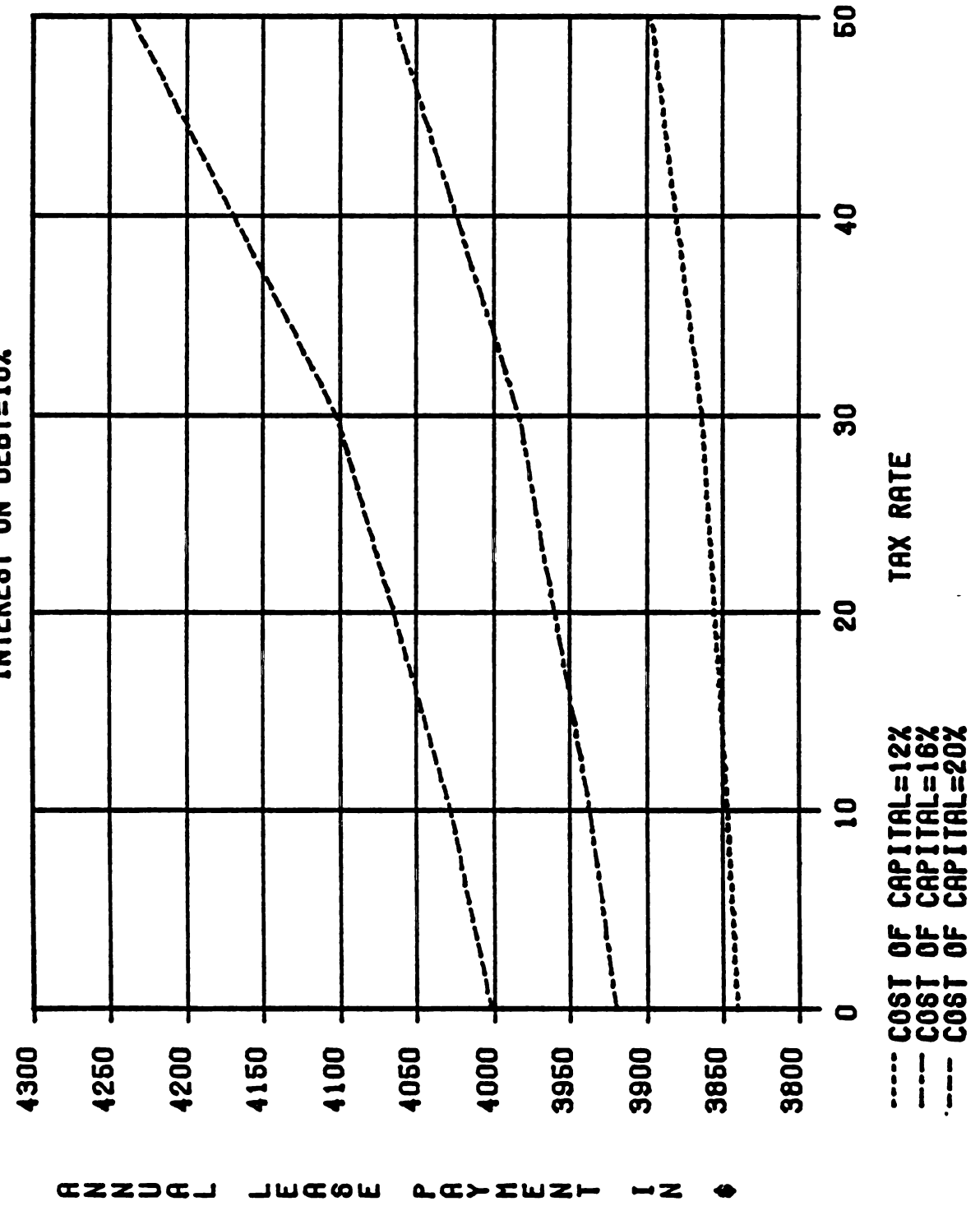
This and the following series of figures allow the desired rate of return to vary from 12 to 16 to 20 percent. As stated previously, this analysis assumes no opportunity cost, security deposit, or buy-out, and a 10 percent salvage or residual value. All prior assumptions stated in this chapter are considered. The interpretation of these figures is identical to the previous figures.

As the tax rate increases the BREAK-EVEN lease payments also increase. A lessee can afford to pay more in before-tax lease payments since the rent is tax-deductible.

Reference to the figures shows the BREAK-EVEN lines shifting upward as the rate of return is increased. This is because at lower rates of return, the present value (discount) factors are higher and the NPV is more negative (more costly). As the rate of return is increased the present value factors are less. Thus, as the buy decision becomes less costly, one can afford to pay higher lease payments since future payments are cheaper (in present dollars) as the rate of return increases.

Again, as the interest on debt increases, the buy option becomes less attractive (more costly). The lease payments must increase to equate the two NPV's. The vertical axis are adjusted upward to reflect the increase in interest on debt.

Figure D.1
THREE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=10%



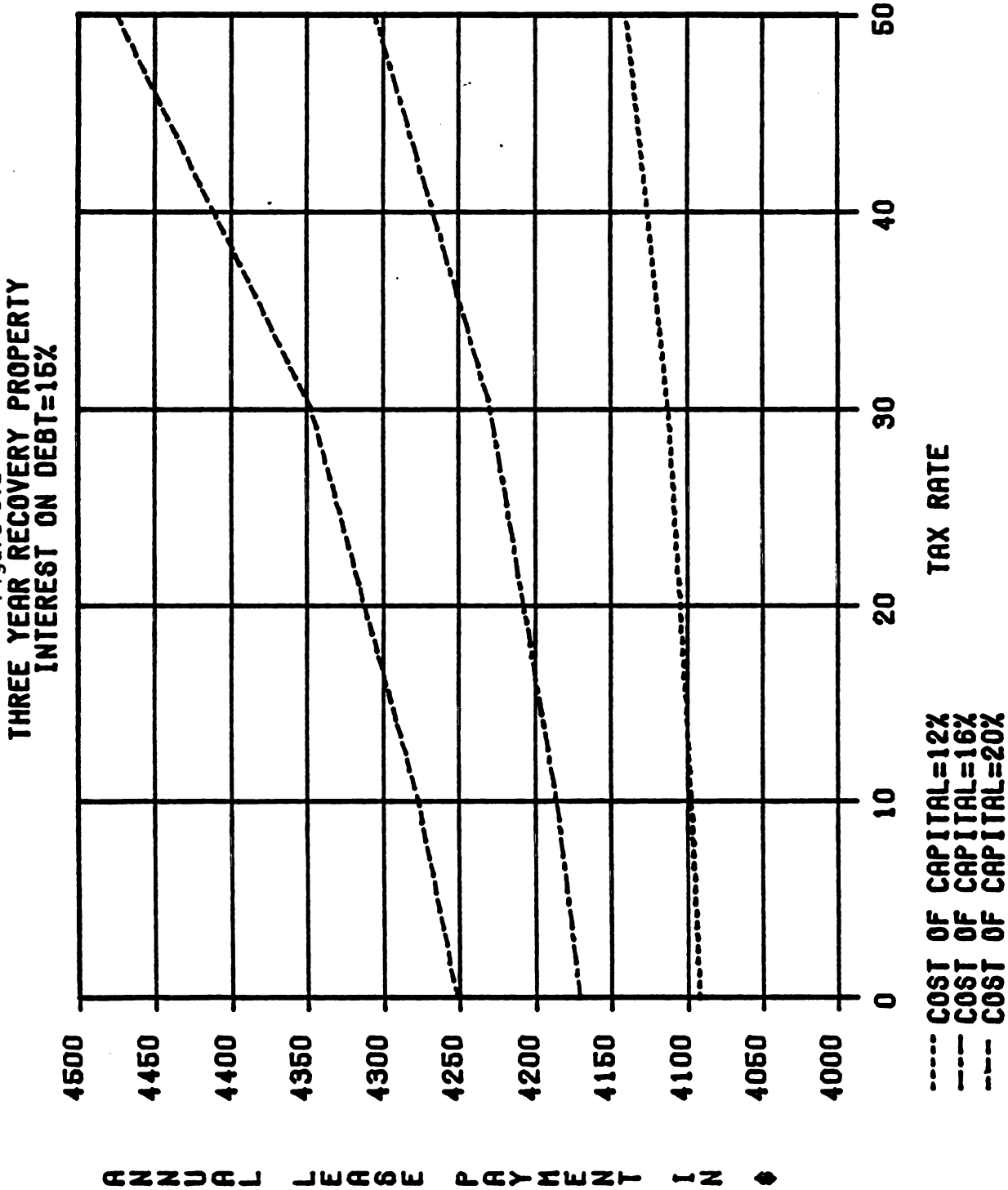

THREE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=16%
ANNUAL LEASE PAYMENT IN $
4500
4450
4400
4350
4300
4250
4200
4150
4100
4050
4000
0
10
20
30
40
50
TAX RATE
---- COST OF CAPITAL=12%
—— COST OF CAPITAL=16%
-.-- COST OF CAPITAL=20%

Figure D.2

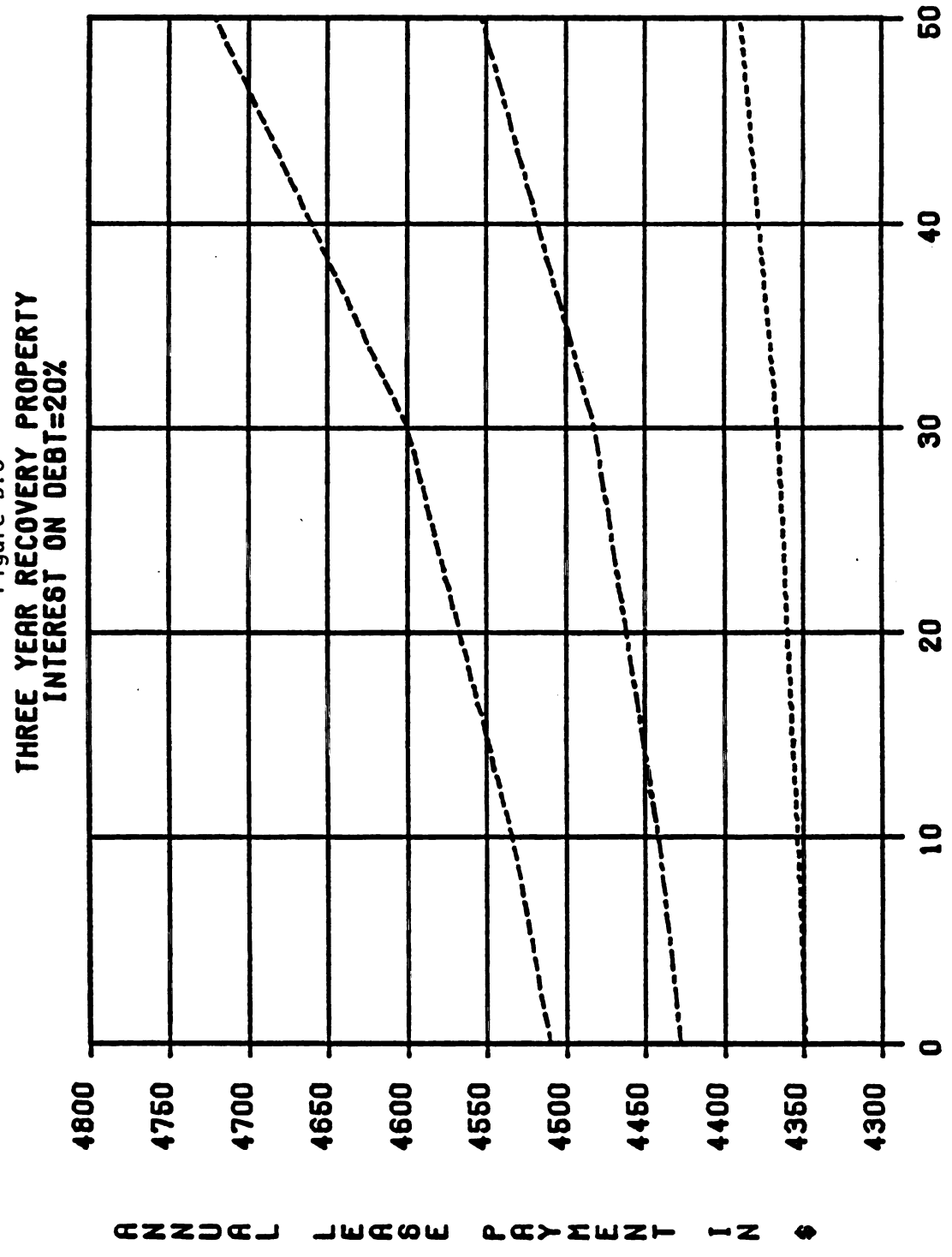

THREE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=20%
ANNUAL LEASE PAYMENT IN $
4800
4750
4700
4650
4600
4550
4500
4450
4400
4350
4300
0
10
20
30
40
50
TAX RATE
---- COST OF CAPITAL=12%
--- COST OF CAPITAL=16%
--- COST OF CAPITAL=20%

