Managing the Corporate Financial Structure

by

James E. Walter

and

Michael R. Milken

Working Paper No. 26-73

RODNEY L. WHITE CENTER FOR FINANCIAL RESEARCH
The Wharton School
University of Pennsylvania
Philadelphia, Pennsylvania 19174

MANAGING THE CORPORATE FINANCIAL STRUCTURE

This paper evaluates the present and prospective responsiveness of corporate financial structures to aberrations in the structure of returns to investors. The end in mind is to draw - so far as possible - the parallel between the management of corporate financial structures and that of, say, balanced portfolios. In developing this parallel the conclusion is drawn that opportunities for successful modification of corporate financial structures are somewhat limited by constraints not confronting a portfolio manager, e.g., high transaction cost, long time delay, and inability to achieve portfolio diversification.

Previous studies [1] have dealt with the value of the call privilege and with bond refunding. Few - if any - treat the broad range of alternatives open to management in its efforts to optimize the firm's financial structure through time.

To the end of redressing this apparent deficiency in the literature, the present study (1) analyzes the financial structures of a diversifed sample of corporations, (2) considers the character of interperiod adjustments in financial structures, (3) differentiates portfolio management from financial-structure management, and (4) works toward a model for the interperiod optimization of capital structure.

FINANCIAL STRUCTURE

Consider a $\underline{n} \times \underline{t}$ matrix whose $\underline{n}$ rows constitute the diverse components

of the financial structure and whose t columns represent the cash outlay commitment schedule related to each element of the financial structure. Let each cell contain the absolute dollar commitment associated with the ith security and the jth period, the corresponding present value figure, and the percentage of total present value for all components. The bottom row sums the periodic outlay commitments, while the right-hand column totals items across periods for each of the firm's outstanding securities. With the elapse of time, the left-hand columns are eliminated sequentially and are replaced by increments in one or more of the remaining cells (unless total assets decline correspondingly).

To be specific, the matrix format shown in Table 1 for Combustion Engineering (as of the end of 1968) sets forth the maturity structure of the debt positions held by the firm and identifies the interest sensitive components of the financial structure. Some two-thirds of the scheduled outlays in present value terms occur in the first five years (Table 2). Interest sensitive elements are confined largely to the sinking fund feature of publicly held obligations. Given a market yield greater than the coupon rate, the sinking fund requirement can be satisfied at less than par by open-market purchases. No such opportunity normally exists for privately placed issues. The importance of this distinction between publicly and privately placed issues has increased markedly in recent years with higher base rates and greater volatility in the bond market. During the past three years, for example, Jones & Laughlin Steel has been able to meet sinking fund requirements ($5,000,000/year) on its 5% First Mortgage Series E debentures due 2/1/91 by open market purchases at an average price below 70. Had this issue been issued with a pro-rata sinking fund operating at face value (a common

TABLE 1

COMBUSTION ENGINEERING, INC. - 1968

	Outlay Commitment Schedule (Year):							Totals		
	1	2-5	6-10	11-15	16-20	21-25	26 & Over	Interest	Par	Present Value
Notes Payable (Bank)										
Interest	1,616							1,616		
Principal	22,289								22,289	22,289
Term Loan (Prime + 1/4%)										
Interest	2,774	6,711	226					9,711		
Principal	3,128	32,020	3,127						38,275	38,275
Debenture (3 1/4%)										
Coupon	236	708	358	1				1,303		
Sinking Fund										
Par	750	3,000	3,750	39					7,539	
Present Value*	545	2,324	3,299	38						6,206**
Debenture (5 7/8%)										
Coupon	2,937	11,748	13,417	10,119	6,855	3,134		48,210		
Sinking Fund										
Par	---	---	8,888	11,110	11,110	18,892			50,000	
Present Value*	---	---	8,164	10,366	10,612	18,730				47,872**
Preferred Stock										
Book							4,562		4,562	
Market							38,500			38,500
Common Stock										
Book							218,775		218,775	
Market							317,632			317,632

* as of payment date, based upon current market yield of 6.71%

** future period present values

TABLE 2

FINANCIAL STRUCTURE FOR COMBUSTION ENGINEERING, INC.

Year Payment Scheduled	Notes Payable (Bank)	Term Loans	Debentures	Pfd. Stock	Common Stock	Total	Present Value	% Of Present Value	Cum. % Of Present Value
			December 31, 1968 (000 of $)						
1	23,905	5,902	3,718	---	---	33,525	31,276	7.3	7.3
2 - 5	---	38,731	14,780	---	---	53,511	41,796	9.8	17.1
6 - 10	---	3,253	25,202	---	---	28,455	17,146	4.0	21.1
11 - 15	---	---	20,524	---	---	20,524	8,898	2.1	23.2
16 - 20	---	---	17,467	---	---	17,467	5,457	1.3	24.5
21 - 25	---	---	21,864	---	---	21,864	4,847	1.1	25.6
26 & over	---	---	---	---	---	---	317,632	74.4	100.0
Total	23,905	47,886	103,555						
Present Value	60,567		48,898	38,500	279,132		427,097		
Percent of Present Value	14.2		11.4	9.0	65.4			100.0	
			December 31, 1969 (000 of $)						
1	20,339	2,426	3,373	---	---	26,138	24,155	5.4	5.4
2 - 5	---	29,492	14,568	---	---	44,060	33,776	7.6	13.0
6 - 10	---	4,482	24,608	---	---	29,090	16,315	3.7	16.7
11 - 15	---	---	18,934	---	---	18,934	7,097	1.6	18.3
16 - 20	---	---	16,258	---	---	16,258	4,148	.9	19.2
21 - 25	---	---	18,581	---	---	18,581	3,323	.7	19.9
26 & over	---	---	---	---	---		357,943	80.1	100.0
Total	20,339	36,400	96,322						
Present Value	46,406		42,390	18,808	339,135		446,739		
Percent of Present Value	10.4		9.5	4.2	75.9			100.0	
			December 31, 1968 (000 of $)						
Book Values	22,289	38,276	57,539	4,562	218,775	341,441			
Percent of Book Value	6.5	11.2	16.9	1.3	64.1	100.0			

Source: Moody's Industrials, 1969 and 1970

characteristic of private placements), the additional cost to Jones & Laughlin Steel would already have exceeded $4,500,000.

The present-value figures given in Table 2 represent current market values (or approximations thereof). As such, these dollar magnitudes measure the prices to be paid for instantaneous modification of the financial structure. Use of market values for equity poses some problem (for both interpretation and reaction) due to their volatility; a normalized value might well be preferable in the assessment of financial structures.

That individual corporations may feature complex capital structures is evident from the three firms found in Appendix A. An excellent example is Jim Walter Corporation with five distinct levels of debt and seven different preferred stock issues (each with a specific dividend and liquidation preference). Whatever the apparent complexity of the financial structure, however, the rating services rarely admit to more than one gradation of bond quality for a given firm. Overall firm quality apparently dictates issue quality, and thereby restricts management's financial flexibility.

That sizable differentials may exist between book and market value for the longer-term components in a firm's capital structure is also confirmed by Appendix A. Such differentials afford the corporate financial officer numerous modification possibilities.

INTERPERIOD ADJUSTMENTS

Conceptually, maturing obligations can be replaced by any feasible component in the financial structure. Refundings, exchanges, or swaps are also possible for nonmaturing claims unless precluded by provisions contained in the financing agreement.

Realistically, efforts to modify the financial structure in direct response to the capital market environment tend to be confined to periods of notable imbalance in the market. Interperiod adjustments ordinarily involve the replacement of maturing claims by either equity (retained earnings) or short-term credit. Under normal circumstances, new issues tend to reflect operating cash needs, capital expenditure programs, or acquisitions.

Virtually all components of the financial structure have featured notable price fluctuations during the past five years. Not only have severe price movements occurred within specific financial markets (i.e., long-term corporate bonds, preferred stocks, and common stocks), but wide swings in relative values have also existed between these individual markets. During the last three years, the spread between Baa and A industrial has ranged from 60 to 300 basis points. Within the last 30 months, the spread between single A rated utility preferreds and bonds has varied from a positive spread of more than 30-40 basis points to a negative spread of more than 50-60 basis points. This year (1973) alone, the variation in the spread between the highest grade intermediate and long-term bonds has exceeded 100 basis points. This recent period

of imbalance has perhaps been most evident in the equity markets, where, despite record profits and cash flow, the market values of common stock issued by many corporations has reached new three, five, and in some cases ten year lows.

Share Repurchase

Depressed market environments apparently motivate companies to purchase their own shares.* Corporations whose stocks are listed on the New York Stock Exchange acquired 12.9 million shares in the second quarter of 1966, 15.4 million shares in the third quarter of 1969, and 24.9, and 30.4 million shares respectively in the first and second quarters of 1973 (Table 3)**By way of contrast, normal purchases designed to cover treasury stock needs for stock option plans, acquisitions and convertible issues fall in the seven-to-eleven-million range.

Notwithstanding their direct effect upon per-share earnings, share repurchases have produced questionable benefits upon occasion. Of 36 companies that repurchased stock in the 12-months ending August, 1970 (Table 4), only 13 out-performed the S&P 500 over the 32-month period ending mid-April, 1973. The stocks of 12 firms actually declined in price.

Better results are obtained if the interval is confined to the six and twelve month recovery periods following such repurchases.*** Of 25 issues featuring repurchases of at least 97,000 shares in 1966, 72% out-performed the market in the following six months. Of 25 other issues involving repurchases in 1970, 68% outdid the market in the succeeding half year. Most such issues also did better than the market over the next 12-month period.

