Volume 2 Number 2

The Journal of Equipment Lease Financing™

The Journal of
Equipment Lease
Financing™

HEDGING INTEREST-RATE RISKS FOR LESSORS

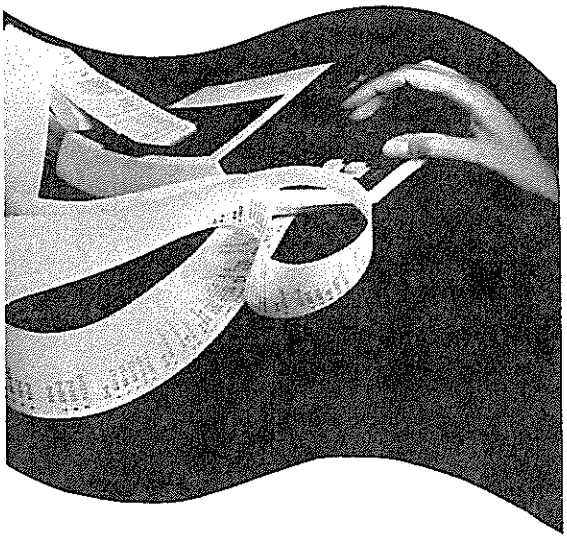
BY GEORGE A. HACHEY, PH.D. AND JAMES M. JOHNSON, PH.D.

The level and volatility of interest rates has increased dramatically over the past fifteen years, causing lessors to explore and implement new methods of protecting profit margins. This article examines tools which can be used to protect profit margins of businesses subject to variable interest rates, and evaluates their usefulness to lessors. The two asset mechanisms evaluated are variable rate leases and variable lease maturities. Liability management tools examined include financial futures and interest rate swaps.

SINGLE-INVESTOR LEASE ACCOUNTING:

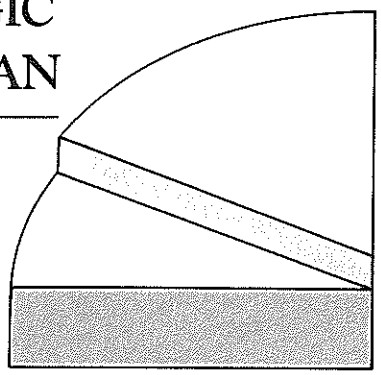
IS IT ECONOMICALLY REALISTIC?

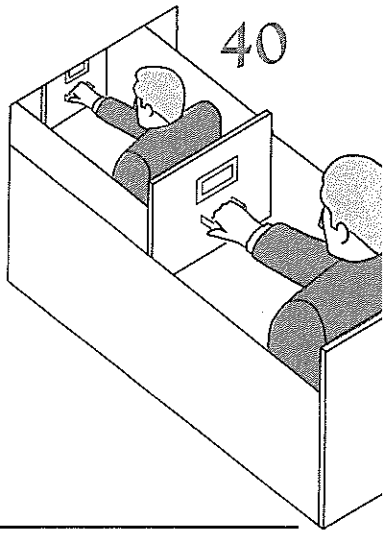
BY LLOYD A. HANES, JR.

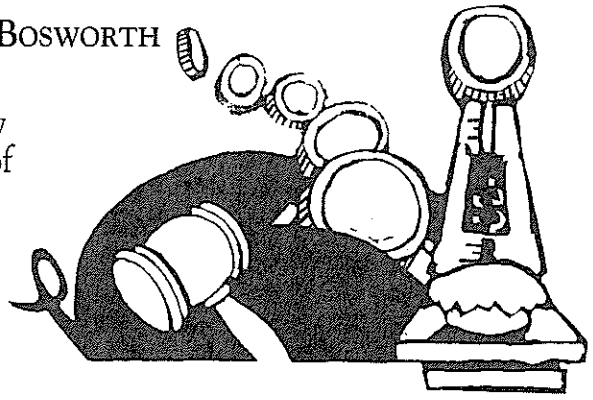


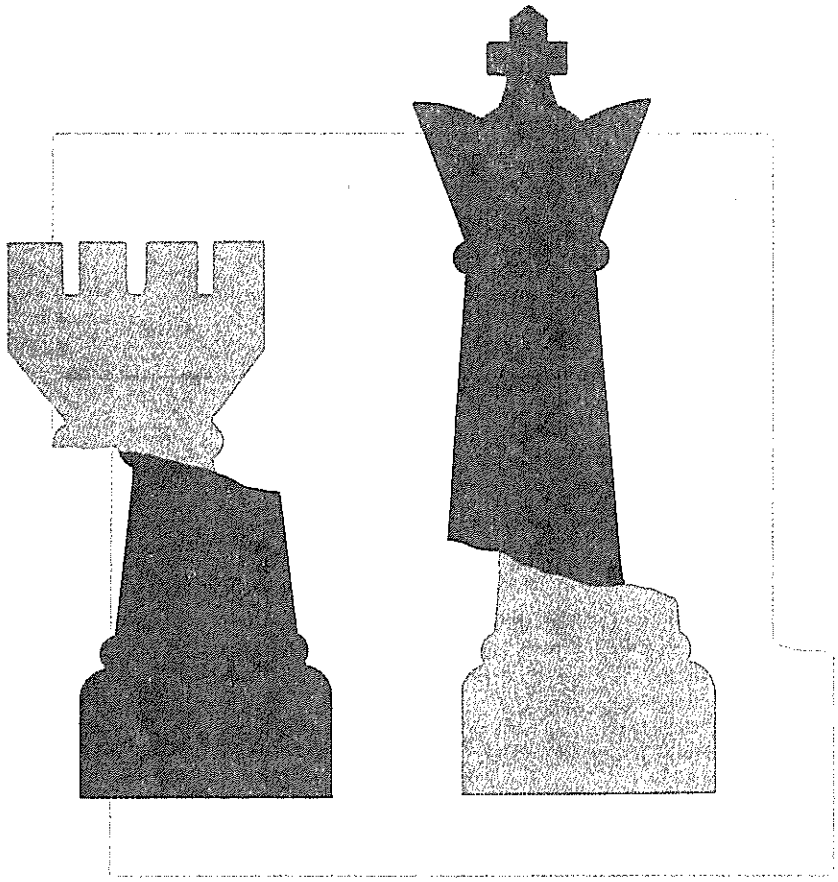
The article analyzes how well accounting for single-investor leases represents the underlying economics. The implications of the conclusions reached are then investigated with regard to stipulated loss values and lessor default exposure.

The Journal of Equipment Lease Financing™









Hedging Interest-Rate Risks for Lessors

By George A. Hachey, Ph.D. and James M. Johnson, Ph.D.

Lessors increasingly have become exposed to interest rate risk over the past fifteen years due to structural changes in the global economy. As a result of interest rate variability, lessors which cannot obtain fixed-rate financing run the risk of diminishing profit margins (or losses) whenever interest rates are rising. This article discusses some of the ways in which a lessor can protect against such risk from both theoretical and practical perspectives.

Background

The level and volatility of interest rates have become a fact of life over the past fifteen years, and show no signs of abating in the near future. During this period, each successive business cycle has set both higher highs and higher lows in interest rates. As a result of this phenomenon, many lessors have been faced with a problem not confronted previously: Obtaining fixed-rate debt financing. During the 1950s and most of the 1960s, lessors could finance leasing portfolios with either short or long-term debt at rates which were fixed or virtually fixed. The beginning of the new era can be traced to the 1969-1970 recession in which many banks were forced to honor contractual lines of credit at fixed 10% rates, while borrowing in the federal funds market (from other banks) at 11 to 12%. Due to the inevitable profit margin squeeze which ensued, banks began to negotiate variable-rate loans in increasing numbers.

During the 1980-1982 recession, many lessors found it increasingly difficult to raise fixed long-term financing as well. The result of these variable interest rate pressures—both short and long-term—was to cause a number of lessors to consider or require variable rental payments to protect profit margins.

Interest-Rate Risk

The dilemma facing lessors can be explained in terms of interest-rate risk. Interest-rate risk can be defined broadly as the adverse consequences associated with an unexpected change in interest-rate levels. It can impact a lessor in several ways. First, if interest rates rise, the value of fixed-income (rent) investments (leases) declines. Also, if a lessor is financing a fixed-rate lease investment with variable-rate debt (either short-term commercial paper or bank lines, or longer-term variable-rate debt), the cost of the financing increases. Depending upon the magnitude and duration of the interest rate increase, profit can be eroded and losses can result. Alternatively, a decline in rates will result in a more favorable yield on fixed-rent leases, although this is somewhat diminished by cash flows being reinvested at lower rates. Any strategy employed by lessors to protect yields when they are subject to variable-rate debt financing is termed hedging.

Traditional Perception of Hedging

Basic finance textbooks discuss hedging as a matching of asset and liability maturities.[1] Thus, short-term assets are financed with short-term debt (or variable-rate debt set to be repriced when the assets mature) and long-term assets are financed with long-term fixed-rate debt. The goal of this approach to asset/liability management is to secure a positive spread between leasing and borrowing rates, developing an acceptable yield on invested capital.

If a lessor finances intermediate to long-term lease investments with short-term or variable-rate debt, it faces two risks. The first risk is that the lessor may not be able to "roll over" or renew the financing. The second risk is that it only may be able to roll over

George A. Hachey is assistant professor of finance at Bentley College in Waltham, MA, a suburb of Boston. Hachey's specialties are financial markets, management of financial institutions and consumer finance. He has published in the Journal of Money, Credit and Banking, *and is an active financial consultant. Hachey earned his doctorate in finance at the University of New Hampshire.*

James M. Johnson is associate professor of finance at Bentley College, and was previously a member of the finance faculty at Notre Dame University. Johnson has been an active financial consultant and writer for the past ten years. He has written over two dozen articles on business and finance subjects, for many publications including The Journal of Equipment Lease Financing, Financial Management, Financial Executive, Journal of Portfolio Management, *and* Journal of Bank Research. *Johnson earned his doctorate in finance at The Ohio State University.*

The authors would like to express their appreciation to Herbert A. Huene of Coopers and Lybrand, Raymond W. Leyden, Jr. of General Electric Credit Corp., Thomas McGrath of the First National Bank of Chicago, and Joel Rosenberg of the Federal Home Loan Bank of Boston for their assistance in this project.

the financing at a higher rate (interest-rate risk). The more closely the lessor matches the maturities of asset investments with those of the funds used to finance them, the smaller the potential impact of rollover and interest-rate risks.

Alternative traditional hedging strategies involve intentional mismatching of asset and liability maturities. These strategies are utilized to take advantage of expected changes in interest rates. Thus, if interest rates are expected to decline, a fixed-rate borrower might choose to shorten the maturity of its liabilities in order to lower its cost of funds more rapidly. If an increase in interest rates is forecast, a borrower might choose to lengthen the maturity of its fixed-rate liabilities to take advantage of their current lower cost.

Matching the maturities of assets and liabilities would seem to be a relatively easy strategy to follow. In practice, however, significant difficulties can and do arise. A lessor must design its financing product to meet the needs of its customers, and be competitive with other lessors. The terms and maturities of leases it can offer are largely determined by these two factors. Thus, lessors often find it important to offer fixed-rate leases for intermediate or longer periods of time. At the same time, however, a lessor might be unable to obtain fixed-rate debt financing with a term which matches that of the lease being structured. During volatile interest-rate periods, variable-rate debt may be the only type of funding available. Thus, matching asset and liability maturities may prove difficult or impossible during such times.

When confronted with variable-rate debt financing, a lessor may attempt to hedge (protect) profit margins by employing either asset or liability strategies. The conceptual and practical aspects of four possible strategies will be explored in the remainder of this article: Two on the asset side and two on the liability side. Possible asset hedges are variable lease payments and variable lease terms. Liability-focused tools include financial futures and interest-rate swaps.

Variable Lease Payments

Variable lease payments would seem to be the easy solution to a variable interest-rate financing problem. Lease payments could be tied to any number of indices, and adjusted at various intervals. The ideal hedge would require, for example, that rent payments be adjusted such that lessor yield is constant—regardless of the duration or extent of unfavorable interest-rate changes affecting lessor financing.

Although straightforward in concept, lessors must assess three issues in determining whether variable rents represent an attractive hedging tool. One issue relates to the financial substance of the lessee. To the extent that a lessee is a relatively weak credit risk and/or operates a cyclical business, *charging* variable lease payments does not necessarily insure *collection*.[2] Because interest rates tend to peak at the conclusion of an economic recovery (and thus at the beginning of a decline), variable lease payments tend to increase lessee obligation at precisely that time when it will create the greatest economic burden to do so.

A second consideration involves specification of the formula selected to link lease payments to interest-rate changes. For lessors which adhere to IRS Revenue Procedures (guideline lessors), it is important to specify in the lease contract how rents may vary as a function of a defined index.[3] In terms of economics, it is important to utilize an index which matches—as nearly as possible—the changes in the lessor's cost of funds. The importance of this is caused by the lack of perfect correlation between different interest rate series. Ideally, a lessor will specify the same index for lease payment adjustments as its lenders use in adjusting its debt service.

A third consideration—and to many lessors the most important—relates to marketing. Offering variable-rate leases may protect lessor profit margin, but at what price? If a lessor offers only variable-rate leases while competitors offer attractive fixed-rate leases, the effectiveness of variable rates as a profit hedge becomes somewhat irrelevant. Little comfort can be had in knowing that profit margins have been protected if transactions cannot be closed, leaving no profit to protect.

Thus, the ultimate effectiveness of variable-rate leases as a hedging device is directly related to competitive product offerings.

Variable Lease Maturities

Commercial banks have used successfully variable loan maturities as a method of protecting investment yields, without requiring borrowers to increase their debt service payments during periods of rising interest rates. Effectively, a loan is structured such that the total periodic payment is fixed. If bank cost of funds subsequently changes, the fixed payment simply is allocated between interest and principal reflecting the rate appropriate for that period. Should interest rates rise subsequent to commencement of the loan, the result will be a longer than originally anticipated loan term, because smaller allocations of loan payments will be made to principal than was originally the case.

Variable lease maturities, as with variable rents, would appear to be a plausible mechanism for lessors to employ. This device would eliminate the unattractive aspects of variable lease payments, while permitting the lessor to protect its investment yield. However, tax law may preclude this from being an attractive option to guideline lessors.[4] IRS guidelines require that the useful economic life of a leased asset be the greater of one year or 20% of its total economic life at the end of the lease term. Thus, if a variable lease term is negotiated, it *ultimately* could violate the remaining life requirement even though this was

met at the inception of the lease. Concern over this requirement will be greater as the initial lease term in relation to the economic life of the asset increases. Another potential tax issue concerns residual value. Because guideline lessors must expect a residual equal to 20% (or more) of original equipment cost, a maturity extension brought about by interest rate increases would be expected to diminish residual value—possibly below the allowable minimum.

Financial Futures

Many commodities and financial assets can be purchased with two basic types of delivery terms. The first is for immediate delivery, and takes place on what is called the cash or spot market for the asset. Alternatively, an asset can be purchased with delivery deferred to some future date: This is the futures market. Futures contracts in financial instruments provide a means for hedging mismatched asset and liability maturities for relatively short periods of time.

A financial futures contract is an agreement to buy or sell an asset at a specified future date. Futures markets presently exist for such financial instruments as Government National Mortgage Association pass-through securities, U.S. Treasury bills, notes and bonds, commercial bank certificates of deposit, Eurodollars, and others. In a futures market transaction, the price at which the underlying financial asset is purchased is determined in the current day's trading, but payment and delivery are deferred until some specified date in the future. In fact, because the futures market is used primarily to hedge against interest rate movements rather than to take future delivery of a financial security, most positions are closed out (repurchasing a contract previously sold) before delivery occurs.

Hedging with financial futures contracts requires a high degree of correlation between the price of the futures contract and the price or rate of the transaction being hedged. It involves taking a position (buying or selling a financial futures contract) in the financial futures market that is equal in value to the cash market position. However, the futures market position is selected so that when adverse consequences of a change in interest rates occur, a gain is obtained on the futures position which will wholly or partially offset the loss on the cash market side.

To illustrate, assume that a lessor is financing the asset underlying a six-month fixed-rate lease with commercial paper having a three-month maturity. The lessor expects interest rates to increase in the near future, and thus expects to pay a higher rate upon rolling over the paper for the second three-month financing term. This investment ideally would be hedged by the lessor selling a three-month commercial paper futures contract for delivery in three months. If the lessor's expectations regarding interest rates proved correct, in three months two transactions would take place. First, the lessor would roll over the commercial paper issue used to fund the lease at a higher rate. Second, the lessor would go into the market and purchase a three-month commercial paper issue in the cash market, effectively closing out the hedge investment. Because interest rates had increased, the lessor would be buying the hedge contract at a price below that of the original contract. To the extent that the lessor matched the funding and hedge transactions, the dollar loss on refunding the commercial paper issue would have been offset exactly by the dollar gain on the hedge.

As a practical matter, the lessor would be required to hedge using U.S. Treasury bills rather than commercial paper since financial futures contracts in commercial paper were tried and abandoned by one of the major futures exchanges, due to their failure to gain acceptance by the market. Thus, a perfect hedge against commercial paper is not possible since commercial paper and Treasury bill rates are not perfectly correlated; at various times during a business cycle, the spread between these two instruments widens and narrows. In fact, regardless of the short-term or longer-term variable-rate debt security employed, a pefect hedge rarely can be achieved, since short-term rates are not perfectly correlated with one another, and the correlation of variable longer-term rates with

Treasury bills will depend upon the index used to adjust the variable rate. A second problem with attempting to use Treasury bill futures as a variable-rate debt hedge in leasing has to do with contract timing. The market for Treasury bill futures does not consist of numerous issues maturing on a daily basis, and thus the timing of refunding or changing longer-term debt rates may not coincide perfectly with the expiration date of futures contracts. Consequently, the price of the futures contract cannot converge perfectly with the cash-market price. The resultant basis (the difference between cash and futures prices) can cause the change in futures prices to imperfectly match the change in financing costs, causing a gain or a loss to result. A third issue concerns the current practice in the futures market of requiring that increases in the futures contract price used to create the short hedge (described above) be "marked to market." This means that the lessor must deposit additional funds with the futures broker to prevent the broker from liquidating the hedge. This practice can cause unexpected and undesirable reductions in the lessor's cash account. This last issue, however, can be offset to a considerable extent by posting margin in the form of marketable securities—a practice available to most market users.

Notwithstanding the above caveats with regard to the use of financial futures contracts, they *could* offer a reasonably effective vehicle for lessors to hedge variable-rate debt. It would be a rather simple matter to sell a series of contracts for delivery at appropriate future dates in such a fashion to hedge any variable-rate debt contract (or series of short-term rollovers) and thereby eliminate a con-

siderable amount of interest-rate risk. At the present time, however, financial futures are not available for sufficiently long periods of time for them to be of use to lessors. Contracts presently extend out for delivery for a maximum of eight quarters, and thus only very short-term leases can be hedged using this tool. But even this is an overstatement, since the market for contracts more than one year out is quite thin. The thinness of the outer part of the market makes its usefulness questionable, and, even if purchases or sales can be effected, they are more costly.

Although the short period available in the futures market is a distinct disadvantage for lessors, a strategy known as "rolling the hedge" is considered by some to at least partially offset the short maturity problem. Though there are numerous methods of employing a rolling hedge, most strategies amount to a series of purchases and sales of futures contracts over the life of the underlying investment being funded. The "roll" comes about due to investments having longer lives than futures available to hedge them.[5]

Consider, for example, a lessor which invests in five-year leases, and funds them with 90-day bank notes. the lessor will make a 20-quarter investment, requiring the bank note to be rolled over 19 times. Since 90-day futures contracts are available for only eight quarters, the lessor may elect to sell (short) one contract for each of the first seven quarters, and sell (short) 12 contracts for quarter eight (for a total of 19 futures contracts for 19 bank note rollovers). At the end of the first quarter, the lessor would: Buy back (cover) the contract for that period, thus closing that position; sell a new contract (short) for quarter nine; and buy back one of its 12 quarter-eight contracts. Thus, every quarter, the lessor would sell one new contract and buy back two until quarter 16, at which time no further contracts would be sold. In quarters 16 through 20, one contract would be bought back each quarter, resulting in the last contract being closed out (covered) in quarter 20.

Unfortunately, the difficulties in employing a rolling hedge are considerable. In addition to the issues raised with respect to standard futures hedges, the rolling hedge can result in much higher transactions costs due to the relatively large number of purchases and sales of contracts. Also, due to the thinness of the futures market beyond one year, the roll may be constrained to four quarters rather than the theoretical eight, thereby rendering it less useful than would otherwise be the case.

Interest-Rate Swaps

Interest-rate swaps are another method by which lessors may hedge interest-rate risk. The major advantage of swaps for lessors is that they are available in considerably longer maturities than are futures. The most prevalent maturity range is three to ten years, although maturities as short as one year and as long as twelve years have been negotiated.

An interest-rate swap is a contract between two parties who agree to exchange interest payments for a specified period of time; one party swaps variable interest-rate payments to another who trades fixed interest-rate payments in return. The term "interest-rate swap" is indicative of the transaction, as the two parties do not exchange principal obligations—only interest payments. Typical transactions involve $10 to $15 million in notional principal (the amount of financing that underlies the swap), and indications are that $5 million is generally the minimum (though some transactions have been in the $1 million range).

The interest-rate swap market originated by most accounts in 1982, and has expanded rapidly from about $5 billion (in 1982) to a projected $35 to $40 billion for 1984.[6] Though the first swaps involved U.S. variable-rate and foreign fixed-rate partners, numerous transactions presently involve two U.S. partners, and, according to estimates, the vast majority of transactions involve an intermediary.

The participants and fund flows that result from a lessor interest-rate swap transaction are characterized in the following example. The four parties involved are a U.S. lessor, a U.S. commercial bank, a European bank, and Eurobond investors.[7] The motives for entering into a swap are as follows. The U.S. lessor can obtain readily relatively inexpensive variable-rate financing via commercial paper or a variable-rate term loan. However, the lessor has a maturity mismatch between its assets and liabilities because it offers fixed-rate leases for terms of seven years, yet runs the risk of adverse interest-rate changes every 90 days (the frequency with which it either rolls over its short-term debt or experiences a term loan rate adjustment). To reduce the lessor's exposure to rising interest costs, it would prefer to finance with fixed-rate liabilities. However, the lessor faces difficulties in securing fixed-rate money at a reasonable cost. The lessor lacks recognition in international financial markets, and/or has an adequate but not strong credit rating. The Eurobank makes variable-rate loans, with interest pegged to the London Interbank Offer Rate (LIBOR)—the rate at which major European banks lend to one another, and comparable to Federal Funds for U.S. banks—and may tap easily both money markets for short-term variable-rate funds and capital markets for intermediate-term fixed-rate debt financing. The Eurobank would like to protect its investment spreads by making variable rate interest payments pegged to LIBOR. The Eurobank also is interested in taking advantage of arbitrage opportunities in international financial markets.

Thus, the ingredients for a favorable exchange exist. The U.S. lessor may obtain reasonably priced fixed-rate debt, and the Eurobank may obtain relatively inexpensive variable-rate debt. The result of the swap will be for the U.S. lessor to both borrow and invest at fixed rates, and the Eurobank to borrow and invest at

variable rates. The U.S. lessor will eliminate debt payment fluctuations, and fully hedge (eliminate) interest-rate risk. The Eurobank will not eliminate borrowing and lending rate fluctuations, but will lock in a fixed percentage point spread between the two, since both rates are tied to LIBOR.