Figure D.3

-- Figure Series E

A change in the tax rate has virtually the same effect with five-year recovery property as with three-year. However, reference to Figures D.1 - E.3 shows the BREAK-EVEN lines at a 12 percent desired rate of return negatively sloped. (The BREAK-EVEN lease payments decrease on both a before- and after-tax basis as the tax rate increases.) This occurrence is partially caused by the five-year recovery property asset valued at five times the three-year asset. Due to this, some of the overriding effects of lease payment deductions are lost. This, along with the fact that an investor receives the full effect of the tax savings from ITC and ACRS deductions (since no opportunity cost is applied), force the BREAK-EVEN rate to decrease as taxes increase. There is an interaction between the 12 percent rate of return and the tax savings under both financing alternatives.

As with Figure Series D, the BREAK-EVEN lines shift upward as the rate of return is increased since future payments are cheaper (in present dollars) as the rate of return increases. Reference to Figure E.1 shows an investor in a 50 percent tax bracket could afford to pay approximately $700 more annually with a desired rate of return of 16 percent compared to 12 percent.

As more interest is paid with a purchase, the lease payments must increase to equate the two options. As previously, the vertical axes are increased for higher rates of interest on debt.

Figure E.1

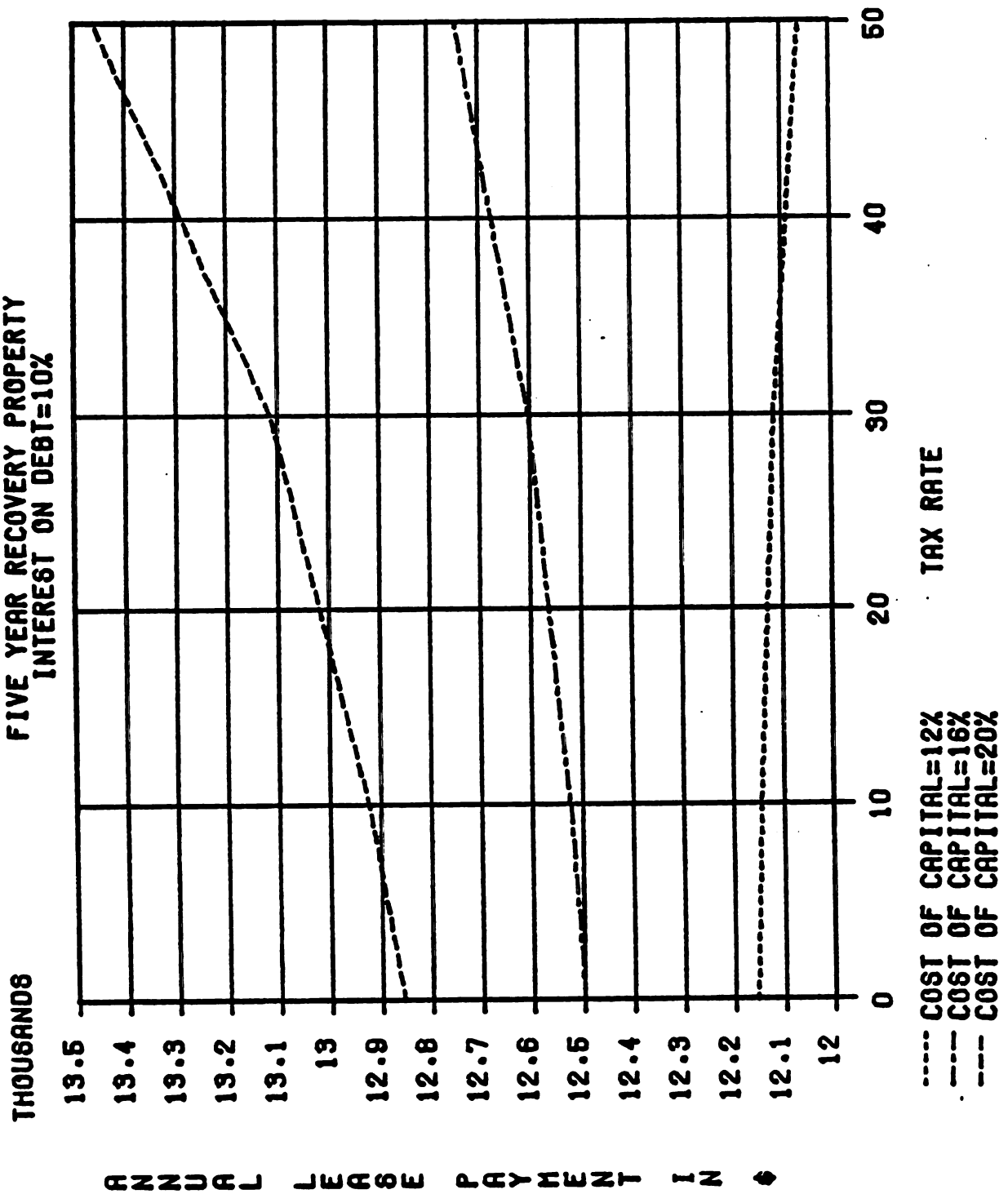

FIVE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=10%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
13.5
13.4
13.3
13.2
13.1
13
12.9
12.8
12.7
12.6
12.5
12.4
12.3
12.2
12.1
12
0
10
20
30
40
50
TAX RATE
COST OF CAPITAL=12%
COST OF CAPITAL=16%
COST OF CAPITAL=20%

Figure E.2

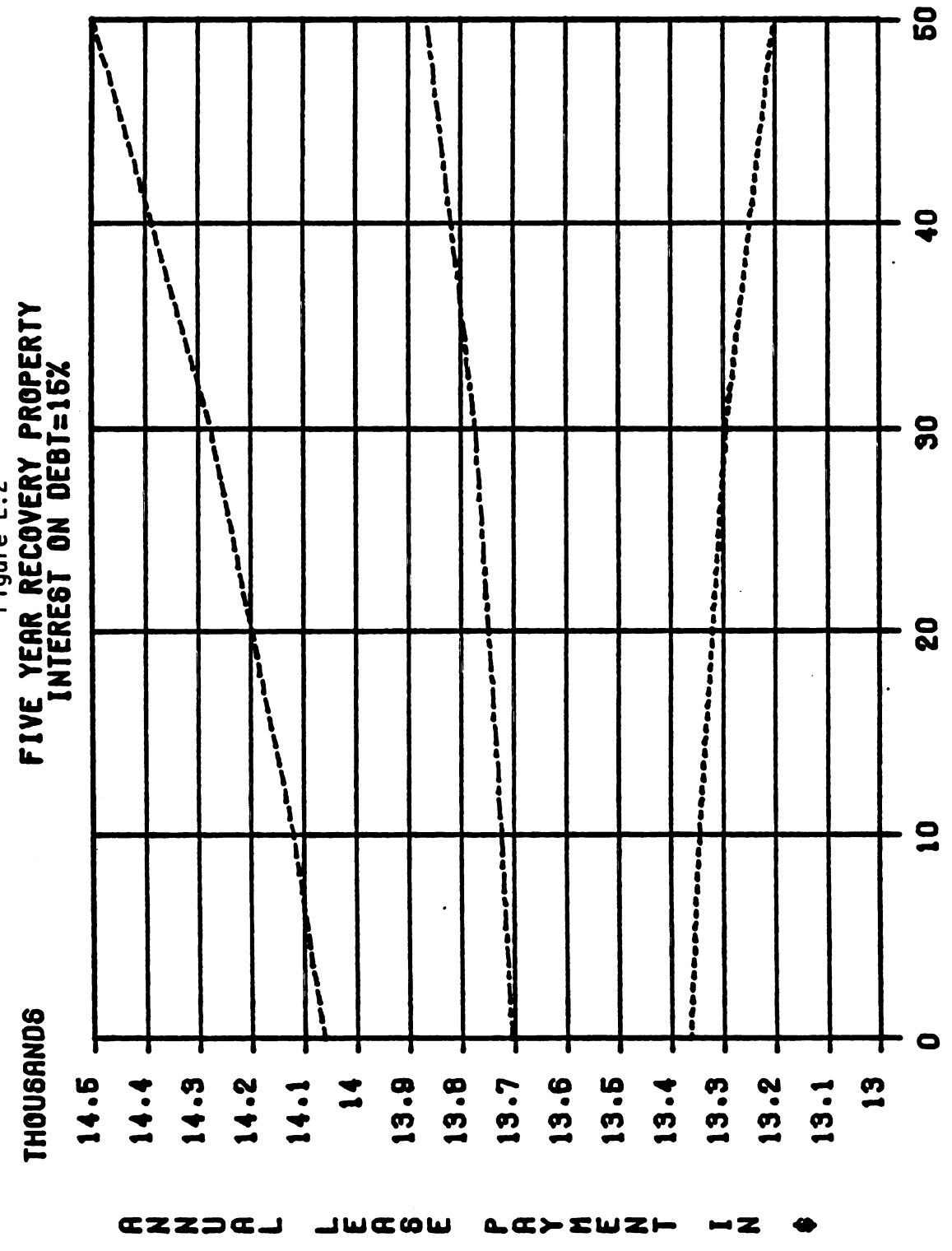
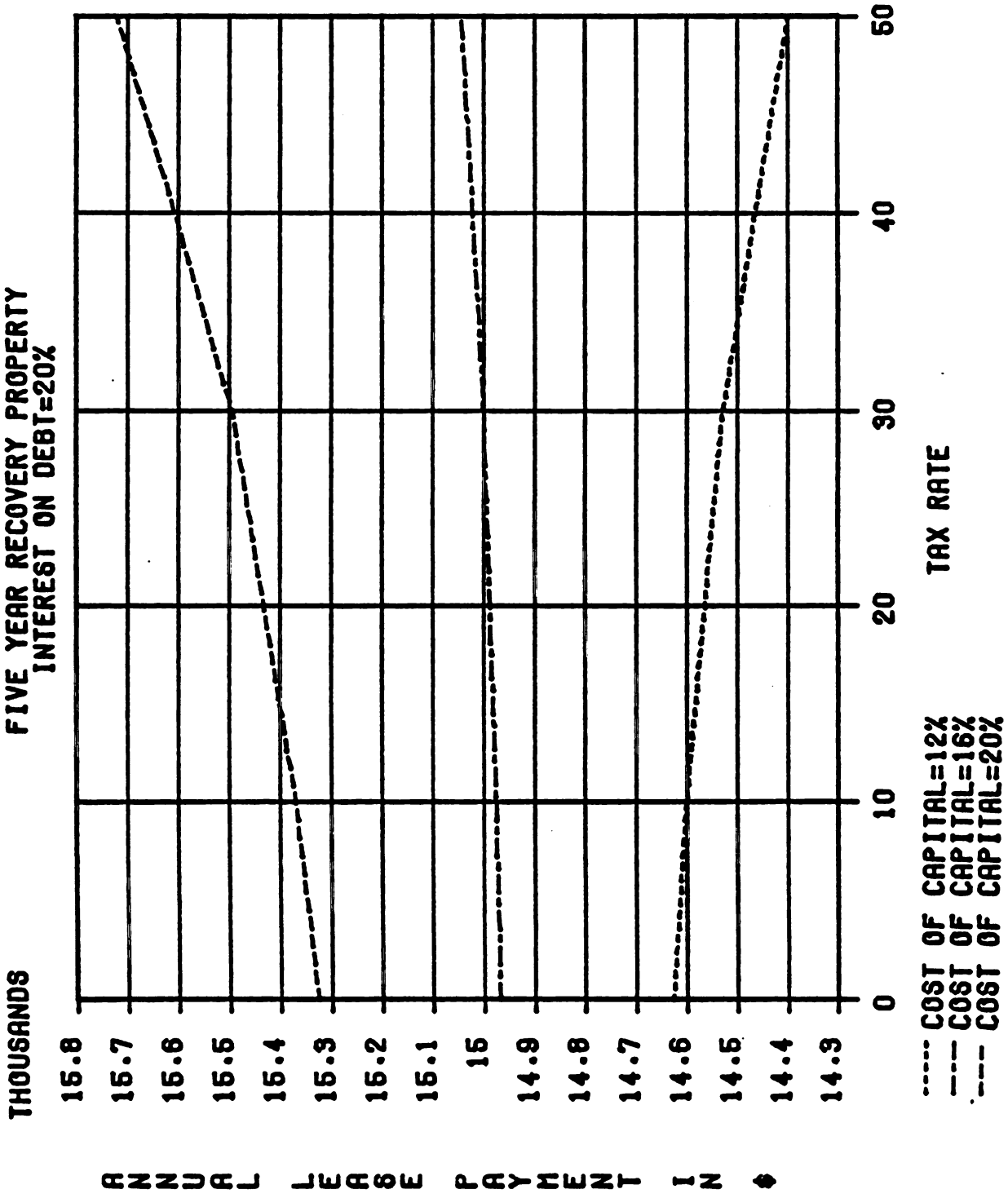