---

* "Bad Bargains," Wall Street Journal, May 22, 1973.

** The exceptional levels attained in 1973 are attributable in part to restriction placed on dividends.

*** A. Morjos, "Taking a Long View," Barron's, May 28, 1973.

Treasury Stock Holdings

Net increase (or decrease) in reacquired shares held by NYSE listed companies of 100,000 shares or more.

(in 000's)

AirCo, Inc.	207	Ingersoll Rand	105
Alleghany Corp.	125	Insilco Corp.	353
American Cyanamid	225	INA Corp.	410
American Home Prod.	5,508	Interlake, Inc.	149
AMF, Inc.	649	International Paper	242
Amrep, Corp.	113	Jefferson Pilot	442
Ampco Pittsburgh	415	Keebler Co.	122
Anderson Clayton	298	Louisiana Pacific	140
Archer Daniels Midland	(434)	MacMillan, Inc.	1,202
Arlen Realty	(537)	Marlennan Corp.	185
Bath Industries	150	Martin Marietta	888
Bethlehem Steel	454	McDonnell Douglas	124
Cabot Corp.	241	Mead Corp.	367
Castle & Cook	(186)	Merrill Lynch	371
Certainteed Products	121	Minn. Mining & Mfg.	112
Champion Int'l	117	Norris Industries	145
Continental Corp.	134	Ogden Corp.	227
Crown Cork & Seal	117	Olin Corp.	246
CTS Corp.	266	Rockwell Int'l	1,458
Doric Corp.	233	Schlumberger	341
Dun & Bradstreet	214	Servomation Corp.	183
Eaton Corp.	368	Sperry & Hutchinson	304
Ethyl Corp.	146	Studebaker Worth.	273
Evans Products	(370)	Sun Oil	(261)
Exxon Corp.	102	Textron Inc.	(1,787)
Foremost-McKesson	1,030	Thinkol Chemical	144
Fred S. James	164	Thompson, Walter J.	104
Gen. Amer. Transport	161	Uniroyal, Inc.	125
General Electric	456	U.S. Fidelity & Guar.	252
General Foods	164	U.S. Industries	(456)
General Motors	229	Varian Associates	441
Goodyear Tire	193	Warner Communications	982
Harcourt Brace	203	Weyerhaeuser Co.	208
Hercules, Inc.	(195)	Wometco Enterprises	205
Illinois Central Ind.	(584)	Zenith Radio	146
Indian Head, Inc.	119		

Changes in Reacquired Treasury Shares

(Shares in 000's)

	Treasury Stock Beginning of Period	Increases	Decreases	Treasury Stock End of Period
Second Quarter, 1972	95,678	8,941	4,258	100,360
Fourth Quarter, 1972	85,826	8,986	3,500	91,311
First Quarter, 1973	92,072	24,859	7,249	109,602
Second Quarter, 1973	106,660	30,366	8,418	128,639

Source: The Money Manager, July 30, 1973

TABLE 4

CORPORATE STOCK REPURCHASES

Company	Shares Repurchased in 1970 (thousands)	Pct. of Listed Shares	8/10/70 Price	Recent Price	Pct. Change
Allied Chemical	205	0.7	17⅞	33⅛	85.3
Am. Broadcasting	237	3.2	11⅝	25	115.1
Ancorp Natl Services	175	9.6	14⅝	4⅞*	—66.7
Archer-Daniels-Midland	111	6.2	14⅞	22⅞	53.8
Bendix	318	2.5	21¼	38¼	80.0
Cities Service	153	—	46½	46	—1.1
CLC of America	150	4.0	4⅝	7¼	56.8
Cleveland-Cliffs	134	3.2	44⅞	57⅛	27.3
Cone Mills	340	9.1	15⅝	19⅝	25.6
Di Giorgio	135	3.6	10⅜	10⅞	4.8
Diversified Inds	319	7.1	8¾	2⅞	—67.1
Duplan	200	9.1	24¾	10	—59.6
First Natl Stores	248	15.0	30⅛	17¼	—42.7
Getty Oil	916	4.5	50	109	118.0
W.T. Grant	467	3.3	35⅝	26½	—25.6
Grumman Corp	295	4.1	14⅛	9½	—32.7
Gulf & Western Inds	2,007	11.5	12	25⅝	113.5
Intl Mining Corp	143	4.4	10⅜	8¾	—17.7
Jefferson-Pilot	395	3.2	26	67	157.7
LTV	1,756	28.6	12¼	8¾	—28.6
Lukens Steel	93	3.2	17	26⅜	55.2
Natl Presto Inds	75	5.0	23¼	32⅝	40.3
Norris Inds	123	2.9	14¾	32¾	122.0
Penn-Dixie Cement	74	2.5	8	8	0
Quaker State Oil	468	6.3	12	29⅛	142.7
Standard Oil Ind	1,975	2.7	45⅞	82¾	80.4
Standard Prudential	168	3.9	7½	10¾	43.3
Studebaker-Worthington	175	2.7	44⅝	43	—3.6
Swift & Co.	385	3.1	26	27	3.9
Talley Inds	332	8.4	8	8½	6.3
United Industrial	1,049	46.6	6⅝	8	20.8
U.S. Freight	260	3.7	20½	20¼	—1.2
U.S. Industries	469	2.1	12⅜	14	13.1
UV Industries	109	4.4	22¾	27¼	19.8
Vornado	496	8.1	9⅞	12¼	24.1
Ward Foods	121	3.7	10	8⅝	—13.8
S&P 500			**76.20**	**108.88**	**42.8**

*Last price prior to suspension of trading Mar. 15, 1973.

Source: Forbes, April 15, 1973

Exchange Offers

Prevailing market conditions (1973), together with accounting rules such as those (1) limiting the deductibility of interest expense arising from an acquisition and (2) requiring the recognition of potential dilution, have also fostered numerous and sizeable (if fully accepted, approximately two billion dollars) exchange offers (Appendix B). While many of the same companies are reappearing, the 1973 vintage of exchange offers differ markedly from the acquistion oriented offers of the mid to late 1960's. Only one of the nineteen exchange offers outlined in Appendix B was proposed for the purpose of acquiring a non-affiliated company. In fact, in the case of United Brands, Gulf & Western, L.T.V., Leasco, National General and Studebaker-Worthington, the current exchange offer will reduce or eliminate securities created in previous mergers or tender offers. These former "kings of acquisition" with complex financial structures and high debt to equity ratios have been penalized (see P/E ratios in Appendix B) rather than rewarded by the market place. Their response, therefore, has been to shrink and/or simplify instead of expand.

Recent exchange offers have generally taken the form of (1) reducing the parent or subsidiary common stock outstanding in exchange for debt or (2) exchanging straight debt for high yielding, lower coupon, "debt oriented" convertibles.* The case for using debt to retire common shares rests upon the tax deductibility of interest, the company's current P/E ratio, the minimal effect on overall firm quality and bond ratings (which are already low in most cases), the per-share income effect of reducing the number of shares outstanding and the reluctance to deplete cash balances under prevailing financial

* These convertibles have such high premiums over their stock value that they tend to sell almost solely on their bond value.

conditions. An implicit assumption in equity/debt exchange is that the common stock is relatively under-priced and additional equity, if needed, can be raised in the future at far more favorable prices.

The exchange of straight debt or preferred stock for convertible securities removes potential dilution, provides earnings equal to the difference between the cost of retiring the old issue and its book value, gives the cosmetic effect of reducing the book value of outstanding debt, provides an opportunity to extend maturity and eliminates (or reduces) redemption and capital maintenance requirements. A deferred benefit noted in the Fibreboard exchange offer is the possibility for (1) a permanent reduction in scheduled debt payments and (2) an increase in equity. In this case, the current exchange offer is just the first half of a contemplated two-step financing. The second half is the calling of the convertible issue when the common stock rises sufficiently.

Other Responses to Market Environment

Departures from normal yield and return relationships within and among segments of the securities market have also influenced the form and timing of new security offerings. A relatively large amount of Baa rated long term debt was issued during the first part of 1973 in response to the historically narrow spreads between Baa and higher grade issues. During the late spring and early summer of this year, 1973, many companies in turn announced issues with split maturities in recognition of normal relationships in the term structure. By sale time, however, the spreads between long and short term rates had narrowed to such an extent that the short maturities were often cancelled and, in some cases, the longer maturities were increased. Finally, industrial common stock offerings have

proved to be almost non-existent due to the weak equity markets during most of the second and third quarter of 1973.*

As a final example, with the great fluctuation between long-term debt rates and preferred stock rates during the past few years, it is our estimate that a number of high grade utilities have saved as much as 5% of the principal amount borrowed (on a present value basis) by properly timing their use of these two markets.

* "Can U.S. Industry Find the Money It Needs?" Business Week, September 22, 1973

ANALOGY TO PORTFOLIO MANAGEMENT

Notwithstanding the focus of most corporate executives upon the operating side of the business, opportunities for profit enhancement also exist in the financial end of the business. The liability and net worth segments of the balance sheet represent portfolio positions that are subject to modification as conditions warrant. Neglect of such matters is patently inconsistent with rational behavior.

On the surface, financial-structure management appears to be a mirror reflection of portfolio management. Both managements are financially motivated to act in a manner that corrects temporary aberrations in the structure of market returns. The rational financial manager offers comparatively overpriced issues in exchange for relatively underpriced securities; whereas, the portfolio manager acquires underpriced issues and liquidates their overpriced counterparts.

