THE EFFECT OF CORPORATE CAPITAL INVESTMENT CHANGES ON THE WEALTH OF NONCONVERTIBLE BONDHOLDERS AND CONVERTIBLE BONDHOLDERS

Joseph C. P. Shieh*

謝 劍 平*

摘 要

過去的研究已提供實證結果，認爲公司資本支出的變動，符合股東財富極大化的假設 McConnell and Muscarella (1985)，McCnnell and Nantell(1985)，及 Woolridge and Snow(1990)，但是並沒有任何研究針對債權人財富的影響來探討。此篇論文即針對公司資本支出對普通公司債持有人及可轉換公司債持有人之財富效果來探討：本研究並沒有發現財富移轉的證據，如果普通公司債與可轉換公司債一起觀察的話、本研究發現有證據支持訊息效果的假設。

Abstract

Although prior studies showed the evidence that shareholders g ained (lost) as a result of increases (decreases) in capital investment McConnell and Muscarella (1985), McConnell and Nantell (1985), and Woolridge and Snow (1990), there is no study examining the impact of corporate capital investment changes on the wealth of bondholders. This paper empirically examines the wealth impacts of bondholders in response to changes in capital investment decisions. Our results indicated that nonconvertible bondholders did not significantly benefit from the information revealed by managers, while significant excess return is associated with convertible bond issues. Conversely, our results indicated that bondholders suffered significant negative excess return when the firms announced decreases in capital investment. These results indicated the presence of information effect, but finds noo evidence of wealth transfer effect.

1. Introduction

The corporate capital investment decision has been an issue of interest in

*作者爲本校財務管理學系副教授

* Associate Professor, Department of Finance, National Chengchi University, Mucha, Taipei, Taiwan.

financial research.[1] Capital investment decisions involve committing current real assets made in anticipation of generating future cash flows. Since this decision involves using current firm's resources and expecting an uncertain cash inflows, the motivation for firm's capital investment decisions has been examined to confirm manager's attitude toward market value maximization.

Prior studies found evidence that the information-content of the firm value maximization hypothesis can explain the motivation for firm's manager to undertake capital investment projects. According to this hypothesis, increases in capital investment signal firm's future prospects and create economic value for shareholders as measured by increases in a firm's market value. The information-content of the firm value maximization hypothesis predicts that the stock market will react positively to corporate capital investment announcements. For example, McConnell and muscarella (1985) studied the behavior of common stock prices when firms made announcements about their acquisitions of capital assets. McConnell and Muscarella analyzed a sample consisting of five hundred and forty seven industrial firms that made announcements with respect to firms' capital budgeting and found that positive excess returns were earned by the sample firms that increased their capital expenditure and negative excess returns by the sample firms that decreased their capital expenditure. A more recent paper by Woolridge and Snow (1990) investigated the stock market's reaction to corporate strategic investment decisions.[2] Their finding supported the predictions of the information-content of firm value maximization hypothesis.

Although research cited above has documented the effect of capital expenditure announcement on security price movements, previous studies solely examined the effect on stock price. Since capital investment decisions provide shareholders with a mechanism to engage in risk-shifting actions by investing in risky investment projects, it is necessary to provide further evidence investigating possible wealth redistribution, arising from the framework of stockholder-bondholder conflict. Thus, wealth transfer hypothesis serves an alternative explanation regarding manager's

---

[1] Corporate investment decisions can take two forms: acquiring another firms (M&A) or acquiring real assets. However, existing studies in capital investment decisions primarily concentrated their efforts on the first type of investment decisions, namely, mergers and acquisitions. Jensen and Ruback (1983) provided a comprehensive reference list of mergers and acquisitions literature.

[2] Woolridge and Snow considered a wide range of strategic capital investment decisions: formation of joint ventures, research and development projects, capital expenditures, and diversification intoo new product and/or markets.

motive in making capital investment decisions.

This paper empirically examines these two competing hypotheses by examining the wealth impacts of bondholders in response to changes in capital expenditure decisions. The study is organized into five sections. The present section introduces the controversy. Section Two discusses the effect of the two competing hypotheses on the market value of the debt. Section Three describes sample design and methodological issues. Section Four reports the empirical results of corporate bond and the results of several subgroups of the sample. Section Five contains a summary of the findings and additional remarks. Finally, investigation of stockholders' reaction in response to capital investment announcements is reported in Appendix B.

2. The two competing hypotheses

Two hypotheses have been presented in the financial literature to explain and predict the impact of changes in corporate investment decisions on security holders. These two hypotheses have been referred to as the wealth transfer hypothesis and the information-content of firm value maximization hypothesis (hereafter the information-content hypothesis)

2.1 The wealth transfer hypothesis

Wealth transfer hypothesis stems from the widely recognized conflict of interest between the firm's stockholders and bondholders.[3] These conflicts exist because the firm's fixed claim holders bear default risk, while stockholders have limited liability residual claims. Thus, stockholders may be able to increase the value of their equity

[3] The implications of the conflicts between stockholder and bondholder have been documented by a number of studies, such as Black and Scholes (1973), Fama and Miller (1972), Jensen and Meckling (1976), Galai and Masulis (1976), Myers (1977), and Smith and Warner (1979). These papers consistently argue that stockholders who control the firm's decision making would try to maximize their own wealth at the expense of bondholders. Thus, if no appropriate restriction on stockholders' investment and financing decisions, then stockholders may have incentives to pursue wealth redistribution by adding to stockholder wealth at the expense of bondholders. As a result, this situation sacrifices the objective of maximizing the market value of the firm.

by switching the firm's assets into investment projects or lines of business with a higher standard deviation of return. The interesting implication is that the sources of wealth gain of stockholders, resulting from changes in capital investment may be only the wealth loss of bondholders.

2.2 The information-content hypothesis

The information-content maximization hypothesis suggests that capital investment changes convey information about the firm's future outlook. Announcements of capital investment changes by value-maximizing firms may reveal the management's belief regarding firm's investment opportunities. Those investment changes could affect the default risk of the outstanding bonds. Announcements of increases in corporate capital expenditure should, in most cases, lead to bond price increases, since a positive outlook of the firm will provide bondholders the security of their principal and interests earned. Similarly, capital expenditure decreases could signal unfavorable news about the firm's prospect. As a result, the default risk of bonds outstanding would increase, and consequently, bond prices would decline. In summary, the information-content hypothesis predicts that stockholders and bondholders would share the positive (or negative) NPV resulting from changes in capital expenditure.[4]

2.3 Testable hypotheses

This paper investigates these two competing hypotheses by examining the effect of announcements of unexpected changes in capital expenditure on bond prices.