Suppose the U.S. lessor presently can borrow seven-year money from a U.S. bank at a fixed rate of 12.25%, or borrow at an initial variable rate of 10.50%, the latter rate pegged to changes in LIBOR.[8] The Eurobank may sell seven-year Euronotes at a fixed rate of 11.00%, and the present LIBOR rate is 10.00%. Either directly or through an intermediary, the U.S. lessor and the Eurobank are matched and an interest swap is negotiated. Because the Eurobank is large, well-established and has the financing sources, it offers to assume the U.S. lessor's variable-rate interest obligations—but at a rate 25 basis points (.25%) below LIBOR, for a day-one rate of 9.75%. In return, the U.S. lessor must agree to assume the Eurobank's fixed interest payments of 11.00%.

Figure 1 illustrates the parties and funds flow for the example on day one (commencement) of the swap. The U.S. lessor obligates itself to repay principal on its variable-rate loan from the U.S. bank, and to pay variable-rate interest, pegged at 50 basis points over LIBOR (for a day-one rate of 10.50%). The Eurobank obligates itself to repay principal on its fixed-rate loan from Euroinvestors, and to pay fixed interest of 11.00%. The U.S. lessor and the Eurobank then swap interest obligations, but it is not a pure swap, due to the financial preeminence of the Eurobank. Instead of the Eurobank paying the U.S. lessor's LIBOR rate plus 50 basis points, the Eurobank pays LIBOR minus 25 basis points, leaving the U.S. lessor 75 basis points short on day one. On the Eurobank's side, it will receive 11.00% interest from the U.S. lessor for payment to its Euroinvestors and pay the U.S. lessor 9.75%. This puts the Eurobank 25 basis points ahead on day one relative to its borrowing rate (LIBOR) from other European banks (its alternate source of variable-rate debt).

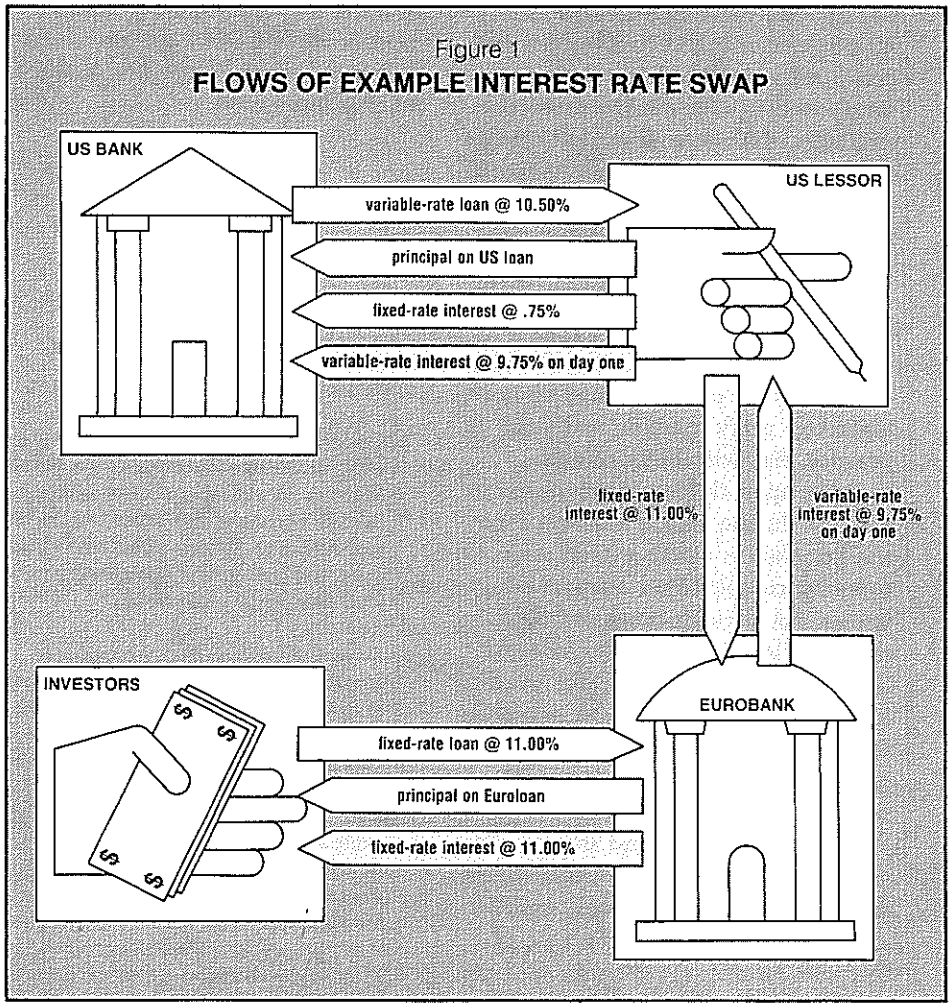
In Figure 1, it will be noted that the obligations of the U.S. lessor and the Eurobank to their financing sources (the U.S. bank and investors, respectively), are shown by white arrows, and the swapped obligations shown by gray arrows. Under the swap agreement, the U.S. lessor has agreed to make fixed interest payments of 11.00% to the Eurobank, with 11.00% flowing through to Euroinvestors. The U.S. lessor also makes fixed interest payments of .75% to the U.S. bank. The Eurobank makes variable interest payments (at a day-one rate of 9.75%) to the U.S. lessor, all of which flows through to the U.S. bank.

In the example, the U.S. lessor has managed two favorable effects by swapping. It has lowered its fixed obligation from 12.25%, which it would have had to pay the U.S. bank, to 11.75%. It also has hedged its interest-rate risk by exchanging variable-rate debt for fixed-rate debt. The Eurobank, for its part, has locked in a variable-rate loan pegged at 25 basis points less than it would need to pay if it borrowed from other European banks—its alternate (and conventional) source of variable-rate financing.

It is clear that both parties benefit from the example swap transaction. The U.S. lessor achieves a fixed-rate cost of borrowing at a lower cost than is possible through direct fixed-rate borrowing from the U.S. bank, and the Eurobank converts a fixed-rate liability into a variable-rate one on favorable terms relative to other alternatives.

Whether an interest-rate swap involves U.S. and foreign partners, U.S. partners exclusively, or involves an intermediary is not the central issue, however. What is important is the ability of two business entities with different interest payment needs to

Figure 1
FLOWS OF EXAMPLE INTEREST RATE SWAP



effect a trade such that both may match their asset and liability structures, and do so on more favorable terms than available by engaging in direct financings. In other words, an interest-rate swap will be mutually advantageous if it accomplishes the following: A fixed-rate asset business achieves a lower fixed interest cost, and a variable-rate asset business achieves a lower variable interest cost by exchanging interest payments than would be possible by negotiating their own fixed and variable-rate (respectively) loans directly with lenders.

Summary and Conclusions

This article has presented techniques which lessors might use or investigate to protect lease investments against interest-rate volatility. Background regarding interest rates, interest-rate risk and hedging has been presented as a prelude to discussing four possible profit margin protection strategies which lessors might consider if faced with variable-rate debt financing (attributable to either short-term rollover financing or adjustable rate intermediate term loans).

The two asset strategies discussed are variable rent payments and variable lease maturities. In principle, either of these two tools may be used to protect profit margins and yield. In practice, the desirability of each depends upon the factors discussed in the text. In the case of variable rents, the key issue is whether such structures are competitively attractive to lessees. For variable-term structures, the main issue is one of tax risks for lessors who adhere to the IRS guidelines. Guideline lessors must assess the likelihood that either the remaining life or residual value test (or both) ultimately would be violated.

Financial futures and interest rate swaps are examined as possible liability hedging strategies. Although some drawbacks are noted in the case of financial futures, overall they do have the potential to become a variable hedging tool. At present (and for the foreseeable future), however, financial futures do not extend nearly far enough out in time to be useful for lessors engaged in leasing for terms greater than about two years. Also, the protection offered by employing rolling hedges does not appear to significantly alleviate the maturity problem of futures, due in large part to the thinness of the market beyond one year.

Of the four hedging tools examined, interest-rate swaps generally appear to be the most promising. Swaps avoid the potential tax issues discussed with respect to variable-term leases. In addition, swaps eliminate the need to transfer interest-rate risk to lessees in the form of variable rates or terms. The appeal of swaps relative to financial futures lies in the substantially longer maturities available with swaps. Furthermore, as the interest-rate swap market continues to grow and mature, it is likely that minimum transaction sizes will decline, which will broaden its availability to include smaller lessors.

Footnotes

1. See, for example, reference 4, pages 164-169.

2. Commercial banks faced comparable problems with variable-rate loans during the 1980-1982 recession. In a number of cases, especially hard-hit borrowers were able to reduce their debt service to "interest only," and in extreme cases, both principal and interest payments were temporarily suspended.

3. Revenue Procedure 75-21 (applicable to leveraged leases, yet adhered to by a number of lessors in single-investor leases as well) includes uneven rent tests for true lease compliance. Among other tests, rents for any one year may not be more than 10% higher or lower than average annual rents over the entire lease term. Though this would appear to place certain variable-rent structures in tax jeopardy, the tests are not applied when rents are referenced to an index.

4. Most lessors choose to follow the Revenue Procedures indicated, even though they were written for use in leveraged lease transactions. Although some argue with merit that guideline-complying leases represent conservatism, it does in fact represent a "safe harbor" for lessors who feel to do otherwise would run the risk of an adverse audit outcome.

5. For an excellent analysis of rolling hedges, the interested reader is referred to reference 4.

6. See reference 3, page 1.

7. Note that this is an illustrative transaction. It need not include foreign participants, and the variable rate may be tied to whatever index agreed to (other than LIBOR). See footnote 8.

8. Discounts from or premiums to LIBOR are an increasingly prevalent method of pricing loans and adjusting variable-rate loans in both the U.S. and Europe. Other floating rate index candidates include U.S. Treasury bills, U.S. prime rate, certificate of deposit composite rate, commercial paper composite rate, Federal Funds, as well as others.

References

1. American Association of Equipment Lessors. *1983 Survey of Accounting and Business Practices.* Arlington, VA. 1983.

2. Federal Home Loan Bank of Boston. *Interest Rate Swap Services.* Boston, MA. May, 1984.

3. The First Boston Corporation. *Interest Rate Swaps.* Boston, MA. 1984.

4. McCabe, George M. and Frankle, Charles T. "The Effectiveness of Rolling the Hedge Forward in the Treasury Bill Futures Market." *Financial Management*, Summer, 1983, pp. 21-29.

5. Van Horne, J.C. *Fundamentals of Financial Management*, 5th ed. Englewood Cliffs, N.J.: Prentice-Hall, Inc. 1983.

Everyone claims they deliver the "best answer," but have you asked yourself...

WHAT DOES THE BEST ANSWER *INCLUDE?*

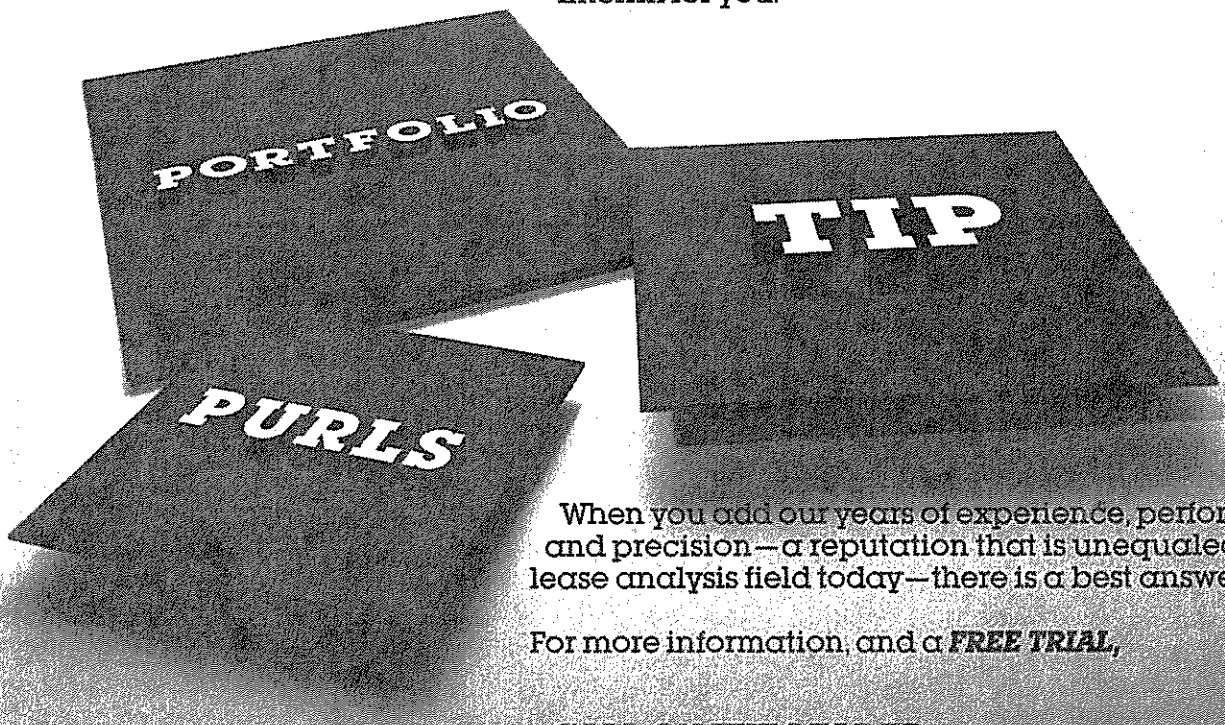
To influence your profit potential, you need superior results—and that's what TIP gives you. But TIP also gives you results that are marketable, timely and cost efficient.

■ ***Superior Results***—The highest possible yield to the lessor, and the lowest possible cost to the lessee.

■ ***Marketable Results***—Structures that can be controlled, understood and tracked by the lessor, lender and lessee.

■ ***Timely Results***—Today's competitive market won't wait for your bid optimizer. And with TIP it won't have to. You'll have your results in minutes, not hours.

■ ***Cost Efficient Results***—For as little as $49 per rent *and* debt optimization, instead of $100's. That's because TIP automatically chooses your periodicity, timing and interim for you.



When you add our years of experience, performance and precision—a reputation that is unequaled in the lease analysis field today—there is a best answer. TIP!

For more information, and a ***FREE TRIAL,***

CALL ON THE LEADER.

Outside California, call toll-free:

800-227-3770

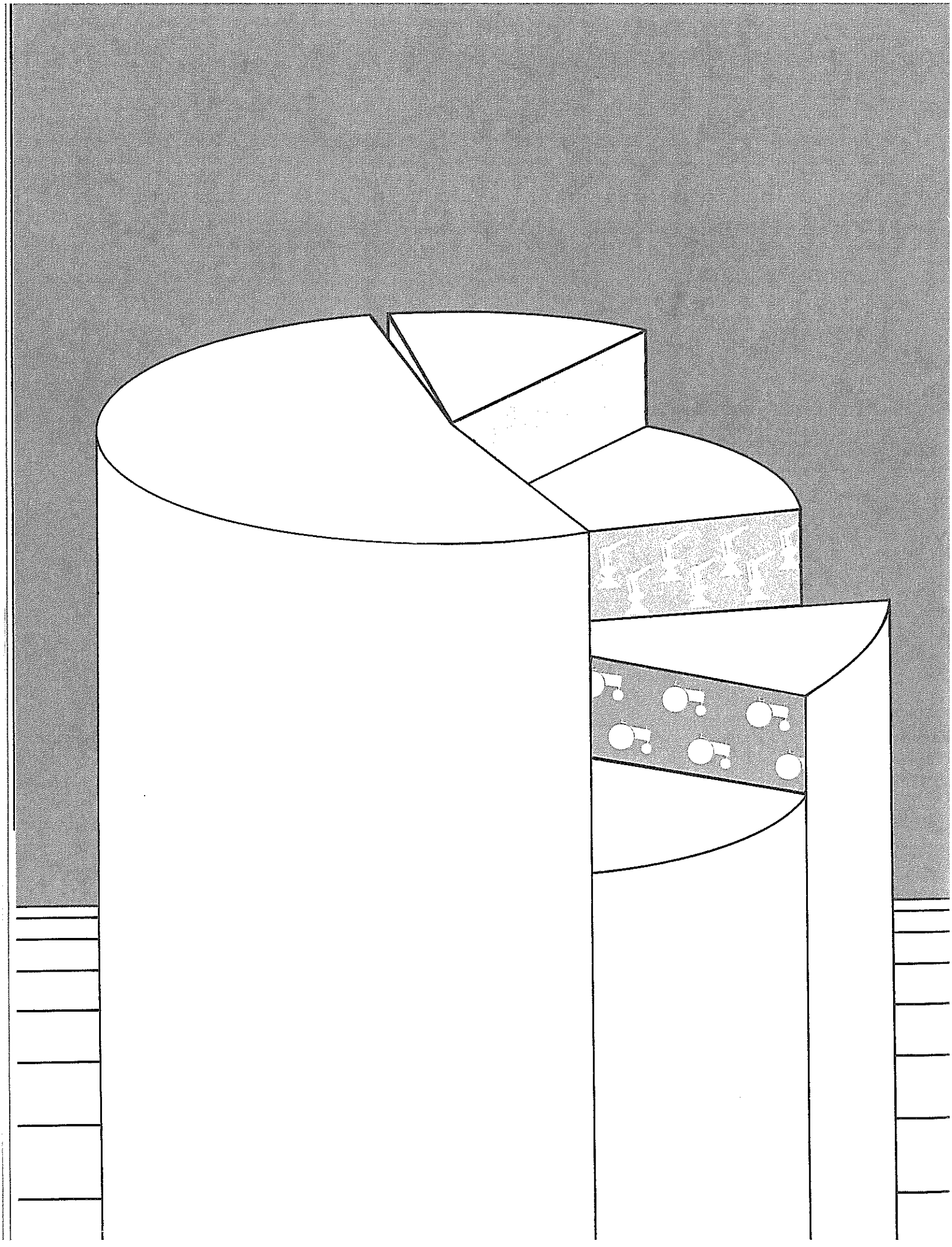
Within California, call:

(415) 434-0850

New York
805 3rd Avenue
Suite 2800
New York, N.Y. 10022
(212) 935-7490

TXL CORPORATION
One Embarcadero Center
Suite 3800
San Francisco, CA 94111

Chicago
3 First National Plaza
Suite 2715
Chicago, IL 60602
(312) 726-0500



Developing a Strategic Marketing Plan

by Stephen C. Diamond

Much has been written about how leasing has blossomed into a major economic force during the past two decades. A large part of this growth was generated by entrepreneurs who instinctively recognized that leasing is no more a single, homogeneous product than is lending. They saw that leveraged leases, involving such big-ticket items as aircraft fleets, have different marketing, credit, and operational dynamics than do small-ticket conditional sales contracts. In addition, the discounting of operating leases requires a different type of risk analysis than does discounting of full payout leases. These equipment leasing entrepreneurs carved out market segments, or niches, which became the base of their business.

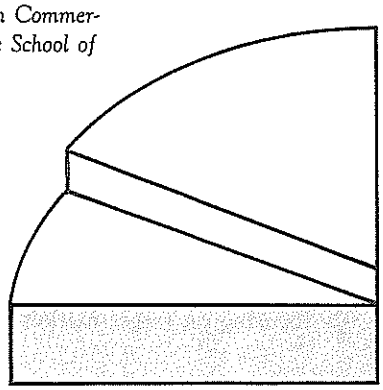
Today, there may be fewer entrepreneurs and more professional managers in the industry than was the case several years ago, but the fact remains that leasing still includes a myriad of different market segments, each of which may have its own credit and operational characteristics. The mix of market segments chosen to be served will dramatically impact the profit and market dynamics of an operation.

Because there are differences in profit dynamics, because second generation professional management may not have the same instinctive market sense as founding entrepreneurs, and because the leasing market, while still growing, is beginning to mature, it is becoming increasingly incumbent to better formalize

---

The author is chairman of First Chicago Credit Corporation, responsible for First Chicago Corporation asset-based lending and vendor finance activities. Diamond attended Stanford University and U.S.C. Law School, where he was an associate editor of the Law Review. After a brief period of practicing law, he worked with Walter E. Heller & Company for 20 years, leaving as president of Heller's central commercial finance and factoring division. He served three years as president of Chase Commercial Corporation, a subsidiary of Chase Manhattan Corporation, immediately prior to his present position.

Diamond serves as consultant or director to a number of corporations, and is chairman of the National Commercial Finance Association, a trade association for firms engaged in asset-based financial services. He has made numerous speaking appearances before professional groups and has published many articles, including several in the Robert Morris Associates Journal. *His teaching background includes The Wisconsin School of Banking, The American Banking Association Commercial Bank Lending School and The School of Banking of the South.*



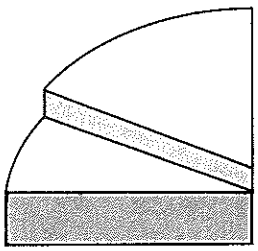
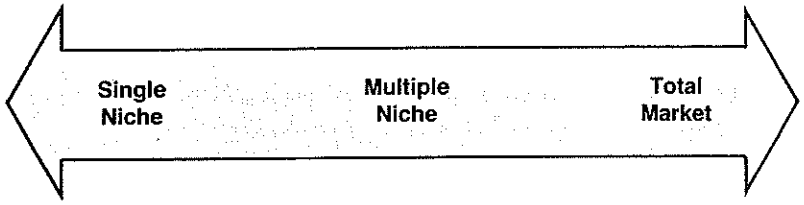


Figure 1

MARKET SEGMENT FOCUS



market planning efforts. This includes identifying available market segments, deciding which to serve, and gearing sales and operating processes around the needs of those identified segments. This article presents some of the variables that should be considered in segmenting the market as a prelude to developing a strategic marketing plan.

Market segmentation is essential to developing a successful marketing strategy. A lessor (or other financial source) may define its target market universe in a number of ways. The broadest definition would include "every conceivable user of any type of capital equipment," and would be represented at the extreme right in the continuum presented in Figure 1. This position would be categorized as a "total market" player. Few companies have the resources to effectively implement this approach.

At the other extreme would be a lessor who defines its business closely, such as leasing copy machines to professional firms with populations of from 5 to 100 located in metropolitan areas of over 50,000. This hypothetical lessor would be a single-niche player.

Between these two extremes are a wide number of variations. The advantage in concentrating on a single-market niche is that resources can be dedicated exclusively to that niche, focusing on target market criteria, and customizing operating, credit, and marketing efforts into a tightly linked, integrated package. A firm attempting to cover the total market will have to take a much more diffused, less integrated approach. The single-niche player can develop both cost efficiency and market effectiveness through products tailored to the specific segment's needs, focused selling efforts, and communications efforts targeted to those needs. The tradeoff, however, is that by limiting market scope, the single-niche player also may be limiting upside sales potential, since it is narrowing the definition of its target market. This, incidentally, highlights why market share statistics can be extremely misleading, since a niche player will, by definition, have a smaller potential market universe than will a total-market player.

