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CAPITAL STRUCTURE REARRANGEMENTS AND ME-FIRST RULES IN AN EFFICIENT CAPITAL MARKET

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PERHAPS THE ISSUE OF FOREMOST CONCERN to the theory of business finance as it has evolved over the past two decades has been the impact of corporate financial policy on the market value of a firm's common stocks and bonds. Building on the foundation laid by Modigliani and Miller (1958, 1961, 1963) numerous authors,[1] using a variety of analytic techniques, have shown that in a perfect capital market neither the debt-equity decision nor the dividends-retained earnings decision should have any effect on the total market value of a firm's securities once its investment decision has been determined and made known. Some of these same authors have shown further that the existence of corporate income taxes provides sufficient economic incentive for firms to maximize their use of corporate debt financing. However, even then, it is only the tax deductibility of interest payments that has any effect on firm value. These various analyses typically have assumed that firms have no debt outstanding when they establish their financing policies.

Since most firms are on-going entities, the more general case is that firms will make capital structure decisions after they have issued some debt. When a firm has debt outstanding, in the absence of a prior arrangement to protect its bondholders, stockholders may rearrange the firm's capital structure to transfer wealth belonging to the firm's creditors to themselves. This possibility has been noted by Stiglitz (1972, p. 462).

> When there is a finite probability of bankruptcy, the rule of firm value maximization is not equivalent to maximizing the value of equity, and it is clearly the latter with which firms are concerned.

Black and Scholes (1973, p. 651) have commented further on this topic in another context.

> Suppose that [the firm] sells all [its assets] and uses the proceeds to pay a dividend to its common stockholders. Then the value of the firm will go to zero and the value of the bonds will go to zero. The common stockholders will have 'stolen' the company out from under the bondholders.

However, Fama and Miller (1972, p. 152) have stated that bondholders "... could easily have been protected against such infringements by a 'me-first' rule...."

In this paper, the "me-first" rule is defined as a prior arrangement to protect bondholders from uncompensated shifts of wealth from bondholders to stockholders through a change in the capital structure of the firm.

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1. These authors include Robichek and Myers (1966), Mossin (1969), Hamada (1969), Stiglitz (1969, 1974), Schall (1971, 1972), and Rubinstein (1973).

Even in a perfect capital market, in which we allow for the possibility of default on corporate debt obligations, the irrelevance of corporate financial policy will hold only if the me-first rule is perfectly effective. If the me-first rule is enforced less than perfectly, then financial policy is no longer irrelevant and a firm (stockholders) may prefer one set of financial policies over another. From a bondholder's perspective, the existence of less than perfectly effective me-first rules increases the risk of holding corporate bonds. Therefore, the question of whether or not the me-first rule holds is an important issue not only for financial managers, but also for the investing public.

The purpose of this paper is to examine the impact that a violation of the me-first rule has on the market value of a firm's common stocks and bonds. The analysis is both theoretical and empirical. The theoretical analysis examines corporate capital structure rearrangements that violate the me-first rule first in a no-tax world, then in a world that includes corporate income taxes. In both cases, the analysis shows that a violation of the me-first rule should yield a windfall gain to stockholders and a windfall loss to bondholders. The paper then examines empirically one special case in which the me-first rule has been violated.

The empirical analysis examines the returns to the stockholders and bondholders of firms that have formed captive finance subsidiaries. The formation of a captive finance subsidiary represents a rearrangement of the asset and liability structure of the firm that creates a new class of security holders with income claims that are superior to those of the parent company's original bondholders. The empirical evidence indicates that this form of capital structure rearrangement has on average yielded windfall gains to common stockholders and windfall losses to bondholders.

I. Violations of the Me-First Rule

In this section we examine capital structure rearrangements that violate the me-first rule. We assume throughout that securities are traded in a perfect, transactions-cost-less capital market in which prices adjust immediately to new information. The values of all securities are assumed to depend only upon the distribution of cash earnings which they confer upon their owners and, although all firms face a positive probability of default, bankruptcy is costless. Thus, when default occurs, ownership of the firm is merely transferred to bondholders. There are no "end-of-game" penalty costs levied against either stockholders or bondholders.

The following symbols are used in the analysis where primes (′) denote post-financial structure rearrangement values:

P, P' = market price per share of common stock before and after the capital structure rearrangement,

N = number of shares of common stock outstanding at price P prior to the capital structure rearrangement,

D, D' = total market value of the firm's original debt before and after the capital structure rearrangement,

d, d' = market price per bond of the firm's original debt before and after the capital structure rearrangement,

n = number of bonds outstanding at price d, per bond, prior to the capital structure rearrangement (i.e., $D = nd$),

D_n = total market value of newly issued debt,

V, V' = total market value of the firm's securities (common stock plus debt) before and after the capital structure rearrangement.

A. *The No-Tax Case*

The analysis begins with a firm that has outstanding N shares of common stock selling at a market price of P per share and total debt outstanding with a market value of D. Furthermore, the firm has determined its investment decision which will not be altered by changes in its financial structure.

The capital structure rearrangement that the firm has decided to undertake is to issue new debt in the amount D_n and to use the proceeds to retire common stock. The new debt issue will permit the firm to retire $\Delta N = D_n / P'$ shares of common stock at their post-rearrangement market price P'. The post-rearrangement market values of common stocks and bonds will be attained as soon as the rearrangement plan is announced and these values may differ from their pre-rearrangement values.