Differences arise in the comparative lack of flexibility afforded the financial manager, in the risk character of the underlying cash flow, and in his greater concern with bankruptcy risk.

Objective Function

The presumed intent of the financial manager is to maximize the shareowners' economic income, subject to the condition that bankruptcy risk be severely limited and to other constraints noted below. Economic income is understood to refer to the periodic change in the value of the ownership interest plus distributions to shareowners (including net purchases (+) or sales (-) of stock).

The tendency for certain corporate managements to equate performance of earnings per share with shareholder welfare motivates actions that may be

inconsistent with the hypothesized intent. The repurchase of discount bonds is a case in point [3]. So-called profits from the refunding of discount debt are reported as current period income (APB Opinion No. 26) whether or not offset by higher future interest charges or initial cash charges.

For example, United Brands (Appendix B) realized an extraordinary gain before tax of approximately $33.4 million on its exchange offer of 9 1/8% '98 for 5 1/4% '94. This gain was calculated as follows:

Principal Amount of Old Issue Retired	$125,000,000
Less: Unamortized debt discount (est)	2,775,000
Principal amount of new debentures	75,000,000
Cash payment made to holders who tendered old issue	12,500,000
Expenses involved in the tender (est)	350,000
Soliciting dealer and manager fees (est)	975,000
	$91,600,000
Book gain on exchange offer before tax	33,400,000
Estimated taxes (approx. 40% bracket)	13,400,000
Net gain after tax on exchange offer	20,000,000

While the above profit was reported in the current period, the "benefits" will only begin to accrue in 1980 when the sinking fund payments begin and will not be fully realized until 1994. In fact, current period net cash outlays of approximately $13.4 million were required in order to reduce the long term debt by 50 million. Under the generous assumption that sinking fund purchases would have averaged as much as 80% of face value, the compounded rate of return over the next fifteen years* on the $13.4 million investment is less than 7 1/2%.

United Brands' subsequent $30,000,000 plus write-off from the closing of an unprofitable Morrell meat packing plant not only nullified any possibility of taxes due to profits from the exchange offer, but also suggested that the underlying purpose of the exchange offer was to avoid the reporting of extraordinary losses

* Weighted average life of 5 1/2 issue.

in excess of $30,000,000 pre-tax.

Whenever the rate of return to the company from early retirement of its bonds is far below its overall return on capital, a strong possibility exists that the early retirement of debt is being employed as a tool in the management of earnings. In fact, current accounting practice permits corporations to hold bonds purchased in excess of current sinking fund requirements in the corporate treasury until they choose to cancel them, e.g. Borden, Inc.* Although recent accounting changes require separation of earnings arising from retirement of debt at a significant discount, no mention need be made of the future interest or opportunity costs incurred when the debt is retired.

The objective function of the portfolio manager can be stated in essentially the same terms; that is, the maximization of fundholders' economic income is once again assumed to refer to the periodic changes in the value of the ownership interest plus distributions to fundholders.

Recent suits against fund management companies have raised questions as to the compatability of the fund manager's objectives with the shareholder's objectives. While the portfolio manager's behavior may also be inconsistent with this hypothesized intent, these questions are beyond the scope of this paper.

Limiting Factors

Managing the financial structure entails costs and inflexibilities that do not confront the portfolio manager. Public issues and exchange offers necessitate the time-consuming and costly preparation of registration statements and prospectuses; when bonds are acquired, the excess of book value over acquistion price is taxed as ordinary income; restrictions exist in the trading of outstanding issues by the issuing firm; nonrefunding, call premium, sinking fund and other constraining

* Metz, New York Times

provisions may be incorporated in existing debt agreements.

1. Costs:

Low transaction costs enable the portfolio manager to benefit from frequent substitution or arbitrage swaps (Table 5). While the compounded profit from a series of such trades might be quite large, the spread for each trade is limited by the market place, and the transaction cost must be small in order for each trade to be profitable. In the case of the Commercial Credit swap, the transaction cost to the portfolio manager was approximately .01% or $50.00. The only cost involved was the transaction charge imposed by the fund custodian. As a result, $5,525 of the $5,625 gain on the trades accrued to the fund.

In contrast, the transaction cost to the financial manager encompasses registration, accounting, legal, advertising, underwriting, selling, printing and/or listing expenses. The following list outlines the cost ranges for different types of issues from 5 to 100 million dollars in size: *

Private placement of new securities - .3% to 3.0%
Public bond offering - straight - .6% to 3.0%
Public bond offering - convertible or equity features - 1.0% to 5.0%
Public common equity offering - 3% to 9%

It follows that the spreads between issues would have to be substantially larger than those cited in Example 1, Table 5 before a financial manager could profit from exchanges.

Since the historic spreads between AAA and Aa or Aa and A rated bonds with similar characteristics have moved within relatively narrow ranges, the financial manager of a corporation with highly rated debt has been effectively denied the possibility of substitution swaps.** As the quality of the issues decreases, the the variability of yield spreads between issues widens significantly. Despite

* For specific examples see Table 6.

** This point is accentuated by the fact that spreads between issues of the same issuer are smaller than the averages.

TABLE 5

SUBSTITUTION SWAPS

EXAMPLE 1

			Price	Rating	Yield to Maturity	Current Return
4/73						
Sell	500M	Commercial Credit 7 3/4% 4-1-93	99 1/2	NR/A	7.79	7.79
Buy	500M	Commercial Credit 7 3/4% 2-15-92	99	NR/A	7.85	7.82

Advantages:

Take out $2,500 or.5% and purchase essentially identical securities.

8/73						
Sell	500M	Commercial Credit 7 3/4% 2-15-92	91.689	NR/A	8.66	8.45
Buy	500M	Commercial Credit 7 3/4% 4-1-93	91.064	NR/A	8.71	8.51

Advantages:

Take out $3,125 and purchase essentially identical securities.

Total profit on both swaps $5,625.

EXAMPLE 2

2/73						
Sell	250M	Whittaker 10% 7-1-88	104 5/8	Ba/B	9.42	9.56
Buy	250M	Whittaker 9 5/8% 1-15-93	100	Ba/B	9.63	9.63

Advantages:

Take out $11,563, pick up yield, go to senior security (9 5/8% are senior to the 10%).

6/73						
Sell	250M	Whittaker 9 5/8% 1-15-93	89	Ba/B	11.00	10.82
Buy	250M	Whittaker 10% 7-1-88	85 1/2	Ba/B	12.11	11.70

Advantages:

Take out $8,750 and pick up considerable yield.

Total profit on both swaps $20,313.

7/73						
Sell	250M	Whittaker 10% 7-1-88	84 1/2	Ba/B	12.29	12.66
Buy	250M	Whittaker 9 5/8% 1-15-93	81	Ba/B	12.20	12.56

Advantages:

Take out $8,750, give up only a few basis points while going to a senior security.

TABLE 6
COST OF NEW SECURITY ISSUES

DATE	RATING	AMT. (MM)	DESCRIPTION	UNDERWRITING COST (1) AMT.(MM)	UNDERWRITING COST (1) %	OTHER EXPENSES (2) AMT. (MM)	OTHER EXPENSES (2) %
Public Bond Offerings - Straight							
7/7/73	A	100	Alabama Power 8 7/8% '03	1.243	1.243	.304	.304
10/3/73	A	50	Carrier Corp. 7 3/4% '98	.4385	.875	.125	.250
4/21/72	BB	25	City Investing 8 7/8%	.500	2.000	.225	.900
10/19/72	A	100	Ford Motor Cr. 7% '80	.600	.600	.125	.125
10/19/72	A	50	Ford Motor Cr. 7 1/2% '92	.438	.875	.100	.200
11/21/72	NR	75	Wells Fargo & Co. 7 3/8% '97	.656	.975	.215	.287
3/16/72	Baa	70	Western Union 7.90% '97	.788	1.125	.170	.242
2/8/73	Ba	25	Whittaker 9 5/8% '93	.750	3.000	.200	.800
Public Preferred Offerings - Straight							
3/27/73	AA	500	AT&T $3.64 Pfd.	5.5	1.100	.370	.074
8/9/72	BB	25	Goodrich $7.85 Pfd.	.500	2.000	.160	.640
Public Bond Offerings - Convertible or Equity Features							
5/9/72	B	30	American Medicorp cv 5% '97	.413	1.375	.135	.450
1/13/72	BBB	65	Burlington North. cv 5 1/4% '92	.813	1.250	.135	.208
9/8/72	BB	20	Cenco cv 4 3/4% '97	.250	1.250	.175	.700
8/9/72	Baa	75	Goodrich 7% '97 with warrants	1.688	2.250	.150	.200
Exchange Offers							
2/15/73	Ba	125	United Brands cv 5 1/2% '94	1.010	.808	.350	.280

(1) Underwriting cost including manager fees, underwriting fee, selling concessions, and soliciting dealer fees.

(2) Includes printing cost, accounting and legal fees, charges for registration and exchange listings, and other miscellaneous expenses.

transaction costs that vary inversely with issue quality, managers of companies with lower ratings accordingly may find profitable substitution swaps possible (Table 5, Example 2).

Tax considerations further complicate the financial manager's cost calculation. Purchases of company stock have no tax consequence to the corporation. Retirements of liabilities at discounts necessitate, however, the tax treatment of the difference between book value and purchase (or market) price as ordinary income. Taxes attributable thereto may - as noted above - be offset by writing down assets, provided such assets can be shown to have declined in value.