The wealth transfer hypothesis predicts that negative (positive) wealth effect on bondholders can be found when increases (decreases) in capital expenditure are announced. By contrast, the information-content hypothesis predicts that bond prices would increase (decrease) in response to announcements of unexpected positive (negative) changes in capital expenditure.

---

[4] However, the sharing of the NPV between shareholders and bondholders may not be a symmetrical distribution because the former is residual claimholders, while the latter is fixed claimholders.

3. Research methodology

3.1 Sample selection

This paper examines the impact on bondholder wealth of capital expenditure annoouncements. A total of 329 capital expenditure announcements were found during the five year period from 1985 through 1989. The announcements were compiled from an exhaustive search of the Standard & Poor's News Dialogue Information Retrieval Service and the Wall Street Journal Index. The size of the sample was further reduced to satisfy the following criteria:

1. Multi-year announcements were eliminated from the sample.[5]
2. The equity securities must be listed on the CRSP excess returns file, and the corporate bond prices must be reported in the Wall Street Journal.
3. The corporation must have at least one bond issue that was traded at least once a week. (with no more than 5 calendar days between trades).
4. Firms with contemporaneous announcements, such as dividend announcements, earnings reports, and new securities offerings, shown on the Wall Street Journal Index during the event period (day = -1, 0, 1) are excluded from the final sample.

Table 1 reports descriptive statistics on the final sample of corporate capital expenditure announcements. As shown in Table 1, a total of 111 announcements, consisting of 31 convertible bonds and 80 nonconvertible bonds, remained after applying the screening criteria. The sample consisted of 74 announcements of increases in capital budgets and 37 announcements of decreases.

Table 1 shows that, of the nonconvertible bond issues, 14 out of 80 capital expenditure announcements were made by utility firms. Similarly, the table also shows the breakdown of the sample on the basis of bond ratings. As reported in the table, the majority of the bond ratings assigned by S&P have a rating of "BBB" or better. Since any change in the value of the bonds will arise from changes in the default risk of the bonds. It is likely that inivestment grade bonds will be less influenced by the announcements than noninvestment grade bonds. Hence, in addition to examining the entire sample, the study partitioned the sample by bond quality, and then investigated each subsample separately.

---

[5] The multi-year announcements were eliminated because of the difficulty of classifing the announcements as either an increase or a decrease. Examples of a multi-year announcement and other types of announcements are given in Appendix A.

Table 1

Sample description of bond issues classified by the type of bonds, the regulatory nature of the firm and ratings.

		Capital exp. incr.	Capital exp. decr.	Total
Convt.		20	11	31
Nonconvt.		54	26	80
	breakdown by regulatory			
	industrial	46	20	
	utility	8	6	
	breakdown by rating			
	AAA	5	6	
	AA	16	6	
	A	11	4	
	BBB	15	9	
	BB	4	1	
	B	3	0	
Total		74	37	111

3.2 Methodology

The methodology used in our analysis is an adaptatioon for bonds of the mean-adjusted excess returns model for equities that was examined by Brown and Warner (1980, 1985).[6] The event period is from 10 days prior to the announcement date ($t=-10$) to 10 days subsequent to the announcement date ($t=+10$). The estimation period consists of the 15 trading days before the event period ($t=-25$ through

[6] The mean-adjusted excess return model is used because of the difficulties in specifying a market index for bonds.

$t=-11$) and the 15 trading days after the event period ($t=11$ through $t=25$).[7]

Equation [1] describes the observed return.

$$R_{it} = (1/K_t) \operatorname{Ln} (P_{it} / P_{it-1}) \quad [1]$$

where P_{it} = Quoted price + accrued interest of bond i at time t.

A mean return for each bond u_i was estimated by taking an arithmetic average of the R_{it} for each day on which a trade occurred during the estimation period [$t=-25$, $t=-11$] and [$t=11$, $t=25$]. The excess returns for trading days during the event period was then calculated by subtracting $R_{it} - u_i$ for each day t in the event period [$t=-10$, $t=10$].

Unlike common stock issues, most firms in the sample have more than one issue of debt outstanding. For those firms having multiple issues of debt, we selected the two debt issues that were most frequently traded. The bonds were combined into a portfolio, and the average return for each portfolio for each day was used in the event study. This procedure was used to attenuate the noise introduced by the nonfrequent trading problem. If one bond traded on day t and the other did not, then the return was simply the return on the bond that did trade.

The excess returns for each company during time t were then combined into a portfolio and the portfolio excess returns were calculated as follows:

$$PER_t = (1/n) \sum_{i=1}^{n} ER_{it} \quad [2]$$

The test for significance for each portfolio excess return was:

$$T = PER_t / S_i \quad [3]$$

---

[7] The estimation period is only 30 days in total and the combined estimation and event period is 51 days. Normally, estimation periods for event studies using stock returns are substantially greater in length. However, since bond prices are not as easily obtained as are stock prices, it is common to have a substantially reduced study period. For example Masulis (1980), Dann (1981), and Woolridge (1983) all use a combined event and estimation window from $=-10$ to $t=10$. Hite and Owers (1983) use an estimation period of from $t=-50$ through $t=-10$.

where S_i is the standard deviation of the portfolio estimated during the estimation period. Additionally, we calculated and tested cumulative average excess returns as follows:

$$CPER[t_1,t_2] = \sum_{t_1}^{t_2} PER_t \qquad [4]$$

The test statistic for the cumulative average excess returns was:

$$T = CPER[t_1,t_2] \; / \; S_i \; (t_1-t_2+1)^{1/2}$$

4. Empirical results

This section presents the results of the data analyses of the effect of announcements of unexpected capital expenditure changes on the returns of corporate bonds. The analysis of the excess returns to corporate bonds focuses on the immediate vicinity of the capital expenditure annoouncement date. Daily portfolio excess returns from 10 days before the announcement through 10 days after are reported. The wealth transfer hypothesis predicts that the regulatory nature of the firm, the convertibility feature and the rating of a bond would hae differential impact on debt securities with respect to unexpected change in capital expenditure. In addition to reporting the results of the entire sample, the results of several subsets of the sample are reported and analyzed separately.