FIVE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=16%
THOUSANDS
14.5
14.4
14.3
14.2
14.1
14
13.9
13.8
13.7
13.6
13.5
13.4
13.3
13.2
13.1
13
0
10
20
30
40
50
TAX RATE
ANNUAL LEASE PAYMENT IN $
COST OF CAPITAL=12%
COST OF CAPITAL=16%
COST OF CAPITAL=20%

Figure E.3


FIVE YEAR RECOVERY PROPERTY
INTEREST ON DEBT=20%
THOUSANDS
ANNUAL LEASE PAYMENT IN $
15.8
15.7
15.6
15.5
15.4
15.3
15.2
15.1
15
14.9
14.8
14.7
14.6
14.5
14.4
14.3
0
10
20
30
40
50
TAX RATE
COST OF CAPITAL=12%
COST OF CAPITAL=16%
COST OF CAPITAL=20%

E. Summary

These figures offer both a quick method for determining the proper financing decision, and they demonstrate the importance of the variables involved in an investment. Again, these figures are not meant to act as the sole decision criteria in any or all financing decisions. It is hopeful that individuals will use these figures as a temporary or back-up decision and determine the proper decision with the use of Net Present Value techniques discussed in Chapter IV. One must be careful to understand not only all of the relevant variables involved in his or her investment alternative, but also to understand the assumptions through which these figures are developed.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND NEED FOR FURTHER RESEARCH

A. Summary

To facilitate the realization of the increased benefits from both ITC and ACRS deductions, the Economic Recovery Tax Act of 1981 contains certain provisions that allow the transfer of credits and deductions related to investments in new equipment, and further increases the possibility of leasing as a financing alternative. While leasing has been an accepted part of our federal tax system for years, these provisions, known as "Safe Harbor" leasing rules, are a significant extension of prior tax policy and principles. It is not surprising that they have generated much discussion and controversy. Much of the discussion has centered around the impact of "Safe Harbor" leasing on investment decisions, concerns about inefficiency and excessive benefits to those buying tax benefits, concerns whether these guidelines will aid smaller, less-profitable businesses, and speculation about the consequences of repealing these provisions.

This text has explored and analyzed the "Safe Harbor" guidelines with major emphasis in the analysis section addressed to the concern of whether these guidelines can aid smaller, less-profitable businesses.

Tax benefit transfers through the use of "Phantom Sale-Leaseback" agreements are discussed in detail in the qualitative chapters. However,

in Chapter V, where the analysis of the lease versus purchase decision is examined quantitatively, all lease agreements are simply two-party capital leases. Whether or not the lessor transfers some of the tax benefits is considered irrelevant to the firm-level analysis. An attempt has been made to present the analysis in a simplified and systematic manner so that farmers as well as other interested individuals could expand their knowledge in this area.

Chapter I introduced some of the new terminology as a result of the Economic Recovery Tax Act of 1981. The term "Safe Harbor" was defined as well as the principal requirements needed for eligibility. An alternative financing scheme known as EDC financing was briefly discussed and then analyzed further in Chapter III.

The next chapter began with a discussion of the three major types of leases. None of these lease agreement are new, but with the enactment of the new "Safe Harbor" guidelines, greater advantages are given to both capital and "Phantom Sale-Leaseback" agreements. Following the types of leases were the specific guideline changes which created these advantages. The fixed price buy-out option helps to eliminate any hesitancy prospective lessees had towards asset appreciation. The three-month "grace period," along with eliminating profit as a criteria for a lessor, facilitates the transfer of tax benefits under a "Phantom Sale-Leaseback" agreement.

Chapter III discussed possible factors a lessor should consider about the credit worthiness of a lessee. Although every lessor has their own evaluation criteria, it is important for both parties to realize that leasing is simply an alternative financing method and should be evaluated as such. Careful evaluation by both parties may

still leave some loose ends with any financing agreement. Some of the contract provisions which have caused grievances in the past were discussed as were some of the concerns a lessee should be aware of prior to entering into a lease agreement.

As mentioned previously, a more thorough discussion of Michigan Public Act 501 (EDCs) followed the concerns for a lessee. This method of tax-exempt financing is increasing in popularity. Many farmers are confused about the consequences of this act, and this section hopefully helps to eliminate any misconceptions.

At the close of Chapter III some of the principal advantages to leasing versus purchase were discussed. Again, the advantages do not apply to every investor and/or every investment decision. The pros and cons of advantages to disadvantages must be weighed for each decision, and then, as suggested previously, a quantitative technique such as Net Present Value should be employed.

Chapter IV discussed the quantitative factors involved in making the most economical financing decisions. The Net Present Value method was chosen as the decision criteria since it is perhaps the best current method of evaluating financing alternatives. The chapter began with a section on determining the relevant after-tax cost of capital to be used as the discount factor. It then discussed the cash flows for three types of financing alternatives: 1) a purchase; 2) a two-party lease; and 3) a "Phantom Sale-Leaseback." Each alternative was followed with a Net Present Value example demonstrating the proper use of this technique. It was hoped this chapter would act as an introduction to Chapter V so that little detail of the determination of the analysis statistics would be required.

Chapter V, utilizing case examples, attempted to demonstrate what the optimal-equivalent lease payment would be given certain assumptions. As stated previously, this case example analysis is based on several specific assumptions. These assumptions were stated prior to the figure analysis and were followed by a section describing the interpretation of the figures. The reader should thoroughly understand these sections before proceeding to the figures themselves. This chapter also demonstrated the importance of incorporating all relevant variables into the decision criteria. Failure to do so can reverse the decision from the proper solution.

B. Conclusions

While leasing is not a cure-all form of financing for distressed businesses, it can be a more economical way of financing an asset. The primary conclusion of this analysis is that the financing decision cannot be based on a single criteria (i.e., tax rate). Every variable relevant to the analysis must be included and its after-tax cost accurately determined and identified with either the lease or purchase option.

There has always been a misconception that a buy and lease decision can be based entirely on tax liability. Tax liability has a significant effect, but there are other costs, such as opportunity cost, which are relevant and can just as easily alter the decision. For example, referring back to Figure A.1, let's assume an individual has all of the assumptions stated in this analysis and is consistent with this figure.

If you assume the individual has 0 percent tax liability, the BREAK-EVEN lease payments which equate the buy and lease options are the following for each level of opportunity cost:

Opportunity Cost (%)	Annual Lease Payment
5%	$3,991
10%	4,141
15%	4,291

The change in lease payment that the individual should pay as a maximum amount varies by $300 annually per $10,000 investment as the opportunity cost increases from 5 to 15 percent. If the individual assumed a 5 percent opportunity cost, when in actuality he or she could have invested those funds for 15 percent, depending on the value of the quoted lease payment, it is very possible the wrong decision could be made. Thus the consequences of failing to incorporate all relevant costs are obvious.

The opportunity cost applied to the down payment brings up another point. For an individual who is cash drained, leasing may be the only feasible alternative even if it is not the most economical. In many instances leasing can provide 100 percent financing, and many of the contract costs associated with the agreement can be included directly into the lease payments. The only time this should be considered an advantage to leasing is when the desired asset is classified as a necessity. If the asset is purely a need or want, the investment should be postponed until the most economical form of financing can take place.

Still many investors remain confused over the determination of the proper financing alternative. It is hoped that this text has facilitated the decision and can act as a guide in determining all relevant variables to incorporate into the analysis and yield the least-costly alternative.

1. Need for Individual Analysis

It can be seen that there is no easy, set answer to the question of whether to lease or buy. Selecting the least-costly method of financing an asset involves an in-depth analysis for each desired asset. This has been mentioned over and over again in almost every chapter of this thesis. It is perhaps the most important conclusion of this study.

No two investment decisions will ever be identical. They vary from investor to investor and from asset to asset. Each investment should be analyzed separately using the techniques discussed in this text. Although the majority of the considerations have already been discussed in previous chapters, the more important factors are summarized in outline form below.

In considering whether to lease:

1) Determine whether asset is a necessity, need or want
2) Estimate current and future tax liability
3) Determine all relevant cashflows for the financing alternatives
4) Consider any qualitative factors which may influence the decision
5) Determine the desired rate of return on the investment
6) Evaluate the options using Net Present Value techniques
7) Choose the least-costly alternative

C. Need for Further Research

If the objective of "Safe Harbor" leasing is to encourage investment by companies with low earnings and those in distressed industries, a recent survey conducted by Arthur Andersen and Company is an indicator

it is working.[1] They surveyed 42 buyers and sellers of tax benefits and found that the majority of companies that sold tax benefits could not use those benefits currently, either because of depressed conditions or other factors. This factor alone presents a need for further research. An analysis of the "Safe Harbor" guidelines and the macro-effect they have had on stimulating investment is one area unexplored in this text.

Another need is that no two financing decisions are identical. This analysis makes a lot of assumptions and evaluates a very limited capital investment horizon. Further conclusions could be reached with the adoption of more case examples depicting varying circumstances.

A third area for further research is what effect the transfer of tax benefits through "Phantom Sale-Leaseback" agreements has on the lessee's rental payments. This analysis assumed that any transfer of tax benefits from the lessor to a third party was irrelevant.

The fourth, and most important reason for further research, is the speculation about the consequences of repealing or restricting the "Safe Harbor" provisions. The majority of the proposed changes seem to be directed towards the larger, more profitable corporations which have substantially benefited. Some of the changes are:

1) Buyers of tax benefits could not reduce more than 50 percent of a year's taxes from these benefits, and must bar application of transactions to prior-year taxes.

2) Sellers of tax credits would be limited to having "Safe Harbor" leases covering about 45 percent of their new property each year, declining to 40 percent in 1984.

3) "Safe Harbor" leasing would end in 1985 unless renewed by Congress.