The question is whether to penetrate more deeply into a smaller market universe or less deeply into a larger one. The total-market player is really acknowledging that by diluting its focus it may not get as large a share of any single segment as it would had it concentrated on that segment, but it nevertheless is proceeding on the premise that it will get enough share from a number of segments to compensate for this inefficiency. The total-market player argues that it will overcome inefficiency through increased volume. The problem is compounded in the real world because one has to make a difficult series of choices in allocating resources—people, capital, tax base—to serve the targeted market optimally. The greater the number of market segments attempted, the greater the likelihood of a degradation of operational efficiency and/or market efficiency.

In a rapidly growing economic environment, there is room for such suboptimal producers to grow and even prosper, but as an industry matures and economic growth slows, the rewards go to the low-cost producer and/or effective marketer. In this writer's judgment, there is a greater probability of the niche player achieving that future status than the full-market player.

A compromise approach is a multiple-niche strategy, where the lessor doesn't attempt to be all things to all people, but at the same time refuses to limit itself to a single market niche. The tradeoff conceptually is the same as with the single-niche player—greater volume against suboptimal allocation of resources—but the degree of tradeoff is reduced as the number of niches increases.

If the aim is total market status, in its broadest sense, market segmentation becomes irrelevant; if, however, a company opts for either a single-niche or multiple-niche strategy, it becomes important to clearly define the niche(s) that will be targeted, and to integrate all credit, operations, and sales policies around the needs of that segment(s). There are obviously an almost limitless number of approaches available to segment the market for leasing services. Although not necessarily appropriate for all leasing firms, following is a template used successfully by the author in past efforts at strategic planning.

Segmenting the Market

Begin by segmenting the market through four sets of variables: Source of business, transaction size, product, and customer class. Since a four-function matrix cannot be reduced to a visually understandable rendering,

Figures 2 and 3 depict two-dimensional matrices. This article will discuss each of the variables as an axis of a matrix; the reader should remember, however, that in the actual decision making process, the two matrices are linked and not separate.

Source of Business

The vertical axis of Matrix 1 segments the market by source. A company that sources through markets to *end users* basically will be selling leasing as a stand-alone product. The equipment leased will be of secondary importance as long as it passes the credit screen of the lessor. For this reason, a direct-market sales force has a better chance of absorbing its costs if different types of equipment are involved than if it concentrates on a single type of equipment. Even so, it is obvious that the cost of supporting a sales force capable of calling on every potential end user, to determine what new capital equipment it might want to acquire, would be prohibitive. A lessor attacking the end-user community, therefore, should direct its sales force calling activities to prescreened segments of that community. Even with a more focused marketing effort, however, maintenance of a sales force capable of sourcing through the end user is extremely expensive. In addition, there tends to be little customer loyalty, since the lessor is providing only transactional financing. This moves pricing closer to a commodity basis, except to the extent the lessor is willing to take an equipment risk. The bottom line is that the end-user source provides the greatest market potential in terms of size, but it also necessitates

Figure 2

MATRIX 1

Source of Business	Transaction Size ($)			
	⟨50M	50M-250M	250M-1MM	⟩1MM
End User				
Vendor • Wholesale • Retail				
Broker				

Figure 3

MATRIX 2

Product	Customer	
	Public Sector	Private Sector
Lease • Finance • Operating • Tax Oriented – Leveraged – Single Investor		
Conditional Sale		

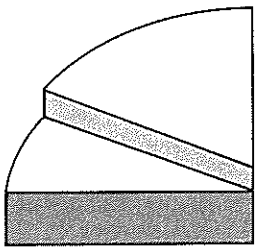
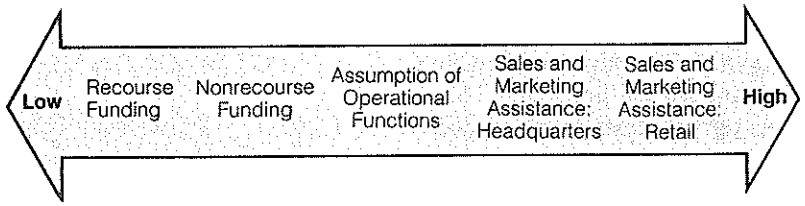


Figure 4

RELATIVE VALUE ADDED TO A VENDOR BY A VENDOR FINANCE SOURCE



heavy selling expenses, with relatively narrow pricing available for a given level of credit risk.

A lessor attempting to source through a *vendor* has two basic options: It can provide wholesale vendor financing programs, with relatively low selling expense, while adding less value to the customer than does a retail program—thereby subjecting itself to greater price sensitivity than with a retail program; or, it can provide retail financing programs, which both add more value to the customer and significantly increase selling expense—thereby increasing both its cost and pricing structures. The relationship between incremental market opportunity, incremental yield, and incremental selling expense will, of course, direct the decision.

The relative value added to the vendor in any vendor program can be schematically displayed, as on the continuum shown in Figure 4, with the recognition that as value is added, pricing becomes less sensitive and the lessor's costs increase.

This is not to say that funding is *per se* low value-added; it is, however, to point out that funding alone will provide minimal differentiation between financing sources, and pricing will tend to be commodity-oriented.

In assessing risks and rewards to the financing source, the vendor program brings an additional item of value to the table: Most are supported by some type of recourse, repurchase, or remarketing agreement, which provides the lessor with a higher level of protection for a given quality of credit than is the case with either most end users or brokers. Vendor finance, in sum, brings a wide range of risk/reward ratios to the financing source.

The third source of business for the lessor is the *broker*. Since the broker lives by the "scalp," the financing source is trading off spread within a given range of credit quality for: (1) A lower marketing cost, and (2) an ability to build portfolio quickly. The primary caution in broker-generated paper is related to credit quality. If acceptable quality business can be generated from this source at returns that meet financing source targets, this can be desirable business. Experience, however, has indicated that such a combination is relatively rare.

One additional point the lessor should note in determining the source(s) upon which it will focus: Operational requirements are quite different with respect to paper generated from a vendor than with paper generated from other sources. Clearly, some financial weight can generally be given to representations and warranties, relating to paper, that are made by the vendor, whereas in the direct market such representations and warranties are nonexistent; and, in the case of brokers, even where they are obtained, they may have questionable financial value. Operating inefficiencies will develop to the extent that the same operating personnel are asked to process contracts generated by different sources. Therefore, defining the target market will not only enable the scoping of marketing costs, but also will help define the scope of operating expense.

Transaction Size

The horizontal axis in Matrix 1 (Figure 2) relates to size of each individual transaction. The target size established by a financing source will be a function of its operational and systems capacity. Generally speaking, the stronger that capacity, the greater will be the ability to manage smaller-ticket transactions effectively. A corollary is that the smaller the ticket size, the less the pricing sensitivity. Each lessor has to determine what size range it can effectively and efficiently handle within available systems and operational capacity. A concomitant issue is what incremental investment would be required to reduce the threshold transaction size that could be efficiently processed by the operation, and what incremental income such investment would produce.

In addition to transaction size being constrained by systems and operational capacity, the credit process also is impacted by transaction size. Clearly, as the average size per transaction decreases, credit scoring and procedures applicable to retail credit become increasingly relevant, since a substantial analytical time investment cannot be justified by the available dollar spread contribution on a small-ticket item.

Customer Class

Once having decided source and transaction-size niches that will define the target market, the focus can turn to the horizontal axis of Matrix 2 (Figure 3)—segmentation by customer class. Again, this segmentation can be cut in many ways. It's useful to make the initial cut between the public and private sector; subsequently, the private sector can be further defined by company size, credit quality, geography, and industry, to name only four variables.

Public-sector finance obviously has the risk of nonappropriation or cancellation. Some financing sources take on this risk; others do not. Some may be willing to invest only a given percentage of their portfolio in this type of paper. Once a decision is made with respect to what the risk appetite should be, that decision links into the segmentation strategy that will define the target market.

Product

The vertical axis of Matrix 2 (Figure 3) addresses the type of product that will be offered. The amount of tax base available to the lessor will determine its tax appetite. Its willingness to take equipment risk will determine its mix of operating leases, true leases and finance leases. The type of equipment also will be a factor in determining targeted product mix: A determination must be made as to what given percentages of the portfolio should be invested in particular types of equipment, from both a residual risk and a credit risk perspective.

Having gone through this process, aided by industry knowledge and whatever meaningful statistics are available, each player can determine which market segments it intends to attack and what resources are required to make the attack effective. A whole set of strategic issues will flow from this process, including staffing requirements, pricing requirements, funding requirements, processing options, risk appetite, and systems needs—to name but a few. After completing this process, the difficult part remains. It is one thing to develop a strategic plan and another to implement it—particularly if significant change is required. Nevertheless, the framework for action will be present.

Conclusion

The risk of writing an article about market segmentation is that it will be either too short, and therefore superficial, or too long, and therefore tedious. This article does not attempt to articulate all variables that should be considered in determining segmentation; instead, it tries to describe a conceptual framework for developing a meaningful segmentation.

The benefit of investing time up front in the planning stage is that, done properly, it will produce a more effective marketing plan and a more efficient back office. Nonplanners may eliminate the effort and accomplish the same results through trial and error. But the fact that "doing" rather than "planning" may have worked in the past does not argue either that it is optimally efficient or that it will work in the future. Times change, and so must the industry. In this increasingly competitive world, those who understand the dynamics of their particular operation and link them effectively with a marketing strategy based on market segmentation will probably have a greater opportunity to optimize performance than those who are not as well focused.

Developing a marketing strategy is much like an athlete developing a training strategy. What works for one person might not work for the next, because of differences in style, structure, or capacity. The athlete who has the best chance of winning is the one who has developed a regimen uniquely suited to his capacities; but even a regimen that is not optimal will probably permit him to finish ahead of those who didn't train at all. The world is filled with one-time successes who eventually failed because they could not anticipate or react to a change in environment. Intelligent planning will minimize the risk of that happening, and increase the odds for continued success.

Single-Investor Lease Accounting: Is it Economically Realistic?

Art Stein

by Lloyd A. Haynes, Jr.

The formal guidelines for accounting for leases by lessors go back to the Accounting Principles Board (APB) Opinions No. 7 (*Accounting for Leases in Financial Statements of Lessors*, issued May, 1966) and 27 (*Accounting for Lease Transactions by Manufacturer or Dealer Lessors*, issued November, 1972). As discussed more fully below, these guidelines essentially dictate that leases be accounted for by a lessor like a loan. The Financial Accounting Standards Board (FASB) in its Statement No. 13 (*Accounting for Leases*, issued November, 1976), with several exceptions (including leveraged leases), endorsed the APB approach to lessor accounting. In paragraph 97, the FASB states: . . . *the accounting provisions of this Statement applicable to lessors, with the principal exceptions noted below, generally follow those of the two APB Opinions.* Thus, the formalized approach to accounting for the single-investor leases by lessors required today has its roots in the 1960s.

The discussion which follows addresses the question of whether lessor accounting for single-investor leases represents economic reality. Due to space constraints, it will be accepted for purposes of this article that the best indicator of economic reality is "yield."[1]

The accounting unquestionably does not represent economic reality in the case of single-investor leases. The case of leveraged leases is not as clear cut. Leveraged lease accounting comes closer to economic reality than virtually any other generally accepted accounting principle methodologies in use today. This is not to say no problems exist, however, this article will limit itself to single-investor lease accounting treatment.

Single-Investor Accounting

Single-investor accounting for leases is computed based upon the pretax cash flow from a lease. The only exception to this is that, if investment tax credit (ITC) is taken, it is netted out against the initial investment by the lessor. Once the net initial outlay for the equipment is determined, the rents are set, and an estimate of the equipment residual value is made, an internal rate of return (IRR) is computed on these cash flows. For all intents and purposes this is a pretax yield computation. For a transaction which is clearly tax-oriented, use of this yield to accrue income has little logical appeal. The lessor is not making its investment decision on pretax cash flows, but rather after-tax cash flows. Nor, to the extent this methodology is recognizing the tax cash flow from ITC, is it even accurate. This is because a lessor can never receive all of its ITC on day one of a lease. Under the Internal Revenue Code, it can only net ITC proportionately against its estimated and make-up tax payments over time.

A fuller understanding of single-investor lease accounting can be gained by looking at an actual transaction. Consider the single-investor lease transaction outlined in Table 1. The cash flows associated with the transaction are derived in Table 2. The single-investor yield is 13.9% based on pretax cash flow net of ITC and is used to compute the allocation of pretax earnings on investment in Table 3 as with a variable payment

The author is a vice president of Chase Manhattan Capital Markets Corp. in New York City. He heads the Chase Lease Advisory Service, which provides financial advisory services to lessors and lessees and offers industry leasing seminars. Prior to joining Chase, he had seven years of leasing experience, working for PruCapital, Inc., Xerox Credit Corp. and Equilease Corp. In addition, he is currently authoring a book on equipment leasing to be released by Probus Publishing of Chicago during the latter half of 1985.

Table 1

SINGLE INVESTOR LEASE TERMS AND ASSUMPTIONS

Cost of leased equipment	$1,000,000
Lease term	7 years
Lease rental payments	$190,661, annually in arrears
Residual value	$200,000 estimated to be realized at lease termination
Depreciation allowable to lessor for income tax purposes	Five-year accelerated cost recovery system on 95% of original equipment cost, due to depreciable basis being reduced by 50% of ITC taken
Lessor income tax rate	46% paid annually (assumed to continue in existence throughout the lease term)
Investment tax credit	10% of equipment cost or $100,000
Initial direct costs	For simplicity, initial direct costs have not been included in this example
Multiple investment yield	17% pretax, 9.18% after-tax

Table 2

SINGLE-INVESTOR LEASE CASH FLOW STATEMENT

Year	Asset Cost & Residual	Rent	Pretax Cash Flow	Depreciation	Taxable Income (Loss)	Income Tax Benefit (Liability) @ 46%	ITC	After-Tax Cash Flow
0	(1,000,000)		(1,000,000)					(1,000,000)
1		190,661	190,661	(142,500)	48,161	(22,154)	100,000	268,507
2		190,661	190,661	(209,000)	(18,339)	8,436		199,097
3		190,661	190,661	(199,500)	(8,839)	4,066		194,727
4		190,661	190,661	(199,500)	(8,839)	4,066		194,727
5		190,661	190,661	(199,500)	(8,839)	4,066		194,727
6		190,661	190,661		190,661	(87,704)		102,957
7	200,000	190,661	390,661		390,661	(179,704)		210,957
	(800,000)	1,334,627	534,627	(950,000)	584,627	(268,928)	100,000	365,699

Quote to Lessee:	7.7848%
Yields Based on After-Tax Cash Flow	
After-Tax IRR:	9.1800%
Pretax IRR:	17.0000%
Yields Based on Pretax Cash Flow	
Pretax	10.8514%

Table 3

SINGLE-INVESTOR LEASE INCOME STATEMENT

(based on single-investor lease accounting methodology)

	Allocation of Pretax Cash Flow to Earnings on & Return of Investment				Allocation of Pretax Earnings to Pretax Income, ITC, & Tax Payments on a Pro Rata Basis				
Year	Pretax Cash Flow (Including ITC)	Pretax Earnings on Investment at 13.9179%	Amortization of Investment	Investment Balance	Pretax Income	Tax Effect at Effective Rate of 50.3021%	ITC	After-Tax Income	Cumulative After-Tax Income
0	(900,000)		(900,000)	900,000					
1	190,661	125,261	65,400	834,600	105,523	(53,080)	19,738	72,181	72,181
2	190,661	116,159	74,502	760,097	97,855	(49,223)	18,303	66,935	139,116
3	190,661	105,789	84,872	675,226	89,120	(44,829)	16,670	60,960	200,076
4	190,661	93,977	96,684	578,542	79,169	(39,824)	14,808	54,154	254,230
5	190,661	80,521	110,140	468,402	67,833	(34,121)	12,688	46,399	300,629
6	190,661	65,192	125,469	342,932	54,919	(27,625)	10,272	37,566	338,195
7	390,661	47,729	342,932	0	40,208	(20,225)	7,521	27,503	365,699
	634,627	634,627	0		534,627	(268,928)	100,000	365,699	

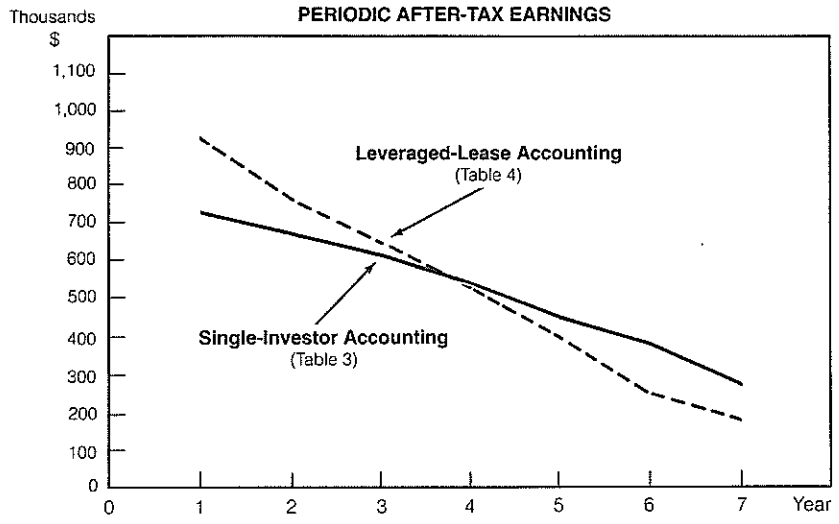
Table 4

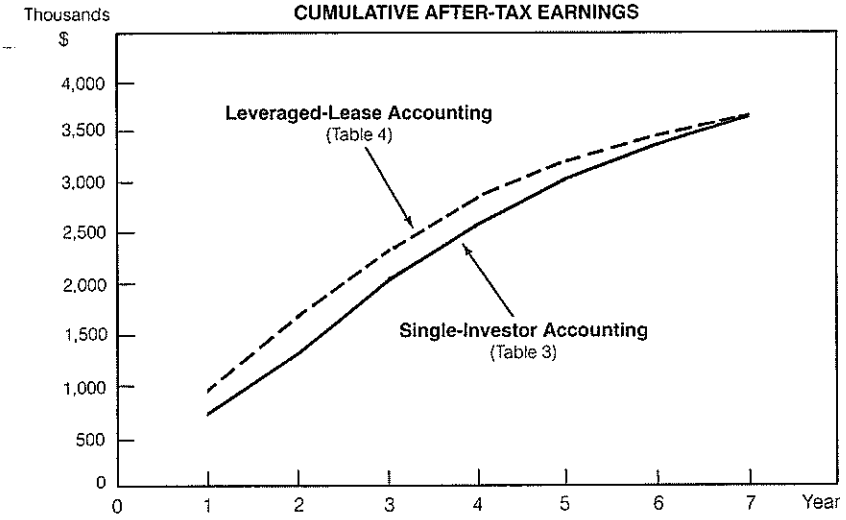
SINGLE-INVESTOR LEASE INCOME STATEMENT

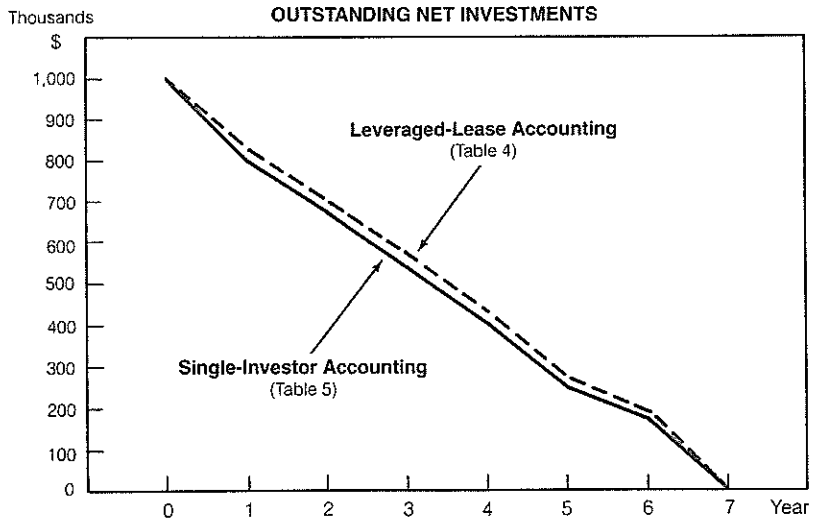
(based on leveraged-lease accounting methodology)

	Allocation of After-Tax Cash Flow to Earnings on & Return of Investment				Allocation of After-Tax Earnings to Pretax Income, ITC, & Tax Payments on a Pro Rata Basis				
Year	After-Tax Cash Flow	After-Tax Earnings on Investment at 9.1800%	Amortization of Investment	Investment Balance	Pretax Income	Tax Effect at Effective Rate of 50.3021%	ITC	Cumulative After-Tax Income	Prior Investment Balance Plus Accrued Earnings
0	(1,000,000)		(1,000,000)	1,000,000					1,000,000
1	268,507	91,800	176,707	823,293	134,205	(67,508)	25,103	91,800	1,091,800
2	199,097	75,578	123,519	699,774	110,490	(55,579)	20,667	167,377	898,871
3	194,727	64,239	130,488	569,286	93,913	(47,240)	17,566	231,616	764,012
4	194,727	52,260	142,467	426,819	76,401	(38,431)	14,291	283,877	621,546
5	194,727	39,182	155,545	271,274	57,281	(28,814)	10,714	323,058	466,001
6	102,957	24,903	78,054	193,219	36,406	(18,313)	6,810	347,961	296,176
7	210,957	17,737	193,219	0	25,931	(13,044)	4,850	365,699	210,957
	365,699	365,699	0		534,627	(268,928)	100,000		

Figure 1


PERIODIC AFTER-TAX EARNINGS
Thousands
$
1,100
1,000
900
800
700
600
500
400
300
200
100
0
Leveraged-Lease Accounting
(Table 4)
Single-Investor Accounting
(Table 3)
0
1
2
3
4
5
6
7
Year


CUMULATIVE AFTER-TAX EARNINGS
Thousands
$
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Leveraged-Lease Accounting
(Table 4)
Single-Investor Accounting
(Table 3)
0
1
2
3
4
5
6
7
Year


OUTSTANDING NET INVESTMENTS
Thousands
$
1,000
900
800
700
600
500
400
300
200
100
0
Leveraged-Lease Accounting
(Table 4)
Single-Investor Accounting
(Table 5)
0
1
2
3
4
5
6
7
Year

loan. The pretax income, tax effect, and ITC columns simply involve accruing the total figures from the same columns in Table 2 on the same pro-rata basis as the pretax earnings on investment column. Thus pretax earnings of $125,261 in year one represent 19.738% of total pretax earnings of $634,627, so 19.738% of the $100,000 in ITC or $19,738 is booked as income, etc. The initial outlay of $900,000 is, of course, the $1,000,000 equipment cost minus the $100,000 in ITC.[2] The total tax effect of $268,928 is 50.3% of the total pretax income of $534,627. This is higher than the 46% statutory rate because, if a lessor takes 10% ITC, it must reduce its asset's depreciable basis for tax purposes by one-half the ITC taken. The column representing after-tax income is derived by summing the three columns showing the allocation of pretax income to taxable income, tax effect, and ITC.