4.1 Announcements of Unexpected Capital Expenditure Increases

4.1.1 Empirical results of nonconvertible bonds.

Table 2 displays the portfolio excess returns (PERS), cumulative portfolio excess returns (CPERS), and the number of positive and negative excess returns for day -10 through day $+10$. As shown in Table 2, the PERs on day -1, 0, and 1 are -0.07%, 0.14%, and 0.10% respectively.

The CPERs for various subperiods and the corresponding test-statistics are reported in Table 2. The CPERs calculated over the interval of day -10 to day 0 is 0.30%, while the CPER for day -10 to day 10 is 0.36%. A two-day cumulative portfolio excess returns for the period from day -1 through day 0

Table 2

Portfolio excess returns (PER), cumulative portfolio excess returns (CPER) and t statistics for nonconvertible bonds of the industrial and utility firms over a 21 day period around announcement of unexpected capital expenditure increases.

(a) Portfolio excess returns

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	0.16	0.43	38	24 : 14
−9	−0.11	−0.30	39	19 : 20
−8	0.09	0.24	34	21 : 13
−7	−0.17	−0.46	43	19 : 24
−6	0.11	0.30	39	23 : 16
−5	0.01	0.03	35	18 : 17
−4	0.04	0.12	37	18 : 19
−3	0.05	0.14	37	21 : 16
−2	0.05	0.14	41	20 : 21
−1	−0.07	−0.19	38	20 : 18
0	0.14	0.39	40	25 : 15
1	0.10	0.27	40	23 : 17
2	−0.04	−0.10	41	19 : 22
3	−0.03	−0.08	36	19 : 17
4	−0.03	−0.08	40	18 : 22
5	0.04	0.11	39	20 : 19
6	−0.17	−0.46	38	17 : 21
7	−0.18	−0.48	35	21 : 14
8	0.16	0.42	42	25 : 17
9	0.07	0.19	39	19 : 20
10	0.13	0.34	36	18 : 18

(b) Cumulative portfolio excess returns

Days in interval	CPER (%)	Test-statistic
−10 to 10	0.36	0.21
−5 to 5	0.28	0.23
−10 to 0	0.30	0.25
−5 to 0	0.23	0.25
−1 to 5	0.12	0.12
−1 to 3	0.11	0.13
−1 to 1	0.17	0.27
−1 to 0	0.07	0.14

is 0.07%. While previous studies showed that shareholders of the firms making capital expenditure increases earn significant positive excess returns, (Our results in Appendix B provide similar findings) most of the mean excess returns of nonconvertible bonds shown here are positive but small in magnitude and iinsignificantly different from zero. Given insignificant bondholders' reactions around the announcement date, we are unable to reject the hypothesis that the portfolio excess returns on the announcement day is insignificantly different from zero. The wealth transfer hypothesis asserts that the stockholders' wealth gains could represent more wealth transfers from bondholders. However, this source of the wealth gains is not evident from Table 2. Since bond price changes remain non-negative while stock prices increase (see Table B-1), the market value of the firm most probably increases. In this respect, the empirical evidence based on our sample seems to support the hypothesis of the information-content of the firm value maximization.

4.1.2 Empirical results of subgroups of bonds.

One certain criticism with our inferences is that no significant bond excess returns found may be due to the fact that both the information-content effect and the walth transfer effect affect bond prices simultaneously, cancelling each other. In an attempt to differentiate between these two effects, the entire nonconvertible bond sample is partitioned to reflect (1) the regulatory nature of the firm and (2) the effect of bond ratings. In addition, the results of convertible bond are independently reported in Section 4.1.3.

(1). Utility firms v.s. industrial firms

The general lack of significant bond price reactions reported in Table 2 for the entire sample of all available nonconvertible bond issues does not change if bond issues are analyzed separately on the basis of non-regulated firms (industrial sample) and regulated firms (utility sample). If the regulatory environment in a particular industry leaves little room for conducting risk-shifting investment activities, less wealth impact on bondholders would be expected. We used utility firms v.s. industrial firms as a proxy to measure the degree of regulation.

Table 3, however, indicates that the bondholders' wealth impact of capital expenditure announcements is not sensitive to the type of the firms analyzed. For the industrial firms sample, 46 equally weighted bond portfolip;s mean excess returns at day $(-1,0)$ and day é are an insignificant 0.07% and 0.16%. Similarly, for

The Effect of Corporate Capital Investment Changes on the Wealth of Nonconvertible Bondholders and Convertible Bondholders

Table 3

Portfolio excess returns (PER) and t statistics for nonconvertible bonds, broken down on the basis of the industrial firms and utility firms, over a 21 day period around announcement of unexpected capital expenditure increases.

Event DAY	Industrial firms sample			Utility firms sample		
	PER (%)	t sta.	Positive : Negative	PER (%)	t sta.	Positive : Negative
−10	0.15	0.37	22 : 13	0.28	1.21	2 : 1
−9	−0.13	−0.31	17 : 19	0.10	0.42	2 : 1
−8	0.12	0.30	20 : 9	−0.10	−0.44	1 : 4
−7	−0.13	−0.32	16 : 21	−0.43	−1.84	3 : 3
−6	0.14	0.34	22 : 24	−0.21	−0.90	1 : 2
−5	0.01	0.03	15 : 15	0.00	0.02	3 : 2
−4	0.06	0.14	17 : 16	−0.08	−0.34	1 : 3
−3	0.04	0.09	18 : 16	0.23	0.96	3 : 0
−2	0.04	0.09	17 : 19	0.16	0.67	3 : 2
−1	−0.09	−0.23	18 : 15	0.07	0.31	2 : 3
0	0.16	0.39	24 : 12	−0.00	−0.01	1 : 3
1	0.10	0.24	21 : 16	0.11	0.47	2 : 1
2	−0.03	−0.07	18 : 19	−0.12	−0.51	1 : 3
3	0.03	0.08	19 : 13	−0.51	−2.19**	0 : 4
4	−0.03	−0.08	16 : 19	0.01	0.05	2 : 3
5	0.07	0.18	18 : 16	−0.17	−0.74	2 : 3
6	−0.18	−0.45	15 : 20	−0.02	−0.06	2 : 1
7	−0.22	−0.54	19 : 11	0.08	0.34	2 : 3
8	0.12	0.30	21 : 16	0.39	1.68	4 : 1
9	0.07	0.16	17 : 16	0.10	0.40	2 : 4
10	0.16	0.38	16 : 15	−0.06	−0.26	2 : 3

CPER(−1 to 0) = 0.07%

** indicates significance at the 5% level (two sided test).

utility firms sample, 8 equally weighted bond portfolio's mean excess returns are also indistinguishable from zero.