4) Having a minimum corporate tax, so-called "mini-tax."

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[1]Arthur Andersen & Company, "Report on Survey of Selected Participants in Safe Harbor Lease Transactions," Washington, D.C.: Office of Federal Services; 1982.

5) Increasing the "at risk" rule from 10 to 20 percent.

6) Lower the amount of money a purchaser of tax benefits would be inclined to pay for them.

7) Shorten the length of leases.

8) Spread out ITC over a three-year period.

9) Stretch out ACRS deductions and calculate them on a leaner straight-line basis.

10) Subtract one-half of the value of ITC from the value of the asset prior to calculating ACRS deductions.

There is no way to determine what the final ruling for "Safe Harbor" guidelines will be. As long as Congress and the Administration do not eliminate the provisions completely, this analysis will still be valid. However, once the changes are made they should be incorporated into this analysis, and the case examples should be regenerated to consider any such changes.

APPENDIX

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10 REM - CASH DRAIN PROGRAM DEVELOPED BY DR. ALLAN RAHN -- LAST MODIFICATIONS MADE NOVEMBER 8, 1981
20 REM--THIS PROGRAM WAS MODIFIED BY ROSANNE MCGREGOR AND MARK PROCTOR IN JUNE 1982
40 DIM C1(15,2),C5(15),A6(15,2),R3(15), N12(35), O2(15,2),E(2,14,15),N1$(15),C2(14),V2(14,4),N3$(3)
50 PS=0:PRINT CHR$(12) : GOSUB 5070
60 PRINT TAB(25);"CASH DRAIN ANALYSIS PROGRAM":PRINT:PRINT : PRINT "GENERAL INFORMATION INPUT SECTION "
70 PRINT "Please enter the requested information, and then depress the ENTER key"
80 ZC1$="N" : PRINT : LINE INPUT "Enter the Name of the asset or service to be obtained : "; N$ .
90 IF ZC1$="Y" GOTO 200
100 PRINT : INPUT "Enter the Number of Years in the Planning Period : "; P
110 IF P>15 THEN PRINT "CAN'T BE MORE THAN 15! " : GOTO 100
120 IF ZC1$="Y" GOTO 200
130 PRINT : INPUT "Enter the Average Working Capital Balances ($) : "; W : IF ZC1$="Y" GOTO 200
140 PRINT : INPUT "Enter the combined Federal & State Income Tax Rate (%) : "; X1
150 IF X1>100 THEN PRINT "Can't be more than 100! " : GOTO 140
160 IF ZC1$="Y" GOTO 220
170 PRINT : PRINT "Enter a 1 to perform a BUY Option Analysis" : PRINT "      a 2 to perform a LEASE Option Analysis"
180 INPUT "      a 3 to perform a BUY VERSUS LEASE Analysis "; O3
190 IF O3<1 OR O3>3 GOTO 170
200 PRINT CHR$(12)
210 ZC1$="N" : PRINT: PRINT "List of General Information for ";N$ : PRINT : PRINT: PRINT "Asset Name =       ";N$
220 PRINT : PRINT "Number of Years =  "; P : PRINT: PRINT "Working Capital =  ";W
230 IF PS=1 THEN X1 = X1 * 100
240 PRINT: PRINT "Income Tax Rate =  ";X1; "%" : IF PS=1 THEN X1 = X1 / 100
250 IF O3=1 THEN PRINT: PRINT "Option selected is BUY"
260 IF O3=2 THEN PRINT: PRINT "Option selected is LEASE"
270 IF O3=3 THEN PRINT: PRINT "Option selected is BUY VERSUS LEASE"
280 PRINT:PRINT:IF PS=1 AND O3=2 GOTO 1340
290 IF PS=1 AND O3<>2 GOTO 740
300 INPUT "Are these inputs correct ( Y or N ) "; Z25$ : IF Z25$ = "Y" THEN 400
310 PRINT CHR$(12) : ZC1$="Y" : PRINT "Change Keywords are : " : PRINT "NAME, YEAR, WORKCAP, TAX, OPTION, ALL or END" : PRINT
320 LINE INPUT "Enter Keyword of input that needs to be corrected : "; ZC$ : IF ZC$="NAME" GOTO 80
330 IF ZC$="YEAR" GOTO 100
340 IF ZC$="WORKCAP" GOTO 130
350 IF ZC$="TAX" GOTO 140
360 IF ZC$="OPTION" GOTO 170
370 IF ZC$="ALL" GOTO 60
380 IF ZC$="END" GOTO 200
390 PRINT:PRINT: PRINT : PRINT "You apparently did not type the keyword correctly, so no changes have been made" : GOTO 310
400 X1=X1/100 : IF Z25$="Y" AND O3=2 GOTO 1100
410 IF AN=2 GOTO 740
420 PRINT CHR$(12); "BUY Option Information Input Section" : PRINT "Please enter the requested information and then depress the ENTE
R key"
430 PRINT : INPUT "Enter the Initial Cost of the Asset ($) ";B1 : IF ZC1$="Y" GOTO 740
440 PRINT : INPUT "Enter the ACRS Property Class ( 3, 5, OR 15 YEARS ) ";PC : IF PC<>3 AND PC<>5 AND PC<>15 GOTO 440
450 PRINT : PRINT "Enter Depreciation Method - use a 1 for ACRS " : PRINT "                                                    a 2 for STRAIGHT LINE"
460 INPUT "                                  a 3 to OMIT DEPRECIATION ";DM
470 IF DM<1 OR DM>3 GOTO 450
480 IF DM=1 THEN N1=PC
490 IF DM<>2 GOTO 560
500 IF PC=3 THEN INPUT "  Enter Straight Line Recovery Period: 3, 5, OR 12 years ";N1
510 IF PC=3 AND N1<>3 AND N1<>5 AND N1<>12 GOTO 500
520 IF PC=5 THEN INPUT "  Enter Straight Line Recovery Period: 5, 12 OR 25 years ";N1
```