In the matter of refunding, call premiums and other expenses associated with the process constitute current period expense for tax purposes and can be amortized for book purposes over the life of the old or new issue (whichever is shorter). Any interest differential also enters the tax computation. It appears therefore that costs are an important factor in restricting the financial officer from taking advantage of the short term aberrations in the market.

2. Flexibility and Provisions:

Both the portfolio and financial manager have policy guidelines under which they must operate. One common condition concerns the mix of debt and equity. In the case of a corporation a general policy as to the long term mix of debt and equity is formulated by the Board of Directors for the financial officer to follow. In the case of a balanced fund, restrictions on the concentration of assets are generally outlined in the prospectus. The need for at least a minimal degree of cash equivalents is also required of both the financial and portfolio manager.

As suggested by Table 7, major differences in freedom to act on portfolio changes exist between portfolio and financial managers. When potential limits on financial managers are combined with high transaction cost, it becomes clear that for most corporations, potential "profit opportunities" are more likely to occur in the timing of an offering and the selection of the type of security to offer than in the substitution or intermarket exchanges mentioned earlier.

3. Interaction:

The character of the firm itself also restricts the financial manager. As a case in point, Standard & Poor's recently downgraded the senior debt issues of GAC Finance partly because of its parent's current financial condition.

Moreover, Fortune's 500 largest industrial corporations feature a direct association between quality of senior debt and size, as follows:

Group	Average Rating*	Number with Public Issues Outstanding*
First 100	4.22	88
Second 100	3.71	68
Third 100	3.38	61
Fourth 100	3.24	42
Fifth 100	3.01	36

Few corporations, as noted earlier, have bonds whose ratings diverge by more than one rank.** Financial managers, therefore, are constrained from offering new and diverse types of securities, because the market has stereotyped their capitalizations.

---

* Based on the scale of 6 for Aaa, 5 for Aa, ..., 1 for B, and exclusive of non-rated companies, June 1972

** Moody's Bond Record, June, 1973

EXAMPLES OF CONSTRAINTS CONFRONTING FINANCIAL MANAGERS

FLEXIBILITY LIMITATIONS

Time Delays

It is not unusual for SEC approval of registration statements to take a couple of months. This time coupled with that involved in the preparation of a prospectus and registration statement makes capital modifications which include the issuance of new public securities practical in only those circumstances where discrepancies between issues or markets exist for long periods of time.

Legal Restrictions on Purchases and Sales

Both SEC and various security exchanges have regulations which govern (when applicable) corporations' transactions in their own securities. Some of the areas these regulations concern are: (1) prior announcement of company purchases, (2) price paid for securities, and (3) amount purchased.

RESTRICTIVE PROVISIONS

While transactions involving private placements eliminate many of the above limitations they generally include more restrictive provisions than public issues. Some of these provisions (which might also be found in public issues) are listed below:

Coverage

Limitations on the issuance of additional debt unless a specified level of fixed charge coverage is met.

Capital Ratios

Limitation on the percentage of senior debt, subordinate debt, or preferred stock in the capitalization.

Working Capital

Requirements concerning a minimum level of working capital.

Dividends or Security Purchases

Constraints on future dividends, early retirements of subordinated debt, and/or purchases of equity. These restrictions are normally tied to the level of profits and retained earnings or equity.

Anti-Dilution Provisions

Requirement for reduction in exercise price of existing issues if future equity securities are offered at lower prices.

For further insight into the influence of company attributes upon security diversity, end-of-month price relatives for a sample of 12 bonds issued by five debt-oriented corporations were regressed against the corresponding 49-month price relative for the issuing firm's stock.* The covariability of each bond pair was also measured.

As evidenced by the t values and $\bar{R}^2$s (Table 8) the performance of the bonds is significantly related to that of the underlying stock, despite regression coefficients generally less than .5. A possible implication of Table 8 is that the stock performance of debt-oriented companies is relatively sensitive to bond yields in the market. Interestingly enough, the correlation coefficients for bond pairs (Table 9) also suggest appreciable interaction among the bonds sampled.

Comparative Latitudes and Evaluation

Freedom to modify the financial structure varies widely among companies. Large industrial companies with sizeable cash flows can time their issues much more efficiently than finance or utility companies that must come to the market continuously.

Wide latitude also exists in the type of securities that can be offered. Higher grade companies can continue to offer straight debt until they begin to endanger their rating. Lower grade companies, however, do not have this option. Efforts to overcome this problem by offering "sweeteners", the most common being convertibility or warrants, may be costly. As Lerner and Auster have pointed out, the increased dilution has a definite negative effect on the P/E ratio of the company.** Supply and demand considerations also enter the picture for lower

---

* The period covered was the 50 months ending June, 1973. A monthly price relative is defined as the ratio of succeeding end-of-month prices.

** "Does the Market Discount Potential Dilution" Financial Analysts Journal July-Aug. The study must be viewed in the light that it doesn't account for risk.

TABLE 8

REGRESSION OF MONTHLY BOND RELATIVES ON CORRESPONDING STOCK PRICE RELATIVES FOR FIVE CORPORATIONS

Ind. Variable	Dep. Variable	Regression Constant	Regression Coefficient	t-Value	$\bar{R}^2$
		National General			
Common Stock	Convertible Deb.	.58327	.41332	8.61	.612
	Straight Deb.	.68054	.32061	4.08	.262
		Gulf & Western			
Common Stock	Convertible Deb.	.55692	.44339	8.35	.597
	Convertible Deb.	.47483	.52514	10.24	.691
	Straight Deb.	.77315	.22725	3.98	.252
		L T V			
Common Stock	Jones & Laughlin Deb.	.88551	.11878	3.02	.163
	Straight Deb	.6037	.40604	8.92	.629
		Rapid American			
Common Stock	Straight Deb.	.78645	.21538	5.71	.409
	McCrory Deb.	.83797	.16238	3.92	.246
	Straight Deb.	.75787	.2434	6.68	.487
		City Investing			
Common Stock	Convertible Deb.	.65043	.34867	4.22	.484
	Straight Deb.	.83716	.16561	2.69	.275

Source: Various

TABLE 9

CORRELATION COEFFICIENTS FOR TEN BONDS ISSUED BY FOUR CORPORATIONS*

Bond Number	1	2	3	4	5	6	7	8	9	10
1	--									
2	.5118									
3	.6038	.4250								
4	.4735	.4263	.5752							
5	.5460	.3259	.8340	.5700						
6	.4154	.3588	.4617	.4531	N.A.					
7	.5205	.2813	.5210	.5241	N.A.	.5756				
8	.5948	.4829	.7386	.6543	N.A.	.5923	.5924			
9	.4209	.4209	.6542	.5824	N.A.	.6364	.7001	.7967		
10	.5464	.4747	.5814	.6476	N.A.	.6984	.5590	.7639	.7496	

* Enclosed coefficients are bonds issued by the same corporation.

grade securities; many debt buyers are restricted both as to the percentage they own below a certain rating and the percentage they own in one company.

TOWARD INTERPERIOD OPTIMIZATION

Interperiod optimization goes far beyond the simple act of refunding in the ordinary sense. Within boundaries established by the foregoing constraints, it includes intermarket spread swaps and rate anticipation swaps as well as pure substitution swaps.

As a first approximation, any feasible action that augments expected return to equity holders without appreciably changing total liabilities (in a market value sense and relative to the underlying equity position) is desirable. This conclusion follows from the interaction between expected returns and beta values. For reasons stipulated elsewhere [2], the beta value that determines the risk premium for a given common stock is presumed to be largely dependent upon the underlying unlevered beta value of the firm and the degree of leverage employed.

As a second approximation, the fact that not all debt and equity forms are equal merits consideration. Diverse maturity structures occasion different bankruptcy risks. Hybrid securities in turn affect the response of equity shares to changes in the market environment.

Any transaction involving either the exchange of debt for equity (or vice versa) or the exchange of cash for equity conditions both expected returns and beta values. For the adjustment to be beneficial, the positive element must outweigh the negative factor.

Refunding

Refunding - as treated in the literature - is confined to so-called

substitution swaps. Such swaps involve the exchange of near-perfect bond substitutes. The price advantage derives from (a) the existence of a call provision and (b) the stochastic behavior of interest rates.

Refunding allegedly occurs whenever the value of the call option drops below the excess of the market price of the replacement over the call price. According to Elton and Gruber [1], "the optimum strategy at any point in time is now a function of the level of interest rates, the age of the outstanding bond, the level of interest rates at the time at which the outstanding bond was issued, and whether the current bond is callable." As is evident from the following illustration, the refunding decision is really only concerned with benefit now versus expected values one period hence (discounted back to the present).

1. A case in point:

For illustrative purposes, consider a bond issued at par to yield 9%; other hypothesized features include (a) a remaining maturity of 25 years, (b) a call premium presently set at 9% reduced by one-fifth yearly, (c) no sinking fund provision and (d) refunding costs of 5%. Suppose further that the market yield for this class of bonds has declined to 6.8% and that the assessed distribution of interyear relatives for market yields is: *

Probability	Interperiod Relative [Int. (T + 1) ÷ Int. (T)]
1/9	1.165
1/6	1.115
1/9	1.055
2/9	1.000
1/9	.950
1/6	.900
1/9	.860

* Based upon observed interyear changes over the past decade.