(2). The effect of bond rating

Empirical evidence, such as Weinstein (1977) and Wakeman (1981) has suggested that bond ratings are a reflection of the relative probability of the default risk of bonds outstanding. If a firm has low rating bonds outstanding, it is perceived by investors to have high probability of financial distress; such firms with risky debt are considered to be more likely to engage in wealth transfer activities through undertaking risk-increasing investment projects.[8] Hence, if this thought is valid, we should expect to observe that low-rating bond prices decrease more than those of high-rating bonds or at least less positive excess return for low-rating bonds).

The data presented in Table 4 shows the effect of bond ratings on the impact of announcements of unexpected capital expenditure increases on bond prices. The rating of each bond issue is extracted from the rating assigned by Standard & Poor's, ten days preceding the capital expenditure announcement. The entire nonconvertible bond sample is subdivided into two subsamples; the first sample contained only bonds with ratings higher than BBB, while the second contained bonds with ratings lower than or equal to BBB.[9]. As Table 4 shows, two rating classes (high-rating and low-rating) display insignificant mean excess returns around the announcement date. The high-rating group experiences insignificant excess returns of 0.11% and 0.05% at day 0 and day (−1,0) respectively, while the low-rating group (BBB or lower) exhibits insignificant excess returns of 0.19% and 0.10% at day 0 and day (−1,0). The results in Table 4 do not support the wealth transfer hypothesis. However, positive signs on both the low-rating and high-rating group seem to suggest that the wealth transfer effect, if any, on bond prices appears to be more than offset by the positive impact of the information-content effect.

---

[8] We can also argue that bond ratings reflect the degree of protection the bondholders has. For examples, senior bonds usually have higher ratings than junior or subordinated bonds, because they have priority of claims on the assets of the firm.

[9] We admit that this classification scheme is rather arbitrary, but it provides us with a balanced sample size.

The Effect of Corporate Capital Investment Changes on the Wealth of Nonconvertible Bondholders and Convertible Bondholders

Table 4

Portfolio excess returns (PER) and t statistics for nonconvertible bonds, (the industrial firms and utility firms), broken down on the basis of two rating groups, over a 21 day period around announcement of unexpected capital expenditure increases.

Event DAY	High-rating group			Low-rating group		
	PER (%)	t sta.	Positive : Negative	PER (%)	t sta.	Positive : Negative
−10	0.14	1.18	12 : 10	0.18	0.26	12 : 4
−9	−0.00	−0.03	13 : 7	−0.27	−0.38	5 : 13
−8	0.09	0.73	12 : 7	0.09	0.13	9 : 6
−7	−0.28	−2.33**	8 : 15	−0.05	−0.07	11 : 9
−6	0.11	0.88	10 : 9	0.17	0.23	13 : 6
−5	−0.12	−1.02	8 : 10	0.15	0.22	10 : 7
−4	0.07	0.55	13 : 8	0.01	0.02	5 : 11
−3	0.06	0.53	12 : 7	0.04	0.06	9 : 9
−2	0.02	0.19	11 : 13	0.09	0.13	9 : 8
−1	−0.06	−0.46	8 : 10	−0.09	−0.12	12 : 8
0	0.11	0.90	14 : 8	0.19	0.26	11 : 7
1	0.14	1.17	12 : 11	0.04	0.06	11 : 6
2	−0.09	−0.78	9 : 12	0.02	0.04	10 : 10
3	0.12	0.96	10 : 9	−0.20	−0.28	9 : 7
4	0.02	0.15	9 : 13	−0.08	−0.12	9 : 9
5	0.05	0.43	10 : 11	0.03	0.04	10 : 8
6	−0.04	−0.34	10 : 12	−0.34	−0.49	7 : 9
7	−0.11	−0.95	7 : 12	−0.25	−0.35	9 : 7
8	0.11	0.91	15 : 9	0.23	0.33	10 : 7
9	−0.01	−0.03	8 : 13	0.16	0.22	11 : 7
10	0.17	1.41	9 : 11	0.07	0.10	9 : 7
CPER(−1 to 0) = 0.05%				CPER(−1 to 0) = 0.10%		

** indicates significance at the 5% level (two sided test).

4.1.3 Empirical results of convertible bonds.

The conertibility features of a bond allows bondholders to convert debt securities into a specific number of shares. According to the option pricing theory, a convertible bond is viewed as a non-convertible bond plus a call option of exchanging a fixed claim for shares of common stock. Thus, the existence of a conversion clause in a bond indenture should mitigate the negative impact of a risk-increasing investment project, because such a project increases the value of the call option portion of the convertible bond issues. Since convertible are portfolios that combine features of both equity and debt, the owners of convertible bonds should experience the wealth increments of unexpected capital expenditure increases as realized by shareholders.

Table 5 presents the price behavior of convertible bonds around the announcement date, following capital expenditure increases.[10] The portfolio of 20 convertible debt issues experiences a 0.47% gain in price on day 0 and its two-day excess return over the interval −1 to 0 is 0.65%, with corresponding t statistics of 1.72 and 1.66 respectivel. These excess returns are statistically significant at the conventional level. In addition, the number of positive excess returns substantially exceeds the number of negative returns on the announcement date. These results indicate that changes in convertible debt prices are positively related to changes in the underlying common stock prices, a finding which can be due to their convertibility clause. In contrast with the results in the sample of nonconvertible bonds, the statistically significant positive excess returns of convertible bonds suggest that unexpected capital expenditure announcements excert some wealth increments on convertible bondholders.