```
530 IF PC=5 AND N1<>5 AND N1<>12 AND N1<>25 GOTO 520
540 IF PC=15 THEN INPUT "  Enter Straight Line Recovery Period: 15, 35, OR 45 years ";N1
550 IF PC=15 AND N1<>15 AND N1<>35 AND N1<>45 GOTO 540
560 IF ZCI$="Y" GOTO 740
570 PRINT : INPUT "Do you want to claim Investment Tax Credits (Y OR N) ";ITC$ : IF ITC$<>"Y" AND ITC$<>"N" GOTO 570
580 IF ZCI$="Y" GOTO 742
590 PRINT : INPUT "Enter Debt Financing Percentage "; L1 : IF L1>100 THEN PRINT "CAN'T BE OVER 100! " : GOTO 590
600 DPRMT = ( 1 - ( L1/100) ) * B1 : IF ZCI$="Y" GOTO 740
610 IF L1<>0 AND P6=0 GOTO 630
620 IF L1=0 GOTO 670
630 PRINT : INPUT "Enter Debt Retirement Period ( in years ) ";P6 : IF ZCI$="Y" GOTO 740
640 IF L1<>0 AND P1=0 GOTO 650
650 PRINT : INPUT "Enter Annual Interest Rate (%) on Debt Capital ";P1 : IF ZCI$="Y" GOTO 740
660 PRINT : INPUT "Enter Annual Interest Rate (%) for Opportunity Cost : "; BOC : IF ZCI$ = "Y" GOTO 740
670 PRINT : INPUT "Enter Useful Life of Asset ( in years ) ";L : IF ZCI$="Y" GOTO 740
680 IF L=>5 GOTO 700
690 PRINT : INPUT "Enter Anticipated Rate (%) of Increase in Asset Replacement Costs ";G1 : IF ZCI$="Y" GOTO 740
700 PRINT : PRINT "Resale or Salvage Value Estimate " : PRINT "   Enter a 1 to use a % of Remaining Book Value"
710 INPUT "         a 2 to use a Specific Dollar Amount   ";SVM : IF SVM<1 OR SVM>2 GOTO 700
720 IF SVM=1 THEN INPUT "                              Use a Percentage of ";SVN
730 IF SVM=2 THEN INPUT "                             Use a Dollar Amount of ";SVN
740 PRINT CHR$(12) : ZCI$="N"
750 PRINT: PRINT "List of ";N$;" BUY Option Information " : PRINT: PRINT "Initial Cost of Asset =            $";B1
760 PRINT: PRINT "ACRS Property Class =                ";PC;" years" : PRINT: PRINT "Depreciation Method";
770 IF DM=1 THEN PRINT "  -Accelerated Cost Recovery System"
780 IF DM=2 THEN PRINT "  -Straight Line for  ";N1;" years"
790 IF DM=3 THEN PRINT "  -to be Omitted "
800 PRINT: PRINT "Include Investment Tax Credits --    ";ITC$ : PRINT: PRINT "Percent Debt Financed =            ";L1; "%"
810 PRINT: PRINT "Debt Retirement Period =            ";P6;" years" : PRINT: PRINT "Debt Interest Rate =            ";P1; "%"
820 PRINT: PRINT "Down Payment Opportunity Cost Rate =";BOC; "%" : PRINT: PRINT "Asset Useful Life =            ";L;" years"
830 IF L=>5 GOTO 850
840 PRINT: PRINT "Replacement Cost Inflation Rate =   ";G1; "%"
850 PRINT  : IF SVM=1 THEN PRINT "Resale Value =                    ";SVN; "%"
860 IF SVM=2 THEN PRINT "Resale Value =                $"; SVN
870 IF PR=1 AND C3=1 GOTO 1730
880 IF PR=1 GOTO 1340
890 PRINT: INPUT "Are these inputs correct ( Y OR N ) ";Z25$
900 IF Z25$="Y" AND OD=1 GOTO 1690
910 IF Z25$="Y" GOTO 1100
920 PRINT CHR$(12) : ZCI$="Y" : PRINT "Change Keywords are "
930 IF L=>5 GOTO 950
940 PRINT "ALL, COST, ACRS, DPRMT, ITC, DBT, DBTPD, DBTINT, DPOCR, LIFE, RESALE" : PRINT "  or END" : GOTO 960
950 PRINT "ALL, COST, ACRS, DPRMT, ITC, DBT, DBTPD, DBTINT, DPOCR, LIFE, INFLATE" : PRINT "   RESALE, or END"
960 PRINT : LINE INPUT "Enter Keyword of input that needs to be corrected  ";ZC$ : IF ZC$="ALL" THEN ZCI$="N" : GOTO 420
970 IF ZC$="COST" GOTO 430
980 IF ZC$="ACRS" GOTO 440
990 IF ZC$="DPRMT" GOTO 450
1000 IF ZC$="ITC" GOTO 570
1010 IF ZC$="DBT" GOTO 590
1020 IF ZC$="DBTPD" GOTO 630
1030 IF ZC$="DBTINT" GOTO 650
1040 IF ZC$="DPOCR" GOTO 660
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1050 IF ZC$="LIFE" GOTO 670
1060 IF ZC$="INFLATE" GOTO 690
1070 IF ZC$="RESALE" GOTO 700
1080 IF ZC$="END" GOTO 900
1090 PRINT: PRINT: PRINT "You apparently did not type the Keyword correctly, so no changes have been made " : GOTO 960
1100 PRINT CHR$(12) : IF AN=2 GOTO 1340
1110 PRINT "LEASE Option Information Input Section"
1120 PRINT "Please enter the requested information and then depress the ENTER key" : PRINT
1130 PRINT: INPUT "Please enter the Amount of the Initial Lease Deposit Payment ($)  ";LPD : IF ZCI$="Y" GOTO 1340
1140 PRINT : INPUT "Please enter the Annual Interest Rate on the Security Deposit (%) : "; SDI : IF ZCI$="Y" GOTO 1340
1150 PRINT : INPUT "Please enter the Annual Interest Rate for Opportunity Cost (%) :"; OPIR : IF ZCI$="Y" GOTO 1340
1160 PRINT : INPUT "Enter the Amount of the Lease Payment ($) ";LPA : IF ZCI$="Y" GOTO 1340
1170 PRINT : INPUT "Enter the Total Number of Lease Payments ";NLP : IF ZCI$="Y" GOTO 1340
1180 PRINT : PRINT "Enter the Frequency of Lease Payments " : PRINT "  use a 1 for ANNUAL " : PRINT "      a 2 for SEMIANNUAL "
1190 PRINT "      a 3 for QUARTERLY " : INPUT "      a 4 for MONTHLY    ";FLP : IF FLP<1 OR FLP>4 GOTO 1180
1200 PRINT : INPUT "Payments are made at the Beginning-of-the-Period (Y OR N) ";TLP$ : IF TLP$<>"Y"  AND TLP$<>"N" GOTO 1200
1210 IF ZCI$ = "Y" GOTO 1340
1220 PRINT : INPUT "Enter the Useful Life of the asset ( in years ) : "; L : IF ZCI$ = "Y" GOTO 1340
1230 PRINT : INPUT "Enter the Resale or Salvage Value ($) : "; SVNL : IF ZCI$ = "Y" GOTO 1340
1240 PRINT : INPUT "Enter the Terminal Lease Buyout Price ($) ";LBB : IF ZCI$ = "Y" GOTO 1340
1250 IF LBB=0 THEN 1340
1260 PRINT: INPUT "Enter the ACRS Property Class ( 3, 5, or 15 years ) ";LPC : IF LPC<>3 AND LPC<>5 AND LPC<>15 GOTO 1260
1270 PRINT: PRINT  "Enter Depreciation Method - use a 1 for ACRS" : PRINT "                                    use a 2 for STRAIGHT LINE "
1280 INPUT "                                use a 3 for OMIT DEPRECIATION"; LDM : IF LDM<1 OR LDM>3 GOTO 1270
1290 IF LDM=1 THEN LN1=LPC
1300 IF LDM<>2 THEN 1340
1310 IF LPC=3 THEN INPUT "Enter Straight Line Recovery Period: 3,5, or 12 years ";LN1 : IF LN1<>3 AND LN1<>5 AND LN1<>12 THEN 1310
1320 IF LPC=5 THEN INPUT "Enter Straight Line Recovery Period: 5, 12, or 25 years ";LN1 : IF LN1<>5 AND LN1<>12 AND LN1<>25 THEN 132
0
1330 IF LPC=15 THEN INPUT "Enter Straight Line Recovery Period: 15, 35, or 45 years ";LN1 : IF LN1<>15 AND LN1<>35 AND LN1<>45 THEN
1330
1340 PRINT CHR$(12) : ZCI$= "N" : IF PR=1 THEN PRINT
1350 PRINT: PRINT "List of ";N$;" LEASE Option Information " : PRINT : PRINT "INITIAL LEASE DEPOSIT PAYMENT =     $";LPD
1360 PRINT: PRINT "Interest on Initial Deposit Payment= ";SDI; " %" : PRINT: PRINT "Interest Rate for Opportunity Cost = "; OPIR : "
%"
1370 PRINT: PRINT "Lease Payment Amount =              $";LPA : PRINT: PRINT "Total Number of Lease Payments =     ";NLP : PRINT
1380 IF FLP=1 THEN PRINT "Frequency of Lease Paument is ANNUAL "
1390 IF FLP=2 THEN PRINT "Frequency of Lease Payment is SEMIANNUAL "
1400 IF FLP=3 THEN PRINT "Frequency of Lease Payment is QUARTERLY "
1410 IF FLP=4 THEN PRINT "Frequency of Lease Payment is MONTHLY "
1420 PRINT: PRINT "Lease Payments at the Beginning-of-the-Period - ";TLP$ : PRINT : PRINT "Useful Life of Asset=                ";L
; " years"
1430 PRINT : PRINT "Resale Value=                          $"; SVNL
1440 PRINT : PRINT "Terminal Buyout Option Price =         $"; LBB : IF LBB=0 THEN 1490
1450 PRINT: PRINT "ACRS Property Class = ";LPC : PRINT: PRINT "Depreciation Method = ";
1460 IF LDM=1 THEN PRINT "Accelerated Cost Recovery System"
1470 IF LDM=2 THEN PRINT "Straight Line for ";LN1;" years"
1480 IF LDM=3 THEN PRINT "To be Omitted"
1490 IF PR=1 GOTO 1730
1500 PRINT: INPUT "Are these inputs correct (Y OR N) ";Z25$ : IF Z25$="Y" GOTO 1690
1510 PRINT CHR$(12) : ZCI$="Y" : PRINT "Change Keywords are:" : IF LBB=0 GOTO 1530
1520  PRINT "ALL, DEPOS,DINT, OPCR, AMT,NMBR,FREQ,TIMING,LIFE, RESALE, BUYOUT,ACRS,DEPMETH, or END" : GOTO 1540
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1530 PRINT "ALL, DEPOS, DINT, OPCR, AMT, NMBR, FREQ, TIMING, LIFE, RESALE, BUYOUT, or END"
1540 PRINT : LINE INPUT "Enter Keyword of input that needs to be corrected: ";ZC$: IF ZC$="ALL" THEN ZCI$="N" : GOTO 1130
1550 IF ZC$="DEPOS" GOTO 1130
1560 IF ZC$="DINT" GOTO 1140
1570 IF ZC$="OPCR" GOTO 1150
1580 IF ZC$="AMT" GOTO 1160
1590 IF ZC$="NMBR" GOTO 1170
1600 IF ZC$="FREQ" GOTO 1180
1610 IF ZC$="TIMING" GOTO 1200
1620 IF ZC$="LIFE" GOTO 1220
1630 IF ZC$="RESALE" GOTO 1230
1640 IF ZC$="BUYOUT" GOTO 1240
1650 IF ZC$= "ACRS" GOTO 1260
1660 IF ZC$= "DEPMETH" GOTO 1270
1670 IF ZC$= "END" GOTO 1340
1680 PRINT: PRINT : PRINT "You apparently did not type the Keyword correctly, so no changes have been made " : GOTO 1540
1690 PRINT: PRINT "Do you want a printed copy of the input information " : INPUT "  that you have just entered ( Y OR N ) ";P$
1700 IF P$<>"Y" GOTO 1750
1710 GOSUB 4970
1720 GOTO 210
1730 GOSUB 4990
1740 PRINT: INPUT "Would you like another printed copy ( Y OR N ) ";P$ : IF P$="Y" GOTO 1710
1750 L1=L1/100 : P1=P1/100 : G1=G1/100 : P2=P2/100 : IF O3=2 GOTO 2720
1760 AT= B1 + W : L2= B1 * L1 : N2= AT - L2
1770 F1$="                              \                                        \"
1780 F2$="                \                          \                        ##,###,###"
1790 PRINT CHR$(12) : PRINT: PRINT "                                  Initial Balance Sheet for ";N$
1800 PRINT : PRINT USING F1$;"        Assets" : PRINT : PRINT  USING F2$; "Working Capital";W
1810 PRINT USING F2$; N$; B1 : PRINT : PRINT  USING F2$; "     Total", AT
1820 PRINT : PRINT : PRINT USING F1$;"Liabilities and Equity" : PRINT : PRINT  USING F2$;"Long-Term Debt";L2
1830 PRINT : PRINT  USING F2$; "Net Worth";N2 : IF PR=1 GOTO 2570
1840 PRINT: PRINT "I'M WORKING!"
1850 K=L : D=N1 : S=B1 : N=N1 : X=1 : U1=0 : F2= 0 : IF PC=3 THEN F2=.06 ELSE F2=.1
1860 D9= S*F2 : C5(1)= D9 : U=S : D1(1,2)=S
1870 FOR I1=1 TO P
1880  IF D=3 GOTO 2050
1890  IF K<2 AND D=0 GOTO 1900
1900  IF D<> 1 THEN 2040
1910  IF I1>1 GOTO 1990
1920  DATA .25,.33,.37,.15,.22,.21,.21,.21,.08,.14
1930  DATA .12,.10,.10,.10,.09,.09,.09,.09,.12,.10,.09
1940  DATA .08,.07,.06,.06,.06,.06,.05,.05,.05,.05,.05,.05
1950  RESTORE 1920
1960  FOR T=1 TO 33: READ N12(T): NEXT T
1970 IF O2 <2 THEN 1992
1980  RETURN
1990 IF N1=3 THEN N13 = 0 : GOTO 2030
2000 IF N1=5 THEN N13 = 3 : GOTO 2030
2010 IF N1=10 THEN N13 = 8 : GOTO 2030
2020 N13=13
2030 D2=S*N12(X+N13) : GOTO 2050
2040 D2= B/N1 : IF X=1 THEN D2= B/N1*.5
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2050 IF D<2 GOTO 2080
2060 D2=0 : IF DM=3 GOTO 2090
2070 U1=U1+1 : IF U1=1 AND DM=2 THEN D2= B/N1*.5
2080 D1(I1,1) = D1(I1,1) + D2 : IF DM=3 GOTO 2110
2090 K=K-1 : D=D-1 : IF D<=0 THEN D = 0
2100 X=X+1
2110 NEXT I1
2120 R=0
2130 FOR I=1 TO P
2140  IF I>1 GOTO 2160
2150  D1(1,2) = D1(1,2)-D1(1,1) : GOTO 2200
2160  IF D1(I,2)<0 GOTO 2180
2170  R=0 : GOTO 2190
2180  R=D1(I,2)
2190  D1(I,2) = D1(I-1,2)-D1(I,1) + R
2200 NEXT I
2210 PRINT "To continue, depress the ENTER key "; : SB$=INPUT$(1)
2220 IF L1=0 GOTO 2560
2230 PRINT: PRINT : PRINT "Do you want Debt Payments 1) AMORTIZED, or"
2240 INPUT "                              2) EQUAL PRINCIPAL PAYMENTS "; Y6 : DEBTOUT= L2
2250 IF Y6=1 GOTO 2300
2260 IF Y6=2 GOTO 2500
2270 N=P6 : K=L : D=P6 : B=B1 * L1
2280 FOR J=1 TO P
2290  R3(J)=0 : IF K>0 AND D>=0 GOTO 2340
2300   G = (1+G1)^(J-1)
2310   IF SVM=1 THEN RV= D1(J-1,2)* SVN/100
2320   IF SVM=2 THEN RV= SVN
2330   P= ((B1*G)-RV)* L1 : A6(J-1,2)= B : R3(J-1)= ((B1*G)-RV)* (1-L1) : K = L : D = P6
2340  A5=P/N : IF D<=0 THEN A5 = 0
2350  A6(J,1) = A6(J,1) + A5 : K=K-1 : D=D-1 : IF D<=0 THEN D = 0
2360 NEXT J
2370 GOTO 2520
2380 N = P6 : K = L : D = P6 : B = B1*L1 : A5 = B*((P1*(1+P1)^N)/(((1+P1)^N)-1))
2390 FOR J=1 TO P
2400  IF K>0 AND D>=0 GOTO 2460
2410  G = (1+G1)^(J-1)
2420  IF SVM=1 THEN RV= D1(J-1,2)* SVN/100
2430  IF SVM=2 THEN RV= SVN
2440  P= ((B1*G)-RV) *L1 : A6(J-1,2)= B : R3(J-1)= ((B1*G)-RV)*(1-L1) : A5 = B * ((P1*(1+P1)^N)/(((1+P1)^N)-1))
2450  K = L : D = P6
2460  I9 = A5-(B*P1)
2470  IF D<=0 THEN I9 = 0
2480  A6(J,1) = A6(J,1) + I9 : B = B-I9 : K = K-1 : D = D-1 : IF D<=0 THEN D = 0
2490 NEXT J
2500 A6(2,2)= DEBTOUT
2510 FOR I=1 TO P
2520  IF A6(I,2)>0 THEN DEBTOUT= DEBTOUT+ A6(I,2)
2530  DEBTOUT=DEBTOUT- A6(I,1) : A6(I,2)= DEBTOUT
2540  IF DEBTOUT<=0 THEN A6(I,2)=0
2550 NEXT I
2560 PRINT : PRINT CHR$(12) : GOTO 2580
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```
2570 PRINT : PRINT : PRINT :PRINT : PRINT
2580 PRINT USING F1$;"Depreciation and Anticipated Debt" : PRINT  USING F1$;"      Retirement Schedule" : PRINT
2590 PRINT "                                REMAINING          DEBT        PRINCIPAL"
2600 F4$="     \  \    DEPRECIATION    BOOK VALUE       PAYMENT     OUTSTANDING" : PRINT USING F4$;"YEAR"
2610 F5$="     ##       ########        #######     ########      ########"
2620 FOR I=1 TO P : PRINT USING F5$;I,D1(I,1),D1(I,2),A6(I,1),A6(I,2) : NEXT I
2630 IF PR=1 GOTO 2690
2640 PRINT: PRINT "Do you want a Printed Copy of the Balance Sheet," : INPUT "Depreciation and Debt Payment Schedules ( Y or N ) ";P
$
2650 IF P$="N" GOTO 2720
2660 IF P$ <> "Y" THEN PRINT "Bad Response" : GOTO 2640
2670 GOSUB 4970
2680 GOTO 1792
2690 GOSUB 4990
2700 PRINT: INPUT "Would you like another printed copy ( Y or N ) ";P$ : IF P$ = "Y" GOTO 2670
2710 IF P$<>"N" THEN PRINT "Bad Response" : GOTO 2700
2720 DATA "      BUY OPTION","    LEASE OPTION","BUY AND LEASE OPTION"
2730 RESTORE 2720
2740 FOR I=1 TO 3: READ N3$(I): NEXT I
2750 PRINT CHR$(12) : PRINT N3$(03) : IF 03=3 GOTO 2880
2760 PRINT : PRINT " Operating Costs " : IF AN=2 GOTO 2830
2770 PRINT : INPUT "Are the Operating Costs the same for each Year ( Y or N ) "; OPS$ : IF OPS$ = "N" GOTO 2810
2780 IF OPS$<>"Y" THEN PRINT "Bad Response" : GOTO 2770
2790 PRINT : INPUT "Enter the Operating Cost for one year : "; OPC
2800 FOR I = 1 TO P : O2(I,03) = OPC : NEXT I : GOTO 2830
2810 PRINT : PRINT "Enter the Operating Costs for each year of the Planning Period"
2820 FOR I=1 TO P : PRINT: PRINT "Year  ";I : INPUT O2(I,03) : NEXT I
2830 PRINT: PRINT "These values were input:"
2840 FOR I=1 TO P: PRINT O2(I,03);:NEXT I
2850 PRINT:PRINT: INPUT "Are they all correct ( Y or N ) ";Z23$ : IF Z23$="Y" GOTO 2990
2860 IF Z23$<>"N" THEN PRINT "Bad Response" : GOTO 2850
2870 PRINT CHR$(12) : PRINT "Input the data again, from the beginning." : PRINT : GOTO 2760
2880 PRINT : PRINT " Operating Costs for Buy and Lease" : IF AN=2 GOTO 2950
2890 PRINT : INPUT "Are the Operating Costs the same for each Year ( Y or N ) :"; OPS$ : IF OPS$ = "N" GOTO 2930
2900 IF OPS$<>"Y" THEN PRINT "Bad Response" : GOTO 2890
2910 PRINT : INPUT "Enter the Buy and Lease Operating Costs, separated by a comma : "; OPCB, OPCL
2920 FOR I = 1 TO P : O2(I,1) = OPCB : O2(I,2) = OPCL : NEXT I : GOTO 2950
2930 PRINT : PRINT "Enter the Buy and Lease Operating Costs for each Year, separated by a comma"
2940 FOR I=1 TO P : PRINT: PRINT "Year  ";I : PRINT "Buy,Lease" : INPUT O2(I,1),O2(I,2) : NEXT I
2950 PRINT: PRINT "These values were input:" : FOR I= 1 TO P : PRINT O2(I,1),O2(I,2) : NEXT I
2960 PRINT: INPUT "ARE THEY CORRECT (Y OR N) ";Z3I$ : IF Z3I$ = "Y" GOTO 2990
2970 IF Z3I$<>"N" THEN PRINT "Bad Response" : GOTO 2960
2980 PRINT CHR$(12) : PRINT "Input the data again, from the beginning." : GOTO 2880
2990 F1$="                          \                          \"
3000 PRINT CHR$(12)
3010 PRINT : PRINT:PRINT: PRINT  "                  Operating Expenditures for ";N$ : PRINT : PRINT  USING F1$;N3$(03)
3020 PRINT : PRINT "  Year                         Expenditures" : PRINT : IF 03=3 THEN : PRINT "                                BUY
     LEASE"
3030 PRINT : F2$="    ##                        #########" : F3$="    ##               #########       #########"
3040 FOR I= 1 TO P
3050  IF 03<3 THEN PRINT  USING F2$;I,O2(I,03)
3060  IF 03=3 THEN  PRINT  USING F3$; I,O2(I,1),O2(I,2)
```

