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THE EFFECT OF EQUITY-FOR-DEBT SWAPS ON SECURITY RETURNS: SOME NEW EVIDENCE

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Abstract

This study re-examines the effects of equity-for-debt swaps on security returns. Special attention is paid to the effects of the swaps across industries and calendar years. The results indicate that the market reactions to such swaps after 1984 (Deficit Reduction Act) are not significantly different than those before 1984. Moreover, we find that although there is a decrease in alpha and increase in beta of the market model during the announcement period, as expected, beta declines in the post swap period.

INTRODUCTION

In this paper we examine the reaction of equity-for-debt swap announcements on security price. An equity-for-debt swap is a leverage decreasing recapitalization transaction in which a swapping firm exchanges a portion of its debt for newly issued equity. It is a pure capital structure change because approximately an equal amount of stock and debt is exchanged, while the investment policies remain unchanged. Thus, these swaps provide another opportunity to study the effects of capital structure changes, resulting from new common stock issues, on shareholder wealth and the total risk of the firm.

Several previous studies (Peavy and Scott [1985], Finnerty [1985], Rogers and Owers [1985], Lys and Sivaramakrishnan [1988], and Cornett and Travlos [1989]) document a negative effect of equity-for-debt swaps on security returns around their announcements. These studies focus primarily on the effect of the swap announcements on the security returns before the implementation of the Deficit Reduction Act of 1984. The Act removed the tax-exempt status of the accounting income from such swaps. These studies, however, confine their samples to swap announcements during or prior to 1984.

Scott and Martin [1975] and Bowen, Daley, and Huber [1982] show that there are considerable differences in financial structure across industries. However, there have been no studies which examine possible differences in effects across industries of equity-for-debt swaps taking place subsequent to the Act. Equity-for-debt swaps are leverage-decreasing events. Since such events have an impact on the risk structure of the company, one may expect differential effects of the swaps announcements. Moreover, earlier studies of equity-for-debt swaps implicitly assume that systematic risk of the swapping firm remained unaffected after the swap announcements.

The purpose of this study is to re-examine the effects of equity-for-debt swaps on security returns. Special attention is paid to the effects of the swaps across industries and calendar years. Given the rapidly changing financial environment in the 1980s, it is likely that the impact of the equity-for-debt swaps is different across industries and after the implementation of the Deficit Reduction Act of 1984. The assumption of unchanged systematic risk around announcements is also examined.

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The remainder of the paper is organized as follows. Section II briefly reviews the related literature. Section III summarizes the data collection procedure. Section IV discusses the methodology. The empirical results are presented in Section V which is followed by a summary in Section VI.

A BRIEF LITERATURE REVIEW

The pioneer studies of Modigliani and Miller [1958, 1963] lay down the theoretical environment for studies of capital structure. Modigliani and Miller [1963] suggest that corporate debt has value to the firm in terms of the present value of the interest tax shield. Since the equity-for-debt swap reduces a firm's debt level, one would expect the swap announcement to have a negative impact on the security returns.

Miller [1977] claims that debt financing does not offer any tax savings when personal income taxes are considered.[1] Accordingly, a swap announcement should not have any influence on the security returns.

Kraus and Litzenberger [1973], Scott [1976], and Kim [1978] provide the bankruptcy cost arguments of capital structure. They suggest that a firm will have a high bankruptcy cost if it carries a high level of debt. As a firm decreases its leverage through an equity-for-debt swap, the impact of such an announcement on security returns should be positive.

Ross [1977] hypothesizes the information signaling effects of capital structure. He argues that an increase in leverage implies management's optimism about the firm's future and is a good signal. A decrease in leverage, conversely, conveys 'bad news' about the firm. Consequently, when a firm decreases its leverage through a swap, we would expect (under Ross's hypothesis) a negative effect on the security returns.

In summary, according to the capital structure theories, the effect of an equity-for-debt swap is obscure. The aggregate impact of corporate tax, personal tax, bankruptcy costs, and information signaling on security returns is uncertain. Nevertheless, studies of Peavy and Scott [1985], Finnerty [1985], Rogers and Owers [1985], Lys and Sivaramakrishnan [1988], and Cornett and Travlos [1989] all document a negative effect of equity-for-debt swaps on security returns around the announcement dates.

DATA COLLECTION

This study uses equity-for-debt swap announcements during 1981 to 1989 in the *Wall Street Journal* (*WSJ*).[2]

The *National News Paper Index*, an on-line data base, through DIALOG Information Services, Inc., was searched to assemble the equity-for-debt swap announcements. The search provided one line abstracts of leverage reduction news published in both the eastern and the western editions of the *WSJ*. The eastern edition of the *WSJ* was then read on microfilm to eliminate newspaper articles. The dollar amount involved in each swap, wherever available, was noted at this stage.