Given that the after-tax cash flow for the transaction in Table 2 would appear to be much more front-loaded than the pretax cash flow, a corresponding question would be what is the internal rate of return on the after-tax cash flow? It is 9.2% after-tax, or, grossed up, 17.0% pretax. That is considerably higher than the 13.9% pretax yield computed on pretax cash flows. Using this yield to allocate after-tax cash flows between after-tax earnings and return of investment, gives the results in Table 4. The allocation of earnings in the last three columns (pretax income, tax effect, and ITC) is done on the same pro-rata basis as after-tax earnings. This is analogous to the methodology in Table 3. In leveraged-lease accounting, the yield just computed is called the multiple-investment yield. The internal rate of return and multiple-investment yield become the same when no sinking fund (i.e., negative investment) phase is created. Thus, Table 4 follows the same accounting approach as the FASB dictates for a leveraged lease.

Comparing the Approaches to Booking Income

Figure 1 shows a graphic comparison of the periodic and cumulative after-tax accounting earnings which would result from each of the two approaches outlined above. It is interesting to note that, based on the leveraged-lease accounting approach, after-tax book earnings are higher for the first three years than on a single-investor basis. On a cumulative basis this advantage persists throughout the lease term.

Single-investor accounting actually has very little underlying logic. As indicated above, it is an attempt to account for a lease like a loan. However, unlike a loan, lease yield is significantly impacted by tax cash flows. This does not mean that in using single-investor accounting some after-tax cash flows are unaccounted for, it simply means that they are allocated differently. The total allocation of after-tax cash flow is very transparent with leveraged-lease accounting. This is not the case with single-investor accounting.

As a first step in understanding the allocation of after-tax cash flow under single-investor accounting, it is useful to set up a balance sheet for the transaction. This is shown in Table 5. The two sides of the balance sheet are fairly straightforward, except for the net funds invested and the deferred taxes columns. Deferred taxes are computed by taking the cumulative difference between the tax liability accrued for accounting purposes in Table 3 and those actually paid in Table 2. This is cash to the lessor which is not recognized in the pretax amortization of investment in Table 3. Thus, the deferred tax figure must be netted against book investment to obtain actual cash investment. On a single-investor accounting basis, it is

Table 5

SINGLE-INVESTOR LEASE BALANCE SHEET
(based on single-investor lease accounting)

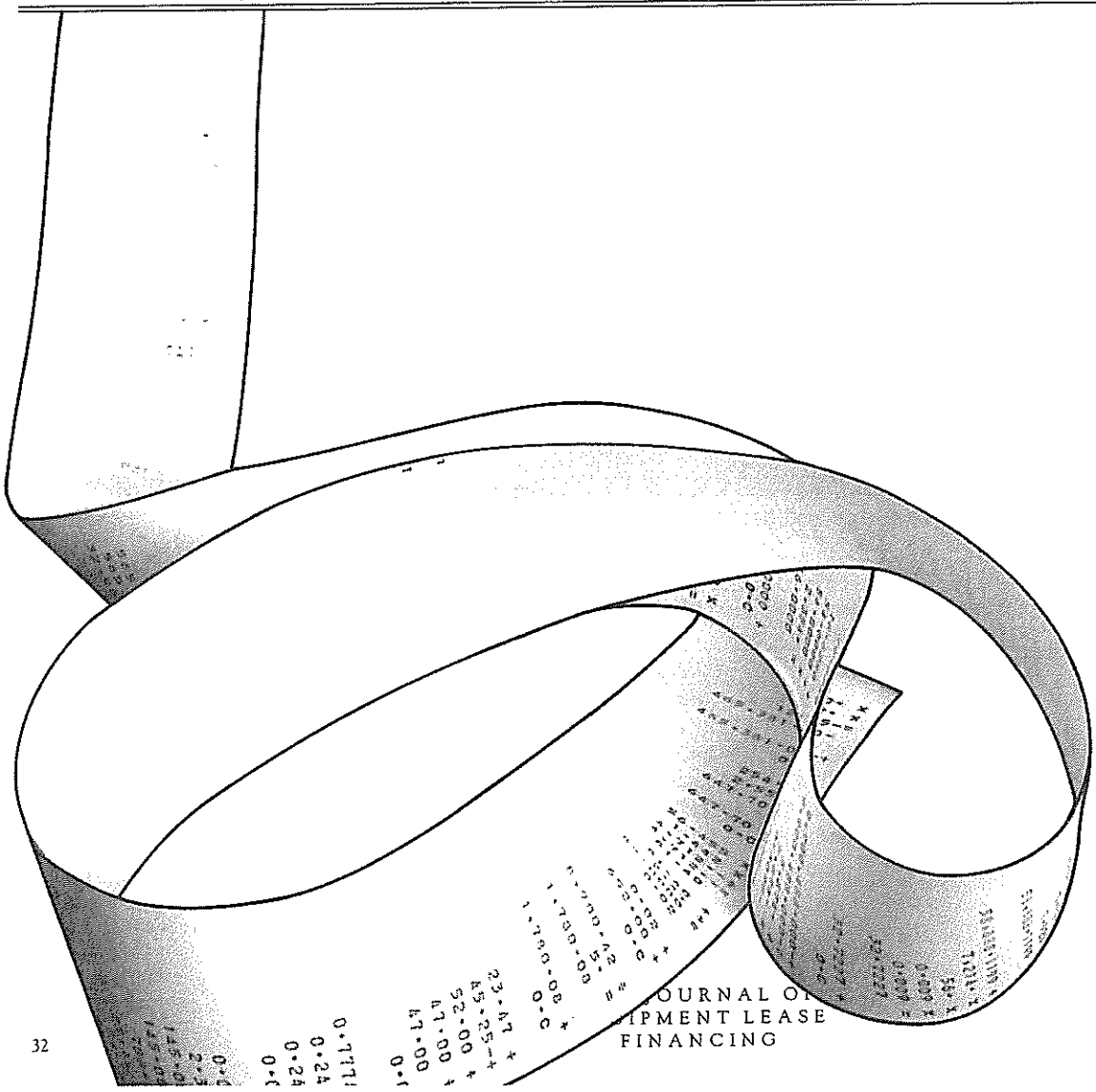
	ASSETS					LIABILITIES & OWNER EQUITY		
Year	Gross Rents Receivable	Residual Receivable	Unearned Income	Deferred ITC	Net Assets	Net Funds Invested	Deferred Taxes	Net Lease Investment
0	1,334,627	200,000	(534,627)	(100,000)	900,000	900,000	0	900,000
1	1,143,966	200,000	(429,104)	(80,262)	834,600	803,674	30,926	834,600
2	953,305	200,000	(331,249)	(61,959)	760,097	671,512	88,585	760,097
3	762,644	200,000	(242,129)	(45,289)	675,226	537,745	137,480	675,226
4	571,983	200,000	(162,960)	(30,481)	578,542	397,172	181,370	578,542
5	381,322	200,000	(95,127)	(17,793)	468,402	248,844	219,557	468,402
6	190,661	200,000	(40,208)	(7,521)	342,932	183,454	159,479	342,932
7	0	0	0	0	0	0	0	0

Table 6

ALLOCATION OF AFTER-TAX CASH FLOW TO NET LEASE INVESTMENT

(based on single-investor accounting methodology)

	from Income Statement Based on Single-Investor Lease Accounting Methodology		from Single-Investor Accounting-Based Balance Sheet	Cash Flow to Investment (= After-Tax Cash Flow from Cash Flow Statement)	Cash Flow to Reduce (Increase) Investment	Net Lease Investment (= Amount Carried on Single-Investor Accounting-Based Balance Sheet)
Year	After-Tax Earnings on Investment	Amortization of Investment	Increase (Decrease) in Deferred Taxes			
0		(1,000,000)		(1,000,000)		
	ITC:	100,000		100,000	(900,000)	900,000
1	72,181	65,400	30,926	168,507	96,326	803,674
2	66,935	74,502	57,659	199,097	132,162	671,512
3	60,960	84,872	48,895	194,727	133,767	537,745
4	54,154	96,684	43,889	194,727	140,573	397,172
5	46,399	110,140	38,187	194,727	148,328	248,844
6	37,566	125,469	(60,079)	102,957	65,391	183,454
7	27,503	342,932	(159,479)	210,957	183,454	0
	365,699	0	0	365,699	0	



the after-tax actual cash investment (i.e., net funds invested) figure from Table 5 which is comparable to the investment balance figure in Table 4.

Further clarification can be gained by looking at Table 6. This table reconciles the cash flow to investment under single-investor accounting to the after-tax cash flow figure used to amortize investment under leveraged-lease accounting. When the change in deferred taxes is added to the after-tax earnings accrued and the amortization of investment, the net result is equal to after-tax cash flow. Whether leveraged-lease accounting or single-investor accounting is used, the incoming cash must be allocated to return on or reduction of investment. The only difference is how much of the cash flow is attributed to earnings and how much to return of invested funds. This has interesting implications for the computation of stipulated loss values.

Stipulated Loss Values for a Single-Investor Lease

Stipulated loss values (SLVs) are computed to protect lessor economics in a transaction in the event of a casualty. They are computed so that, on an after-tax basis, the lessor comes out whole. In other words, after recognizing any tax implications of the equipment destruction and receipt of the SLV by the lessor, there are just enough funds left over to recover the lessor's outstanding investment including any accrued earnings.

Given our definition of lessor economics, it should be readily apparent that SLVs based on the multiple-investment yield will maintain both lessor economics and book income for a leveraged lease. For all intents and purposes the economic and accounting measures of a leveraged lease transaction are one and the same. There are, however, frequently questions as to how SLVs for single-investor lease transactions should be computed. There is often concern as to whether the common practice of basing all SLVs, whether for leveraged or single-investor transactions, on the multiple-investment yield really offers protection.

It should be clear that SLVs based on the multiple-investment yield will always protect the economics of a transaction. For single-investor leases, the question is whether the lessor can be assured that no book loss will be incurred if a casualty occurs. However, there is no need for concern in this regard. Single-investor accounting's primary computations are done on a pretax basis, thus its primary outstanding investment figure is pretax. What counts is after-tax investment. Two major points to remember are: (1) Single-investor accounting books after-tax earnings more slowly than leveraged-lease accounting; and (2) The after-tax cash flows to be allocated are identical in either case (see Table 6). Therefore, using single-investor accounting on an after-tax basis, funds are applied more rapidly to recovery of investment than under leveraged-lease accounting. This implies that, except at the beginning or end of the lease term, the lessor's outstanding investment balance will be consistently lower using single-investor accounting than using leveraged-lease accounting. This can be verified by comparing the net funds invested figure on the balance sheet in Table 5 (an after-tax, single-investor, accounting-based figure) with the investment balance in Table 4 (a leveraged-lease, after-tax, accounting figure). A graphic representation of this is shown in Figure 1. While basing SLVs on the lower after-tax, single-investor accounting, net funds invested balance would protect book earnings, this is not a rational economic decision. In a true economic sense, the lessor expected to earn a higher rate of return during the given time span. Thus basing SLVs on the after-tax, leveraged-lease accounting investment balance makes the most sense. These higher SLVs will result in a book accounting gain for a single-investor lease, but no economic gain. The after-tax book gain which would result will be equal to the difference between the outstanding after-tax investment

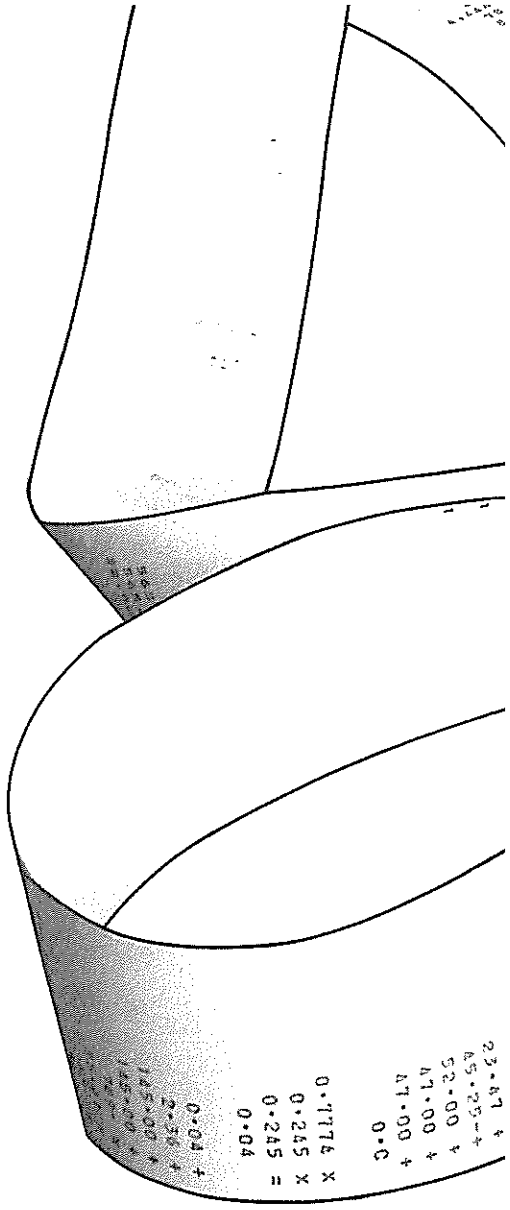


Table 7

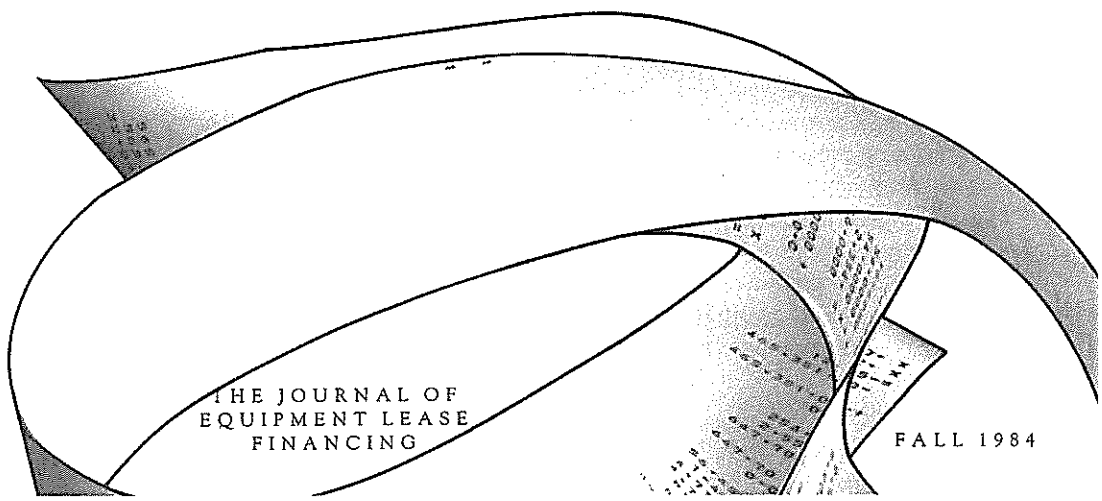
COMPUTATION OF STIPULATED LOSS VALUES UNDER LEVERAGED-LEASE ACCOUNTING

	Nontax-Adjusted Components of SLV			Tax-Adjusted Components of SLV			
Year	Unrecovered Investment	ITC Recaptured	Additional Basis Writeoff	Investment /.54	ITC/.54	Writeoff X (.46/.54)	SLV
0	1,000,000	0	(1,000,000)	1,851,852	0	(851,852)	1,000,000
1	823,293	100,000	(857,500)	1,524,616	185,185	(730,463)	979,338
2	699,774	80,000	(638,500)	1,295,877	148,148	(543,907)	900,118
3	569,286	60,000	(429,000)	1,054,233	111,111	(365,444)	799,899
4	426,819	40,000	(219,500)	790,405	74,074	(186,981)	677,498
5	271,274	20,000	(10,000)	502,359	37,037	(8,519)	530,877
6	193,219			357,814			357,814
7	108,000			200,000			200,000

Table 8

PROOF OF STIPULATED LOSS VALUES IN TABLE 7

Year	SLV	Final Rent	Pretax Cash Flow	Total Basis Writeoff in Year	Taxable Income (Loss)	Income Tax Benefit (Liability)	Net ITC Recapture	After-Tax Cash Flow
0	1,000,000		1,000,000	(1,000,000)	0	0	0	1,000,000
1	979,338	190,661	1,169,999	(1,000,000)	169,999	(78,200)	0	1,091,800
2	900,118	190,661	1,090,779	(847,500)	243,279	(111,908)	(80,000)	898,871
3	799,899	190,661	990,560	(628,500)	362,060	(166,548)	(60,000)	764,012
4	677,498	190,661	868,159	(419,000)	449,159	(206,613)	(40,000)	621,546
5	530,877	190,661	721,538	(209,500)	512,038	(235,538)	(20,000)	466,001
6	357,814	190,661	548,475		548,475	(252,298)		296,176
7	200,000	190,661	390,661		390,661	(179,704)		210,957



balances under each of the two accounting methods.

The method of computing SLVs to maintain the economics, or to maintain the book income, of a single-investor lease is the same except for the handling of lessor outstanding investment. Thus, for simplicity, initial concern will focus upon only the computation of SLVs to maintain the multiple-investment yield of a transaction. If an SLV for each period can be found which is sufficient to pay off the lessor's outstanding investment plus accumulated earnings, economic yield will be maintained.

The computation of the SLVs needed to protect lessor economic yield is shown in Table 7 and their proof in Table 8. Three clarifications concerning the tables should be made.

First, a conservative assumption for purposes of vesting ITC was made; namely that vesting of portions of ITC does not take place until the day after the equipment acquisition anniversary date. Note, too, that the recapture of the ITC is an after-tax number. Since $1.00 in SLV results in only $0.54 after-tax, any ITC recapture must be grossed up. Thus each dollar of ITC recaptured will require $1.85 ($1.00/0.54) in SLV for the lessor to come out whole. The same logic would apply to recouping the lessor's outstanding investment.

Second, the handling of depreciation may seem confusing. Keep in mind that the depreciable basis is increased by one-half of any ITC recaptured and that our concern here is with cash flow. Depreciation in and of itself results in no cash flow. It generates cash flow only to the extent it reduces the lessor's taxes. The cash flow from writing off $1.00 of depreciable basis is only $0.46. This is an after-tax figure and must be divided by .54 to gross it up to a pretax figure. As a result, $1.00 in depreciable basis writeoff only reduces the required SLV by $0.85.[3]

Third, Table 8 proves the SLV by computing the after-tax cash flow resulting from a casualty and showing that it covers outstanding investment plus accrued earnings from Table 4.

Table 9

COMPARISON OF STIPULATED LOSS VALUES
(Based on Single-Investor & Leveraged-Lease Accounting & the Economic Yield Protected by Each)

	Leveraged-Lease Accounting		Single-Investor Accounting			
Year	SLV	Protected Yield Based on After-Tax Cash Flows	SLV	Protected Yield Based on After-Tax Cash Flows	Understatement of SLV Needed to Maintain Economic Yield Using Single-Investor Accounting	Net Loss in Economic Yield Due to Basing SLVs on Single-Investor Accounting
0	1,000,000		1,000,000		0	
1	979,338	9.1800%	943,007	7.2181%	36,332	1.9619%
2	900,118	9.1800%	847,782	7.6927%	52,336	1.4873%
3	799,899	9.1800%	741,491	8.0357%	58,408	1.1443%
4	677,498	9.1800%	622,596	8.3486%	54,902	0.8314%
5	530,877	9.1800%	489,342	8.6610%	41,536	0.5190%
6	357,814	9.1800%	339,729	8.9853%	18,085	0.1946%
7	200,000	9.1800%	200,000	9.1800%	0	0.0000%

The fundamental assumptions underlying this table are that, as of the casualty date, the lessor receives the rent due it, the SLV due it, writes off any remaining depreciable basis, and pays any tax liability due (including ITC recapture).

In order to compute SLVs based upon book net funds invested, substitute this figure for unrecovered investment in the tables. The book net funds invested figure from Table 5 is appropriate for this purpose, since the deferred tax figure on the balance sheet disappears when all the tax payments associated with a casualty are made. While detailed tables deriving and proving these values are not provided, the actual figures are contained in Table 9, and can be verified easily. Another column is also provided showing the lessor's actual economic yield based on these SLVs, assuming a casualty in any given period. Note that the economic yield would be consistently lower, even though no book loss would result.

Lessor Maximum Default Exposure

A more neglected issue is the lessor's maximum default exposure. Using leveraged-lease accounting, it is the same for both book and economic purposes. However, this is not true for single-investor accounting. The book default exposure for a single-investor lease is consistently less than the economic default exposure.

Tables 10 and 11 show the maximum economic default exposure of the lessor and a proof thereof. These are fairly straightforward. They assume that the lessee defaults, the lessor does not receive its latest rent (or any succeeding rents), the equipment proves to be worthless, any remaining depreciable basis is written off, and any tax benefit (net of ITC recapture) is received. Obviously, to the extent the equipment being leased has some value, the maximum default exposure would be reduced.

One caveat in analyzing Table 10 is that maximum default exposure is being computed on an after-tax cash flow basis. Thus the handling of items is somewhat different from the SLV table (Table 7). Loss of the lessor's outstanding investment results in no tax benefit and so on an after-tax basis is simply the amount written off. (Remember that the lessor received a depreciation writeoff on its investment.) ITC is likewise already an after-tax number. Depreciation, on the other hand, results in an after-tax cash inflow of $0.46 per $1.00 of basis written off.

For purposes of Table 11 (proof of maximum default exposures) any after-tax cash flow upon a default results solely from the tax consequences of liquidation of the lessor's position. Thus lessor default exposure can be looked at as simply its outstanding investment less any tax benefits received.

It is interesting to note that for much of the lease term, the lessor's default exposure is less than its outstanding investment plus accrued earnings. This is due to the fact that for the first five years of the lease term, the lessor is still eligible for depreciation tax writeoffs upon default. However, once all depreciation has been taken this will no longer be true. (The recapture of ITC would always work against the lessor.)

Table 10

COMPUTATION OF MAXIMUM DEFAULT EXPOSURE UNDER LEVERAGED-LEASE ACCOUNTING

	Nontax Adjusted Exposure Components			Tax-Adjusted Exposure Components			
Year	Unrecovered Investment	ITC Recaptured	Basis Writeoff	Investment	ITC	(Writeoff X .46)	Maximum After-Tax Default Exposure
0	1,000,000	0	(1,000,000)	1,000,000	0	(460,000)	540,000
1	1,091,800	0	(1,000,000)	1,091,800	0	(460,000)	631,800
2	898,871	80,000	(847,500)	898,871	80,000	(389,850)	589,021
3	764,012	60,000	(628,500)	764,012	60,000	(289,110)	534,902
4	621,546	40,000	(419,000)	621,546	40,000	(192,740)	468,806
5	466,001	20,000	(209,500)	466,001	20,000	(96,370)	389,631
6	296,176			296,176			296,176
7	210,957			210,957			210,957

Table 11

PROOF OF MAXIMUM DEFAULT EXPOSURE FIGURES IN TABLE 10

Year	SLV Received	Rent Received	Pretax Cash Flow	Total Basis Writeoff in Year	Taxable Income (Loss)	Income Tax Benefit (Liability)	Net ITC Recapture	After-Tax Cash Flow	Outstanding Investment Plus Accrued After-Tax Earnings	Maximum After-Tax Exposure
0	0		0	(1,000,000)	(1,000,000)	460,000	0	460,000	1,000,000	540,000
1	0	0	0	(1,000,000)	(1,000,000)	460,000	0	460,000	1,091,800	631,800
2	0	0	0	(847,500)	(847,500)	389,850	(80,000)	309,850	898,871	589,021
3	0	0	0	(628,500)	(628,500)	289,110	(60,000)	229,110	764,012	534,902
4	0	0	0	(419,000)	(419,000)	192,740	(40,000)	152,740	621,546	468,806
5	0	0	0	(209,500)	(209,500)	96,370	(20,000)	76,370	466,001	389,631
6	0	0	0		0	0		0	296,176	296,176
7	0	0	0		0	0		0	210,957	210,957

Table 12

COMPARISON OF MAXIMUM BOOK DEFAULT EXPOSURE
(Single-Investor Accounting versus Leveraged-Lease Accounting)

Year	Maximum After-Tax Default Exposure Based on Leveraged-Lease Accounting	Maximum After-Tax Default Exposure Based on Single-Investor Accounting	Understatement of Economic After-Tax Default Exposure Using Single-Investor Accounting
0	540,000	540,000	0
1	631,800	612,181	19,619
2	589,021	560,759	28,262
3	534,902	503,362	31,540
4	468,806	439,159	29,647
5	389,631	367,201	22,429
6	296,176	286,411	9,766
7	210,957	210,957	0

Analogous to computing SLVs, in order to evaluate book default exposure, substitute book unrecovered net investment figures based on single-investor accounting for those based on leveraged-lease accounting. As was done with SLVs, although derivations and proofs are not given, the default exposures based on net funds invested using single-investor accounting are shown in Table 12. Also shown are the default exposures from Table 10 and the amount by which the book loss for a casualty in any given period would understate the lessor's true economic loss.