```
3070 NEXT I
3080 IF PR=1 GOTO 3130
3090 PRINT: INPUT "Do you want a Printed Copy of the Operating Expenditures ( Y or N ) ";P$ : IF P$="N" GOTO 3160
3100 IF P$<>"Y" THEN PRINT "Bad Response" : GOTO 3090
3110 GOSUB 4970
3120 GOTO 3210
3130 GOSUB 4990
3140 PRINT: INPUT "Would you like another printed copy ( Y or N ) ";P$ : IF P$="Y" GOTO 3110
3150 IF P$<>"N" THEN PRINT "BAD RESPONSE" : GOTO 3140
3160 PRINT: PRINT "I'M WORKING! "
3170 DATA "Operating Costs","Depreciation","Interest Income","Interest on Debt", "Taxable Income", "Income Tax"
3180 DATA "Invest. Tax Credit","After-Tax Costs","Depreciation", "Opportunity Cost", "After-Tax Cash Drain","Debt Retirement"
3190 DATA "Equity Reinvestment", "Net After-Tax Cash", "     Drain"
3200 RESTORE 3170
3210 FOR I=1 TO 15: READ N1$(I): NEXT I
3220 FOR K=1 TO 2
3230  FOR I=1 TO 14
3240   FOR J=1 TO P : E(K,I,J)=0 : NEXT J
3250  NEXT I
3260 NEXT K
3270 LI1=1 : LI2=2
3280 IF O3<>3 THEN LI1=O3
3290 IF O3<>3 THEN LI2=O3
3300 IF O3=1 GOTO 3370
3310 IF FLP=1 THEN FYLP=1
3320 IF FLP=2 THEN FYLP=2
3330 IF FLP=3 THEN FYLP=4
3340 IF FLP=4 THEN FYLP=12
3350 SVRI = SVNL * ( 1 - X1 ) : IR= P2/FYLP : NYLP= INT(NLP/FYLP) : ODD= NLP MOD FYLP : IF ODD<>0 THEN NYLP= NYLP+1
3360 REMAIN=FYLP- ODD : X=1
3370 FOR K=LI1 TO LI2
3380  FOR J=1 TO P
3390   IF O3=2 GOTO 3560
3400   IF O3=3 AND K=2 GOTO 3560
3410   N1$(2) = "Depreciation" : E(K,1,J)= O2(J,K) : E(K,2,J)=D1(J,1) : E(K,3,J) = 0 : E(K,4,J)= A6(J-1,2)* P1
3420   E(K,5,J)= E(K,1,J)+ E(K,2,J)+ E(K,4,J) : E(K,6,J)= E(K,5,J)* X1 : E(K,7,J)= C5(J) : E(K,8,J)= E(K,5,J)- E(K,6,J)- E(K,7,J)
3430   E(K,9,J)= -D1(J,1) : IF J <= P6 THEN E(K,10,J) = ( BOC / 100 ) * DPMT
3440   E(K,11,J)= E(K,8,J) + E(K,9,J) + E(K,10,J) : E(K,12,J)= A6(J,1) : IF J><P GOTO 3550
3450   E(K,12,J)= E(K,12,J)+ A6(J,2) : S2 = 0
3460   IF SVM=1 THEN CGAIN= (D1(J,2)*SVN/100)- D1(J,2)
3470   IF SVM=2 THEN CGAIN= SVN- D1(J,2)
3480   IF N1= 15 AND O3=2  GOTO 3520
3490   IF SVM=1 THEN S2= D1(J,2)*SVN/100- (CGAIN*X1)
3500   IF SVM=2 THEN S2= SVN- (CGAIN*X1)
3510   GOTO 3540
3520   IF SVM=1 THEN S2= D1(J,2)*SVN/100- (CGAIN*X1*.4)
3530   IF SVM=2 THEN S2= SVN- (CGAIN*X1*.4)
3540   R3(J)= -(S2+W)
3550   E(K,13,J)= R3(J) : E(K,14,J)= E(K,11,J)+ E(K,12,J)+ E(K,13,J) : GOTO 3770
3560   N1$(2)= "Lease/ Depreciation" : DEF FNSAFACT(IR,NP)= ((1+IR)↑NP-1)/IR : DEF FNPPFACT(IR,NP)= (1+IR)↑NP
3570   E(K,1,J)= O2(J,K) : IF J>NYLP THEN GOSUB 5100 ELSE 3600
3580   IF J<= (NYLP+LPC) THEN E(K,2,J)=LD2
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```
3590   GOTO 3620
3600   E(K,2,J)= LPA : IF FLP=1 AND TLP$="N" GOTO 3620
3610   GOSUB 5010
3620   IF J <= NYLP THEN E(K,3,J) = - ( SDI / 100 ) * LPD
3630   E(K,4,J) = 0 : E(K,5,J) = 02(J,K)+E(K,2,J) + E(K,3,J) : E(K,6,J) = E(K,5,J)*X1
3640   IF J=(NYLP+1) THEN E(K,7,J)=LITC ELSE E(K,7,J)=0
3650   E(K,8,J)=E(K,5,J)-(E(K,6,J)+E(K,7,J))
3660   IF J<NYLP THEN E(K,9,J) = -E(K,2,J) ELSE E(K,9,J)=0
3670   IF J <= NYLP THEN E(K,10,J) = ( OPIR / 100 ) * LPD
3680   E(K,11,J)=E(K,8,J)+E(K,9,J) + E(K,10,J) : E(K,12,J) = 0 : E(K,13,J) = 0
3690   IF J<NYLP OR J>NYLP GOTO 3740
3700   IF FLP=1 AND TLP$="N" GOTO 3730
3710   IF ODD=J GOTO 3730
3720   E(K,13,J)= LSS* F:FPFACT(IR,RMAIN) : GOTO 3760
3730   E(K,13,J) = LSS
3731 IF E(K,13,J)=0 THEN GOTO 3760
3740   IF J = L THEN E(K,13,J) = E(K,13,J) - EQRI
3750   IF J = NYLP THEN E(K,13,J) = E(K,13,J) - LPD
3760   E(K,14,J) = E(K,11,J) + E(K,13,J)
3770 NEXT J
3780 F4$="                    Year          ##        ##        ##        ##        ##"
3790 F5$="  \                     \    #######   #######   #######   #######   #######"
3800 F6$= "  \                    \"
3810 F7$="  \            \at ##%      #######   #######   #######   #######   #######"
3820 F8$="   ##      #######    #######    #######    #######    #######    ########"
3830 PRINT CHR$(12) : IF OPT$="Y" GOTO 4140
3840 PRINT "   Net After-Tax Cash Drain Calculations for ";N$;" - ";N2$(K)
3850 PRINT : IF K=2 THEN PRINT "            Security Deposit of $"; LPD : PRINT
3860 FOR J=1 TO P STEP 5
3870   PRINT  USING F4$;J,J+1,J+2,J+3,J+4 : PRINT
3880   FOR I=1 TO 15
3890     IF I=6 GOTO 3970
3900     IF I=15 GOTO 4020
3910     IF I=5 OR I=8 OR I=11 OR I=14 GOTO 3980
3920     IF K=2 AND I=13 AND (J+4)=NYLP GOTO 3960
3930     PRINT USING F5$;N1$(I),E(K,I,J),E(K,I,J+1),E(K,I,J+2),E(K,I,J+3),E(K,I,J+4)
3940     IF I=5 THEN PRINT : PRINT "     Deductions" : PRINT
3950 GOTO 4010
3960     PRINT USING F5$;N1$(I),E(K,I,J),E(K,I,J+1),E(K,I,J+2),E(K,I,J+3),E(K,I,J+4); " * " : GOTO 4020
3970     PRINT USING F7$;N1$(I),X1*100,E(K,I,J),E(K,I,J+1),E(K,I,J+2),E(K,I,J+3),E(K,I,J+4) : GOTO 4020
3980     PRINT "                                  -------   -------   -------   -------   -------" : GOTO 3930
3990     IF I = 6 THEN PRINT
4000     PRINT USING F6$; N1$(I)
4010 IF I=15 AND J=NYLP AND K=2 THEN PRINT " * NOT
4020   NEXT I
4030   IF J>5 THEN PRINT
4040 NEXT J
4050 IF PR=1 GOTO 4110
4060 PRINT: INPUT "DO YOU WANT A PRINTED COPY OF THESE DRAIN CALCULATIONS ( Y OR N ) ";P$ : IF P$="N" GOTO 4140
4070 IF P$<>"Y" THEN PRINT "BAD RESPONSE" : GOTO 4060
4080 GOSUB 4970
```