The sample was then screened and firms were retained in the sample only if:

1. The firm's stock was listed on one of the national exchanges.
2. The stock return data of the firm was available on the CRSP daily return tape.
3. The stock was trading during the study period.
4. The firm made a specific equity-for-debt announcement.
5. The swap was voluntary.
6. The announcement was not associated with a bankruptcy or a liquidation.

Sample sources were screened 6 months prior to the announcements to ensure that it was the first public announcement of the event. The final sample contains 139 swap announcements by 105 firms. Overall 8 firms had 3 swap announcements each during the study period; 18 firms had 2, and 79 firms had 1 announcement each. Sample firms were then classified into industry groups. The two letter standard industry code (SIC) employed by CRSP is used to classify a firm within an industry group.

Table 1 summarizes industry-wise announcements. The sample is divided into 33 different industry categories. The chemicals industry had the maximum number of swap announcements (14) during the study period. This was closely followed by the primary metals industry with 13 swap announcements. Information regarding the dollar values of all the swaps in these two categories is available. The primary metal industry had $1,112 million worth of equity-for-debt swaps, whereas chemicals had $619 million worth of swaps during the period.

TABLE 1

Equity-For-Debt Swaps By Industry In 1981-1989

139 equity-for-debt swap announcements are classified according to the Standard Industry Classification (SIC). Market values of the swaps in each industry are also reported.

SIC	Industry	Number Of Announcements	$ In Millions (Number Of Firms Where Details Are Unavailable)
13	Oil & Gas Extraction	7	224.1 (3)
15	Building Construction	1	16.0 (0)
20	Food & Kindred Products	7	158.5 (1)
21	Tobacco	1	25.0 (0)
22	Textile	1	11.0 (0)
24	Lumber & Wood	4	73.0 (2)
25	Furniture & Fixtures	1	7.0 (0)
26	Paper	3	31.0 (2)
28	Chemicals	14	619.5 (0)
29	Petroleum Refining	7	596.0 (0)
30	Rubber	2	245.0 (0)
32	Stone, Clay & Glass	7	108.4 (2)
33	Primary Metal	13	1,111.9 (0)
34	Fabricated Metal	7	37.3 (4)
35	Machinery & Computer Equipment	9	93.3 (1)
36	Electronic & Electrical	5	161.0 (0)
37	Transportation Equipment	7	386.0 (0)
38	Measuring, Analyzing & Controlling Instruments	2	74.0 (0)
40	Railroad	1	24.0 (0)
41	Passenger Transportation	1	13.5 (0)
45	Air Transportation	2	83.0 (0)
47	Transportation Services	1	30.0 (0)
48	Communications	2	66.0 (0)
49	Electric, Gas & Sanitary Services	4	285.0 (1)
53	General Merchandise Stores	7	309.0 (0)
54	Food Stores	2	83.0 (0)
58	Eating & Drinking Places	1	0.0 (1)
60	Depository Institutions	7	181.7 (1)
64	Insurance Services	1	15.5 (0)
65	Real Estate	1	12.5 (0)
67	Holding & Other Investment	9	225.5 (2)
73	Business Services	1	33.6 (0)
80	Health Services	1	0.0 (1)
	Total	139	5,340.3 (21)

Table 2 lists the swap announcements on an yearly basis. The maximum number of swaps (54) occurred in 1982. Incidentally, 1982 is also the year when both chemicals and primary metals had maximum number of swaps. Table 2 shows that the majority of swap announcements in this study took place during period 1981-1984. The number of swap announcements dropped significantly after 1984. It appears that the passage of the Deficit Reduction Act of 1984 made it less profitable to engage in equity-for-debt swaps.

Table 3 summarizes year-wise and industry-wise swap announcements.

TABLE 2
Equity-For-Debt Swaps By Year In 1981-1989

139 equity-for-debt swap announcements are classified according to the calendar years of the announcements. Market value of the swaps in each year are also reported.

Year	Number Of Swap Announcements	$ In Millions (Number Of Firms Where Details Are Unavailable)
1981	21	762.1 (1)
1982	54	1,839.4 (6)
1983	29	930.6 (6)
1984	24	1,045.1 (2)
1985	4	681.0 (2)
1986	4	33.6 (3)
1987	2	48.5 (0)
1988	0	0.0
1989	1	0.0 (1)
Total	139	5,340.3 (21)

METHODOLOGY

The following model is used to test for variation in the systematic relationship of securities to the market as a consequence of the swap announcement:

Equation 1

$$R_{p,t} = \alpha_{p,0} + \alpha_{p,1}D_{0,t} + \beta_{p,0}R_{m,t} + \beta_{p,1}R_{m,t}D_{0,t} + e_{p,t}$$

where:

- p = an equal weighted portfolio of all firm in the study
- $R_{p,t}$ = the average of the daily realized returns on securities in portfolio p in day t. Daily returns on individual securities are taken from the CRSP daily return tape
- $D_{0,t}$ = a dummy variable which is equal to 1 during event interval (t-3 to t+20), and zero elsewhere
- $\alpha_{p,0}$ = the intercept term for portfolio p
- $\alpha_{p,1}$ = shift in the intercept term for portfolio p during the event period
- $\beta_{p,0}$ = the systematic risk of portfolio p
- $\beta_{p,1}$ = measure of shift in the systematic risk of the portfolio during the event window
- $R_{m,t}$ = the return on value weighted market portfolio (*VWRETD*) in day t, taken from the CRSP daily return tape
- $e_{p,t}$ = a random disturbance term

TABLE 3

Equity-For-Debt Swaps By Industry And Year In 1981-1989

139 equity-for-debt swap announcements are classified according to the Standard Industry Classification (SIC) and calendar years.

SIC	Industry	Number of Swap Announcements									
		81	82	83	84	85	86	87	88	89	Total
13	Oil & Gas Extraction		2	1	2	1	1				7
15	Building Construction	1									1
20	Food & Kindred Products	2	3	1	1						7
21	Tobacco	1									1
22	Textile		1								1
24	Lumber & Wood	1	1				2				4
25	Furniture & Fixtures		1								1
26	Paper	1	1		1						3
28	Chemicals	1	8	3	2						14
29	Petroleum Refining		5		2						7
30	Rubber		1	1							2
32	Stone, Clay & Glass		1	6							7
33	Primary Metal	1	5	4		1		2			13
34	Fabricated Metal		3	2	1					1	7
35	Machinery & Computer Equipment	1	1	3	3	1					9
36	Electronic & Electrical		4		1						5
37	Transportation Equipment	1	3	3							7
38	Measuring, Analyzing & Controlling Instruments				2						2
40	Railroad	1									1
41	Passenger Transportation				1						1
45	Air Transportation				1	1					2
47	Transportation Services			1							1
48	Communications	1	1								2
49	Electric, Gas & Sanitary Services	2	1		1						4
53	General Merchandise Stores	1	5		1						7
54	Food Stores		1	1							2
58	Eating & Drinking Places				1						1
60	Depository Institutions	4	1	1	1						7
64	Insurance Services				1						1
65	Real Estate				1						1
67	Holding & Other Investment	2	4	2	1						9
73	Business Services						1				1
80	Health Services		1								1
	Total	21	54	29	24	4	4	2	0	1	139

We apply the standard event study methodology to investigate the impact of swap announcements on the common stock returns. The daily return generating model proposed by Karafiath (1988) is used[3] as follows:

Equation 2

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \sum_{n=-3}^{20} \Gamma_{i,n} D_{n,t} + e_{i,t}$$

where:

$R_{i,t}$ = the realized return on security i in day t
$D_{n,t}$ = a dummy variable which is equal to 1 on observation n (in the event interval) and zero elsewhere
$\Gamma_{i,n}$ = estimated coefficient on dummy variable $D_{n,t}$
α_i = the intercept term for security i
β_i = the systematic risk of security i
$R_{m,t}$ = the return on value weighted market portfolio in day t
$e_{i,t}$ = a random disturbance term

The 'event day' (t=0) is the newspaper date on which the swap announcement is reported. Newspapers frequently carry news that is released prior to the date of the newspaper. To allow for this, the event window contains day t=-3 through day t=+20.

The use of dummy variables in the above model allows estimates of prediction errors (excess returns) for each security i, for each day t, to be directly obtained from Γ coefficients.

Equation 3

$$PE_{i,t} = \Gamma_{i,n}$$

The standardized prediction errors for each security for each day (*SPEi,t*) in the event interval are then computed.

Equation 4

$$SPE_{i,t} = PE_{i,t}/s_{i,t}$$

where $s_{i,t}$ is equal to the standard error of the excess return for security i for observation t and is computed as:

Equation 5

$$s_{i,t}^2 = s_i^2 \left(1 + \frac{1}{X_i} + (R_{m,t} - \overline{R}_m)^2 \Big/ \sum_{t=1}^{T_i} (R_{m,t} - \overline{R}_m)^2\right)$$

where:

s_i^2 = the residual variance for security i from the market model regression
X_i = the number of observations in the estimation period
$R_{m,t}$ = the return on value weighted market index (*VWRETD*) for day t
$\overline{R}_m$ = the average return on the value weighted market index over T_i days used as estimation period (day -250 to day -11).

The prediction errors are assumed to be normally distributed with zero mean, so the standardized prediction errors, $SPE_{i,t}$s, are assumed to be student 't' distributed. The number of days used for regression is large, and therefore, $SPE_{i,t}$s are approximately standard normal.