Under these circumstances, the profit (per $1,000 bond) from immediate refunding is $121 and is equal to the difference between the cash flow stream discounted at 6.8% ($1,261) and the sum of par, call premium, and refunding costs ($1,140). The expected profits (discounted) of refunding one, two and three years hence are respectively $126.80, $136 and $142.08.

Should a call feature be incorporated in the new issue and feature a 6.8% call premium initially, an additional $11.61 can be added to the profit from immediate refunding. * Future refundings may become desirable, provided yields continue to drop beyond the point at which the discounted cash flow stream equals the sum of par, the new call premium, and the new issue cost.

With the prevailing market yield set at six percent (and other factors unchanged), the profit from immediate refunding becomes $243.50 per $1,000 The anticipated (discounted at market yield) profits attributable to refunding one and two years hence are respectively $239.40 and $235.39. At this yield level, immediate refunding is desirable.

2. Reverse funding:

Consider further the case of utility company A with three low coupon issues, e.g.,

Book Amount	Coupon	Maturity	Current Price	Yield to Maturity
200MM	4.625%	1994	68	7.70%
100MM	5.750%	1996	79	7.70%
100MM	6.500%	1997	87	7.70%

*This value is the expected one-period profit (discounted) accruing to the new issues call feature two periods hence.

Assume also that these issues can be exchanged for a new callable issue yielding eight percent and maturing in 25 years, that total exchange costs come to 5% of the issue value, a nd that market yields for equivalent issues are expected to decline subsequently to 6.75%. The question is whether to exchange the low coupon bonds for the high coupon bond in anticipation of a future refunding.

In order to resolve this matter, the composite yield for the joint exchange - refunding (net of costs) was calculated on the assumption that the refunding took place five years after the exchange, four years, etc. The results (see Appendix C) show the break-even point to be about two years.

Interestingly enough, neither the United Brands nor the Western Union exchange offer (Appendix B) is an attractive candidate for reverse refunding. Each seemingly offers an unnecessarily high inducement to existing holders. Should the market yield on Western Union quality bonds decline by two per cent even as early as the next year, the effective cost of the exchange offer (including refunding) would be 12.6%. The effective yield on the existing bond issue is 10.5%.

3. Other considerations:

The profit potential from refunding may be affected by (a) the price - if any - paid for the call option, (b) the differential between new and seasoned issue yields, and (c) corporate taxes.

Pye [6], for example, found that the inclusion of a five-year non-call provision reduced Aa utility yields (new issue) by 13 basis points when the one-year interest rate ranged between 4% and 5 1/4% and by 3.9 basis points when the one-year rate was between 2 3/4% and 4%. Although the substantial

increase in interest rates since the period studied (1959 - 1966) by Pye may have rendered these results obsolete, the direct association between the price of the call option and relative interest rates is expected to persist.

According to Salomon Brothers, the average excess of new issue yields on Aa industrial bonds over the yields on seasoned issues of similar quality with coupon rates of 8 1/2% to 9 1/8% was 57 basis points in 1971 and 55 basis points in 1972. * The corresponding spread for 72 Baa industrial bonds issued between February, 1966, and October, 1972, averaged 54 basis points. The Salomon data also show market yields for Aa industrial bonds that vary directly with the coupon rate; this variation is largely attributable to the sinking fund feature.

Corporate taxes reduce both the net benefit derived from refunding, and the hurdle of call premium and new issue expense, provided the company is otherwise profitable.

Other Exchange or Switch Possibilities

Strictly speaking, modification of the financial structure can proceed without reliance upon the call provision. Not only can exchange offers be submitted to the holders of outstanding issues, but the securities themselves can also be purchased in the market place.

The former entails about the same costs as new issues but necessitates sufficient sweeteners to induce holders to accept the exchange offer. The latter requires a market environment that engenders an adequate supply without undue price effects.

---

*An Analytical Record of Yields and Yield Spreads.

Extension of the refunding concept to this broader range of alternatives presupposes a willingness and ability on the part of management to offer a variety of securities to investors. To the degree that securities characterized by diverse risks are - or can be - created by the individual firm, intermarket switches become possible. Such exchanges involve the substitution of one security type for another and derive their benefits from temporary aberrations in the structure of returns prevailing in the market.

1. Substitution Exchanges:

Monthly spreads between Baa and A industrial bonds averaged 66.8 basis points for the 39 months ending May, 1973; the associated standard deviation was 12.1 basis points. The means of the highest and lowest quartiles were respectively 82 and 52.3 basis points.

It follows from these benchmarks that, for an assumed A - rating, yield of 7.5%, the mean Baa yield is 8.17%, with a range (quartile average) from 8.02% to 8.32%. These hypothetical yields further imply the following range of values for a 25-year Baa bond ($1,000 par) with a coupon of $81.70 and no sinking fund:

Bond	Low	Mean	High
Baa	$ 984.42	$1,000	$1,015.98
A	$1,000.00	$1,000	$1,000.00
Difference	$ (15.58)	$ 0	$ 15.98

Under the range of spreads stipulated, switches are not likely to be profitable unless other considerations are involved.* The potential magnitudes

* This point was discussed in greater detail earlier in Analogy to Portfolio Management.

may be sufficient, for instance, to expedite the refunding process.

2. Rate anticipation switches:

Should long-term rates be deemed abnormally high or low, moreover, rate anticipation switches may be warranted. Such exchanges entail the lengthening or shortening of maturities, thus necessitating adjustments in either terminal maturities, sinking fund provisions, or coupon rates.

Table 10 shows 25-year yield equivalents for diverse combinations of present 5-year yields and anticipated 20-year yield (five years hence). Allowance is made for new issue costs (at five per cent) in the derivation of these yield equivalents. Given a present five-year yield of nine per cent and an anticipated 20-year yield (five years hence) of seven per cent, for instance, the five-year maturity is preferred whenever the 25-year yield exceeds 8.52%.

Public Versus Private

The choice between public issues and private placements, in the event a switch is warranted, hinges upon the interest-rate spread between the public and private segments,issue (or placement) cost differentials, and interest-rate expectations. Spreads in recent years have ranged from 12 basis points or less to 75 basis points.

Suppose for illustrative purposes that the prevailing public rate on 25-year issues is eight per cent, that the probability of higher interest rates is .5, and that the partial expectations of public rates (conditional upon their increase) rise to 9.5% over the succeeding nine years and remain there. With public issue costs (including the new issue rate differential) at five per cent and a straight-line sinking

TABLE 10

TWENTY-FIVE YEAR YIELD EQUIVALENTS*

Current Five-Year Yield	Anticipated 20-Year Yield Commencing Five Years Hence				
	.06	.07	.08	.09	.10
.05	6.33%	7.00%	7.66%		
.055	6.50%	7.18%	7.83%		
.06	6.68%	7.36%	8.01%	8.64%	
.065	6.85%	7.54%	8.19%	8.82%	
.07	7.03%	7.73%	8.39%	9.02%	9.63%
.075	7.23%	7.92%	8.58%	9.22%	9.82%
.08	7.41%	8.11%	8.78%	9.41%	10.02%
.085	7.61%	8.31%	8.98%	9.62%	10.24%
.09	7.81%	8.52%	9.19%	9.83%	10.45%
.095	8.02%	8.73%	9.40%	10.04%	10.66%
.10	8.23%	8.94%	9.62%	10.26%	10.88%
.11			10.08%	10.73%	11.34%
.12			10.55%	11.20%	11.81%
.13				11.70%	12.33%
.14					12.85%

* Includes new issue costs

fund designed to retire the total issue over its 25-year life, the effective cost yield to the issuer becomes 8.43%. This cost is diminished by the possibility that the sinking fund can be satisfied in the public market at less than par. Were debt retirements only at par, the effective cost would rise to 8.68%.

Given private placement costs at one-half of one per cent and no possibility for sinking fund retirements below par, the interest-rate spread (between public and private) that equates effective costs is approximately 40 basis points. Effective costs under other coupon, spread, and expense assumptions are given below:

	Coupon	Expense	Effective Cost (Yield)
Public		Sinking Fund Retired at Market or Par	
1	8%	5.0%	8.43%
2	8%	2.5%	8.09%
3	8%	1.0%	7.90%
		Sinking Fund Retired at Par	
3	8%	5.0%	8.68%
4	8%	2.5%	8.34%
Private		Sinking Fund Retired at Par	
5	8.4%	1.0%	8.53%
6	8.5%	1.0%	8.63%
7	8.6%	1.0%	8.74%
8	8.4%	.5%	8.46%
9	8.5%	.5%	8.56%
10	8.6%	.5%	8.66%

Convertible Issues and Common Stock

Exchanges involving straight bonds and either convertible debentures or common stock add a further dimension to the optimization problem. Specifically, they directly condition the beta value for the common stock and thereby render suspect conclusions based exclusively upon the impact upon expected returns.

1. Convertible issues:

Evaluation of exchange possibilities involving convertible debentures (or preferred stock for that matter) entails analysis of the convertible premium. As shown by Walter-Que [7], the premium - defined as the excess of the convertible's market price over the higher of the conversion or straight bond value - varies inversely with the ratio (M_i) of the conversion value to the straight bond value (or its reciprocal), directly with M_i^2 (or its reciprocal), and directly with such variables as the log of the months to final maturity ($L_{10}T_i$), a dummy variable for quality (Q_i), and the bond coupon minus cash dividends per share (C_i). Should the expected premium values, based upon the regression equations shown in Table 11, exceed required premiums in the market, the convertible issue is presumed to be underpriced relative to other issues. The magnitude of the differential relative to costs determines the desirability of the exchange.