```
4090  FOR PS=1 TO 5: PRINT: NEXT PS
4100  GOTO 3842
4110  GOSUB 4990
4120  PRINT: INPUT "Would you like another printed copy ( Y or N ) ";P$ : IF P$ = "Y" GOTO 4000
4130  IF P$<>"N" THEN PRINT "Bad Response" : GOTO 4120
4140  NEXT N
4150  PRINT "I'm Working!"
4160  DATA 0,.02,.04,.06,.08,.10,.12,.14,.16,.18,.20,.25,.30,.40
4170  RESTORE 4160
4180  FOR I=1 TO 14: READ C2(I): NEXT I
4190  FOR K= LI1 TO LI2
4200    FOR I=1 TO 14
4210      V2(I,K)=0
4220      IF O3=1 OR (O3=3 AND K=1)  THEN V2(I,K)=N2
4230      IF O3=2 OR (O3=3 AND K=2) THEN V2(I,K)=LPD
4240      FOR J=1 TO P
4250        V2(I,K) = V2(I,K) + (E(K,14,J)/((1+C2(I))↑J))
4260      NEXT J
4270    NEXT I
4280  NEXT K
4290  DEF FNAPFACT(IR#,NP#)= IR#*(1+IR#)↑NP#/ ((1+IR#)↑NP#-1)
4300  IF LI1<>LI2 GOTO 4340
4310  V2(1,LI1+1)= V2(1,LI1)/P
4320  FOR I=2 TO 14 : V2(I,LI1+1)= V2(I,LI1) * FNAPFACT(C2(I),P) : NEXT I
4330  GOTO 4390
4340  V2(1,LI1+2) = V2(1,LI1) / P : V2(1,LI2+2) = V2(1,LI2) / P
4350  FOR I = 2 TO 14
4360    V2(I,LI1+2) = V2(I,LI1) * FNAPFACT(C2(I),P) : V2(I,LI2+2) = V2(I,LI2) * FNAPFACT(C2(I),P)
4370  NEXT I
4380  IF OP$="Y" GOTO 4720
4390  PRINT CHR$(12) : PRINT "                  Capital Expenditure Analysis for ";N$
4400  IF O3T$="Y" THEN PRINT "                       Lease Payment of $"; LPA
4410  PRINT
4420  IF O3=1 THEN PRINT  "INTEREST   PEC BUY    AEC BUY"
4430  IF O3=2 THEN PRINT  "INTEREST   PEC LEASE  AEC LEASE"
4440  IF O3=3 THEN PRINT  "INTEREST   PEC BUY   PEC LEASE   AEC BUY   AEC LEASE     PEC         AEC"
4450  IF O3=3 THEN PRINT "  Rate" : PRINT
4460  IF O3=3 THEN PRINT  "  Rate                                                    RESIDUAL   RESIDUAL" : PRINT
4470  FOR I=1 TO 14
4480   C2I = C2(I)*100 : IF LI1<>LI2 GOTO 4500
4490   PRINT  USING F9$;C2I,V2(I,LI1),V2(I,LI1+1) : GOTO 4510
4500   PRINT USING F9$;C2I,V2(I,1),V2(I,2),V2(I,3),V2(I,4),(V2(I,1)-V2(I,2)),(V2(I,3)-V2(I,4))
4510  NEXT I
4520  IF O3=3 THEN PRINT : PRINT " PEC RESIDUAL = PEC BUY - PEC LEASE": PRINT " AEC RESIDUAL = AEC BUY - AEC LEASE" : PRINT
4530  IF ER=1 GOTO 4580
4540  PRINT: INPUT "Do you want a printed copy of this expenditure analysis table ( Y or N )"; P$ : IF P$<>"Y" GOTO 4610
4541  IF P$<>"Y" GOTO 4610
4560  GOSUB 4970
4570  GOTO 4390
4580  GOSUB 4990
4590  PRINT: INPUT "Would you like another printed copy ( Y or N ) "; P$ : IF P$ = "Y" GOTO 4560
4600  IF P$<>"N" THEN PRINT "Bad Response" : GOTO 4590
```

```
4610 IF OPT$="Y" GOTO 4730
4620 IF O3 <> 3 GOTO 4870
4630 OPT$ = "N" : PECF = 0 : AECF = 0
4640 INPUT "Do you want to optimize lease payment with buy schedule ( Y or N ) "; OPT$ : IF OPT$ = "N" GOTO 4870
4650 IF OPT$ <> "Y" THEN PRINT "Bad Response" : GOTO 4640
4660 INPUT "At what Interest Rate do you want to optimize around "; OPTPCT
4670 IF OPTPCT < 0 OR OPTPCT > 100 THEN PRINT "Bad response" : GOTO 4660
4680 OPI = 0 : OPP = OPTPCT / 100
4690 FOR I = 1 TO 14 : IF C2(I)-OPP<.001 THEN OPI = I : NEXT I
4700 IF OPI = 0 THEN PRINT "Bad Value" : GOTO 4660
4710 LPAA = .01 * LPA : IF V2(OPI,1) < V2(OPI,2) THEN LPAA = -LPAA
4720 LPA = LPA + LPAA : GOTO 3220
4730 IF PECF = 1 GOTO 4750
4740 BL = V2(OPI,1) - V2(OPI,2) : BLF = 1 : GOTO 4770
4750 IF AECF = 1 GOTO 4810
4760 BL = V2(OPI,3) - V2(OPI,4) : BLF = 2
4770 IF ( BL <= 1 ) AND ( BL >= -1 ) GOTO 4810
4780 IF ( LPAA > 0 ) AND ( BL < 0 ) THEN LPAA = -.5 * LPAA
4790 IF ( LPAA < 0 ) AND ( BL > 0 ) THEN LPAA = -.5 * LPAA
4800 GOTO 4720
4810 IF BLF = 1 THEN PECF = 1 : PRINT " For PEC, "
4820 IF BLF = 2 THEN AECF = 1 : PRINT " For AEC,"
4830 PRINT " Optimal Lease at "; OPTPCT ; " % is $ "; LPA
4840 PRINT : INPUT "Do you want to see Expenditure Analysis ( Y or N )"; P$ : IF P$="Y" THEN P$="N" : GOTO 4390
4850 IF P$<>"N" THEN PRINT "Bad Response" : GOTO 4840
4860 IF PECF <> 1 OR AECF <> 1 GOTO 4720
4870 PRINT : INPUT " Would you like to run another analysis ( Y or N ) :"; RP$ : IF RP$="N" GOTO 4960
4880 IF RP$<>"Y" THEN PRINT "Bad Response" : GOTO 4870
4890 PRINT : PRINT " Is this a 1) NEW, or " : INPUT "           2) ADJUSTED analysis : "; AN : IF AN <> 1 GOTO 4910
4900 CLEAR : GOTO 40
4910 IF AN <> 2 GOTO 4950
4920 X1 = X1*100 : L1 = L1*100 : P1 = P1*100 : G1 = G1*100 : P2 = P2*100 : OPT$="N"
4930 FOR B = 1 TO 2 : FOR A = 1 TO 15 : A6 (A,B) = 0 : D1 (A,B) = 0 : NEXT A : NEXT B
4940 GOTO 200
4950 PRINT "Bad Response" : GOTO 4890
4960 END
4970 P%=1 : PR2= PEEK(3) : POKE 3, PR2+1
4980 RETURN
4990 POKE 3, PR2 : PR=0
5000 RETURN
5010 IF J<NYLP GOTO 5050
5020 IF NYLP=J AND ODD<>0 GOTO 5040
5030 E(K,2,J)= LPA* FNFAFACT(IR,FYLP) : IF TLP$="Y" THEN E(K,2,J)= E(K,2,J)* (1+IR) : GOTO 5060
5040 E(K,2,J)= LPA* FNFAFACT(IR,ODD)* FNPPFACT(IR,RMAIN) : IF TLP$="Y" THEN E(K,2,J)= E(K,2,J)* (1+IR) : GOTO 5060
5050 E(K,2,J)=0
5060 RETURN
5070 PRINT CHR$(12) : PRINT : PRINT : PRINT CHR$(14)
5080 PRINT "                              CASH DRAIN ANALYSIS PROGRAM
5090 PRINT CHR$(15) : PRINT : PRINT : RETURN
5100 IF LD%<>1 THEN 5170
5110 IF O3=2 AND J=(NYLP+1) THEN GOSUB 1920
5120 IF LPC = 3 THEN LN13=0 : GOTO 5160
```

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5132 IF LPC = 5 THEN LN13=3 : GOTO 5160
5140 IF LPC = 10 THEN LN13=8 : GOTO 5160
5150 LN13 =18
5160 LD2= LBB*N12(X+LN13) : GOTO 5210
5170 IF LDM=3 THEN 5200
5180 IF X=1 THEN LD2=LD2*.5
5190 GOTO 5210
5200 LD2=0
5210 X=X+1
5220 RETURN
```

List of General Information for truck

Asset Name = truck

Number of Years = 8

Working Capital = 0

Income Tax Rate = 10 %

Option selected is BUY VERSUS LEASE

List of truck BUY Option Information

Initial Cost of Asset = $ 10000

ACRS Property Class = 3 years

Depreciation Method -Accelerated Cost Recovery System

Include Investment Tax Credits -- Y

Percent Debt Financed = 70 %

Debt Retirement Period = 3 years

Debt Interest Rate = 15 %

Down Payment Opportunity Cost Rate = 10 %

Asset Useful Life = 8 years

Resale Value = $ 2000

List of truck LEASE Option Information

INITIAL LEASE DEPOSIT PAYMENT = $ 0

Interest on Initial Deposit Payment= 10 %

Interest Rate for Opportunity Cost = 10 %

Lease Payment Amount = $ 4000

Total Number of Lease Payments = 3

Frequency of Lease Paument is ANNUAL

Lease Payments at the Beginning-of-the-Period - N

Useful Life of Asset= 8 years

Resale Value= $ 2000

Terminal Buyout Option Price = $ 1000

ACRS Property Class = 3

Depreciation Method = Accelerated Cost Recovery System

Initial Balance Sheet for truck

Assets

Working Capital	0
truck	10,000
Total	10,000

Liabilities and Equity

Long-Term Debt	7,000
Net Worth	3,000

Depreciation and Anticipated Debt Retirement Schedule

YEAR	DEPRECIATION	REMAINING BOOK VALUE	DEBT PAYMENT	PRINCIPAL OUTSTANDING
1	2500	7500	2016	4984
2	3800	3700	2318	2666
3	3700	0	2666	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0