4.2 Announcements of Unexpected Capital Expenditure Decreases

4.2.1 Empirical results of noncovertible bonds.

In the same fashion as the previous formats, Tables 6 through 9 report the

[10] The convertible bond sample was not divided into an industrial subsample and utility subsample, since in doing so, the size of two subsamples will become extremely small, particularly in utility sample. The explanation for this phenomenon is that the debt of regulated firms seems less likely to include conversion features because monitoring by regulators helps protect the debtholders from having position undercut and limits the gains the shareholders could obtain.

Table 5

Portfolio excess returns (PER), cumulative portfolio excess returns (CPER) and t statistics for nonconvertible bonds of the industrial and utility firms over a 21 day period around announcement of unexpected capital expenditure increases.

(a) Portfolio excess returns

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	0.13	0.46	17	9 : 8
−9	0.20	0.73	16	7 : 9
−8	−0.11	−0.41	14	7 : 7
−7	−0.01	−0.05	16	7 : 9
−6	−0.04	−0.14	15	7 : 8
−5	0.20	0.74	17	12 : 5
−4	−0.05	−0.19	14	9 : 5
−3	−0.02	−0.07	17	9 : 8
−2	−0.23	−0.85	16	4 : 12
−1	0.17	0.63	17	8 : 9
0	0.47	1.72	14	11 : 3
1	−0.42	−1.52	17	3 : 14
2	0.09	0.32	15	11 : 4
3	−0.13	−0.46	19	8 : 11
4	−0.04	−0.15	15	11 : 4
5	0.16	0.58	13	7 : 6
6	−0.05	−0.19	16	9 : 7
7	−0.23	−0.82	15	4 ; 11
8	0.36	0.32	14	9 : 5
9	−0.10	−0.35	17	6 : 11
10	−0.14	−0.52	16	10 : 6

(b) Cumulative portfolio excess returns

Days in interval	CPER (%)	Test-statistic
−10 to 10	0.22	0.17
−5 to 5	0.21	0.22
−10 to 0	0.71	0.78
−5 to 0	0.54	0.81
−1 to 5	0.31	0.43
−1 to 3	0.19	0.31
−1 to 1	0.23	0.48
−1 to 0	0.65	1.66

results for the firms which made announcements that their capital budget for this year would be less than the previous year. In the case of nonconvertible bonds, Table 6 reports evidence that nonconvertible bondholders experienced negative excess returns around the announcement periods. As reported in the table, the PERs on day -1, 0 are -0.20% ($t=-1.83$, significant at the 0.10 level) and -0.11%. A two-day cumulative portfolio excess returns for the period from day -1 through day 0 is -0.31% with a t statistic of -1.97, which is significant at the 0.05 level. The cumulative excess returns for several periods around the announcement day as reported in Table 6 also indicate negative effect in response to the announcement of decreases in capital expenditure.

Overall in the case of capital expenditure decrease, we are able to reject the null hypothesis of no effect. The price behavior of nonconvertible bonds is quite consistent with the hypothesis of information-content of the firm value hypothesis. That is, decreases in capital budget could be interpreted by the market participants as conveying negative information.

4.2.2 Empirical results of subgroups of bonds.

(1). Utility firms v.s. industrial firms

The negative effect is further supported if only industrial firms are considered.

Table 7 presents the results of separate analyses of industrial firms sample and utility firms sample. As can be seen, for the industrial firms sample the PERs on day -1, 0 are -0.33% ($t=-2.45$, significant at the 0.05 level) and -0.10%. A two-day (day -1 through day 0) cumulative portfolio excess returns is -0.44% with a t-statistic of -2.27, which is significant at the 0.05 level. For the utility firms sample, the excess return on the announcement date is negataive, although it is insignificant. These results indicate that the lack of significance in the utility firm sample could be mainly due to the protection of bondholders' interest arising from the regulatory nature of the firm.

(2). The effect of Bond Rating

Table 8 contains the results from testing the effect of bond ratings on excess returns experienced by nonconvertible bondholder. The results indicate that a negative announcement effect on the returns of the high rating bond group at

Table 6

Portfolio excess returns (PER), cumulative portfolio excess returns (CPER) and t statistics for nonconvertible bonds of the industrial and utility firms over a 21 day period around announcement of unexpected capital expenditure decreases.

(a) Portfolio excess returns

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	0.03	0.22	20	13 : 7
−9	0.24	2.15**	16	12 : 4
−8	0.04	0.36	21	14 : 7
−7	0.04	0.35	20	9 : 11
−6	0.15	1.38	19	10 : 9
−5	−0.08	−0.72	18	7 : 11
−4	0.07	0.64	21	14 : 7
−3	0.22	1.98**	21	13 : 8
−2	0.26	2.30**	20	13 : 7
−1	−0.20	−1.83	22	12 : 10
0	−0.11	−0.96	20	8 : 12
1	−0.01	−0.05	24	15 : 9
2	−0.16	−1.47	22	10 : 12
3	−0.11	−1.02	20	12 : 8
4	0.21	1.88	19	12 : 7
5	−0.10	−0.92	22	9 : 13
6	0.20	1.82	23	12 : 11
7	−0.01	−0.10	21	12 : 9
8	0.04	0.32	21	13 : 8
9	0.09	0.81	21	10 : 11
10	0.00	0.02	23	12 : 11

(b) Cumulative portfolio excess returns

Days in interval	CPER (%)	Test-statistic
−5 to 5	−0.02	−0.05
−5 to 0	0.16	0.58
−1 to 5	−0.48	−1.65
−1 to 3	−0.59	−2.38**
−1 to 1	−0.31	−1.63
−1 to 0	−0.31	−1.97**

** indicates significance at the 5% level (two sided test).

Table 7

Portfolio excess returns (PER) and t statistics for nonconvertible bonds, broken down on the basis of the industrial firms and utility firms, over a 21 day period around announcement of unexpected capital expenditure decreases.