Cumulative prediction errors ($CPE_{i,T}$s) for various sub-period (T_1 to T_2) are then computed:

Equation 6

$$CPE_{i,T} = \sum_{t=T_1}^{T_2} PE_{i,t}$$

For each trading day t in the event period (day -3 to day +20), the average prediction error (APE_t) is computed as:

Equation 7

$$APE_t = \frac{1}{N_t} \sum_{i=1}^{N_t} PE_{i,t}$$

where N_t is the number of firms in the portfolio.

APE_t provides the prediction error on an equally-weighted portfolio and can be treated as a single observation in statistical analysis. The APE_ts are summed over various intervals in the event period to give cumulative average prediction errors ($CAPE_T$s).

Equation 8

$$CAPE_T = \sum_{t=T_1}^{T_2} APE_t$$

where T_2 and T_1 are specific days in the event window.

Average standardized prediction error ($ASPE_t$) for each day in the event window is computed as:

Equation 9

$$ASPE_t = \frac{1}{N_t} \sum_{i=1}^{N_t} SPE_{i,t}$$

Individual SPE_is are assumed to be standard normal and independent under the null hypothesis of no excess returns. $ASPE_t$s, therefore, are approximately normally distributed with variance $1/N_t$.[4]

The test statistic, *Z*, is then found as:

Equation 10

$$Z = ASPE_t \times \sqrt{N_t}$$ [5]

These are the test statistics used to examine the statistical significance of daily abnormal returns associated with equity-for-debt announcements.

To measure the statistical significance of abnormal returns over various intervals, we compute standardized cumulative average prediction error ($SCPE_{i,T}$) as:

Equation 11

$$SCPE_{i,T} = \sum_{t=T_1}^{T_2} SPE_{i,t} / (T_2 - T_1 + 1)^{1/2}$$

Interval test statistics are then computed as:[6]

Equation 12

$$Z = \sum_{i=1}^{N_T} SCPE_{i,T} / \sqrt{N_T}$$

EMPIRICAL RESULTS

Test results of the market model parameter shifts are presented in Table 4 Panel A. The results of the ordinary least squares regression show that there was a significant decline in alpha and a significant increase in beta during the study period (day -3 to day +20). Logic would suggest that a decrease in financial leverage will reduce systematic risk which should lead to a decrease of beta. We speculate that there was a break in the portfolio's systematic relationship with the market during the study period and that the parameter shifts observed are not permanent.

Further evaluation of data before and after the swap (day -200 to day +125) is presented in Table 4 Panel B. Beta decreased to .501 by 26 days after the swap announcement. Systematic risk as a percent of total risk also decreased substantially. This further suggests that relative systematic risk, as measured by the market, is not stable during the swap announcement period.

TABLE 4
Parameter Shifts During The Study Period

This table shows the test statistics for tests to evaluate portfolio parameter shifts during and after the 139 equity for debt swap announcements during 1981 to 1989.

Panel A
Market Model Parameters And Parameter Shifts During Day -3 To Day +20

	Estimate	't' value	p value
Alpha	0.00028	1.847	0.0659
Beta	1.12394	6.053	0.0001
Alpha shift	-0.00457	-2.240	0.0259
Beta shift	0.13179	2.191	0.0293
F value	15.820		
R square	0.1490		

Panel B
Total Risk, Systematic Risk, And Unsystematic Risk Before And After The Announcement Period (Day -2 To Day +25)

	Day -200 to Day -101	Day -100 to Day -1	Day +26 to Day +125
Beta	1.12898	1.22286	0.50066
σ(Portfolio)	0.002136860	0.002553220	0.002112510
σ(Market)	0.000709494	0.000645022	0.000684899
σ^2(Portfolio)	0.000004566	0.000006519	0.000004463
σ^2(Market)	0.000000503	0.000000416	0.000000469
Systematic Risk	0.000000641	0.000000622	0.000000118
Unsystematic Risk	0.000003925	0.000005897	0.000004345
Systematic Risk As A Percent Of Total	14.04%	9.54%	2.64%

The effects of swap announcements in various intervals in the event period (day -3 to day +20) are also evaluated. However, the analysis, is presented primarily for two intervals–a 2-day window (day -1 to day 0) and a 22-day window (day -1 to day +20). These two windows represent the announcement period (two-day) and the event period (22-day). Table 5 presents the summary statistics for the cumulative prediction errors (*CPE*s) of the entire sample in 2-day (day -1 to 0) and 22-day (day -1 to day 20) windows. The mean *CPE*s for both these windows are negative. Only 35% of the firms experienced a positive *CPE* during the 2-day announcement period while 47% firms experienced positive share price reaction to swap announcements during the 22-day period. Over the two-day period the maximum *CPE* was 12.9% (t value 1.18) (Energy Exchange Corp.) and the minimum was -32.9% (t value 3.58) (Instruments Systems Corp.). Over the 22-day period the maximum *CPE* was 53.5% (t value 31) (Cities Services Co.) and the minimum was -44.8% (t value 1.87) (Michigan General Corp.).