Net After-Tax Cash Drain Calculations for truck - BUY OPTION

year	1	2	3	4	5
Operating Costs	0	0	0	0	0
Depreciation	2500	3800	3700	0	0
Interest Income	0	0	0	0	0
Interest on Debt	1050	748	400	0	0
Taxable Income	3550	4548	4100	0	0
Deductions					
Income Tax at 10%	355	455	410	0	0
Invest. Tax Credit	600	0	0	0	0
After-Tax Costs	2595	4093	3690	0	0
Depreciation	-2500	-3800	-3700	0	0
Opportunity Cost	300	300	300	0	0
After-Tax Cash Drain	395	593	290	0	0
Debt Retirement	2016	2318	2666	0	0
Equity Reinvestment	0	0	0	0	0
Net After-Tax Cash Drain	2411	2911	2956	0	0

year	6	7	8	9	10
Operating Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	0	0	0	0	0
Deductions					
Income Tax at 10%	0	0	0	0	0
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	0	0	0	0	0
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	0	-1800	0	0
Net After-Tax Cash Drain	0	0	-1800	0	0

Net After-Tax Cash Drain Calculations for truck - LEASE OPTION

Security Deposit of $ 0

Year	1	2	3	4	5
Operating Costs	0	0	0	0	0
Lease/ Depreciation	4000	4000	4000	250	380
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	4000	4000	4000	250	380
Deductions					
Income Tax at 10%	400	400	400	25	38
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	3600	3600	3600	225	342
Depreciation	0	0	0	-250	-380
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	3600	3600	3600	-25	-38
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	0	1000	0	0
Net After-Tax Cash Drain	3600	3600	4600	-25	-38

Year	6	7	8	9	10
Operating Costs	0	0	0	0	0
Lease/ Depreciation	370	0	0	0	0
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	370	0	0	0	0
Deductions					
Income Tax at 10%	37	0	0	0	0
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	333	0	0	0	0
Depreciation	-370	0	0	0	0
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	-37	0	0	0	0
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	0	-1800	0	0
Net After-Tax Cash Drain	-37	0	-1800	0	0

Capital Expenditure Analysis for truck
Lease Payment of $ 4127.5

INTEREST Rate	PEC BUY	PEC LEASE	AEC BUY	AEC LEASE	PEC RESIDUAL	AEC RESIDUAL
0	9478	10244	1185	1281	-766	-96
2	9411	10029	1285	1369	-618	-84
4	9322	9801	1385	1456	-479	-71
6	9218	9566	1484	1540	-348	-56
8	9102	9327	1584	1623	-225	-39
10	8979	9088	1683	1704	-109	-21
12	8850	8851	1782	1782	-1	-0
14	8719	8617	1880	1858	102	22
16	8586	8387	1977	1931	199	46
18	8454	8163	2073	2002	290	71
20	8323	7945	2169	2071	377	98
25	8003	7429	2404	2232	574	173
30	7702	6954	2633	2378	748	256
40	7163	6126	3073	2629	1036	445

PEC RESIDUAL = PEC BUY - PEC LEASE
AEC RESIDUAL = AEC BUY - AEC LEASE

Capital Expenditure Analysis for truck

INTEREST Rate	PEC BUY	PEC LEASE	AEC BUY	AEC LEASE	PEC RESIDUAL	AEC RESIDUAL
0	9478	9900	1185	1238	-422	-53
2	9411	9698	1285	1324	-287	-39
4	9322	9482	1385	1408	-160	-24
6	9218	9259	1484	1491	-41	-7
8	9102	9031	1584	1572	71	12
10	8979	8803	1683	1650	176	33
12	8850	8575	1782	1726	275	55
14	8719	8350	1880	1800	368	79
16	8586	8130	1977	1872	457	105
18	8454	7914	2073	1941	540	132
20	8323	7704	2169	2008	619	161
25	8003	7205	2404	2164	798	240
30	7702	6746	2633	2307	956	327
40	7163	5944	3073	2550	1218	523

PEC RESIDUAL = PEC BUY - PEC LEASE
AEC RESIDUAL = AEC BUY - AEC LEASE

List of General Information for TRACTOR

Asset Name = TRACTOR

Number of Years = 12

Working Capital = 0

Income Tax Rate = 10 %

Option selected is BUY VERSUS LEASE

List of TRACTOR BUY Option Information

Initial Cost of Asset = $ 50000

ACRS Property Class = 5 years

Depreciation Method -Accelerated Cost Recovery System

Include Investment Tax Credits -- Y

Percent Debt Financed = 70 %

Debt Retirement Period = 5 years

Debt Interest Rate = 15 %

Down Payment Opportunity Cost Rate = 10 %

Asset Useful Life = 12 years

Resale Value = $ 10000

List of TRACTOR LEASE Option Information

INITIAL LEASE DEPOSIT PAYMENT = $ 0

Interest on Initial Deposit Payment= 10 %

Interest Rate for Opportunity Cost = 10 %

Lease Payment Amount = $ 14000

Total Number of Lease Payments = 5

Frequency of Lease Paument is ANNUAL

Lease Payments at the Beginning-of-the-Period - N

Useful Life of Asset= 12 years

Resale Value= $ 10000

Terminal Buyout Option Price = $ 5000

ACRS Property Class = 5

Depreciation Method = Accelerated Cost Recovery System

Initial Balance Sheet for TRACTOR

Assets

Working Capital	0
TRACTOR	50,000
Total	50,000

Liabilities and Equity

Long-Term Debt	35,000
Net Worth	15,000

Depreciation and Anticipated Debt Retirement Schedule

YEAR	DEPRECIATION	REMAINING BOOK VALUE	DEBT PAYMENT	PRINCIPAL OUTSTANDING
1	7500	42500	5191	29809
2	11000	31500	5970	23839
3	10500	21000	6865	16974
4	10500	10500	7895	9079
5	10500	0	9079	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0

Net After-Tax Cash Drain Calculations for TRACTOR - BUY OPTION

year	1	2	3	4	5
Operating Costs	0	0	0	0	0
Depreciation	7500	11000	10500	10500	10500
Interest Income	0	0	0	0	0
Interest on Debt	5250	4471	3576	2546	1362
Taxable Income	12750	15471	14076	13046	11862
Deductions					
Income Tax at 10%	1275	1547	1408	1305	1186
Invest. Tax Credit	5000	0	0	0	0
After-Tax Costs	6475	13924	12668	11742	10676
Depreciation	-7500	-11000	-10500	-10500	-10500
Opportunity Cost	1500	1500	1500	1500	1500
After-Tax Cash Drain	475	4424	3668	2742	1676
Debt Retirement	5191	5970	6865	7895	9079
Equity Reinvestment	0	0	0	0	0
Net After-Tax Cash Drain	5666	10394	10533	10636	10755

year	6	7	8	9	10
Operating Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	0	0	0	0	0
Deductions					
Income Tax at 10%	0	0	0	0	0
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	0	0	0	0	0
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	0	-1800	0	0
Net After-Tax Cash Drain	0	0	-1800	0	0

year	11	12	13	14	15
Operating Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	0	0	0	0	0
Deductions					
Income Tax at 10%	0	0	0	0	0
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Opportunity Cost	0	0	0	0	0
After-Tax Cash DRain	0	0	0	0	0
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	-9000	0	0	0
Net After-Tax Cash Drain	0	-9000	0	0	0

Net After-Tax Cash Drain Calculations for TRACTOR - LEASE OPTION

Security Deposit of $ 0

Year	1	2	3	4	5	
Operating Costs	0	0	0	0	0	
Lease/ Depreciation	14000	14000	14000	14000	14000	
Interest Income	0	0	0	0	0	
Interest on Debt	0	0	0	0	0	
Taxable Income	14000	14000	14000	14000	14000	
Deductions						
Income Tax at 10%	1400	1400	1400	1400	1400	
Invest. Tax Credit	0	0	0	0	0	
After-Tax Costs	12600	12600	12600	12600	12600	
Depreciation	0	0	0	0	0	
Opportunity Cost	0	0	0	0	0	
After-Tax Cash Drain	12600	12600	12600	12600	12600	
Debt Retirement	0	0	0	0	0	
Equity Reinvestment	0	0	0	0	5000	*
Net After-Tax Cash Drain	12600	12600	12600	12600	17600	

Year	6	7	8	9	10
Operating Costs	0	0	0	0	0
Lease/ Depreciation	750	1100	1050	1050	1050
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	750	1100	1050	1050	1050
Deductions					
Income Tax at 10%	75	110	105	105	105
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	675	990	945	945	945
Depreciation	-750	-1100	-1050	-1050	-1050
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	-75	-110	-105	-105	-105
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	0	0	0	0
Net After-Tax Cash Drain	-75	-110	-105	-105	-105

Year	11	12	13	14	15
Operating Costs	0	0	0	0	0
Lease/ Depreciation	0	0	0	0	0
Interest Income	0	0	0	0	0
Interest on Debt	0	0	0	0	0
Taxable Income	0	0	0	0	0
Deductions					
Income Tax at 10%	0	0	0	0	0
Invest. Tax Credit	0	0	0	0	0
After-Tax Costs	0	0	0	0	0
Depreciation	0	0	0	0	0
Opportunity Cost	0	0	0	0	0
After-Tax Cash Drain	0	0	0	0	0
Debt Retirement	0	0	0	0	0
Equity Reinvestment	0	-9000	0	0	0
Net After-Tax Cash Drain	0	-9000	0	0	0

Capital Expenditure Analysis for TRACTOR
Lease Payment of $ 13975.9

INTEREST Rate	PEC BUY	PEC LEASE	AEC BUY	AEC LEASE	PEC RESIDUAL	AEC RESIDUAL
0	52185	58392	4349	4866	-6207	-517
2	51406	56294	4861	5323	-4888	-462
4	50417	54121	5372	5767	-3703	-395
6	49300	51935	5880	6195	-2636	-314
8	48110	49781	6384	6606	-1671	-222
10	46890	47686	6882	6999	-796	-117
12	45668	45667	7372	7372	0	0
14	44462	43736	7855	7727	726	128
16	43287	41896	8329	8061	1391	268
18	42151	40151	8794	8377	2000	417
20	41059	38499	9249	8673	2560	577
25	38538	34761	10346	9331	3778	1014
30	36317	31532	11384	9884	4785	1500
40	32677	26334	13305	10723	6343	2583

PEC RESIDUAL = PEC BUY - PEC LEASE
AEC RESIDUAL = AEC BUY - AEC LEASE

Capital Expenditure Analysis for TRACTOR

INTEREST Rate	PEC BUY	PEC LEASE	AEC BUY	AEC LEASE	PEC RESIDUAL	AEC RESIDUAL
0	52185	58500	4349	4875	-6315	-526
2	51406	56396	4861	5333	-4990	-472
4	50417	54217	5372	5777	-3800	-405
6	49300	52027	5880	6206	-2727	-325
8	48110	49868	6384	6617	-1757	-233
10	46890	47768	6882	7011	-878	-129
12	45668	45745	7372	7385	-78	-13
14	44462	43810	7855	7740	652	115
16	43287	41967	8329	8075	1320	254
18	42151	40219	8794	8391	1932	403
20	41059	38564	9249	8687	2495	562
25	38538	34819	10346	9347	3719	998
30	36317	31585	11384	9900	4732	1433
40	32677	26378	13305	10741	6299	2565

PEC RESIDUAL = PEC BUY - PEC LEASE
AEC RESIDUAL = AEC BUY - AEC LEASE

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