Event DAY	Industrial firms sample			Utility firms sample		
	PER (%)	t sta.	Positive : Negative	PER (%)	t sta.	Positive : Negative
−10	0.00	0.02	11 : 6	0.15	0.31	2 : 1
−9	0.25	1.82	10 : 4	0.17	0.34	2 : 0
−8	−0.06	−0.41	11 : 7	0.61	1.25	3 : 0
−7	0.06	0.46	8 : 10	−0.17	−0.35	1 : 1
−6	0.17	1.27	9 : 7	0.05	0.10	1 : 2
−5	−0.09	−0.62	6 : 10	−0.04	−0.08	1 : 1
−4	0.03	0.24	11 : 6	0.23	0.48	3 : 1
−3	0.24	1.73	10 : 7	0.15	0.30	3 : 1
−2	0.24	1.73	11 : 7	0.43	0.88	2 : 0
−1	−0.33	−2.45**	8 : 10	0.39	0.81	4 : 0
0	−0.10	−0.76	8 : 10	−0.13	−0.26	0 : 2
1	−0.03	−0.24	11 : 8	0.10	0.21	4 : 1
2	−0.14	−1.01	9 : 9	−0.28	−0.58	1 : 3
3	−0.12	−0.90	11 : 6	−0.05	−0.11	1 : 2
4	0.24	1.78	10 : 6	0.02	0.05	2 : 1
5	−0.04	−0.28	9 : 9	−0.39	−0.80	0 : 4
6	0.15	1.12	9 : 9	0.38	0.78	3 : 2
7	−0.02	−0.11	9 : 8	0.01	0.01	3 : 1
8	0.07	0.54	10 : 6	−0.09	−0.18	3 : 2
9	0.13	0.96	9 : 8	−0.08	−0.17	1 : 3
10	−0.04	−0.31	9 : 9	0.16	0.33	3 : 2

CPER(−1 to 0) = −0.44% (t=−2.27)**

** indicates significance at the 5% level (two sided test).

the announcement of unexpected capital expenditure decreases exists, while no announcement effect on the returns of the low rating bond group exists. For the high rating group, the day 0 and day (−1,0) portfolio excess return (PER) are −0.35% and −0.51% respectively, with a corresponding t-statistic of −2.12 and −2.21, indicating a negative effect that is statistically significant at 0.05% level. For the low rating group, Table 8 reports no significant effect on bond prices around the announcement day.[11] The results in the sample suggest that the high rating bond group absorb most of the negative effect in response to decreases in capital expenditure announcement.

4.2.3 Empirical results of convertible bonds.

Table 9 presents information on the convertible bond price behavior 10 days prior to and 10 days after decreases in capital expenditure were announced. The results show insignificantly negative response at day 0, PER −0.21% with a t-statistic of −1.0. As shown in the table, only 9 announcements were used to test the effect. The relataively small sample could result in difficulty in detecting significant effect.

5. Discussions and conclusion

Prior studies have shown that positive (negative) capital expenditure change announcements produce positive (negative) common stock excess returns. These findings are consistent with the information-content of the firm value hypothesis, whereas they can also be explained by the wealth transfer hypotheses. In an effort to investigate the possibility of wealth redistribution from bondholders, this paper examined the wealth effects of announcements of corporate capital expenditure decisions on the returns of bondholders. According to our sample, bondholders do not generally suffer wealth losses resulting from unexpected capital expenditure increase announcements, and in the case of convertible bonds, bondholders benefit from the announcement. The hypothesis that shareholders expropriate wealth from bondholders by undertaking risk-increasing investment projects is not supported by the evidence presented in this study. Moreover, the absence of significant negative

[11] No significant effect found in low rated group could be due to relatively small sample size.

Table 8

Portfolio excess returns (PER) and t statistics for nonconvertible bonds (the industrial firms and utility firms), broken down on the basis of two rating groups, over a 21 day period around announcement of unexpected capital expenditure decreases.

Event DAY	High-rating group			Low-rating group		
	PER (%)	t sta.	Positive : Negative	PER (%)	t sta.	Positive : Negative
−10	0.15	0.94	9 : 2	−0.13	−0.47	4 : 5
−9	0.25	1.55	7 : 3	0.21	0.76	5 : 1
−8	−0.12	−0.71	8 : 5	0.29	1.05	6 : 2
−7	0.37	2.28**	8 : 5	−0.58	−2.08**	1 : 6
−6	0.17	1.02	7 : 4	0.13	0.48	3 : 5
−5	−0.27	−1.68	3 : 8	0.22	0.80	4 : 3
−4	0.08	0.49	8 : 3	0.06	0.22	6 : 4
−3	0.21	1.26	7 : 6	0.24	0.86	6 : 2
−2	0.45	2.75	9 : 3	−0.04	−0.13	4 : 4
−1	−0.16	−1.00	7 : 6	−0.26	−0.92	5 : 4
0	−0.35	−2.12**	4 : 9	0.34	1.22	4 : 3
1	0.13	0.81	10 : 4	−0.20	−0.71	5 : 5
2	−0.12	−0.76	5 : 8	−0.22	−0.78	5 : 4
3	−0.14	−0.86	8 : 5	−0.06	−0.22	4 : 3
4	−0.02	−0.13	8 : 4	0.60	2.14**	4 : 3
5	−0.20	−1.21	5 : 8	0.04	0.14	4 : 5
6	0.40	2.42**	7 : 5	−0.01	−0.03	5 : 6
7	−0.04	−0.26	6 : 5	0.02	0.08	6 : 4
8	0.00	0.02	6 : 5	0.07	0.26	7 : 3
9	−0.07	−0.44	5 : 7	0.30	1.09	5 : 4
10	0.31	1.89	6 : 7	−0.40	−1.42	6 : 4

CPER(−1 to 0) = 0.51% (t=−2.21)**

** indicates significance at the 5% level (two sided test).

Table 9

Portfolio excess returns (PER) and t statistics for convertible bonds of the industrial and utility firms over a 21 day period around announcement of unexpected capital expenditure decreases.