Complications arise from the either- or nature of convertible securities. Should the stock price rise, the risk structure improves and beta values for the common stock fall. Should it fall, the risk structure features a long-term addition.

As an illustration, numerous companies have issued convertible securities in lieu of common stock during the past five to seven years. Extrapolating on past

TABLE 11

CROSS-SECTION REGRESSION ANALYSES WITH CONVERTIBLE BOND PREMIUM AS DEPENDENT VARIABLE, FOR FIVE PERIODS

Month & Year		Explanatory Variables M_i	M_i^2	$I_{10}T_i$	$\hat{\beta}_i$	Q_i	C_i	CONS	R^2	S.E.	F-Ratio	No. of Observation
Conversion Value Exceeds Straight Bond Value												
May, 1970	(3.1)	−8.898 (−1.899)*				5.623 (2.237)	2.274 (2.488)	15.385 (2.532)	0.466	4.899	8.270 (3,22)†	26
Nov., 1968	(3.2)	−46.691 (−8.628)	8.024 (7.188)					58.804 (11.187)	0.563	5.118	47.367 (2,70)	73
	(3.3)	−44.731 (−8.554)	7.866 (7.494)	18.625 (2.673)			0.835 (1.813)	9.808 (0.572)	0.618	4.784	30.144 (4,69)	
Oct., 1965	(3.4)	−54.017 (−3.340)	11.816 (2.579)	19.801 (3.954)			0.826 (1.773)	14.165 (0.751)	0.745	4.494	25.82 (4,30)	35
	(3.5)	−76.364 (−4.229)	17.954 (3.379)					78.463 (5.516)	0.612	5.541	27.82 (2,32)	
Straight Bond Value Exceeds Conversion Value												
May, 1970	(3.6)	−18.218 (−2.745)	3.442 (1.944)					23.523 (4.080)	0.370	3.514	11.881 (2,35)	38
Nov., 1968	(3.7)	−13.589 (−3.037)		21.859 (2.728)			2.128 (1.702)	−26.058 (−1.338)	0.486	5.173	6.68 (3,15)	19
Oct., 1965	(3.8)	−21.298 (−3.099)	2.949 (2.509)					34.194 (4.953)	0.443	5.834	8.862 (2,22)	25

* Figures in parentheses below coefficients are t-values.

† Figures in parentheses below F-Ratio are degrees of freedom.

growth rates in equity prices, such companies expected to call their convertibles in the near future and thereby assumed they were selling equity at a premium to prices prevailing at the time. Due to the severe reduction in stock prices over the past few years, however, this form of delayed equity financing has been transformed into what now appears to be long-term debt. For such "equity starved" companies as Pan Am, Memorex, American Export, GAC, University Computing, Computer Science, and Boothe, the previous decision to issue convertibles instead of common stock has weakened the company's finances to the extent that their ability to "weather" current operating difficulties is open to question in varying degrees. In retrospect, the increasing incidence of non-conversion of securities* over the past 5 to 10 years highlights an extremely costly portfolio decision on the part of a number of financial officers.

2. Common Stock:

Substitution of debt for equity presumes that equity shares are priced low relative to longer-run norms and that debt - if out of line - has an upper limit imposed by the call provision. Subject to the questions raised in the section dealing with Interperiod Adjustment above, the supposition is that the net increment in expected returns to the remaining shareholders outweighs the increased risk premium attributable to greater leverage.

Addendum

For the most part, the preceding treatment of interperiod adjustment has focused upon the effect of such modifications in financial structure upon present values. It may also be highly relevant from management's viewpoint to consider the effects of interperiod changes upon (1) earnings per share as noted in the

* S. Groth, "The Trouble With Convertibles" Financial Analysts Journal, Nov.-Dec. '72.

discussion of the objective function, (2) the balance sheet, and (3) cash flows (including near-term coverage and maturity structure of debt). Table 12, outlines the pro-forma effect on the balance sheet, earnings and fixed charge coverage for six of the exchange offers included in Appendix B. In the case of exchange offers for common stock, all achieve their desired objective of substantially increasing earnings per share at the expense of increasing the leverage of the company.

The exchange offers for discount bonds also achieve their stated objective of decreasing book value of debt and increasing equity in addition to reporting sizeable extraordinary profits. To an appreciable extent these benefits relate to cosmetic - as opposed to real - changes as measured on a present value basis and depend for their significance upon imperfections in financial markets.

Conclusion

As we see it, interperiod optimization really entails taking advantage of any relative bargains (net of costs) that exist. Except for substitution switches (e.g., refunding in its purest sense), each exchange or switch involves an element of forecasting based upon historical relationships and carries with it a degree of risk.

Although financial managers have neither the latitude nor flexibility of portfolio managers, opportunities for modifying the financial structure apparently exist. These opportunities have become increasingly numerous in recent years, due to the increased volatility of the financial markets.

TABLE 12
PRO-FORMA RESULTS OF EXCHANGE OFFERS

Exchange Offers For Common Stock

	ITM WALTER CORPORATION			LEASCO CORPORATION			FUQUA INDUSTRIES	
		Shares Exchanged			Shares Exchanged			Shares Exchanged
	6/30/73	2 Million	3Million	6/30/73	1.5 Million	3.0 Million	6/30/73	2.0 Million
Capitalization (000)								
L.T.D.	146,015	196,015	221,015	405,610	426,610	447,610	110,000	140,000
Equity	354,045	304,045	279,045	234,074	212,024	190,274	154,000	124,000
Debt/Equity Ratio	41%	65%	79%	173%	201%	236%	71%	113%
	Year Ended 8/31/72			Year Ended 12/31/72				
Fixed Charge Coverage	3.94	3.42	3.21	2.7	2.5	2.4	N/A	
				3 Months 3/31/73				
				2.7	2.6	2.4		
	Year Ended 8/31/72			Year Ended 12/31/72			Year Ended 12/31/72	
Earnings/Share								
Primary	2.48	2.67	2.78	2.51	2.69	2.92	1.87	2.18
% Change		8%	12%		7%	16%		17%
Full Diluted	2.34	2.48	2.57	2.30	2.39	2.51	1.81	2.08
% Change		6%	10%		4%	9%		15%
	6 Months 2/28/73			3 Months 3/31/73			6 Months 6/30/73	
Primary	1.28	1.37	1.43	.73	.79	.87	.71	.81
% Change		7%	12%		8%	19%		14%
Fully Diluted	1.20	1.29	1.33	.61	.64	.66	.70	.79
% Change		7%	11%		5%	8%		13%

Exchange Offers For Discount Bonds

	AMERICAN MEDICORP, INC.			UNITED BRANDS			WESTERN UNION CORPORATION	
		Converts Exchanged			Converts Exchanged			Converts Exchanged
	6/30/73	50%	100%	12/31/72	80 Million	125 Million	3/31/73	75 Million
Capitalization (000)								
L.T.D.	139,325	130,778	122,231	414,090	382,090	364,090	547,578	522,078
Equity	154,999	163,546	172,093	490,015	503,015	510,015	646,395	670,095
Debt/Equity Ratio	90%	80%	71%	85%	76%	71%	85%	78%
	Year Ended 12/31/72			9 Months 9/30/72			Year Ended 12/31/72	
Fixed Charge Coverage	2.81	2.78	2.75	2.0	2.0 (Does not include opportunity cost on initial cash outlay)	2.0	1.99	1.60 (est.) (Includes charges from initial cash outlay)
	6 Months 6/30/73							
	3.17	3.12	3.07					
Estimated "Profit" From Exchange Offer (000)		8,547	17,094		13,000	20,000		23,700
Estimated Net Change In Annual Interest Charges		+250,000	+500,000		+730,000	+1,200,000		+1,200,000

REFERENCES

1. E. J. Elton and M. J. Gruber, "The Economic Value of the Call Option," Journal of Finance, Vol. XXVII, No. 4 (Sept., 1972) pp. 891-903

2. R. S. Hamada, "Portfolio Analysis, Market Equilibrium and Corporate Finance," Journal of Finance, Vol. XXIV, No. 1 (March, 1969) pp. 13-31

3. R. D. Johnson, "Corporate Purchase of Discounted Long-Term Bonds," unpublished manuscript

4. M. L. Leibowitz, "New Tools in Bond Portfolio Management," Trusts & Estates, January, 1973

5. G. Pye, "The Value of the Call Option on a Bond," Journal of Political Economy, Vol. XXIV, No. 2 (April, 1966), pp. 200-7

6. _____, "The Value of Call Deferment on a Bond; Some Empirical Results," Journal of Finance, Vol. XXII, No. 4 (December, 1967) pp. 623-36

7. J. E. Walter and A. V. Que, "The Valuation of Convertible Bonds," Journal of Finance, Vol. XXVIII, No. 3 (June, 1973) pp. 713-33

APPENDIX A

SCHEDULED MATURITY (PRINCIPAL ONLY) BY YEARS IN (000)

Dow Chemical (Balance Sheet 12/31/72)
(not consolidated)