TABLE 5

Summary Statistics For The Cumulative Prediction Errors (CPEs)

Summary statistics for the 2 day (day -1 to day 0) and 22 day (day -1 to day +20) periods cumulative prediction errors (*CPE*s) are presented.

	Two-Day Period	Twenty-Two Day Period
Sample Size	139	139
Mean *CPE*	-0.01245	-0.01348
Minimum *CPE*	-0.32891(3.58)***	-0.44755(1.87)*
Maximum *CPE*	0.12886(1.18)	0.53450(3.51)***
Standard Deviation	0.04449	0.12102
1st Quartile	0.00744(0.26)	0.04673(0.52)
2nd Quartile	-0.00700(0.21)	-0.00439(0.05)
3rd Quartile	-0.02903(1.17)	-0.06488(0.55)
% Positive	35.252%	47.482%

t-statistics (absolute values) in parentheses
*Significant at 10% level, two-tailed tests
**Significant at 5% level, two-tailed tests
***Significant at 1% level, two-tailed tests

Industry-wise analysis is examined next. However, a number of industries represented in the sample had very few equity-for-debt swap announcements. No meaningful industry-wise analysis could be done for these industries. Therefore, industries with three or fewer swaps are clubbed together into a 'miscellaneous' category. This grouping results in a total of 16 industry categories, including the miscellaneous category.

Table 6 presents industry-wise minimum, maximum, and average *CPE*s for 2-day and 22-day windows. Panel A presents the statistics for the 2-day window while the 22-day window results are contained in Panel B. For the 2-day announcement period, both, Energy Exchange Corp., which had the maximum share price reaction, and Instruments Systems Corp., which experienced the minimum share price reaction, fall under the miscellaneous category. Stone, clay and glass industry had the maximum average *CPE* of 0.8%. The oil and gas extraction industry, on the other hand, had the minimum average share price reaction–*CPE* -3.4%.

Cities Services Co., which experienced the maximum share price reaction of 53.5% (t value 3.51) for the 22-day announcement period is in the petroleum refining industry. Michigan General Corp. which experienced the minimum share price reaction of -44.8% (t value 1.87) falls under stone, clay and glass industry category. The primary metals industry had the maximum average *CPE* of 6.0%, while Stone, Clay and Glass industry had the minimum average share price reaction of -12.3%.

Table 7 presents the year-wise cumulative prediction errors (*CPE*s) of the 2-day and 22-day announcement periods. The average *CPE*s for the two-day period for nearly all the years are negative. For the 22-day period, only half of the calendar years have negative average *CPE*s.

TABLE 6

Summary Statistics For The Cumulative Prediction Errors (*CPE*s) By Industry

Summary statistics of the 2 day (day -1 to day 0) and 22 day (day -1 to day +20) periods cumulative prediction errors (*CPE*s) by industry.

Panel A: Two-Day *CPE*s By Industry

SIC	Industry	Maximum	Minimum	Avg
13	Oil & Gas Extraction	0.061(0.89)	-0.210(2.60)**	-0.034
20	Food & Kindred Products	0.021(0.55)	-0.042(1.45)	-0.006
24	Lumber & Wood	0.003(0.16)	-0.050(1.45)	-0.016
28	Chemicals	0.025(1.08)	-0.036(2.03)**	-0.006
29	Petroleum Refining	0.038(0.83)	-0.023(1.10)	-0.002
32	Stone, Clay & Glass	0.067(3.23)***	-0.036(1.05)	0.008
33	Primary Metal	0.032(1.13)	-0.116(4.29)***	-0.011
34	Fabricated Metal	0.046(1.50)	-0.047(1.26)	-0.001
35	Machinery & Computer Equipment	0.000(0.01)	-0.086(0.47)	-0.033
36	Electronic & Electrical	0.009(0.49)	-0.075(1.38)	-0.018
37	Transportation Equipment	0.029(1.06)	-0.040(1.74)*	-0.013
49	Electric, Gas & Sanitary	0.022(1.26)	-0.028(1.61)	-0.005
53	General Merchandise Stores	-0.000(0.02)	-0.033(1.80)*	-0.019
60	Depository Institutions	0.018(0.65)	-0.025(1.18)	-0.005
67	Holding & Other Investment	0.026(1.01)	-0.042(2.08)**	0.003
99#	Miscellaneous	0.129(1.18)	-0.329(3.58)***	-0.021