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	−0.43	−2.02**	9	3 : 6
−9	0.14	0.66	10	6 : 4
−8	0.02	0.08	9	4 : 5
−7	0.12	0.57	11	8 : 3
−6	0.13	0.60	10	5 : 5
−5	−0.14	−0.63	9	3 : 6
−4	0.01	0.03	9	4 : 5
−3	0.05	0.23	8	3 : 5
−2	0.30	1.38	10	4 : 6
−1	0.36	1.68	8	7 : 1
0	−0.21	−1.00	9	4 : 5
1	0.08	0.37	10	3 : 7
2	−0.18	−0.85	8	4 : 4
3	0.18	0.83	10	5 : 5
4	0.11	0.51	10	4 : 6
5	0.03	0.12	10	4 : 6
6	−0.45	−2.08	10	3 : 7
7	0.24	1.11	9	6 : 3
8	−0.39	−1.81	9	3 : 6
9	−0.02	−0.07	10	5 : 5
10	0.03	0.12	10	9 : 1

** indicates significance at the 5% level (two sided test).

wealth impacts for bondholders examined, combined with significant positive returns to both shareholders (see results in Appendix B) and convertible bondholders, suggests that increases in capital budget increases firm value. The results support the hypothesis that capital expenditure increase announcements constitute a revelation by management of favorable new information about the value of the firm's future prospects.[12]

[12] However, The specific nature of the information contained in the announcements is not readily known and can not be detected by our proposed methodology.

In the case of capital expenditure decrease, we are able to reject the null hypothesis of no effect. The price behavior of nonconvertible bonds is quite consistent with the hypothesis of information-content of the firm value maximization. Capital expenditure decreases could signal unfavorable news regarding the firm's prospects. as a result, the default risk of bonds outstanding would increase, and consequently, bond prices would decline. In addition, utility sample yields weak evidence supporting the view that regulators of utility firms help protect the bondholders from losing their interests in the event of firms' changes in capital expenditure.

In summary, although prior studies showed the evidence that shareholders gained (lost) as a result of increases (decreases) in capital expenditure, our results indicated that nonconvertible bondholders did not significantly benefit from the information revealed by managers. Conversely, our results indicated that bondholders suffered significant negative excess return when the firms announced decreases in capital expenditure. This observed asymmetric price behavior can be explained by the Option Pricing Model in which equity of a leveraged firm can be thought of as a call option on the value of the firm's assets. As a residual claim holder, stockholders receive alll the future incremental cash flow of increases in capital expenditure. By contrast, as a fixed claim holder, bondholders receie no benefits except for decreases in the probability of default risk. In the case of capital expenditure decreases, both stockholders and bondholders suffer significant negative excess return. That suggests that negative information effect of capital expenditure is shared by residual claim holders as well as fixed claim holders.[13]

[13] Previous study has documented positive (negative) effects on stock price associated with increases (decreases) in dividend payout. In an effort to detect a wealth transfer effect, Handjinicolaou and Kalay (1984) examined bond price behavior when changes in dividend payout are announced. In the case of dividend increase, they found no significant bond price change, while in the case of dividend decrease, bond price significantly drops. They conjectured the asymmetrical distribution of bond price could be arising from the fact that stockholders capture positive information of dividend announcement, while bondholders share the losses. In general, the price pattern of securities in their study is consistent with what we found in this study.

Selected references

Black, F. and M. Scholes, 1973, The pricing of options and corporate liabilities, Journal of Political Economy 31, 659-673.

Dann, L., 1981, Common stock repurchases: An analysis of returns to bondholders and stockholders, Journal of Financial Economics 9, 113-138.

Fama, E., 1977, The effects of a firm's financing and investment decisions on the welfare of its securityholders, American Economic Review 68,1 272-284.

Fama, E., 1980, Agency problems and the theory of the firm, Journal of Political Economy 88, 288-307.

Fama, E. and M. Miller, 1972, The theory of Finance. (Hole, Rinehart & Winston, New York).

Galai, D. and R. Masulis, 1976, The option pricing model and the risk factor of stocks, Journal of Financial Economics 3, 53-82.

Handjinicolaou, G. and A. Kalay, 1984, Wealth redistributions or changes in firm value: An analysis of returns to bondholders and stockholders around dividend announcements, Journal of Financial Economics 13, 35-63.

Hite G. and J. Owers, 1983, Security price reaction to corporate spin-off announcements, Journal of Financial Economics 12, 409-436.

Jensen, M., 1986, Agency costs of free cash flow, corporate finance and takeovers, American Economic Review 76, 323-29.

Jensen, M. and W.H. Meckling, 1976, Theory of the firm: Managerial behavior agency costs and ownership structure, Journal of Financial Economics 3, 305-360.

Jensen, M. and R. Ruback, 1983, The market for corporate control:. The scientific evidence, Journal of Financial Economics 11, 5-50.

Masulis, R., 1980, The effects of capital structure change on security prices: A study of exchange offers, Journal of Financial Economics 8, 139.

McConnell J.J, and C.J. Muscarella, 1985, Corporate capital expenditure decisions and the market value of the firm, Journal of Financial Economics 13, 399-422.

Myers, S.. 1977, Determinants of corporate borrowing, Journal of Financial Economics 5, 147-175.

Smith, C. and J. Warner, 1979, On financial contracting: An analysis of bond covenants, Journal of Financial Economics 7, 117-161.

Woolridge J.R., and C.C. Snow, 1990, Stock market reaction to strategic investment decisions, Strategic Management Journal 11, 353-363.

Appendix A

Samples of Corporate Capital Expenditure Announcements

In this appendix we present examples of announcements which were identified from the standard & Poor's News Dialogue Information Retrieval Service. In summary, there are four types of announcements:

(1). An increase announcement:

Mar. 21, 1988, press reports from Pittsburgh, Pa., stated that PPG. Industrial INC. had budgeted $500,000,000 for capital outlays exclusive of acqusitions in current year. For 1987, Co's capital expenditures were $499,000,000 including $102,400,000 for acqusitions.

(2). A decrease announcement:

Mar. 28, 1988, Conrad Conrad, V-P and Chief Financial Officer, was reported as having stated that Quaker state Corp. was planning capital outlay of about $70,000,000 for current year, compared with its $77,700,000 capital program for 1987.

(3). A multiple-year budget announcement:

Aug. 16, 1988, William Scharffenberger, Chrm. and Chief Exec. Officer, stated that Wheeling-Pittsburgh Steel Corp. was planning capital outlays $425,000,000 during the next six years.