Conclusions

Single-investor lease accounting has little to recommend it. It is an attempt by the accounting profession to impose nontax-based loan accounting treatment on a tax-based transaction. It would be simpler, and economically more realistic, to account for all leases using leveraged-lease accounting.

Taxes are a motivating force behind single-investor leases, and should be recognized in the accounting for them as they are in the accounting for leveraged leases. In addition, the concept of matching income to the period it is earned would be better served.

Footnotes

1. This is in deference to common industry practice. However, this is not necessarily true, in general, since the lessor is dealing with limited resources, i.e., investable capital and tax base. For example, assume that one has $1,000,000 to invest and has a choice between three one-year investments of equal risk. The first investment requires $1.00 and yields 100%, the second requires $999,999.00 and yields 10%, and the third requires $1,000,000.00 and yields 15%. Even though it does not have the highest yield, the 15% choice is clearly best, returning $150,000. The 100% choice is intuitively appealing, but it precludes investing in the 15% alternative. The only feasible selection is then a combination of the 100% and 10% investments, which returns only $100,000.90.

2. This is one widely used approach to handling ITC. FASB Statement No. 13 leaves itself open to interpretation. Thus, some lessors may time their netting of ITC against investment differently. However, this would not affect any of the conclusions reached.

3. Note that one-half of the ITC recaptured is added back to the tax book value of the asset. This can be illustrated by deriving the additional basis writeoff for year one of $857,500 as shown in Table 7. In the example, the full 10% ITC was taken. The asset's basis must be reduced to $950,000. Therefore, the asset's tax book value at the end of one year is $807,500 ($950,000 - $142,500). However, in the event of an early termination, the asset's tax book value is increased by one-half of any ITC recaptured—in this case $50,000.

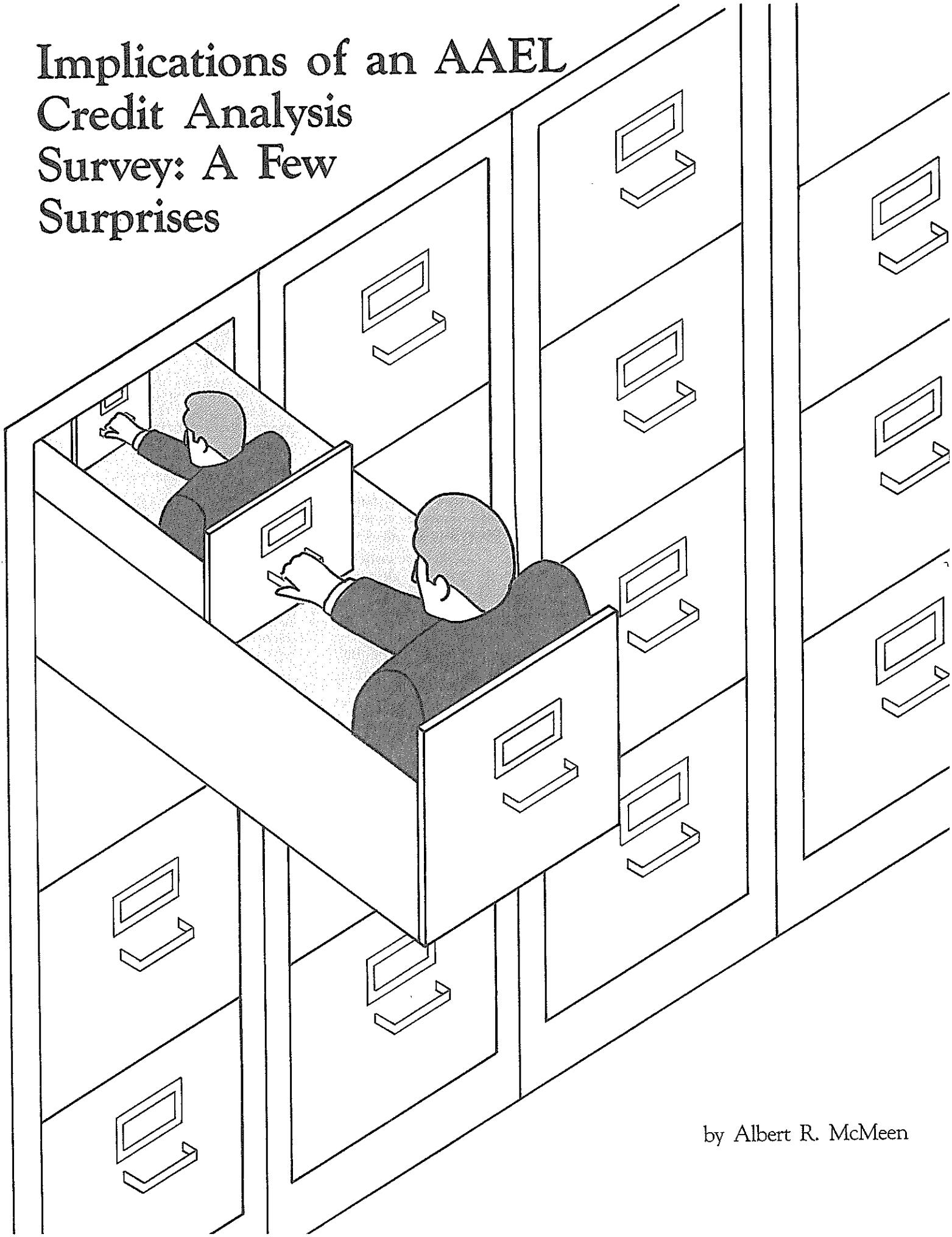
References

Haynes, Lloyd A., Jr., "Analyzing the Economics of Leases: A Portfolio Approach," *The Leasing and Financial Services Monitor*, May/June, 1983

Haynes, Lloyd A., Jr., "Stipulated Loss Values and Measuring Lessor Default Exposure," *The Leasing and Financial Services Monitor*, January/February, 1984.

Haynes, Lloyd A., Jr., "Yield Analysis in Leasing: Methods and Assumptions," *The Leasing and Financial Services Monitor*, September/October, 1983.

Implications of an AAEL Credit Analysis Survey: A Few Surprises



by Albert R. McMeen

For several years the American Association of Equipment Lessors (AAEL) has considered producing more information regarding credit extension in the equipment leasing industry. To initiate activity in this area, in April of 1983, AAEL mailed a Credit Analysis Survey (Appendix A) to 250 of its members. Ninety-two complete responses were received, generating a return rate of 37%.

Technical Aspects

A major problem of any survey is the extent to which it truly represents the overall universe of the audience. The present sample is approximately equal to 10% of the equipment leasing industry population. The Credit Survey stimulated a response mix of 46% independents, 40% bank subsidiaries, and 14% captives—a reasonable matching. From a portfolio size perspective, respondents to the Credit Analysis Survey can be categorized as shown in Figure 1.

Industry-Wide Results

There were a number of industry-wide findings which deserve discussion. For example, 60% of all respondents have no credit manuals. In addition, 86% of the respondents had no credit training manuals. This lack of guidelines raises the question of quality of process, and has implications affecting the industry's profit performance in the long term, as entrepreneurs pass on the reins to professional management.

On the other hand, 77% of the respondents required financial statements on transactions over $10M. The dominance of the financial statement requirement is a clear indication that, while the credit process may not be formally documented, credit controls are in place.

A significant question, and the most difficult to quantitatively assess, concerned information priorities in arriving at a credit decision. Respondents were asked to rank a list of thirteen identified criteria in reaching a credit decision. Part of the assessment problem relates to the manner in which respondents made their rankings. Based on interpretation and extrapolation of the survey data, it appears that the three most significant criteria were: *Financial statement spread* (26%); *bank references* (15.5%); *years in business* (12.2%). Figure 2 illustrates the results of these categories of credit priorities, as well as the remaining items in the top nine. It was of particular interest to note the low ranking of *equipment analysis* and *other lender history*.

The credit philosophy section of the survey offered the contrasting possibilities of: (1) Reducing risk through diversifying the portfolio by industry and geography, and (2) reducing risk through specializing in an industry or area to gain expertise. Overall, 60% of the respondents felt that spreading of risk among clients was an important component of portfolio quality. Spread of risk by industry or geography, however, only elicited a 40% response; and only 16% believed that industry specialization was the optimal way to reduce risk. This low percentage was unexpected, because 33% of the respondents had a 50% concentration of one industry in their portfolio. It is questionable whether respondents believed that while spread of risk may be important from a credit standpoint, credit parameters are not as important as volume. Furthermore, regardless of spread risk, 49% of the respondents agreed that "Historical performance analysis is the best way to predict likelihood of repayment."

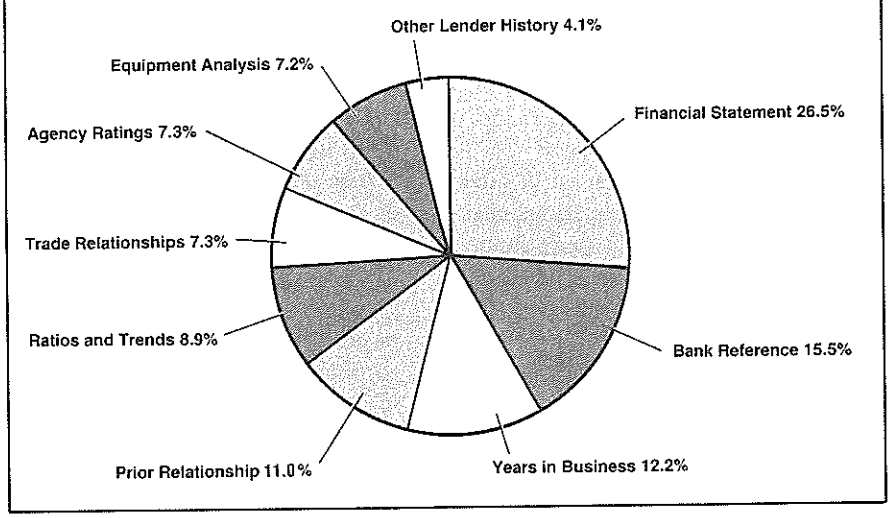
Figure 1

PERCENTAGE OF RESPONDENTS	$ PORTFOLIO SIZE
24	⟨5MM
28	6-20MM
24	21-100MM
24	⟩100MM

The author has a 12-year background in equipment leasing, and recently has written a text entitled The Treasurer and Controller's New Equipment Leasing Guide, *published by Prentice-Hall.*

Figure 2

IMPORTANCE OF CREDIT DECISION TOOLS



In the area of credit operations, 46% of the respondents suggested that the credit department is a support staff to help make the transactions "doable." This open-minded attitude contrasts with the response on credit decentralization, where only 7.6% supported decentralization.

Twenty-five percent of the respondents supported the proposition that: "Credit people keep salespeople from giving away the shop." However, the input of salespeople was considered of value to either the analysis or collection activity by approximately 33% of the respondents. It is interesting that more credit people state that their role is to intelligently support sales than will listen to the salesperson.

Subgroupings

Because of the healthy response, survey responses were segmented into four subgroups using portfolio size, type of company, transaction size, and degree of industry specialization as criteria. The rest of this article focuses on these areas.

The analysis process is based upon how each subgroup evaluated each issue in relation to the other subgroups.

Segmentation by Portfolio Size

The first subgroup based upon portfolio size fell into four categories: (1) Less than $5MM, (2) $6-20MM, (3) $21-100MM, and (4) over $100MM. Respondents were distributed evenly among banks and independents, but, not surprisingly, the smaller-sized firms were under-represented in the captive category, while the larger-sized firms were over-represented in that category. The banks did have a small bulge in representation in the $21-100MM size firms.

With respect to the average transaction size, smaller firms dominated the smaller average transaction size segment, and the larger firms dominated the larger average transaction size segment. (In fact, there are no small firms which have average size transactions over $150M, while 74% of the largest sized firms have average transaction sizes of over $150M.) The primary deviation from the expected distribution curve was the 60% concentration of the $6-20MM size firm in the average $10-75M average ticket size.

Concerning the specialty areas, the distribution of the various sized firms indicated nothing unusual. It is noteworthy, however, that the largest firms predominated in the 30-50% concentration segment, and were under-represented in the less than 30% concentration segment (which is hereafter referred to as the "nonspecialized segment").

To analyze the credit profile section by segment, graphic visualization may be helpful. Figure 3 clearly shows that the larger the firm, the more formalized the credit process. However, there is an absence of training manuals throughout the population. Figure 3 also shows the relatively heavy weighting of process in bank affiliates and in companies with large average size transactions—both of which tend to be in larger-size groupings.

Within the credit analysis priorities section, relative weighting of the various credit components, as indicated in Figure 4, was interesting. The heavier weight placed on financial spreading and ratio analysis by the larger companies both reflects a more analytical approach from a risk standpoint, and a larger average-size transaction of the larger companies.

The graph reflects the interest of the smallest firms in items such as prior relationship (RELAT); trade referenced (TRADE); and years in business (YEARS). The largest firms also exhibited a strong interest in equipment analysis (EQUIP). The weight placed upon the significance of equipment analysis by the largest two categories of firms demonstrates the focus of the larger firms in collateral protection. The low significance given the larger firms for items such as trade and bank references and agency ratings (AGENT) demonstrates a markedly different approach from the one used by the smaller firms, who often have fewer resources with which to analyze historical data. One bulge in the data perhaps worth mentioning, but not clearly understandable, is the relative importance of other lending history

Figure 3

EXISTENCE OF MANUALS BY SEGMENT

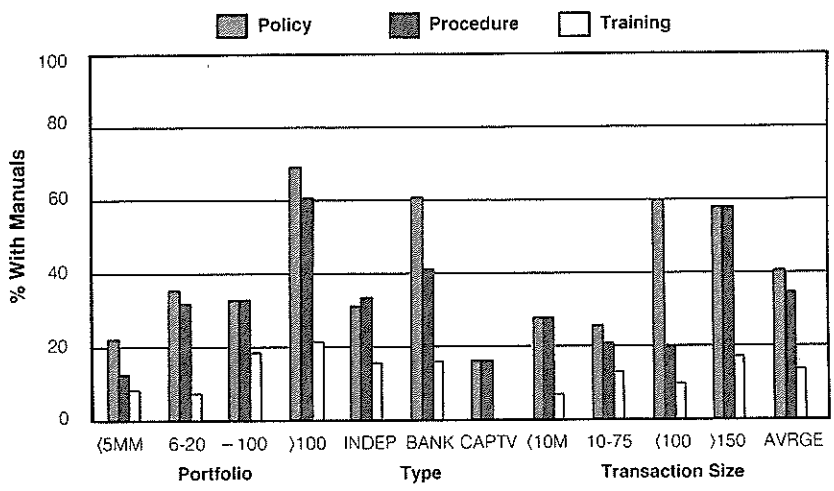
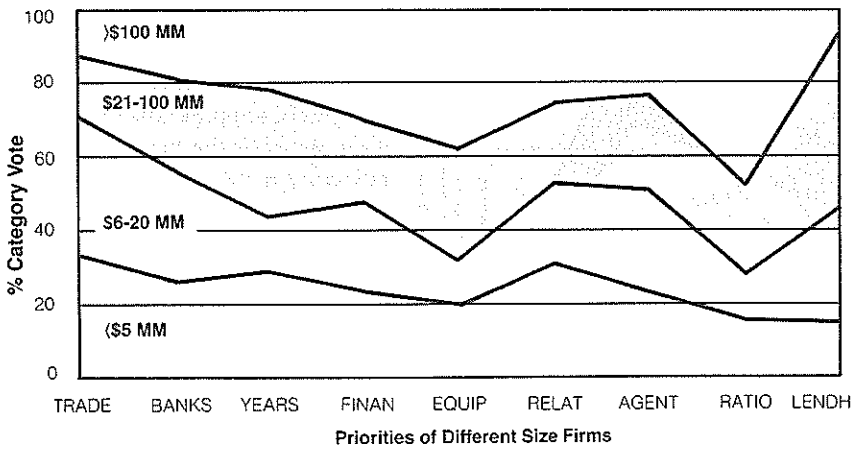


Figure 4

CREDIT ANALYSIS PRIORITIES



(LENDH) by the $6-100MM sized firms.

The differences in credit philosophy focused primarily on the importance of analysis to both the smallest and the largest companies; the $21-100MM segment gave less relative importance to the historical performance analysis, instead focusing its attention on spread of risk, a concept also heavily supported by the smallest firms. The largest companies also relied more on diversification of portfolio by industry and geography than the smallest firms. This may indicate an ability of the largest firms to accomplish this diversification with branches and specialists in different fields. The larger firms also supported credit authority decentralization at twice the rate of other firms in the industry, perhaps because broader geographic coverage is somewhat inconsistent with total centralized control. Specialization was deemed relatively insignificant by the entire industry.

In the credit operation section, the largest variation occurred in the use of salespeople to perform collection work. Thirteen percent of the larger companies supported this notion, as did 56% of the $6-20MM segment. In terms of whether it is a function of the credit department to help make a transaction "doable," of the smallest and $21-100MM size firms nearly 60% articulated that it was, while of the largest and $6-21MM size firms only 30% supported the statement.

The conclusions that might be reached with regard to company size are: (1) The expected focus on establishing policies and procedures by larger companies; (2) the stronger reliance on analytical aspects of financial statement review by the larger firms than by the smaller firms; and (3) greater emphasis on third-party credit information sources by smaller firms. It is questionable whether the larger firms rely more on analysis because it gives better results or because it is consistent with a broader, institutional approach to credit. However, the survey does not answer that question.

Segmentation by Company Type

Classification between independent, bank-related or captive caused some distortion because the captive grouping represented only 13% of the sample size and less than 1% of the total universe. Whether this sampling reflects the position of captives generally is certainly subject to debate. On the other hand, the independent and bank-related segments are well represented, and conclusions concerning their opinions probably can be stated with more confidence.

In terms of portfolio size, captives were generally in the $21MM area and

Figure 5

TRANSACTION SIZE BY COMPANY TYPE

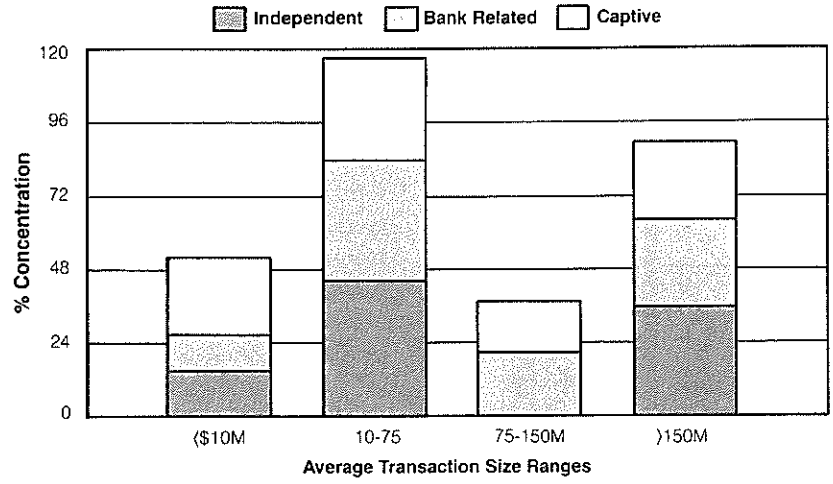
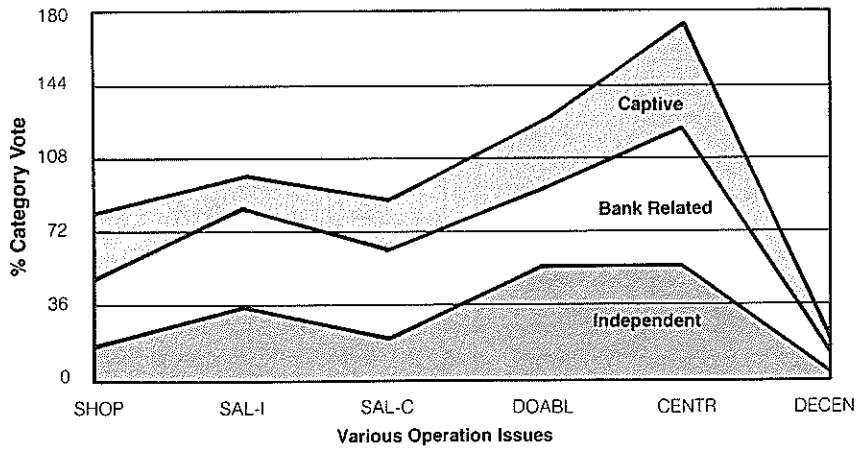


Figure 6

CREDIT OPERATIONS BY COMPANY TYPE



over. Banks and independents were distributed reasonably equally over size ranges.

Figure 5 reflects transaction size. The independents appear to deal in large or mid-small transactions, and not in mid-sized ones—those ranging from $75-150M. The captives were spread relatively equally. Finally, the banks showed relatively low representation in the smaller transaction size segment, probably a reflection of their concern with return on expense.

In the specialty categories, only 19% of the bank-related firms were concentrated at the >50% specialty level. The captive firms obviously were dominant in the >50% level, while independents occupied all levels in line with the total population.

Previously, it was noted that Figure 3 shows the preoccupation of banks with credit process, as reflected by their insistence on manuals. Concerning the requirement of financial statements, 42% of the captives noted this as a requirement on all transactions, compared with 27% of bank-related and independent companies. This contrasts with the legend that captive leasing companies do not require financial statements because they are eager to finance the sales of their parent.

In the credit philosophy area, the captives, unsurprisingly, had a relatively low regard for the spread of risk approach, and also stood out with their greater willingness to accept more risk if the rate is higher. The banks emphasized belief in historical analysis as a proper methodology and also supported diversification by industry and geography—all in accordance with expectations.