Panel B: Twenty-Two-Day *CPE*s By Industry

SIC	Industry	Maximum	Minimum	Avg
13	Oil & Gas Extraction	0.088(0.72)	-0.401(1.49)	-0.105
20	Food & Kindred Products	0.027(0.46)	-0.075(1.11)	-0.021
24	Lumber & Wood	-0.007(0.07)	-0.064(0.56)	-0.030
28	Chemicals	0.130(1.71)	-0.106(1.27)	0.022
29	Petroleum Refining	0.535(3.51)***	-0.086(1.07)	0.049
32	Stone, Clay & Glass	0.085(1.23)	-0.448(1.87)*	-0.123
33	Primary Metal	0.327(1.99)*	-0.148(1.58)	0.060
34	Fabricated Metal	0.159(2.09)**	-0.057(0.95)	0.019
35	Machinery & Computer Equipment	0.105(1.98)*	-0.368(0.61)	-0.094
36	Electronic & Electrical	0.206(1.56)	-0.081(1.28)	0.001
37	Transportation Equipment	0.063(0.66)	-0.116(0.79)	-0.013
49	Electric, Gas & Sanitary	0.016(0.29)	-0.063(1.13)	-0.022
53	General Merchandise Stores	0.083(1.01)	-0.094(1.14)	0.005
60	Depository Institutions	0.072(0.86)	-0.117(1.29)	-0.002
67	Holding & Other Investment	0.134(1.60)	-0.133(2.00)**	0.002
99#	Miscellaneous	0.184(2.39)**	-0.394(1.29)	-0.024

t-statistics (absolute values) in parentheses
*Significant at 10% level, two-tailed tests
**Significant at 5% level, two-tailed tests
***Significant at 1% level, two-tailed tests
#Miscellaneous: include all industries with three or less swap announcements.

TABLE 7
Summary Statistics For The Cumulative Prediction Errors (*CPE*s) By Calendar Year

Summary statistics for the 2 day (day -1 to day 0) and 22 day (day -1 to day +20) periods cumulative prediction errors (*CPE*s) by calendar year.

Panel A: Two-Day *CPE*s

Year	Maximum	Minimum	Avg
1981	0.036(0.99)	-0.329(3.58)***	-0.023
1982	0.067(3.23)***	-0.116(4.29)***	-0.012
1983	0.029(1.06)	-0.210(2.60)**	-0.019
1984	-0.008(0.49)	-0.020(1.08)	-0.005
1985	-0.217(0.60)	-0.042(2.17)**	-0.014
1986	-0.001(0.03)	-0.008(0.21)	-0.016
1987	0.032(1.13)	0.014(0.29)	0.023
1989	—	—	-0.010

Panel B: Twenty-Two-Day *CPE*s

Year	Maximum	Minimum	Avg
1981	0.007(0.09)	-0.394(1.29)	-0.009
1982	0.535(3.51)***	-0.228(3.40)***	0.008
1983	0.127(2.13)**	-0.448(1.87)*	-0.075
1984	0.134(1.60)	-0.193(1.96)**	0.002
1985	0.197(1.82)*	-0.122(0.54)	-0.023
1986	0.088(0.72)	-0.135(1.44)	0.006
1987	0.327(1.99)**	-0.148(1.58)	0.090
1989	—	—	-0.048

t-statistics (absolute values) in parentheses
*Significant at 10% level, two-tailed tests
**Significant at 5% level, two-tailed tests
***Significant at 1% level, two-tailed tests

Note: There was only one swap announcement in 1989.
Therefore, minimum and maximum values do not apply.

The cumulative average prediction errors (*CAPE*s) and related Z statistics for various sub-periods are shown in Table 8. Of the ten event windows examined, six of the sub-periods show significant negative security price reaction around the announcements. For others, the reactions, though negative, are not significant.

Table 9 presents the daily average prediction errors (*APE*s), cumulative average prediction errors (*CAPE*s), and the corresponding Z statistics around the swap announcements. Abnormal returns on days -2, -1, and 0 were significantly negative. However, the cumulative abnormal returns were negative over the entire study period. Almost all the Z statistics for *CAPE*s indicate significant cumulative negative reaction of the security prices to the swap announcements.

A graph of *CAPE*s against time visualizes these results. Figure 1 shows the negative effects of the swap announcements. The evidence suggests that the swap announcements, on average, had a negative influence on the security prices.

TABLE 8
Cumulative Average Prediction Errors

The table shows the mean cumulative average prediction errors (*CAPE*s) and corresponding Z statistics for various intervals in the event window around swap announcements.