(4). An announcement with intended use:

May 11, 1988, Jack W. McNutt, Pres, and Chief Exec. Officer, Stated that he was expecting Murphy Oil Corp. capital outlays in current year to be $343,000,000. That amount would include $166,000,000 for production and exploration and $134,000,000 for contract drilling and diving. (Standard and Poor's News).

Note that in few cases that news release didn't make reference to the previous year's budget, in these cases,, the firm's annual report from the previous year was consulted to determine if the expenditure announced was an increase or decrease from the previous year.

Appendix B

Stockholders' Reaction in Response to Capital Investment Announcement

This appendix presents an investigation of common stock price changes for the sample of firms that made announcements with respect to a firm's capital expenditure. The stock market reaction is analyzed using the event study methodology described previously.

(1). Announcements of unexpected capital expenditure increases

The first investigation involves the 216 announcements regarding capital expenditure increases. Table B-1 displays the portfolio excess returns (PERs), t statistics, sample size, and the number of positive and negative excess returns for day -10 through $+10$. Table B-1 shows the positive common stock price revaluations on day -1, and day 0, although they are not statistically significant at conventional levels. Table B-1 also reports the cumulative portfolio excess returns (CPERs) and test statistics for various subperiods. As indicated in the table, the CPER for day -10 to 0 is 0.78% and it is statistically significant at the 5% level (two sided test). Also, the number of positive PERs on day -1 and day 0 substantially exceeds the number of negative PERs. These results indicate that changes in common stock prices are positively associated with unexpected increases in capital expenditure.

(2). Announcements of unexpected capital expenditure decreases

Table B-2 presents information on the common stock price behavior 10 days prior to and 10 days after a unexpected negative capital expenditure is announced.

The results of 113 announcements indicate that a negative announcement effect on common stock prices at the announcement of unexpected capital expenditure decreases exists. The day 0 portfolio excess return (PER) is -0.70% with a corresponding t statistic of -3.52, indicating a negative effect that is statistically significant at 1% level (two sided test). In addition, the number of positive and negative excess returns around announcement period is reported in the last row of Table B-2; the number of negative portfolio excess returns on the announcement date is substantially more than the number of positive returns.

The negative effect in response to negative capital expenditure is further supported by the evidence presented in Table B-2, which reports cumulative portfolio excess returns and test statistics for various periods. As indicated in the table, the CPERs around the announcement of decreases in capital expenditure are all statistically significant at conventional levels. In short, the results in the sample of capital expenditure decrease reject the null hypothesis of no information effect. These stock price behaviors in response to capital expenditure changes annuncements are consistent with the findings of McConnell and Muscarella (1986).

Table B-1

Portfolio excess returns (PER), cumulative portfolio excess returns (CPER) and t statistics for 216 common stocks of the industrial and utility firms over a 21 day period around the announcement of unexpected capital expenditure increases.

(a) Portfolio excess returns

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	−0.03	−0.22	214	87 : 127
−9	0.06	0.45	213	96 : 117
−8	0.13	1.01	214	101 : 113
−7	0.06	0.49	215	100 : 115
−6	0.15	1.19	214	111 : 103
−5	−0.05	−0.37	212	93 : 119
−4	0.12	1.00	215	110 : 105
−3	0.06	0.48	214	109 : 105
−2	0.01	0.04	214	103 : 111
−1	0.09	0.75	214	116 : 98
0	0.18	1.48	214	113 : 101
1	−0.06	−0.49	214	96 : 118
2	−0.11	−0.87	214	100 : 114
3	0.08	0.64	216	106 : 110
4	−0.04	−0.31	215	100 : 115
5	−0.07	−0.59	213	95 : 118
6	−0.03	−0.25	14	102 : 112
7	0.02	0.13	214	102 : 112
8	−0.08	−0.67	214	100 : 114
9	0.20	1.64	214	112 : 102
10	0.01	0.09	214	100 : 114

(b) Cumulative portfolio excess returns

Days in interval	CPER (%)	Test-statistic
−10 to 0	0.78	1.90**
−5 to 5	0.42	1.38
−1 to 1	0.22	1.01
−1 to 0	0.28	1.60

** indicates significance at the 5% level (two sided test).

The Effect of Corporate Capital Investment Changes on the Wealth of Nonconvertible Bondholders and Convertible Bondholders

Table B-2

Portfolio excess returns (PER), cumulative portfolio excess returns (CPER) and t statistics for 113 common stocks of the industrial and utility firms over a 21 day period around the announcement of unexpected capital expenditure decreases.

(a) Portfolio excess returns

Event Day	PER (%)	t sta.	Sample Size	Positive : Negative
−10	−0.14	−0.69	112	52 : 60
−9	−0.16	−0.82	112	48 : 64
−8	0.09	0.44	112	54 : 58
−7	0.04	0.18	112	50 : 62
−6	0.27	1.34	112	58 : 54
−5	0.18	0.91	112	63 : 49
−4	−0.03	−0.17	112	50 : 62
−3	0.22	1.08	112	60 : 52
−2	−0.07	−0.35	112	56 : 56
−1	0.19	0.92	112	59 : 53
0	−0.70	−3.52*	112	50 : 62
1	−0.12	−0.61	112	57 : 55
2	−0.04	−0.20	112	53 : 59
3	−0.30	−1.51	112	41 : 71
4	−0.40	−2.00**	112	49 : 63
5	0.26	1.28	112	55 : 57
6	0.25	1.27	112	61 : 51
7	0.10	0.50	112	51 : 61
8	−0.08	−0.38	112	50 : 62
9	0.03	0.15	111	53 : 58
10	0.08	0.38	112	49 : 63
30	0.18	0.91	111	53 : 58

(b) Cumulative portfolio excess returns

Days in interval	CPER (%)	Test-statistic
−10 to 0	0.14	−0.20
0 to 4	−1.57	−3.51*
0 to 1	−0.83	−2.92*
−1 to 1	−0.64	−1.85***
−1 to 0	−0.52	−1.84***

* indicates significance at the 1% level (two sided test).
** indicates significance at the 5% level (two sided test).
*** indicates significance at the 5% level (one sided test).