Significant differences appeared in the credit operation area, as shown by Figure 6. While all the segments preferred the centralization of credit (CENTR) to decentralization (DECEN), support was relatively stronger from the bank group—perhaps reflecting institutional rather than industry bias. The bank group also gave heavier relative weighting to the importance of salespeople to (a) the credit analysis (SAL-I) and (b) the collection process (SAL-C). This is probably a reflection of the role of the relationship manager in banking circles, as contrasted with the higher level of sales specialization among the independents and captives. The banks gave little credence to the premise that "credit department should make a deal doable" (DOABL). In contrast to the 36% bank vote for this position, 57% of the independents supported this premise. Finally, the statement: "Credit people keep salespeople from giving away the shop," was supported by 33% and 31% of captives and bankers, respectively, versus only 18% by the independents.

Segmentation by Average Transaction Size

There were sharp differences established by average size of transaction. It is clear that average transaction size and portfolio size are correlated. With regard to types of firms, it appeared that independents were excluded from the $75-150M average size transaction arena. This may be a function of "plain vanilla" low cost transactions flowing to banks on a rate basis, forcing nonbank third parties out of this segment, but permitting them to structure larger, more complex transactions or smaller, less price-sensitive transactions.

Firms with the smallest transaction sizes tended not to require statements on transactions under $10M. Where average transaction size was $10-75M, 60% require statements, and where average transaction size exceeds $75M, virtually all firms require statements on virtually all transactions.

With regard to credit priorities, the graph in Figure 7 indicates the relative importance to the various average transaction size segments of the nine most significant priorities. The largest firms focus their interest on financial statement spreads (FINAN), equipment analyses (EQUIP), agency ratings (AGENT), and ratio studies (RATIO); they give low significance to references.

The smallest firms granted highest priorities to prior relationships (RELAT), agency ratings (AGENT), lending histories of others (LENDH), and years in business (YEARS), and gave low significance to financial statement spreads and ratio analysis. The two middle-size groups (totaling $10-150M) focus their attention on a mixture of the interests of the larger and smaller transaction size subgroups: Financial statements, bank and trade references, and lending histories of others while giving minor significance to equipment analysis, agencies, prior relationships, and ratios. Clearly, as firms move from analysis of the small transaction to the larger transaction, they move from strictly outside references toward more internal analysis.

Figure 7

CREDIT PRIORITIES & TRANSACTION SIZE

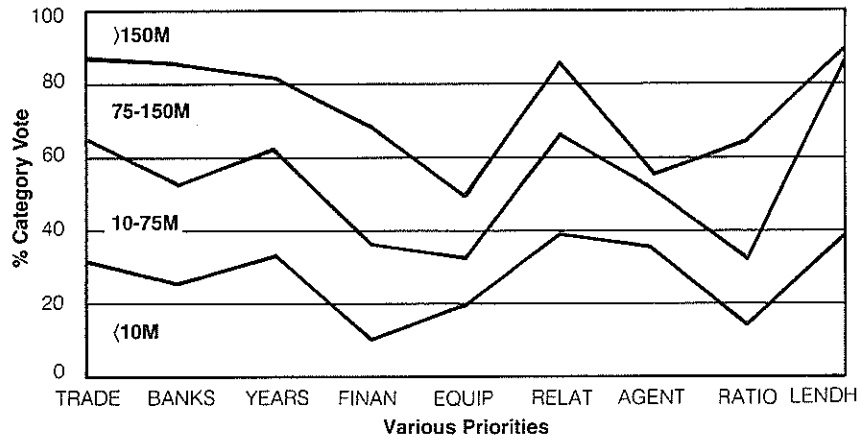


Figure 8

CREDIT PHILOSOPHY & TRANSACTION SIZE

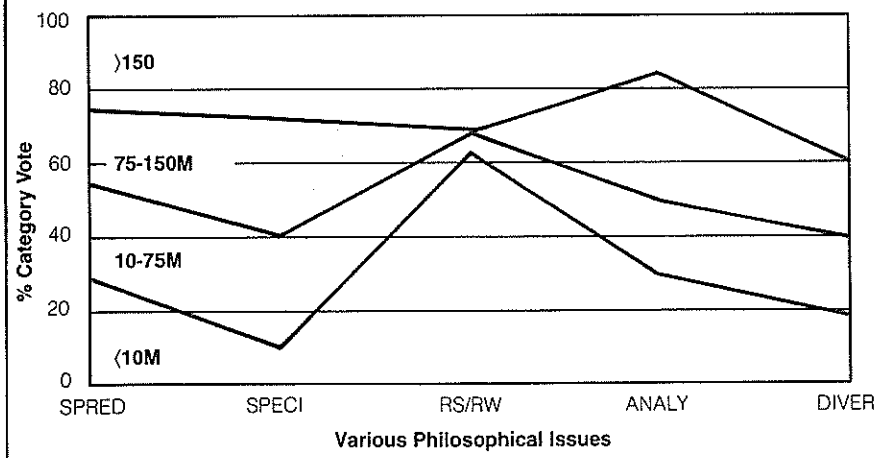
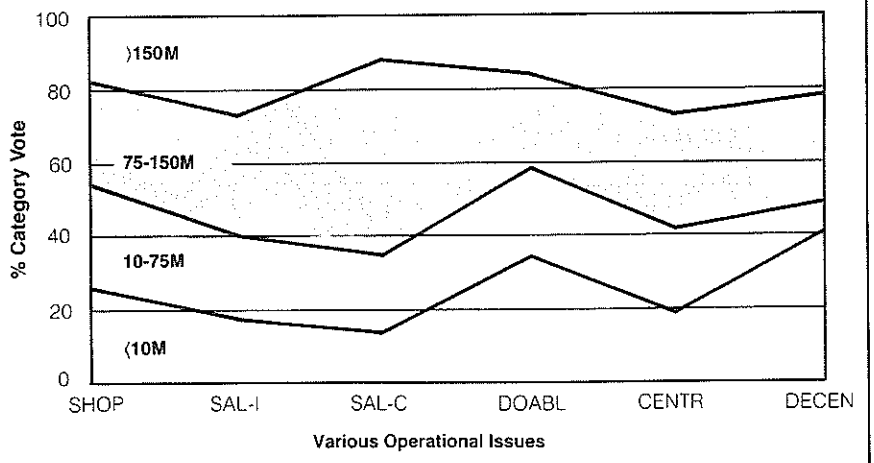


Figure 8 indicates that with regard to credit philosophy and operations, the smallest firms gave little weighting to specialization (SPECI) in reducing credit risk. In addition, they seemed more willing to accept high risk if the rate is commensurate. This graph shows how the middle two subgroups almost totally disregarded the significance of risk/reward (RS/RW). The focus of the middle subgroups was on specialization and analysis, but not on pricing, to offset risk.

The credit operations graph (Figure 9) indicates that the small-transaction firms supported the credit department's responsibililty in making a transaction doable. They also gave surprisingly strong support to decentralization of the credit authority. Eighty percent of the $75-150M group, while small in absolute numbers, supported the use of salespeople in the collection process.

Figure 9

CREDIT OPERATIONS & TRANSACTION SIZE



As indicated previously, this group consists primarily of bankers, who believe in the relationship management generalist; they also showed strong support for centralization. The two middle groups also supported the position: "The credit department keeps the salespeople from giving away the shop."

Segmentation by Specialty

The last part of the company profile section dealt with degree of specialization. This segment of the survey addressed the issue of whether a firm considered itself to be specialized or not. A majority of the respondents (73%) said they were not. This was verified by asking firms to break down their portfolios into major industry groupings. This second approach produced results different from that obtained in the first. The tallying process considered those firms with a greater than 50% concentration (34%) to be highly specialized, those firms with 30-50% concentrations (19%) to be mildly specialized, and the balance (47%) to be unspecialized.

The specialists were underrepresented in the large portfolio area; in contrast, the 30-50% concentrated groups were disproportionately represented in the large portfolio groupings, with 50% of their members falling in that category. Moreover, the 30-50% specialists were disproportionately under-represented in both the portfolio sizes of $6-20MM and $21-100MM.

With regard to company type, banks were well represented in the nonspecialist category and under represented in the >50% concentration category. Captives were high in the latter category, as was expected.

In the average transaction size, specialists and nonspecialists both seemed to focus on the $10-75M subgroup, leaving the >$150M transactions to the moderately specialized (i.e., moderately portfolio concentrated).

Analysis of the credit priority areas showed only minor departures within any segment from the average industry curve. Differences sufficiently significant to merit discussion took place only in the credit philosophy and credit operations areas. Here over 50% of the specialists indicated support for their present concentrations. They also expressed a low level of interest in having salespeople help with the credit work, a factor explained by the high number of captives in this subgroup.

The results of the Credit Analysis Survey offer an overview of how the diverse elements within the equipment leasing industry approach credit analysis. The factors identified by the survey findings should be of assistance in planning credit policies within the industry.

Appendix A

AAEL CREDIT ANALYSIS QUESTIONNAIRE

to be completed by the credit manager

I. *Company Profile*

1. Please indicate your leasing company size (gross receivables).
   - ☐ $5 million or less
   - ☐ $6–20 million
   - ☐ $21–100 million
   - ☐ above $100 million

2. Please indicate your leasing company type.
   - ☐ independent
   - ☐ bank-related
   - ☐ captive

3. Please indicate your average size transaction.
   - ☐ $10,000 or under
   - ☐ $10,000–$25,000
   - ☐ $25,000–$75,000
   - ☐ $75,000–$150,000
   - ☐ $150,000–$1 million
   - ☐ over $1 million

4. Most of my company's business is with:
   - ☐ brokers
   - ☐ vendors
   - ☐ direct to lessee

5. Do you specialize in a particular type of equipment or industry or do you lease a variety of equipment types?
   - ☐ general equipment
   - ☐ particular equipment or industry

6. If you specialized in one or several types of equipment, please indicate approximate percentages of concentration or single specialty:
   - ____ printing/graphics
   - ____ construction
   - ____ business machines/computers
   - ____ medical
   - ____ machine tools/robotics
   - ____ automobiles
   - ____ trucks/containers
   - ____ farm
   - ____ communication (telephone, broadcast)
   - ____ aircraft
   - ____ extractive
   - ____ power generation
   - ____ _____

II. *Credit Profile*

7. How many are employed by your company in the credit function?
   - ☐ 1-5
   - ☐ 6-10
   - ☐ 11-20
   - ☐ over 20

8. Do you presently have a:
   credit policy manual ☐ yes ☐ no
   credit procedures manual ☐ yes ☐ no
   credit training manual ☐ yes ☐ no

9. At what size transaction do you require financial statements?
   - ☐ over $10,000
   - ☐ over $15,000
   - ☐ over $25,000
   - ☐ over $50,000
   - ☐ other _____

10. What type of financial information do you require when analyzing a company's credit worthiness? (Please check all appropriate items and add those not listed in the space provided.)
    - ☐ lease application
    - ☐ financial statements
    - ☐ credit references
    - ☐ agency reports
    - ☐ equipment information
    - ☐ company profile
    - ☐ industry profile
    - ☐ information on lessee's customers
    - ☐ _____
    - ☐ _____
    - ☐ _____
    - ☐ _____

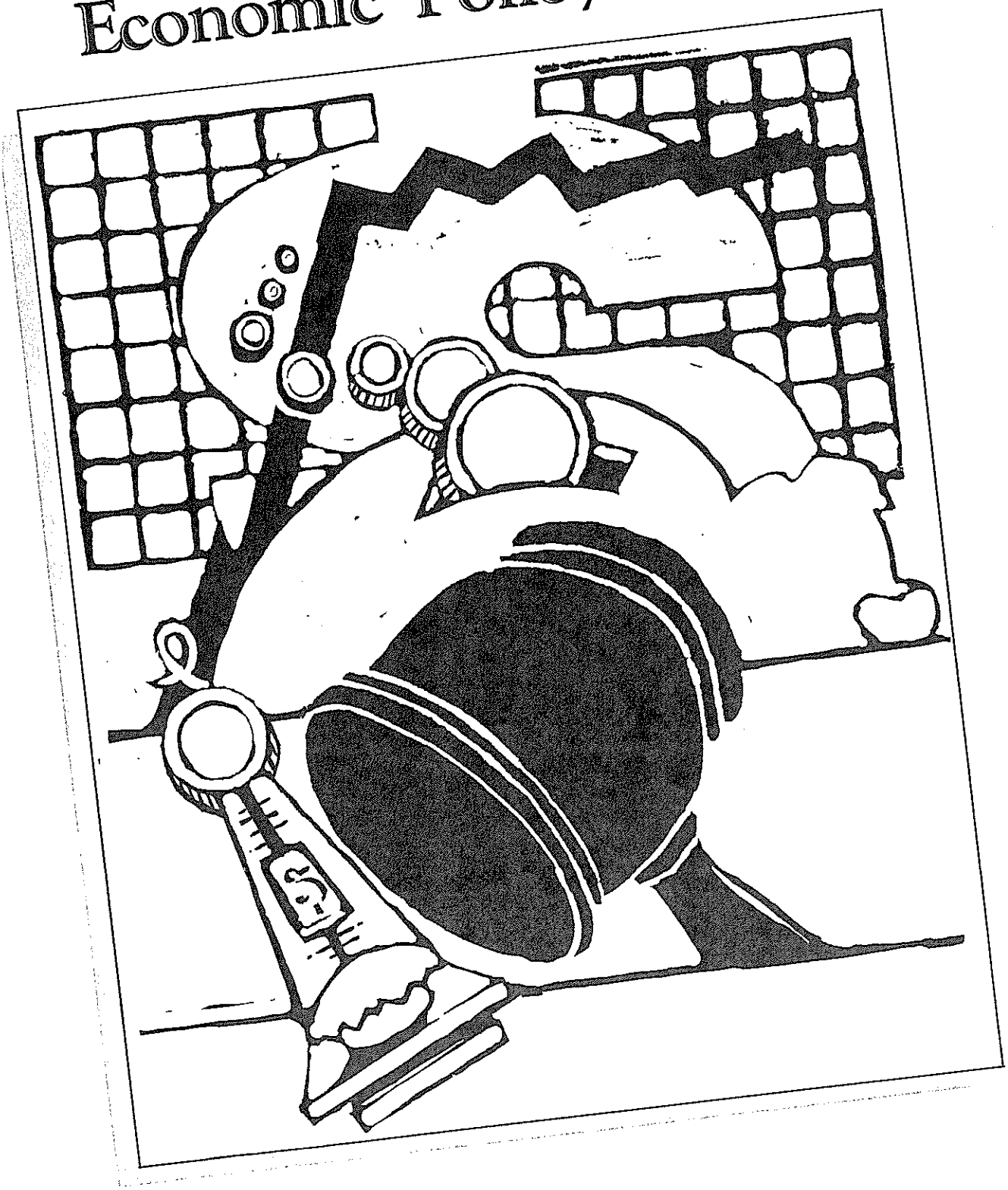
11. Please rank by number the importance you give the following items when making credit decisions. (You may omit those items not included in your decision making process.)
    - ____ trade references
    - ____ bank references
    - ____ years in business (lessee)
    - ____ rating agencies (Moody's, etc.)
    - ____ financial statement spread
    - ____ equipment analysis
    - ____ industry analysis
    - ____ prior relationship with lessee
    - ____ numerical scoring system
    - ____ ratio and trend analysis
    - ____ history of other lenders with lessee
    - ____ references from customers and/or suppliers
    - ____ use of computer aided analysis
    - ____ _____
    - ____ _____
    - ____ _____

12. Which statements most closely describe your credit philosophy? (You may check more than one.)
    - ☐ spread risk in the portfolio among a large number of clients
    - ☐ specialize in industry to better evaluate equipment (collateral) position
    - ☐ specialize in industry to better evaluate financials and references
    - ☐ prepared to take additional risk if rate is sufficient
    - ☐ historical performance analysis is the best way to predict likelihood of repayment
    - ☐ diversify the portfolio both in collateral and geography
    - ☐ _____

13. Which statements are indicative of the operation of your credit department or group? (You may check more than one.)
    - ☐ Credit people keep sales people from giving away the shop.
    - ☐ Sales people must perform an integral part of the analysis.
    - ☐ Sales people are responsible on their accounts for some collection work.
    - ☐ Credit is a support staff to help make the deal "doable."
    - ☐ Credit authority should be centralized.
    - ☐ Credit authority should be decentralized.

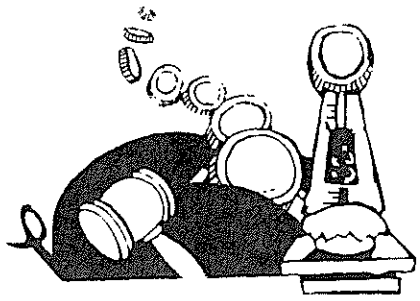
Capital Formation, Technology, and Economic Policy

by Barry P. Bosworth



The sharp deterioration in productivity growth since the early 1970s has been a major motivation behind the renewal of interest in economic policies to expand aggregate supply. The public discussion has emphasized an accelerated accumulation of physical capital as a major goal of policy, and particular importance has been attached to increased tax incentives for private saving as a primary means of achieving that objective. Yet in several respects, the attention directed both to the slowing of physical capital accumulation as a cause of the previous shortfall in productivity growth and the importance attached to tax incentives to promote private saving as the cure seem misplaced. It has also contributed to an excessively narrow view of the actions that could be taken by government to accelerate the growth of productivity. In fact, it can be argued that the net outcome of the policy actions to date will likely be to retard rather than to promote future growth.

The first section of this paper reviews the empirical studies of the productivity growth slowdown with particular emphasis on the role of capital. The second section examines the behavior of saving and investment and trends in capital income taxation. The third section is directed toward the policy actions that might be taken to promote a faster rate of productivity growth in the future.



One of the most critical areas of U.S. policy today focuses upon determining the type of economic policy that can best influence future capital formation. The subject of industrial change within the U.S. and public policy initiatives in this area is important to the equipment leasing industry due to the industry's major role in the capital formation process. The following paper is reprinted from Industrial Change and Public Policy, *the proceedings of an August, 1983, symposium sponsored by the Federal Reserve Bank of Kansas City.*

Capital and the Productivity Slowdown

There are several problems in attributing to capital a major role in the slower growth of productivity.[1] First, since 1973 the contribution of slower growth in the capital-labor ratio accounts for only a few tenths of a percentage point of the shortfall of multifactor productivity growth (output per unit of labor and capital input).[2] That fact is very apparent in the new data on multifactor productivity prepared by the Bureau of Labor Statistics and reproduced in Table 1.

The contribution of capital to output is a product of two factors: The rate of accumulation of capital and its share of total factor income. The slower growth of the capital input that has occurred has been as much due to a fall in its share of income as to a slower rate of physical accumulation. That highlights the second problem: The average before-tax rate of return on capital fell sharply throughout the 1970s. Even after adjusting for the influence of recession, the real return on business capital has fallen by three percentage points—from 11% to 8%—since the mid 1960s.[3] That is not consistent with the usual notion of growing capital scarcity. It also casts doubt on the usual argument that the effective tax rate on capital income increased during the 1970s, a situation which would be expected to produce a higher before-tax rate of return.

The major conclusion that emerges from the growth-accounting studies of recent years is that the productivity slowdown is, in large part, a mystery. Those studies have achieved important results in quantifying the contribution of a large number of potential explanations for the slowdown. Among the contributing factors identified are a younger and less experienced workforce, government regulation, higher energy prices, and reduced research and development. Each of these factors, however, can contribute only a few tenths of a percent annually. Other common explanations, such as a

---

Barry P. Bosworth, is a senior fellow in the economic studies program at the Brookings Institution. He has been a director of the Council on Wage and Price Stability, and has served as staff economist on the Council of Economic Advisers, assistant professor at Harvard University, and visiting lecturer at the University of California-Berkeley. Bosworth, a member of the American Economic Association, has co-authored two books, written several articles, and is an active lecturer.

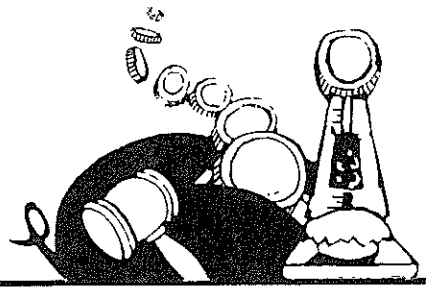


Table 1

AVERAGE ANNUAL RATES OF GROWTH IN OUTPUT, LABOR AND CAPITAL INPUTS, AND PRODUCTIVITY, BY MAJOR SECTOR, 1948-81

(percent)

Measure	Private Business*			Nonfarm Business			Manufacturing		
	1948-73	1973-81	Slow-down	1948-73	1973-81	Slow-down	1948-73	1973-81	Slow-down
Output per hour of all persons	3.0	0.8	−2.2	2.5	0.6	−1.9	2.9	1.5	−1.4
Minus contribution of capital/hour†	1.0	0.7	−0.3	0.8	0.6	−0.2	0.7	1.1	−0.4
equals:									
Multifactor productivity‡	2.0	0.1	−1.9	1.7	0.0	−1.7	2.2	0.4	−1.8
Output	3.7	2.2	−1.5	3.9	2.1	−1.8	4.0	1.2	−2.8
Hours of all persons	0.7	1.4	0.7	1.3	1.5	0.2	1.1	−0.2	−1.3
Capital services	3.6	3.2	−0.4	3.6	3.3	−0.3	3.5	4.0	0.5
Combined capital and labor inputs	1.7	2.0	0.3	2.1	2.1	0.0	1.8	0.9	−0.9

Source: Bureau of Labor Statistics, U.S. Department of Labor
*Excludes government enterprises
†Change in capital per unit of labor weighted by capital's share of total output
‡Output per unit of combined labor and capital input

shift to a service-based economy, have been dismissed. Studies of productivity growth in other countries reach similar conclusions. In many of these countries the decline in multifactor productivity is greater than in the United States.[4]

Another hypothesis is that the 1970s were an unusual period of economic disruptions, and as a result much of the capital stock became obsolete.[5] That is, a measure of the capital stock calculated by cumulating past investments overstates the effective stock during the 1970s. The evidence on the obsolescence hypothesis is, at best, ambiguous, but it appears unlikely that it can account for such a large and sustained slowing of productivity growth.

Unexpected obsolescence does offer an appealing explanation for the decline in the rate of return on capital—the value of the denominator is overstated. But the decline in the rate of return began in the early 1970s. Even if as much as 25% of the equipment stock became obsolete in the 1973-74 period, normal depreciation and retirements would reduce its effect on the value of capital stock, and thus the rate of return, to about 2% by 1981, which would increase the rate of return only by a few tenths of a percentage point. Thus, accelerated obsolescences would have to be very large and continuing to explain the behavior of the return on capital.

More recently, studies have focused on a slowing of advances in knowledge, rather than changes in the quality or quantity of the inputs, as the most likely cause of the productivity slowdown. The term "knowledge" is used in a general sense to include improvements in management skills as well as the introduction of new technology. Dale Jorgenson in particular has argued that reallocations of output among sectors (such as might follow a period of economic dislocation) actually made a small positive contribution to growth after 1973, and that the decline thereafter was caused by slower rates of technical change in individual industries.[6] The difficulty with such an explanation is that the contribution of advances in knowledge is only a residual measure in the growth accounting, which makes it dif-

ficult to analyze in any systematic fashion.