Period	CAPE	Z
-3 to +20	-0.01515	-1.26
-3 to +10	-0.02353	-2.65**
-3 to +5	-0.01987	-3.21***
-1 to +20	-0.01349	-0.93
-1 to +15	-0.02088	-1.60
-1 to +10	-0.02187	-2.34**
-1 to +5	-0.01820	-2.95***
-1 to +2	-0.01716	-3.89***
-1 to +1	-0.01461	-4.27***
-1 to +0	-0.01245	-4.79***

*Significant at 10% level, two-tailed tests
**Significant at 5% level, two-tailed tests
***Significant at 1% level, two-tailed tests

Tests For Effects Of Industry Classification And Calendar Year

To evaluate whether industry classification and the incident of swap in a particular year have any influence on the magnitude and direction of effects, we compare share price reactions across industries and across years. Because we need to do multiple comparisons, ordinary t-tests are not appropriate here. We conduct two multiple comparison tests–Wallar-Duncan K-ratio t-test and Tukey's studentized range tests. Wallar-Duncan procedure assumes homoskedasticity and uncorrelated means. The observed 'F' value is used to compute critical 't' value for comparing two (or more) means. A large F-value indicates heterogeneous means. Wallar-Duncan test uses the ratio, denoted by K, of the relative seriousness of Type I to Type II errors. We use K value of 100 for a significance level of 5%.

Tukey's method of multiple comparisons is exact when the sample sizes are equal. It is conservative, with a confidence of at least $(1-\alpha)$, when the sample sizes are not equal. Tukey's multiple range test uses studentized range, q^7, to compute simultaneous multiple confidence intervals.

Again we perform Wallar-Duncan and Tukey procedures for the 2-day and 22-day *CPE*s, both across industries and across calendar years. To conserve space, the results are not presented here. The results indicate that there is no statistically significant difference in *CPE*s across industries and/or across calendar years.

Testing for differences in market responses by multiple comparison tests before and after the Deficit Reduction Act of 1984 may be difficult as only 11 of 139 swaps occurred after 1984. To secure robust results, we also conduct the Smith-Satterthwaite t tests, which do not require equal variance assumption, on the following hypothesis:

H_0: $ACPE_t^{1981\text{-}1984} - ACPE_t^{1985\text{-}1989} = 0$

H_a: the H_0 is not true

where:

ACPE = average cumulative prediction errors in 1981-1984 and 1985-1989
t = event windows (-1 to 0, -1 to +15, -1 to +20, and -1 to +30)

The results are presented in Table 10. None of the t-statistics are statistically significant. Thus, the impacts of industry classification and the Deficit Reduction Act of 1984 do not appear to be significant. Whether or not a firm receives tax-free accounting income from the swaps does not affect the security price reactions.

TABLE 9
Daily Average Prediction Errors (*APE*s) And Cumulative Average Prediction Errors (*CAPE*s)

The table shows the daily average prediction errors (*APE*s) and related Z statistics for the average prediction errors (*APE*s) and cumulative average prediction errors (*CAPE*s) in the event window around swap announcements.

t	*APE*	Z of *APE*	*CAPE*	Z of *CAPE*
-3	0.00313	0.74	0.00313	0.74
-2	-0.00479	-2.57**	-0.00166	-1.29
-1	-0.00743	-4.18**	-0.00909	-3.46***
0	-0.00502	-2.60**	-0.01411	-4.30***
1	-0.00215	-0.62	-0.01627	-4.12***
2	-0.00255	-0.38	-0.01882	-3.92***
3	-0.00115	-0.34	-0.01996	-3.76***
4	0.00007	0.18	-0.01990	-3.45***
5	0.00003	0.13	-0.01987	-3.21***
6	-0.00294	-1.54	-0.02280	-3.53***
7	0.00012	0.27	-0.02268	-3.29***
8	0.00158	0.96	-0.02110	-2.87***
9	-0.00106	-0.26	-0.02217	-2.83***
10	-0.00136	0.26	-0.02353	-2.65**
11	-0.00235	-0.43	-0.02588	-2.68**
12	-0.00187	-0.99	-0.02775	-2.84***
13	0.00706	2.07**	-0.02068	-2.25**
14	-0.00127	0.32	-0.02196	-2.11**
15	-0.00059	0.55	-0.02254	-1.93*
16	0.00261	0.80	-0.01993	-1.70*
17	0.00061	-0.12	-0.01932	-1.69*
18	0.00341	1.48	-0.01591	-1.33
19	0.00038	-1.02	-0.01553	-1.52
20	0.00038	1.10	-0.01515	-1.26