Rating	Issue	1	2-5	6-10	over 10	No Maturity	Total Book Value 7/31/73 Amount	%	Price	Total Market Value Amount	%
	Notes Payable	148,780					148,780	7.6%	100%	148,780	4.2%
	Promissory Notes										
A/A	4.5%, final mat. 1990	5,000	20,000	25,000	55,000		105,000	5.3	78(est)	81,900	2.3
A/A	5.0%, final mat. 1991	4,000	16,000	20,000	48,000		88,000	4.4	82(est)	72,160	2.0
	Debentures										
A/A	4.35%, final mat. 1988	pre-purchased	12,000	20,000	39,950		71,950	3.7	74	53,243	1.5
A/A	6.70%, final mat. 1998	4,000	16,000	20,000	56,000		96,000	4.9	90	86,400	2.5
A/A	7.75%, final mat. 1999		12,000	20,000	68,000		100,000	5.1	99	99,000	2.8
A/A	8.875%, final mat. 2000		12,000	30,000	108,000		150,000	7.7	105	157,500	4.5
A/A	8.90%, final mat. 2000		12,000	30,000	108,000		150,000	7.7	105	157,500	4.5
A/A	7.40%, final mat. 2002		4,000	20,000	76,000		100,000	5.1	96	96,000	2.7
Baa/BBB	sub. cv deb 3's 1982			505			505	--	295	1,490	--
	Misc. debt issue less discount (estimated maturities)	2,500	10,000	12,500	18,468		43,468	2.2	85(est)	36,948	1.0
	Common stock equity					909,244	909,244	46.3	55 3/8	2,541,380	72.0
	TOTALS	164,280	114,000	198,005	577,418	909,244	1,962,947	100.0%		3,532,301	100.0%

Western Union (Balance Sheet 12/31/72)
(consolidated)

Rating	Issue	1	2-5	6-10	over 10	No Maturity	Total Book Value Amount	%	7/31/73 Price	Total Market Value Amount	%
	Notes Payable	4,035					4,035	.3	100%	4,035	.5%
	Notes Payable Long Term:										
	Telegraph Co.										
	Notes payable to banks due 12/1/75		60,000				60,000	5.1	100%	60,000	7.8
	Other		2,046				2,046	.2	100%	2,046	.3
	Parent										
	Notes payable-Eurodollar due 1/15/74		6,700				6,700	.6	100%	6,700	.9
	Notes payable due 1/15/78			10,000			10,000	.9	100%	10,000	1.3
	W.U. Realty Corp.										
	Notes payable - 8/25/74		13,362				13,362	1.2	100%	13,362	1.7
	Notes payable - 75-97 5 1/2 to 8 3/4% (approx.)	568	5,000	7,500	5,175		18,243	1.6	80%(est)	14,594	1.9
	Debentures										
	Telegraph Co.										
Baa/BBB	4 5/8% due 6/1/80	1,100	5,500	13,200			19,800	1.7	80	15,840	2.0
Baa/BBB	5 1/4% due 2/1/87	---	5,760	10,000	18,000		33,760	2.9	75	25,320	3.3
Baa/BBB	6 1/2% due 12/15/89	617	10,000	12,500	20,000		43,117	3.7	83	35,787	4.6
Baa/BBB	5% due 3/1/92	---	8,025	13,500	37,200		58,725	5.0	69	40,520	5.3
Baa/BBB	8.45% due 3/15/96	---	2,750	13,750	38,500		55,000	4.7	98	53,980	7.0
Baa/BBB	7.90% due 5/15/97	---	---	17,500	52,500		70,000	6.0	93	65,100	8.4
	Parent										
B/B	sub cv 5 1/4% due 8/1/97	---	---	833	124,167		125,000	10.7	61	76,250	9.9
	Preferred Stock										
	Telegraph Co.										
	5.20%	875	3,500	5,250	21,000		30,625	2.6	63	19,293	2.5
	6%	400	1,600	2,000	19,400		23,400	2.0	72	16,632	2.1
	Parent										
	cv 4.6%					33,035	33,035	2.8	59	19,491	2.5
	cv 4.9%					12,748	12,748	1.1	68	8,668	1.1
	Common stock equity					546,028	546,028	46.9	22 1/4	285,623	36.9
	TOTALS	7,595	124,243	106,033	335,942	591,811	1,165,624	100.0%		773,241	100.0%

APPENDIX A CONTINUED

Jim Walter (Balance Sheet 8/31/72)
(consolidated)

Rating	Issue	1	2-5	6-10	over 10	No Maturity	Total Book Value Amount	%	7/31/73 Price	Total Market Value Amount	%
	Notes Payable	283,498					283,498	35.3	100%	283,498	32.5
	Notes Payable Long Term	2,200					2,200	.3	100%	2,200	.3
Baa/BBB	Senior Debentures 7 7/8% due 1997			12,500	37,500		50,000	6.2	93	46,500	5.3
	Notes Payable - Subsidiaries (est)	2,835	12,926	5,000			20,761	2.6	85 (est)	17,647	2.0
	Sub Debentures										
Ba/BB (est)	5 3/4% sen. sub notes due 1980	3,075	12,300	6,175			21,550	2.7	90(est)	19,395	2.2
Ba/BB (est)	6 1/2% sen. sub notes due 1983	960	3,840	4,820			9,620	1.2	88(est)	8,466	1.0
Ba/BB	5 7/8% 1st sub deb due 1981	195	4,000	6,515			10,710	1.3	82	8,782	1.0
Ba/BB (est)	5% sub deb due 1978 cv till '73			2,159			2,159	.3	116	2,504	.3
Ba/BB	5 3/4 cv sub deb due 1991			3,500	31,498		34,998	4.4	75	26,249	3.0
Ba/BB	8% 2nd Founders Bonds due 1986				519		519	.1	98(est)	509	.1
Ba/BB	9% 3rd Founders Bonds due 2001				17,623		17,623	2.2	100	17,623	2.0
	Preferred Stock										
	Non-Convertible					5,037	5,037	.6	13(est)	3,274	.4
	5% (1st priority for div. & liquid.) Series 4 voting - 3rd preferred		758				758	.1	200(est)	722	.1
	Convertible Preferred					541	20,728	2.6	various (est)	116,810	13.4
	Misc. issues (4 issues)		10,000(a)	3,387(a)							
			6,375(b)	425(b)							
			26,497				26,497	3.3	95(est)	25,020	2.9
	5 3/4% 5th preferred stock					295,649	(20,101)(c)	36.8	21 1/4	292,613	33.5
	Common Stock Equity						315,750				
	TOTALS	292,763	76,696	44,481	87,140	301,227	902,307	100.0%		871,812	100.0%

(a) sinking fund on series 3 convertible - 3rd preferred stock - based on common stock price;
(b) sinking fund on 6th preferred stock - based on common stock price;
(c) reduced by preferred sinking fund estimations.

APPENDIX B

EXCHANGE OFFERS

DATE	COMPANY MAKING OFFERING	TERMS OF OFFERING	SIZE OF NEW SECURITY	PURPOSE FOR EXCHANGE OFFER	CURRENT STATUS
8/72 Announced 6/23/72 Dealer Manager: None	(M) City Investing P/E Ratio as of 8/22/73: 4	$30 of City Investing 8 1/8% sub debentures due 7/15/91 for each share of Guerdon common	(Actual) $58,450,000 City Investing 8 1/8% due 7/15/91 Rating: NR/B	Acquistion of remaining shares of 55% owned subsidiary.	Completed
9/72 Dealer Manager: Domintck	(E) North American Car (wholly owed subsidiary of Flying Tiger) P/E Ratio as of 8/22/73: 8	$670 of North American Car 9 1/4% sub debentures due 4/1/92 plus warrants to acquire 17.25 shares of American Export common at $57.37 for each $1000 principal amount of National Equipment Rental 5 1/4% cv sub debentures due 4/1/88	(Actual) $16,750,000 North American Car 9 1/4% due 4/1/92 Rating: Ba/B	Increase in annual consolidated net income of $1,107,000. Annual interest expense will increase by $236,000, net reduction in debt of subsidiary.	Completed
11/72 Dealer Manager: Lehman Brothers Goldman, Sachs	(E) L.T.V. Corporation P/E Ratio as of 8/22/73: 4	$400 of LTV senior cv notes due 12/1/77 convertible at 10.50/share and $600 in cash for each $1000 of LTV 5 1/2% senior debentures due 6/1/73	(Actual) $36,500,000 LTV 7 1/2% due 12/1/77 Rating: B/B	To retire maturing debt in a manner which will: (1) conserve cash, (2) meet bank loan conditions.	Completed
2/73 Dealer Manager: Goldman, Sachs Paine, Webber	(E) United Brands P/E Ratio as of 8/22/73: 7	$600 of United Brands 9 1/8% sub debentures due 2/1/98 plus $100 in cash for each $1000 of United Brands 5 1/2% cv sub debentures due 2/1/94	(Actual) $75,000,000 United Brands 9 1/8% due 2/1/94 Rating: Ba/B	To reduce book amount of debt outstanding and increase book equity.	Completed
'73 Dealer Manager: None	(A) American Financial P/E Ratio as of 8/22/73: 8	Original Terms: $12.50 in cash - $7.50 paid on closing - $5.00 in six months, plus $16.25 principal amount of American Fin. 9 1/2% debentures due 6/88, plus one share of $1.38 dividend $14.50 par value preferred plus a warrant exercisable into 1/2 share of common for each share of National General common. $4.05 principal amount of Amer. Fin. 9 1/2% due 6/88, plus approx. .486 shares of $1.38 dividend preferred for each $40 National General warrant. $600 of Amer. Fin. 9 1/2% due 6/88 plus approx. 27.59 shares of $1.38 dividend pfd. for each $1000 of National General 4% cv 6/1/93	Original Terms: Potential - $26,765,000 in six month notes $174,905,000 in Amer. Fin. 9 1/2% 9,395,000 shares of Amer. Fin. $1.38 dividend preferred 5,951,000 American Financial warrants	Acquistion of National General by American Financial	Proposed - Not Effective
10/73 Dealer Manager: None		Revised Terms $7.50 in cash, $5.00 of American Financial 9 1/2% due 1/10/80, $20.25 of American Financial 9 1/2% due 12/1/88, plus one share of $1.00 dividend pfd., plus 1 warrant exerciseable at 22 1/2 for 1/2 share of National General common. $6.75 of Amer. Fin. 9 1/2% due 6/1/88 for each $40 National General warrant	Revised Terms (approx.) $55,500,000 in American Financial 9 1/2% due 1/10/80 $225,000,000 in American Financial 9 1/2% due 12/1/88 11,100,000 shares of American Financial $1.00 preferred 5,700,000 American Financial warrants Estimated Rating: B/B		Effective