The results of a recent study of trends in output and productivity growth in different regions of the U.S. add to the argument for a general change in the residual. While rates of output growth have varied substantially among the regions, those differences are almost fully explained by different rates of growth in the capital and labor inputs, and there are not major differences in the growth of multifactor productivity. Multifactor productivity has grown at least as rapidly in the Snow Belt as in the Sun Belt, despite a significantly slower rate of capital accumulation. Furthermore, the slowdown in productivity growth after 1973 is common to all.[7]

At times, it is argued that technological innovation is embodied in new capital in order to support a view that capital is of greater importance in the growth process than is implied by the growth accounting studies. However, several authors, in examining the importance of the embodiment hypothesis, have pointed out that there is insufficient variation in the age structure of the capital stock to make it an important source of change in the nation's growth rate.[8] Under such circumstances gross investment is the relevant concept, rather than the net capital stock, and gross investment has increased as a share of GNP during the 1970s.

It is also important to avoid confusion between the argument that new technology may require new capital, and a different argument that increased investment will significantly alter the pace of a technological innovation. In any period there is always a large volume of investment with substantial variation in the expected returns on the individual projects. Those that are most profitable, supposedly embodying the most significant technical advances, will be undertaken first. In each period, investment will be undertaken to the point where the expected return on the marginal investment, inclusive of any return on embodied technology, is equal to the cost of funds. Thus, the embodiment of technology does not imply any extraordinary return on an additional unit of investment at the margin.

Investment was heavily concentrated in areas of rapid technological innovation during the 1970s. Expenditures (measured in 1972 dollars) on computers and communication equipment rose from 12% of total equipment purchases in 1960 to 17% in 1970 and 32% in 1981. Nonetheless, there is little evidence that these high-technology investments had a significant impact on any economy-wide measure of productivity. The increase in productivity should be even more evident if, as is often claimed, investment in such equipment is understated by the use of priced deflators based on resource cost. The investments in information systems were supposed to improve business decisionmaking, but there is little evidence that they have done so.

Saving and Investment

The previous section outlined some reasons for skepticism about the degree of emphasis being placed on physical capital accumulation as a cause of the slowdown in productivity growth.

It is not necessary, however, to argue that reduced capital formation was the cause of the productivity slowdown in order to advocate increased investment as a means of accelerating productivity growth in the future. Although the before-tax return on capital has declined, it has remained in the range of 8-10%. An increase in the share of net investment in net output of one percentage point would, in the near term, raise the growth of output by about 0.1 percentage point annually. If the share of net business output going to investment could be doubled (from an average of 4-5% in the 1970s) the growth of output would rise by about 0.4-0.5 percentage points annually. A rise in the net investment share does not have a permanent effect on the rate of productivity growth, but in the long run the level of output is increased by about 5% for each one percentage point rise in the investment share. These gains are substantial, but they also imply that truly heroic actions would be required to restore the postwar trend in productivity by an expansion of capital formation alone.[9]

There are, however, several significant issues of how best to achieve that objective. The policy conflicts are particularly evident in the tax area, where major new initiatives have been undertaken to expand incentives for both private saving and investment, and additional actions are under consideration for the future.

The main issues can be highlighted by asking whether government policies should focus on expanding incentives for saving or for investment. In an idealized world of full employment, competitive markets, and no foreign trade there would be little relevance to such a distinction. Saving and investment can be viewed as opposite sides (supply and demand) of the same market, with the interest rate serving as the equilibrating price. In the idealized world it makes little difference whether incentives are extended to savers or investors, since the interest rate adjusts to maintain a balance. In practice, there are many pitfalls in this process.

Saving

Much of the discussion concerning the need for expanded incentives for saving implied that private saving has declined in the United States. Yet the private saving rate has remained very stable throughout the postwar period at about 16-17% of GNP, and there is no evidence of a decline during the 1970s (Table 2). What has changed is the composition of that saving: Corporate saving (retained earnings and capital consumption allowances) has increased, while saving attributed to the residual sector of households, nonprofit institutions, and unincorporated business has declined. In part, this compositional change may be asso-

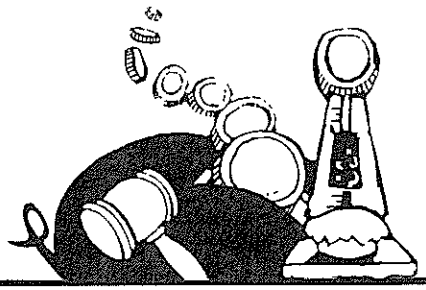


Table 2

SAVING AND INVESTMENT SHARES OF GROSS NATIONAL PRODUCT, 1951-82

(average annual percentage share)

	Private Saving		Government Saving			Investment			Net Saving and Investment*		
Period	Total	Personal	Total	Federal	State and Local	Nonresidential	Residential	Net Foreign	Private Saving	Private Investment	Capital Consumption
1951-60	16.2	4.7	−0.3	−0.2	−0.2	10.4	5.2	0.3	8.0	7.3	8.9
1961-70	16.3	4.7	−0.4	−0.5	0.1	11.1	4.3	0.5	8.6	7.6	8.4
1971-75	17.2	5.6	−1.2	−1.8	0.6	11.1	4.6	0.3	8.7	7.0	9.3
1976-80	17.1	4.2	−0.7	−2.0	1.2	11.9	4.6	−0.2	7.4	6.7	10.5
1981	17.1	4.4	−1.0	−2.0	1.1	12.5	3.6	0.1	6.6	5.4	11.2
1982	17.4	4.6	−3.8	−4.9	1.0	10.6	3.1	−0.2	6.5	2.4	11.6

Source: U.S. Department of Commerce, *National Income and Product Accounts of the U.S.*
*Percent of net national product

ciated with the sharp fall in income of noncorporate business, but any interpretation is complicated by the problems of allocating interest income among sectors of the economy during a period of high variable inflation, and accounting for capital gains and losses in estimating net wealth.[10] In any case, it is not clear that it has any particular significance for the issue of capital formation. The composition of government saving has also changed as a tendency toward larger deficits at the federal level is offset by larger surpluses of the state and local governments' employee retirement funds.

Some economists prefer to deduct from gross saving the flow of depreciation on capital to get net saving, and they observe that the net saving rate has declined (see Table 2). But the rise in depreciation that led to the decline reflects a shift in the pattern of investment rather than saving behavior. The composition of business investment has moved toward shorter-life capital—equipment relative to structures—with a consequent rise in depreciation, and the stock of depreciable capital has grown more rapidly than output. Whether that shift provides a basis for increasing private saving incentives depends upon the factors that caused it. If it is due to a distorting change in the relative taxation of short and long-life capital or if it reflects the often-discussed short-term planning horizon of U.S. business, the shift is not desirable. On the other hand, it may simply reflect the changing nature of current investment opportunities—less need for offices, shopping centers, and industrial plants relative to short-life assets such as computers. We are passing on a smaller capital stock to future generations, but if the social return on that type of capital is declining, the reduction is appropriate. Either way, it is not clear that new incentives for saving are the appropriate response to a changing mix of domestic investment—particularly when that increased saving could flow to many other uses.

The United States is one of a group of countries that stands out in any international comparison as having relatively low rates of private saving (Table 3). Those differences, however, do not appear to be related to differences in the rate of after-tax return on capital.[11] Many of the empirical studies have emphasized the importance of differences in rates of income growth, and, in fact, that explanation was appealing in comparing the United States, Europe, and Japan in the 1960s. However, private saving rates have remained relatively constant in these countries despite a large deceleration of growth in Europe and Japan after 1973. Substantial differences remain that may be related to differing social and institutional arrangements. In any case, the international differences in business investment rates are significantly less than those for private saving. There is a substantial variation in rates of government saving or dissaving that tend to offset differences in private saving, and other countries devote more resources to homebuilding than does the United States.

The question of adequate saving to support a specific level of investment is only relevant to a fully employed economy in which resources for increased investment must be achieved by foregoing private or public consumption. In the presence of unemployment, an increase in investment can be financed by utilizing idle resources. The increase in investment raises production and incomes, providing higher levels of both saving and consumption.

Even commencing from a situation of full employment, it is paradoxical that an increase in planned saving may not lead to an increase in investment—at least in the short run. The increased supply of saving will

lower interest rates and serve as a positive inducement to investment. At the same time, the decline in consumer spending will reduce current demand and business perceptions of the need for additional capital. The increased planned saving will translate into increased investment only if wages, prices, and interest rates adjust quickly to offset the initial decline in demand. Under normal circumstances adjustment lags will lead to a transitional period of depressed output. If that transition is to be avoided, it will be necessary to coordinate changes in saving incentives with direct actions to raise investment.

While both of these concerns about an exclusive emphasis on saving incentives raise only short-run issues of transition, the longer-term view that Americans save too little and that the low saving rate constrains domestic investment ignores the important role of world capital markets. In a situation of international capital markets, domestic saving and domestic investment are not necessarily equal: An increment to private saving could easily flow abroad if the return on foreign investment is above that of domestic investment, and domestic investment can draw on a pool of world-wide saving.[12] In fact, the sharp rise in world saving rates, embodied in the surplus of the OPEC countries after 1973, provides an illustration of the mechanism as the funds flowed primarily through U.S. financial institutions to finance investment in the developing countries. Therefore, the adequacy of domestic private saving is not necessarily relevant to answering the question of why investment in the United States is so low relative to other countries.

There are, of course, political and institutional limits on a country's ability to finance domestic investment on a sustained basis from foreign capital inflows. In view of these constraints, while higher domestic saving may not be sufficient to ensure increased domestic investment, it is an appropriate long-term element of a program that does do so. Government can increase national saving either indirectly by reducing taxes in such a way as to expand private saving incentives or directly through reducing its own dissaving. The difficulty with an emphasis on tax incentives for private saving is that the policy relies on an aspect of economic behavior about which economists are very uncertain of the likely effects.

A reduction in tax rates affects private saving behavior in two ways.

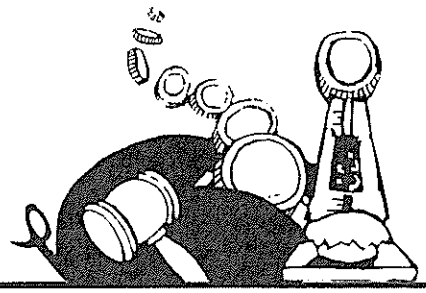


Table 3

PRIVATE SAVING AND ITS USES IN MAJOR INDUSTRIAL COUNTRIES, 1970-79

(percent of gross domestic product, half-decade averages)

			Uses of Private Saving					
Country	Period	Private Saving	Business Investment	Government Deficit	Net Foreign Investment	Residential Construction	Inventory Change	Statistical Discrepancy
Canada	1970-74	17.8	13.0	−0.8	−0.2	5.3	0.9	−0.4
	1975-79	19.6	13.9	2.0	−2.4	5.8	0.5	−0.2
United States	1970-74	16.4	10.5	0.6	0.1	4.6	0.9	−0.2
	1975-79	17.3	10.9	1.3	0.0	4.6	0.7	−0.1
Japan	1970-74	31.5	22.3	−1.8	1.0	7.6	2.1	0.3
	1975-79	29.3	18.1	3.0	0.6	7.5	0.6	−0.6
France	1970-74	20.9	13.1	−1.2	−0.3	7.0	2.2	n.a.
	1975-79	20.4	12.4	0.7	−0.3	6.7	0.9	n.a.
Germany	1970-74	21.1	13.6	−1.7	1.1	7.3	0.9	n.a.
	1975-79	21.0	11.9	1.5	0.7	6.0	1.0	n.a.
Italy	1970-74	26.8	12.4	7.0	−0.4	5.7	2.1	n.a.
	1975-79	27.2	11.1	8.5	0.7	5.2	1.8	n.a.
Netherlands	1970-74	22.3	13.8	−0.9	1.7	5.8	1.9	n.a.
	1975-79	19.9	11.7	1.2	0.8	5.5	0.6	n.a.
Sweden	1970-74	14.2	11.1	−4.0	0.7	5.1	1.2	n.a.
	1975-79	14.0	11.6	−1.2	−1.5	4.3	0.8	n.a.
United Kingdom	1970-74	14.8	10.7	−0.1	−0.8	3.5	0.9	0.5
	1975-79	17.3	11.4	3.2	−0.9	3.5	0.5	−0.4
Australia	1970-74	20.5	15.3	−1.2	−0.5	4.9	1.0	0.9
	1975-79	19.5	13.9	1.8	−1.8	4.8	0.5	0.4

Source: Computed by the author from Organization of Economic Cooperation and Development, *National Income Accounts of OECD Countries, 1962-1979*, vol. II (Paris, 1981).

First, it increases the attractiveness of future relative to current consumption—the substitution effect. But the tax reduction (higher after-tax return) also raises expected future income from previously planned saving and individuals may actually increase current consumption in anticipation of the higher lifetime income—the income effect. This offsetting income response is of particular importance in the short run because of the increased income from previously accumulated wealth of older generations (they receive a windfall gain on prior saving which stimulates consumption). The net effect in saving is ambiguous from a theoretical perspective and the empirical evidence is not convincing on either side of the issue.[13]

In any case, much of the discussion of tax incentives to promote saving ignores the role of the government budget. In a fully employed economy a tax reduction to expand private saving, if not matched by an equal reduction of government expenditures, requires the private sector to save the entire tax cut simply to leave the national saving rate unchanged.

Given the uncertainties surrounding private saving behavior, direct actions to shift the government budget toward a surplus are a more certain means of increasing saving. Yet there is not complete agreement that a rise in government saving will augment national saving. Some economists argue that variations in the government debt, a negative bequest to future generations, lead to compensatory adjustments in private saving and investment.[14] The empirical evidence on the more extreme versions of this hypothesis is not very convincing, however. The general conclusion is that national saving would rise, although probably not on a one-for-one basis.[15]

Investment

The evidence that government policies can have a direct effect on business investment is significantly stronger than the evidence for private saving incentives. One reason is that the direction of the effect of a change in taxes or interest rates is not ambiguous from a theoretical point of view. The major issue under dispute is the potential for substitution between capital and labor in production. For example, given the decision to build a new plant, as determined by expectations of future demand, to what extent will business choose a more capital-intensive process in response to a reduction in the cost of capital relative to that of labor. For more than 20 years the discussion has been led by Dale Jorgenson, who believes that the possibilities for substitution are high, and Robert Eisner, who believes they are low. To date, neither has convinced the other, but I think it is fair to summarize the consensus of the profession that the truth is roughly an average of the two extremes. One convenient rule of thumb that emerges from the major econometric models is that the investment induced by a tax incentive limited to new investment (such as the investment tax credit) is roughly equal to the loss of tax revenue—a bang-for-the-buck of about unity.

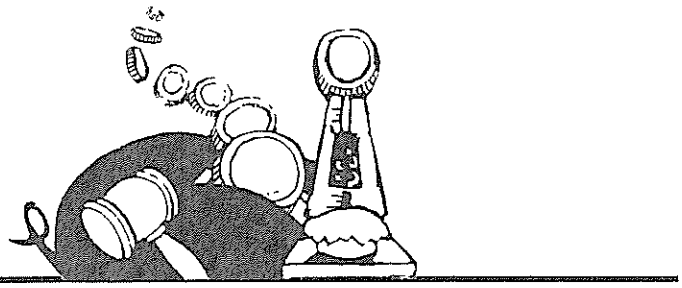
A second major finding of the empirical studies is that a change in the cost of capital has a bigger effect on residential construction and consumer durables than on business investment. Thus, a decline in interest rates, for example, increases total investment but shifts it in the direction of housing and consumer durables. That is a significant issue that I will return to in a later discussion of policy options.

If we accept the hypothesis that government policy can significantly affect investment demand through changes in the after-tax price of capital, the evaluation of past government support for investment depends upon trends in the taxation of capital income and the cost of funds. To date, the public discussion has concentrated on the tax issue. Yet, the economic analysis tends to argue that, if there was an increase in the cost of capital in the 1970s, it was the result of increased financing costs rather than higher taxes.

Taxes and Investment On the tax side, the discussion seems to have been confused by the failure to distinguish adequately between average tax rates on capital income and the marginal tax rate relevant to investment. While the various studies seem contradictory, I believe they are consistent once we adjust for differences in what is being measured.

First, the *average* tax rate on the income from corporate capital was high and increased due to inflation in the 1970s.[16] Inflation affected tax liabilities in several distinct ways. The effective tax rate increased because depreciation allowances were not adjusted for inflation within the corporate tax system. Additionally, corporation taxes were reduced by the deduction of nominal interest payments, which were also not adjusted for inflation. While the inflated interest payments were taxed under the personal income tax, the tax rate on corporate income is higher than that on personal capital income; so that the value of the deduction to corporations exceeded the tax paid by individuals, the treatment of interest actually reduced the net cost of debt finance during the 1970s. Thus, while the effects of inflation on the taxation of interest largely canceled in an integrated view, the failure to adjust depreciation remains a significant source of variation in the tax on the income from corporate capital. Finally, there was a large nominal capital gain on the revaluation of physical assets that potentially may raise tax payments in future years if it is realized in higher earnings.

Second, the *average* tax rate on all capital income (calculated at the margin above labor income) within the personal tax system alone is quite low—about 10%—because so much of the income is exempt from taxation (residential housing) or deferred (pensions and capital gains.)[17]



For investment, it is more relevant to examine trends in the effective *marginal* tax rates on an additional unit of capital. That has been done in several studies of the corporate tax and the general conclusion is that effective rates of taxation fell throughout the 1970s because of liberalization of depreciation allowances, the investment tax credit, and the deductibility of nominal interest payments. A recent study reports a fall in the effective tax rate from 53% in 1960 to a low of 26% in 1965, a rise to 55% in 1969, and a subsequent decline to 33% by 1980.[18] As a result of the 1981 and 1982 tax acts, that rate will continue to fall about 15% in the 1983-86 period. It also is apparent that the effective tax on equipment is substantially lower and has declined more than that for structures; it is thus consistent with the previously mentioned shift toward short-term assets.

These analyses of the effective tax on new corporate investment did not, however, take account of property and personal income taxes. That issue has been examined in a recently completed study of capital income taxation in four countries.[19] The study found that the overall marginal tax on capital income from the corporate sector was about 32% in 1983, and that it had declined from 48% in 1960 and 47% in 1970. As reported for studies of the corporate tax alone, equipment is taxed much less heavily than other types of investment. The study also concluded that elimination of the corporate tax would, in its present configuration, have very little effect on the expected tax for the average new investment. One interesting result of the study was the finding that the marginal tax rate on capital income is lower in the United States than in Germany, about the same as in Sweden, and far higher than in the United Kingdom.[20] The differences in capital taxation certainly do not correlate well with differences in rates of capital formation for these countries.

Thus, the conclusion drawn from the analysis of tax rates is not so much that the tax on capital income has increased but that tax rates are highly variable by type of capital asset and owner. Corporate capital is one type that is particularly heavily taxed. That is a potentially serious source of a misallocation of capital. Yet one has to ask why the corporate share of capital has grown so rapidly if it is so disadvantaged by the tax system? Apparently, the tax doesn't exceed the value that incorporation extends to the owners of capital.

One conclusion that emerges from these studies is, regardless of whether the tax on capital income is too high or too low, the effective tax on new investment has declined throughout the 1970s. That is to say, tax policy has generally been stimulative to private investment, and at least in some studies, the implication is that there is little more that government can do at the corporate level unless it wishes to provide a tax subsidy. There is, however, a wide disparity of tax rates on different types of capital.

Table 4

EFFECTIVE MARGINAL TAX RATES ON INCOME FROM CORPORATE CAPITAL, 1960-83

(percentage)

Category	1960	1970	1980	1983
Asset				
Machinery	59.3	48.5	17.6	11.0
Buildings	45.0	47.1	41.1	33.2
Inventories	45.6	46.3	47.0	47.0
Finance				
Debt	−3.6	−0.2	−16.3	−23.5
New share issues	96.5	92.9	91.2	87.7
Retained earnings	73.1	69.7	62.4	57.3
Overall	48.4	47.2	37.2	31.5
Zero inflation	44.9	43.8	32.0	28.7
10% inflation	48.3	47.4	38.4	33.0
Contribution of:*				
Property tax			6.2	
Corporate tax			1.9	
Personal tax			29.5	

Source: Fullerton and King, *The Taxation of Income from Capital*, chapter 6. The basic calculations assume a constant 10% before-tax real rate of return for all investment projects with a 6.8% inflation rate. Alternatively, if the real rate of return before tax to the saver is equal for all projects, the effective tax rates for the four years are 59, 57, 50, and 45%, respectively.

*Because of interrelationships between the taxes, such as deductibility of property taxes, the components do not add to the total. Instead, they show the decline in the tax rate that would occur if the specific tax were eliminated.

Cost of Funds The uncertainty about the net direction of change in investment incentives results from questions about what happened to the real cost of funds. That cost is a weighted average of the cost of equity and debt finance. The real cost of debt finance appears to have declined as the studies agree that market interest rates did not rise in step with any available measure of expected inflation of capital goods prices. There is greater uncertainty about the cost of equity finance or, in other words, the risk premium, on investment during the 1970s. The price-earnings ratio fell very sharply,

which implies a sharp increase in the cost of equity finance. However, some interpret the decline in market value as a reflection of unexpected obsolescence of existing capital and not as an implication of an increased cost of financing new investment. That is, the present value of future income from existing capital really had declined and existing stockholders were not surrendering large amounts of future income to obtain new equity financing.

Others have interpreted the decline in share values as reflecting confusion by investors in valuing future earnings in an inflationary situation. According to this view, the 1970s might have been a period of high financing costs, but I would then expect the policy issues to revolve around means of strengthening investor confidence—controlling inflation in an economic environment of sustained expansion.[21]

The issue takes on even greater importance in interpreting events of recent years. The 1981-82 tax changes sharply lowered the effective tax on new investments. At the same time, however, the rise in the real interest rate appeared to offset fully any net stimulus to domestic investment.

Policy Options

The decline in productivity growth is an issue that should be of great concern to public policy. While the concept is often confusing to the general public and carries with it negative connotations of automation and robots destroying jobs, it is the source of the rise in real incomes. If the post-1973 slowdown had never occurred, the real income of the average worker would today be over 20% higher than it is.

The discussion of potential policy actions reflects two extremes. In focusing so heavily on tax incentives for private saving, the supplyside debate in the United States has ignored actions in other areas that would make important contributions. Furthermore, the pressure for tax reductions, without a coordinated scaling back of expenditures, has led to large deficits that are likely to discourage investment in future years.

Alternatively, much of the current public discussion reflects a belief that the United States needs to develop an industrial policy. That would require the government to develop an explicit plan of what the future structure of the economy ought to be, and to adopt a combination of tax, loan, trade, and regulatory policies to channel investment and output in the desired direction.

A more conventional view of a pro-growth strategy would give greater weight to the traditional responsibilities of government policy. Stabilization policies are the subject of another paper at this conference. Yet the resolution of those issues is likely to be of greater importance to the future growth of the economy than any of the more microeconomic policies that might be suggested. The creation of a favorable environment for domestic investment and innovative activity involves more than tax policy alone. It is equally important that government restore business confidence in sustained future expansion of the overall economy, reasonable availability of financing, and exchange rates that are reflective of underlying competitive conditions relative to other nations.

Beyond these macroeconomic policy concerns, there are two major areas where changes in government policies might have significant benefits. First, the wide variation in effective tax rates on different types of investments indicates that the current tax system could be seriously distorting the allocation of capital. Second, there is evidence that research and development earns a private rate of return substantially above that of physical capital. And, evidence that the full benefits of R&D are not captured in private returns, such that the social return exceeds the private return, creates an argument in favor of some public role to increase R&D.