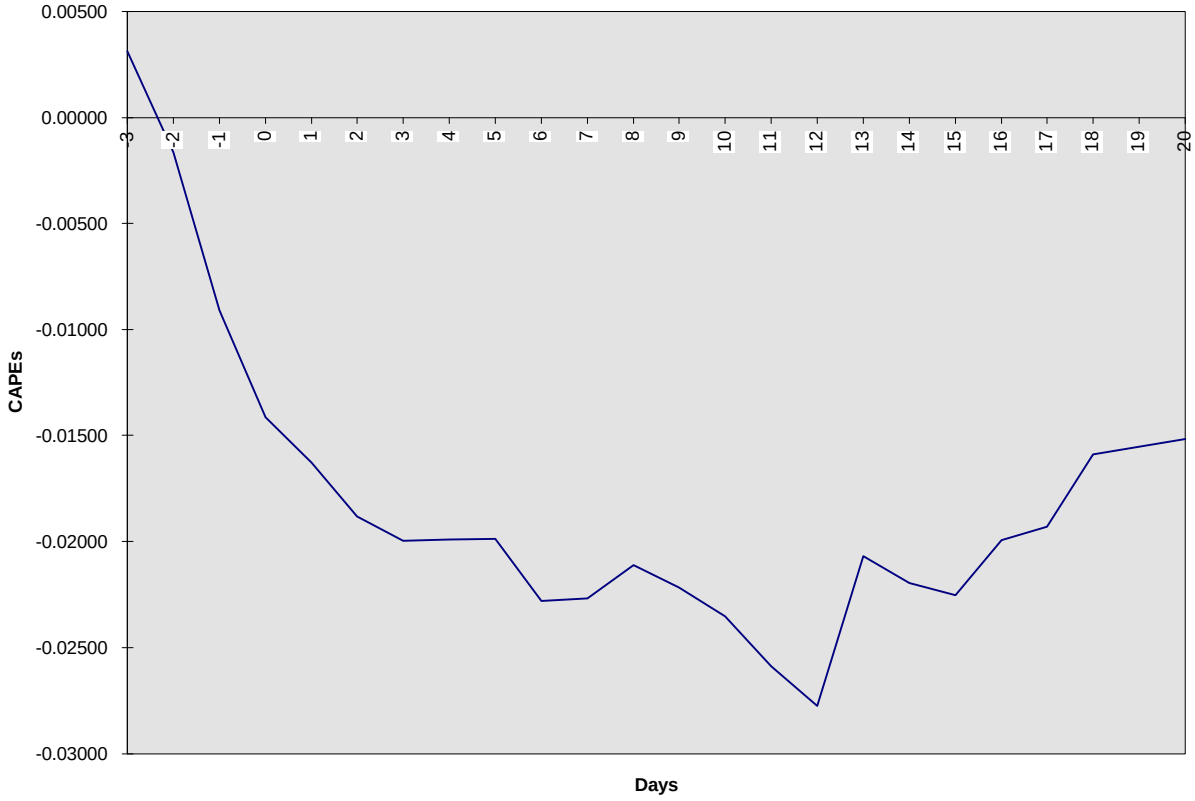
*Significant at 10% level, two-tailed tests
**Significant at 5% level, two-tailed tests
***Significant at 1% level, two-tailed tests

TABLE 10
Smith-Satterthwaite t Tests For The Average Cumulative Prediction Errors Before And After the Deficit Reduction Act of 1984

The table shows the average cumulative average prediction errors (*ACPE*s) in 1981-1984 and 1985-1989 and corresponding t statistics for the differences in the APCEs for various event windows around swap announcements.

Period	$ACPE_{1981-1984}$	$ACPE_{1985-1989}$	t
-1 to 0	-0.01356	0.00043	-1.37
-1 to +15	-0.02285	0.00559	-0.72
-1 to +20	-0.01471	0.00076	-0.35
-1 to +30	-0.00997	-0.00836	-0.03

FIGURE 1
CAPEs For Equity For Debt Swap
For Period Day -3 To Day +20



SUMMARY

Like the earlier studies, we find an overall negative share price reaction to swap announcements. However, we also find that there exists no significant difference of such negative effects across industries and calendar years. Although the Deficit Reduction Act of 1984 eliminated the tax advantage of equity-for-debt swaps, the market reactions to such swaps after 1984 are not significantly different from those before 1984. Moreover, we find that there is a significant decrease in alpha and an increase in beta during the announcement period. We also find that these shifts in the market model parameters are not permanent. In fact, as expected, we find that in the aggregate systematic risk, as measured by beta, actually declines in the post swap periods.

ENDNOTES

1. Miller's argument is based on the reasoning that personal income is taxed at a higher rate than capital gains. However, the Tax Reform Act of 1986 has eliminated this preferential tax treatment of capital gains.

2. The data analysis for this study started in July 1991. Center for Research in Security Prices (CRSP) daily returns for 1990 were not available in time for 1990 swap announcements to be included in this study.

3. Binder (1985) and Thompson (1985) use similar return generating models.

4. See Brown and Warner (1985) and Kim and Schatzberg (1987).

5. Karafiath and Spencer (1989) demonstrated that the Dodd and Warner (1983) test statistic (Z) does not, under the assumptions made by Dodd and Warner, have unit normal distribution. They argue that, for a relatively large event window with a small estimation period, the tests can be biased. However, there is no significant risk of bias in the present case because the estimation period is relatively large (240 days).

6. See Hite, Owers and Rogers (1987, pp. 238-239)

7. q is the ratio of the range (maximum - minimum values) and standard deviation of the sample.

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