APPENDIX B CONTINUED

DATE	COMPANY MAKING OFFERING	TERMS OF OFFERING	SIZE OF NEW SECURITY	PURPOSE FOR EXCHANGE OFFER	CURRENT STATUS
4/73 Dealer Manager: None	(E) Studebaker Worthington P/E Ratio as of 8/22/73: 4	$40 of Studebaker Worthington 8 3/4% due 5/1/98 in exchange for each share of Studebaker Worthington $1.40 cv preferred series A	(Potential) $79,000,000 Studebaker Worthington 8 3/4% due 5/1/98 Estimated Rating: Ba/BB	Reduce dilution and eliminate preferred div. requirements.	Withdrawn
'73 Dealer Manager: None	(M) McCrory Corporation (subsidiary of Rapid Amer.) P/E Ratio as of 8/22/73: 4	Original Terms: $50 of McCrory 7 5/8% sub debs due 12/15/98 plus $8 in cash in exchange for each share of Lerner Stores common stock. $33 of McCrory 7 5/8% 12/15/98 plus $5.60 in cash for each outstanding Lerner Stores warrants.	(Potential) $125,000,000 McCrory 7 5/8% due 12/15/98 Rating: B/B	Acquistion of remaining shares and warrants outstanding of majority owned subsidiary.	Approved by Board of Directors - waiting shareholder approval
9/73		Revised Terms: $50 of McCrory 7 3/4% sub debs due 9/15/95, plus $8 for each share of Lerner Stores common stock. $33 of McCrory 7 3/4% sub debs due 9/15/95, plus $5.35 for each Lerner Stores warrant.	Revised Terms: (Potential) $130,000,000 McCrory 7 3/4% due 9/15/95 Rating: B/B		Effective
4/73 Dealer Manager: None	(E) Gulf & Western P/E Ratio as of 8/22/73: 5	Exchanging Gulf & Western 7% due 7/1/03 series A or B in the following amounts: $75 for one share of $3.875 Gulf & Western cv preferred $35 for one share of Gulf & Western common $1100/$1000 of G.W. 5 1/4% cv 7/1/87 $1100/$1000 of G.W. 5 1/4% cv 11/1/89 $1100/$1000 of G.W. 5 1/4% cv 11/1/90 $1050/$1000 of G.W. 5 1/4% cv 3/1/87 $1000/$1000 of G.W. 5 1/2% cv 7/1/93	Amount of Gulf & Western 7% due 7/1/03 outstanding Potential: 679,500,000 Amt. of Tender: 350,200,000 Actual: 82,500,000 Rating: B/B	"Gulf & Western management believes common stock is undervalued." Objective is to reduce shares currently outstanding and elimate future dilution as much as possible.	Completed
5/73 Announced 4/5/73 Dealer Manager: White Weld	(E) Leasco Corporation P/E Ratio as of 8/22/73: 4	Exchanging one share of Leasco $2.60 series C preferred stock plus 1/2 share of Leasco common for each share of Leasco $2.20 series B cv preferred	Amount of $2.60 Leasco series C prefered outstanding Potential: 3,580,757 Actual: 2,778,951	To reduce the average common and common equivalent shares by up to 3,680,000 shares. Reduce mandatory redemption value of preferred by up to $104,000,000.	Completed
5/73 Dealer Manager: None	(E) City Investing P/E Ratio as of 8/22/73: 4	$12 of City Investing 8 1/4% sub debentures due 7/15/91 for each share of General Development	(Potential) $58,500,000 City Investing 8 1/4% due 7/15/91 Estimated Rating: NR/B	Acquistion of remaining shares of 48% owned subsidiary.	Cancelled
3/73 Dealer Manager: Dominick	(E) Whittaker Corporation P/E Ratio as of 8/22/73: 9	Original Terms: $8 of Whittaker 7% synthetic sub debentures of 5/1/93 plus 1/2 warrant exerciseable at 13 1/2 for each share of Whittaker common. Revised Terms: $7 of Whittaker 6% synthetic sub debentures of 9/1/93 plus 1/2 warrant exerciseable at 15 per share for each share of Whittaker common	Original Terms: (Potential) $40,000,000 of Whittaker 7% due 5/1/93 $2,500,000 warrants exerciseable at 15 1/2 Rating: B/B Revised Terms: (Potential) $35,000,000 of Whittaker 6% due 9/1/93 $2,500,000 warrants exerciseable at 15 Rating: B/B	To reduce the number of common shares of Whittaker stock outstanding	Proposed - Not Effective

APPENDIX B CONTINUED

DATE	COMPANY MAKING OFFERING	TERMS OF OFFERING	SIZE OF NEW SECURITY	PURPOSE FOR EXCHANGE OFFER	CURRENT STATUS
5/73 Dealer Manager: None	(E) National Industries P/E Ratio as of 8/22/73 9	$700 of National Industries 9 1/4% sub debentures due 9/1/93, plus 70 warrants exerciseable at $10/share for $1000 of National Industries 5 3/4% cv sub debentures of 10/1/88 $16 of National Industries 9 1/4% due 9/1/93 plus 2 warrants exerciseable at $10/share for each share of National Ind. $1.25 cv pfd.	(Potential) $20,500,000 National Ind. 9 1/8% due 9/1/93 $2,100,000 National Ind. warrants exerciseable at $10.	Reduce book value of debt.	Proposed - Not Effective
6/73 Dealer Manager: None	(E) ATO P/E Ratio as of 8/22/73 6	$10 of a ATO 20 year sub-ordinated debt issue per share	$10,300,000 of a 20 year ATO sub debenture - coupon not set	Reduce common stock outstanding	Cancelled
6/73 Amended 6/1/73 Dealer Manager: Loeb Rhoades	(E) Jim Walter P/E Ratio as of 8/22/73 5	$25 of Jim Walter Corporation 8% sub debentures due 8/1/98 for each share of Jim Walter common	(Potential) $75,000,000 Jim Walter 8% due 8/1/98 (Actual) $16,500,000 Estimated Rating: Ba/BB	Reduce common stock shares outstanding	Completed
7/73 Dealer Manager: Kuhn, Loeb & Co. Goldman, Sachs	(E) Western Union Corporation P/E Ratio as of 8/22/73 8	$560 of Western Union 10 3/4% sub debentures due 8/1/97 plus $100 in cash for $1000 of Western Union 5 1/4 cv sub debentures due 8/1/97	Western Union 10 3/4% due 8/1/97 (Potential) $42,000,000 (Actual) $32,700,000 Rating: B/B	To reduce outstanding indebtedness and eliminate the potential dilution	Completed
7/73 Dealer Manager: White Weld	(E) Leasco Corporation P/E Ratio as of 8/22/73 4	$14 of Leasco Corp. 9 7/8% sub debentures due 9/1/98 for each share of common	(Potential) $42,000,000 Leasco Corp. 9 7/8% due 9/1/98 Rating: NR/B	To reduce the outstanding common shares by up to 3,000,000 shares	Currently Effective
8/73 Dealer Manager: None	(E) Fuqua Industries P/E Ratio as of 8/22/73 6	$15 of Fuqua Ind. 9 1/2% sub debentures due 8/1/98 for each share of common	(Potential) $30,000,000 Fuqua 9 1/2% due 8/1/98 Rating: B/B	To reduce outstanding common stock by up to 2,000,000 shares - increase book value	Currently Effective
8/73 Dealer Manager: Lehman Brothers	(E) Fibreboard P/E Ratio as of 8/22/73 5	$750 of Fibreboard 6 3/4% cv sub debentures due 10/15/98 for each $1000 of Fibreborad 4 3/4% cv sub debentures of 10/15/93	(Potential) $14,500,000 Fibreboard 6 3/4% cv 10/15/88	To reduce the principal amount of long term debt, increase equity, and increase the possibility for new common equity from the earlier conversion of the new convertibles	Currently Effective
8/73 Dealer Manager: Loeb Rhoades	(E) American Medicorp P/E Ratio as of 8/22/73 4	$650 of American Medicorp 9 1/2% sub debentures due 1998 in exchange for $1000 American Medicorp 5 1/2% cv sub debentures due '89 and $1000 American Medicorp 5% cv sub debentures '97	(Potential) $31,750,000 American Medicorp 9 1/2% due 1998	Reduce and extend long-term debt. Equity will also be increased and potential dilution eliminated	Currently Effective

(M) - merger
(A) - acquisition
(E) - exchange offer

APPENDIX C

Years to Refunding	Composite Yield
5	7.82%
4	7.78%
3	7.74%
2	7.69%
1	7.64%