Stabilization Policy

Government could make a substantial contribution to the potential for future growth if it performed better in managing the overall economy so as to avoid the extremes of inflation and recession. This is an obvious point but it is often overlooked in current discussions. For example, the expected return on new capital is a function of its expected utilization as much as of taxes and the cost of funds. A sustained expansion would increase the utilization and thus the return of existing capital, and raise expectations of future needs. Thus, restoring private-sector confidence in a sustained expansion of overall economic activity is a strong pro-investment measure.

In addition, there is substantial evidence that the mix of fiscal and monetary policies has important effects on the allocation of output between investment and consumption. In recent years there has been a shift toward a more expansive fiscal policy with a consequent increase in the burden placed on monetary policy as a restraining anti-inflation influence. In future years, this pattern is expected to be accelerated as the budget deficit is projected to rise even with economic recovery.

This mix of policy may have an impact on capital formation in several ways. As the economy recovers there will be an increasing tension between the fiscal stimulus and the inflation concerns of the monetary authorities with a consequent upward pressure on interest rates. That is, if concerns about inflation on the part of the monetary authorities place a ceiling on national output, similar to that which would exist at full employment, government borrowing in capital markets could crowd out private investment. Thus, it is argued that a shift in the mix of policy toward fiscal restraint with an offsetting easing of monetary policy would lower interest rates, raise investment, and provide the required financing through higher government saving.

This argument is tempered by noting that both residential construc-

tion and consumer durables spending appear to be more sensitive to interest rates than business investment. Therefore, if personal taxes were raised, with an offsetting change in monetary policy in order to keep the path of GNP unchanged, most of the increment to national saving would be reflected in housing and durables. If the tax increase were concentrated in areas that directly affect investment, nonresidential capital formation might actually decline.

The conflict between an expansionary fiscal policy and a restrictive monetary policy will also affect the foreign balance and the competitive position of U.S. goods in world markets. High domestic interest rates will attract foreign capital and maintain a high value of the dollar. In part, the large government deficit will be offset by a substantial foreign account imbalance. The direct effect of the budget deficit and tight money on business investment is reduced, but the depressive effects on U.S. export and import-competing industries would limit their demand for investment goods.

Capital Income Taxation

Views about the appropriate rate of taxation of capital income relative to labor income are heavily influenced by equity considerations—how tax burdens should be distributed. But the recent studies have highlighted other less controversial issues. First, the system may seriously distort the allocation of investment because of widely disparate effective tax rates for investment of different durabilities, methods of financing, and ownership. For corporations, some categories of equipment investment, financed by debt, are heavily subsidized under the current tax system, while equity-financed structures are taxed at a very high rate. Under the personal tax system, many forms of capital income escape taxation altogether, while others pay very high rates. Second, within both the corporate and personal tax systems, the rate of taxation on capital income is highly sensitive to variations in the rate of inflation. Third, the value of the investment tax incentives is dependent upon the individual firm having sufficient tax liabilities from other operations against which to charge deductions and tax credits. That means that the system may discriminate against investments by new firms. And, fourth, the problems of measuring the income from capital are responsible for most of the administrative complexity of the current tax system. While recent changes in the tax laws have reduced the effective tax on the average new investment, they have aggravated some of the distortions in the allocation of investment.

There have been two major lines of suggested reform. The first would attempt to fix up the system by moving back toward a comprehensive income tax with inflation adjustments and economic depreciation. The second would abandon efforts to tax capital income and move to a consumption tax, which is equivalent to a tax on wage income alone under some circumstances.[22]

At the corporate level these contrasting views are reflected in two proposed reforms. The first, suggested by Jorgenson and Auerbach, would continue to tax capital income, but would give firms the full present value of depreciation, based on economic useful lives, at the time the investment is undertaken, thus, eliminating the problem of adjusting depreciation for inflation.

The alternative plan, suggested by Robert Hall, among others, would convert to a system of current expensing for all investments, thus eliminating the administrative machinery of depreciation accounting. In addition, the tax would be applied to the total income of corporate capital: Interest expenses would no longer be deductible. Current expensing does not imply the elimination of the corporate tax. Taxes would still be paid on any income in excess of the cost of capital—infra-marginal returns. It does imply a zero tax on the opportunity cost of capital. Current expensing also results in a substantial increase in the tax on interest income unless it is combined with a consumption tax concept at the personal level.

Both proposals would create a corporate tax that is neutral in its treatment of investments of differing durability and the elimination of the interest deduction under current expensing would remove any distorting effects induced by variations in the method of financing—equity versus debt. Firms would earn the full before-tax return on assets and they would pay the full before-tax cost of funds. The Jorgenson-Auerbach proposal would retain the interest deduction at the corporate level, however, because the underlying concept is still that of a tax on income. Thus, there would still be a difference in corporate taxation of capital financed by different means.

Both proposals still encounter the possibility that a firm may have negative tax liability in some years. Thus, there would be a possibility of a variation in the tax on investments of different firms. One solution would be to provide an unlimited carry-forward of unused deductions.[23] Alternatively, firms would be paid out of the Treasury for the amount of any negative tax liability, or they could sell unused credits to other firms as with the current system of safe-harbor leasing. [Editor's note: Safe harbor leasing was phased out of the U.S. tax structure by the Tax Equity and Fiscal Responsibility Act of 1982.]

These alternative proposals for reform of the corporate tax illustrate an issue that is confronted more directly in discussions of the personal tax system: Should tax liabilities be based on income or consumption? The Jorgenson-Auerbach proposal maintains income as the tax base, but it adjusts the measure of capital income for the effects of inflation. Current expensing of investment at the corporate level, with elimination of the interest deduction, is equivalent to a consumption tax for individuals.

The current personal tax system is a hybrid between an income and a consumption-based tax, and it is responsible for much of the variation

in effective tax rates on different types of investment. On the one hand, many forms of capital income are either exempt from taxation (housing) or the tax liability can be deferred to the point where the effective tax rate is near zero (capital gains and pension funds). On the other hand, interest income is taxed at high and variable rates because of the failure to index the tax base for inflation.[24]

There are two alternative means of implementing a consumption tax. The first would simply exclude the income of capital from the tax base and eliminate the deduction of interest expenses. The second approach would measure total income (capital plus labor) on a cashflow basis but allow a deduction for saving. The two concepts are equivalent for investments which earn the market rate of return: It makes little difference whether the funds are excluded from taxation when they are put into the savings account (the deduction approach) or when the income is earned (the exclusion approach). Thus, in the simplest case, any consumption tax is a wage tax. The approach of deducting saving, however, maintains taxation of the inframarginal returns to capital—similar to the treatment of business investment as a current expense. In addition, the deduction of saving involves fewer transitional problems when it is introduced because the exclusion of capital income completely would involve large windfall gains to existing wealth holders.

The deduction of saving is not as simple as the exclusion of capital income, but it still results in a simplification of tax reporting because it would use cash-flow accounting. There is no need to measure capital gains or losses because if the funds are not withdrawn from the account they are saved and can be excluded from the measure of income. The use of cash-flow accounting also eliminates the need to adjust the income measure for inflation.

If the United States were to shift from its current personal income tax to a consumption or wage tax of equivalent revenue, there would be an increase in private saving incentives. The greater gain, from the perspective of domestic capital formation, however, is likely to result from the equalization of taxation on different types of capital.

Nonetheless, the consumption tax is controversial. It would initiate a substantial redistribution of tax burdens and the increased effective tax on labor income may cause offsetting reductions of labor supply and work effort. In addition, the consumption-tax advocates assume that wealth has no value beyond its ability to support future consumption. Others believe that wealth confers power, security, and access to opportunities that are not reflected in consumption. Therefore, on equity grounds they prefer to use income as the basic measure of tax liability. One compromise is to combine the consumption tax with an inheritance tax aimed at preventing the concentration of wealth among a few. Because such a combined tax system does imply a positive tax on capital income, we cannot be certain of the net effect on saving.

The opponents of the consumption tax normally advocate a broadening of the current tax base to move in the direction of a comprehensive income tax and use of the proceeds to reduce effective tax rates. In this way, they would equalize the tax on alternative investments by bringing back into the definition of income many of the components that are now excluded, and they would index the tax base to adjust for inflation. Some argue that the failure to index interest is not a major distorting factor as long as the tax rates paid by borrowers (who deduct the payments) and the lenders (who include them in income) are roughly equivalent. Indexation would be required for depreciation and capital gains (which would then be taxed as ordinary income). The revenues raised by the base-broadening measures could then be used to reduce marginal tax rates.

The income tax that emerges may be more complex than a consumption tax, but it is a compromise its advocates accept to achieve their equity objectives. Moreover, the consumption tax is unlikely to emerge, in practice, in the pure form that has been suggested. Most of the tax preferences that exist under the current system are likely to exist under either a consumption or an income tax. These preferences reflect explicit decisions to favor specific groups and activities, rather than difficulties of measurement or concept. Likewise, a consumption tax would encounter its own problems of distinguishing between saving and consumption, education being a particularly important example.

In summary, either a consumption tax or a comprehensive income tax could eliminate most of the distortions in the current treatment of different types of capital income. The comprehensive-income tax is aimed at eliminating tax preferences; the consumption tax extends them to all forms of capital income. The consumption tax would increase saving incentives, but the magnitude of the effect on actual saving is uncertain. More important, an increase in national, rather than private, saving should be the major objective of policy, and that goal could be achieved with greater certainty by simply reducing government dissaving.

Research and Development

A large number of studies over the last two decades have provided strong evidence of a high return to R&D expenditures. Those studies have utilized a variety of different techniques. Griliches has used a production function framework to estimate the contribution to output from time series data of individual firms and industries. He finds a significant effect on output that would correspond to a gross private rate of return (that is, including depreciation) of about 20-25%.[25] Mansfield and his associates evaluated the return on specific innovations. They also found an

average private before-tax rate of about 20-25%, and then went on to estimate the social return, which appears to be much higher.[26] The social return would be expected to be higher because of the ability of competitors to imitate the innovations. There is less evidence of a high return for publicly-financed R&D, but that may be because of its concentration in defense and basic research where the links to output are less immediate and direct.

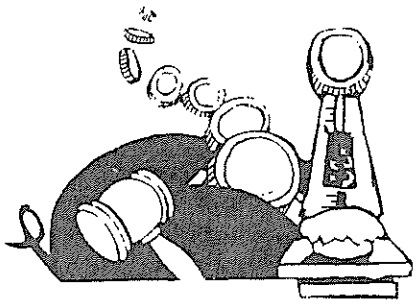
The magnitude of the gap between the social and private return does create a strong argument for a public role in R&D, but the large difference between the private return for R&D and that for physical capital raises a question about why the private sector does not spend more on R&D. In part, the explanation may involve the riskiness of such investment, but it should be possible to pool R&D projects so as to reduce the risk associated with the individual project.

There are also many questions about the most effective form that public incentives for R&D should take. Before 1981, the tax laws allowed firms to deduct all R&D costs as a current expense.[27] The 1981 tax act assigned all capital used for R&D to the three-year recovery class regardless of its expected rate of economic depreciation.[28] Furthermore, qualified R&D expenditures (essentially labor and other nondepreciable costs) in excess of a base period amount are eligible for a 25% tax credit. The net effect of these changes is to provide a neat tax subsidy to labor and other nondepreciable costs of R&D, a net tax subsidy to capital expenses that are financed by debt (because of the deduction of interest costs) and an effective tax of 5-10% on the opportunity costs of R&D capital that is equity financed.[29] It is too early to evaluate the effect of these measures, but there is a concern that firms will simply inflate the category of expenditures that they classify as R&D because of the tax advantages.[30]

The tax system may favor investment in risky activities such as R&D, but the magnitude of the effect, and even its direction, are subjects of continuing controversy. The simple view is that income taxation shifts the distribution of investments toward more risky projects because the government shares in the losses as well as the gains—reducing the variance of after-tax returns. Government thereby becomes a partner in the activity. In practice, however, the situation is more complex for several reasons. First, firms (particularly new firms) may not have sufficient tax liability from other sources to absorb the tax deductions. Second, the progressivity of the personal tax yields an assymmetric treatment of income gains and losses. Third, in a situation where individuals can diversify their portfolios to avoid all but social risk (business cycles, for example) they don't need the government as a partner. And fourth, the analysis depends upon individual attitudes toward risk.[31]

The special treatment of capital gains provides a more clear-cut example of a positive tax incentive. For these purposes R&D constitutes a natural deferral activity in the sense that the costs can be passed through to the partners in the venture and be offset immediately against ordinary income. Meanwhile, the return can be translated into a capital gain, delayed, and then taxed at 40% of the rate on ordinary income. Problems arise because the law applies equally well to a wide range of other activities, and it is difficult to design a capital gains incentive for R&D that is not subject to abuse.

Finally, it is sometimes argued that tax incentives for physical investment are an indirect means of encouraging innovation because an expansion of demand in the capital goods industry stimulates its R&D activity.[32] This demand-pull argument should apply equally to increases in the demand of any industry, and, as far as I know, there is little evidence that R&D in the capital goods industry has a higher return than elsewhere. The argument should reinforce the observation that a sustained economic expansion raises productivity. In fact, a reduction in the tax on physical capital alone reduces the relative advantage of R&D



and may equally well lead to a reduction of such efforts.

It may be a mistake, however, to focus so heavily on tax incentives for private R&D. While total R&D expenditures have fallen as a share of GNP since the 1960s, the decline was due solely to cutbacks in federal government outlays for defense and space (see Table 5).

Conclusion

For future growth it is important to enhance the rate of capital formation, but the definition of capital should be a broad one that encompasses investments in human capital and research as well as in physical

Table 5

SHARES OF GNP DEVOTED TO RESEARCH AND DEVELOPMENT, 1961-81

(percent)

Period	R&D Expenditures by Source		
	Total	Civilian*	Private
1961-70	2.8	1.4	1.0
1971-75	2.4	1.5	1.1
1976-80	2.3	1.6	1.1
1981	2.4	1.7	1.2

	Type of Research†		
	Basic Research	Applied Research	Development
1961-70	0.4	0.6	1.9
1971-75	0.3	0.5	1.5
1976-80	0.3	0.5	1.5
1981	0.3	0.5	1.5

Source: National Science Board, *Science Indicators*, 1980
*Includes private and government civilian expenditures
†Applies to total R&D

capital. The major barrier to increased physical capital seems to be the lack of demand for new investment rather than a lack of available resources in the form of saving. The poor environment for investments is in turn a reflection of the chaotic state of current fiscal and monetary policies—high financing costs and an appreciation of the exchange rate that has sharply reduced the competitiveness of U.S. products in world markets. A shortage of saving at levels of resource utilization acceptable to the monetary authorities is an element in the high financing costs, but the shortage is the result of a sharp rise in government borrowing rather than a decline in private saving. This issue is best addressed by stabilization policy rather than an attempt to achieve an offsetting rise in private saving.

Second, tax incentives for private saving should not be the focus of the current policy discussion. For the short term, the existing level of idle resources can finance a substantial increase in investment. For the longer term, there is room to increase national saving by reducing the government deficit and, even beyond that, by increasing the financing of public pension programs.

Third, the discussion of capital income taxation has focused heavily on the average or average marginal tax rate, with too little concern for the distorting influences of the variation in tax rates for different types of investment. The wide variations in effective tax rates on different types of capital potentially result in a substantial waste and misallocation of existing investment. These allocative issues could be addressed within either a consumption-wage tax or a comprehensive income tax. The choice between the two is a very complex issue that involves equity and other concerns. It is not clear that advocates of either proposal actually address the basic issue of what to do about tax preferences; yet it is the tax preferences, rather than conceptual differences over the appropriate tax base, which is responsible for much of the variation in effective tax rates.

Fourth, the evidence on rates of return supports the advocates of an increased national effort on research and development. Private R&D spending, however, has been steadily increasing, and the 1981 tax law changes introduced several new incentives. The reduction in overall R&D investment is the result of cutbacks in federal financing. Tax incentives to private firms are unlikely to be effective in encouraging basic research where the discrepancy between social and private returns is expected to be most significant. Thus, any increased public effort should probably take the form of direct expenditures rather than tax incentives.

Footnotes

1. There is a large literature on this subject. I have relied most heavily on the following articles: Martin Neil Baily, "Productivity and the Services of Capital and Labor," *Brookings Papers on Economic Activity (BPEA)*, 1:1981, pp. 1-50; Edward F. Denison, "The Interpretation of Productivity Growth in the United States," paper presented at the Conference of the Royal Economic Society, London, July 22, 1982; Barbara M. Fraumeni and Dale W. Jorgenson, "The Role of Capital in U.S. Economic Growth, 1948-76," in George M. von Furstenberg, ed., *Capital, Efficiency and Growth*, Cambridge: Ballinger, 1980, pp. 9-250; John W. Kendrick, "International Comparisons of Recent Productivity Trends," in William Fellner, ed., *Essays in Contemporary Economic Problems*, 1981-82 edition, American Enterprise Institute, 1981, pp. 125-70; and J.R. Norsworthy, Michael J. Harper, and Kent Kunze, "The Slowdown in Productivity Growth: An Analysis of Some Contributing Factors," *BPEA, 2:1979*, pp. 387-421.

2. Capital is defined to include land, plant, equipment, and inventories.

3. Barry P. Bosworth, "Capital Formation and Economic Activity," *BPEA, 2:1982*, pp. 291-95.

4. Kendrick, "International Comparisons."

5. Baily, "Productivity and the Services of Capital and Labor."

6. See, for example, Dale W. Jorgenson, "Taxation and Technical Change," *Technology in Society*, vol. 3 (1981), pp. 151-71, and the references cited there.

7. Charles R. Hulten and Robert M. Schwab, "Regional Productivity Growth in U.S. Manufacturing: 1951-78," February 1983 (*American Economic Review*, forthcoming).

8. Denison, *Accounting for Slower Economic Growth*, pp. 57-58.

9. The hypothesis of a slower rate of technical change has ambiguous implications for future capital formation. Under some circumstances, a slower rate of labor-augmenting technical change reduces the benefits of capital investment. Capital that embodies old technology lasts longer, and less capital is required to equip future entrants to the workforce. On the other hand, a continued slow growth of technology lowers future income and that could argue for a compensation reduction of current consumption and increase of investment in order to shift consumption to future periods.

10. Some of the ambiguity of emphasizing trends in saving of individual sectors is illustrated by the argument of some economists that state and local pension funds should be assigned to personal savings as is done with private employee pensions. That simple change would raise personal saving by over 20% and shift the private saving rate from a historical constant to a rising trend. Government dissaving would rise by an offsetting amount.

11. For a survey of the work in this area, see "International Differences and Trend Changes in Saving Ratios," unpublished paper prepared by the Secretariat for Working Party No. 1 of the Economic Policy Committee, Organization for Economic Cooperation and Development (CPE/WP1 (81) 9, October 1981).

12. A more extensive discussion of the issues, with citations, is given in Bosworth, "Capital Formation and Economic Policy," pp. 313-17.

13. The long-term effect on saving is less uncertain for a shift in the structure of the tax system. A change from an income to a consumption tax that raises the same total revenue, for example, is very likely to raise the private saving rate. The income effect is of limited relevance, and the important point is that the price of future consumption is reduced. But a consumption tax is effectively the same as a wage tax and it will change the supply of labor and total wage income. In addition, while there is a small aggregate income effect associated with a shift in the tax structure, the distribution of the tax burden is altered dramatically between earners of wage and capital income. If their saving behavior is disparate, there may be a significant aggregate effect. As a result, there is some uncertainty about the effect on total saving.

14. Robert J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy*, vol. 82 (November-December 1974), pp. 1095-1117. A second variant of the argument is that public expenditures financed by taxes substitute for private consumption and debt-financed expenditures substitute for private investment. Paul A. David and John L. Scadding, "Private Saving: Ultrarationality, Aggregation, and Denison's Law," *Journal of Political Economy*, vol. 82 (March-April, 1974), pp. 225-50.

15. Willem H. Buiter and James Tobin, "Debt Neutrality: A Brief Review of Doctrine and Evidence," in George M. von Furstenberg, ed., *Social Security Versus Private Saving*, Cambridge: Ballinger Press, 1979, pp. 39-63.

16. Martin Feldstein, James Poterba, and Louis Dicks-mireaux, "The Effective Tax Rate and the Pretax Rate of Return," Working Paper No. 740, National Bureau of Economic Research, 1981.

17. Eugene Steuerle, "Is Income from Capital Subject to Individual Income Tax?" *Public Finance Quarterly*, vol. 10, July 1982, pp. 283-303.

18. Charles R. Hulton and James W. Robertson, "Corporate Tax Policy and Economic Growth: An Analysis of the 1981 and 1982 Tax Acts," unpublished working paper, the Urban Institute, Washington, D.C., December 1982. They assume a 4% real after-tax return in making their calculations and a 6% inflation rate for 1983-86.

19. Don Fullerton and Mervyn A. King, eds., *The Taxation of Income from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany*. University of Chicago Press, forthcoming.

20. The major reason for the low tax rate in the United Kingdom is immediate expensing of depreciation combined with the full deductibility of nominal interest payments.

21. An example of the importance of stock market conditions for the financing of new issues is provided by the recent explosion of new stock issues from $82 million in July of 1982 to $1.6 billion in June of 1983. See Mark Potts, "New Issues," *Washington Post*, July 17, 1983, p. H1.

22. These two contrasting approaches are outlined in more detail, with citations, in Harvey Galper, "Tax Policy," in Joseph A. Pechman, ed., *Setting National Priorities: The 1984 Budget*, Brookings Institution, 1983, pp. 173-200.

23. To maintain equal treatment, the amount of negative tax liability carried forward to future years should earn a market rate of interest.

24. The severity of this problem is reduced for corporate capital when the interest payment is deducted, but there are many situations when the tax rates are not equivalent for the payment and receipt of interest.

25. See, for example, Zvi Griliches, "Returns to Research and Development Expenditures in the Private Sector," in John W. Kendrick and Beatrice N. Vaccara, ed., *New Developments in Productivity Measurement and Analysis*, University of Chicago Press for the National Bureau of Economic Research, 1980, pp. 419-54.

26. See Edwin Mansfield, et al, "Social and Private Rates of Return from Industrial Innovations," *The Quarterly Journal of Economics*, vol. 91, May 1977, pp. 221-40. They report average private and social rates of return of 25 and 56% for a sample of 17 innovations. The variability of the estimated returns also illustrates the high risk associated with such investments.

27. Capital equipment used for an R&D project was subject to normal depreciation, but that is equivalent to expensing of the R&D asset.

28. Because the investment tax credit is limited to 6% in the three-year recovery category compared to the 10% credit on longer life assets, this change had a minor effect on the net incentive for R&D equipment with an economic useful life of 7-8 years.

29. This assumes an after-tax required real return of 4% and that the firm has sufficient tax liabilities from other activities to absorb the tax deductions.

30. As an illustration, preliminary analysis of 1982 tax returns indicates that the biggest reported increase in R&D expenditures was in the advertising industry.

31. These issues are elaborated on and citations provided in Anthony B. Atkinson and Joseph E. Stiglitz, *Lectures in Public Finance*, New York: McGraw Hill, 1980, pp. 97-127.

32. J. Smookler, *Invention and Economic Growth*, Cambridge: Harvard University Press, 1979.