According to the "Value Additivity Principle" [Schall (1972)], in a perfect capital market, the total market value of a stream of earnings is independent of the way in which the earnings are divided among security holders. Thus, if the total earnings available to all security holders are unchanged following a capital structure rearrangement, the total market value of the earnings must also be unchanged. This does not mean that the individual stock and bond components of the firm remain unchanged in value. If the capital structure rearrangement in some way diminishes the prospects for payment to one group of security holders while simultaneously enhancing the earnings stream of another, the market value of the latter should rise at the expense of the former.

To examine this situation more closely, consider that, in equilibrium, the pre- and post-financial structure rearrangement values of the firm must be equal

$$V = V'. \tag{1}$$

Furthermore, the total market value of the firm is just equal to the combined values of common stocks and bonds, so that

$$V = NP + D, \tag{2}$$

where N is the number of shares outstanding prior to the capital structure rearrangement. If the firm then issues new debt D_n and retires ΔN shares of stock at price P', we must have

$$\begin{aligned} V' &= P'\left[N - \Delta N\right] + D' + D_n \\ &= P'N + D', \end{aligned} \tag{3}$$

where D' is the post-rearrangement value of old debt. Substituting (2) and (3) into (1) and rearranging yields:

$$P' = P + (D - D')/N. \tag{4}$$

From (4) it is obvious that $P' \gtreqless P$ depending upon whether $D' \lesseqgtr D$.[2] That is, the market price per share of common stock will be unchanged only if the market value of "old" debt is unchanged.

If old bondholders have protected their senior position to the new bondholders by including perfectly effective me-first covenants in their indenture agreement, then the distribution of earnings to which they have claims will be unchanged and the market value of their holdings will be unchanged.

Suppose, however, that new bondholders are given a claim to the future earnings of the firm that is *equivalent* (or superior) to the claim of the firm's original bondholders. Then, there are some states in which the post-rearrangement returns to the original bondholders will be *less* than their pre-rearrangement returns and there are no states in which their post-rearrangement returns will be *greater* than their pre-rearrangement returns. Specifically, there are some states in which the firm will be unable to meet all of its post-rearrangement debt obligations, but in which it would have been able to meet all of its pre-rearrangement obligations. In these states the original bondholders will now receive only partial payment instead of full payment. Further, in those states in which the firm originally would have been bankrupt, it will still be bankrupt, but original bondholders must now share the residual value of the firm with new bondholders. Thus, the post-rearrangement distribution of returns available to old bondholders will be stochastically dominated by the pre-rearrangement distribution and the value of the old bonds will decline. From (4), the decline in the value of the old bonds implies an increase in the value of common stock.

The stochastic dominance relationship can be demonstrated in a single-period context by considering the pre- and post-rearrangement return distributions owned by the firm's original bondholders when new bondholders are given *equivalent* claims to the future earnings of the firm. The pre-rearrangement earnings distribution is

$$\tilde{Y} = \begin{cases} \hat{Y} & \text{if } \tilde{X} \geqslant \hat{Y} \\ \tilde{X} & \text{if } \tilde{X} < \hat{Y} \end{cases} \tag{5}$$

and the post-rearrangement distribution is

$$\tilde{Y}' = \begin{cases} \hat{Y} & \text{if } \tilde{X} \geqslant \hat{Y} + \hat{Y}_n \\ \dfrac{\hat{Y}}{\hat{Y} + \hat{Y}_n}(\tilde{X}) & \text{if } \tilde{X} < \hat{Y} + \hat{Y}_n, \end{cases} \tag{6}$$

where tildes (˜) represent random variables and

$\tilde{Y}, \tilde{Y}'$, = gross dollar returns to original bondholders before and after the capital structure rearrangement,

$\hat{Y}$ = gross dollar returns *promised* to original bondholders,

2. We are, of course, interested in the incremental wealth of stockholders following announcement of the capital structure rearrangement. Since the new stock price is achieved as soon as the financing plan is announced, the incremental gain to all shareholders is $\Delta W = N(P' - P)$. Therefore, the appropriate comparison is $P' \gtreqless P$. Because all transactions take place without cost at the new price, we need not concern ourselves with the distinction between "old" and "new" shareholders.

$\hat{Y}_n$ = gross dollar returns *promised* to new bondholders,

$\tilde{X}$ = firm's end of period gross dollar return after paying all non-capital factors of production.

To show the difference between the return distributions owned by the original bondholders before and after the rearrangement, (6) is subtracted from (5) to yield

$$\tilde{Y}-\tilde{Y}'=\begin{cases} 0 & \text{if } \tilde{X}\geqslant \hat{Y}+\hat{Y}_n \\ \dfrac{\hat{Y}}{\hat{Y}+\hat{Y}_n}\left(\hat{Y}+\hat{Y}_n-\tilde{X}\right) & \text{if } \hat{Y}\leqslant \tilde{X}<\hat{Y}+\hat{Y}_n \\ \dfrac{\hat{Y}_n}{\hat{Y}+\hat{Y}_n}(\tilde{X}) & \text{if } \tilde{X}<\hat{Y}. \end{cases} \tag{7}$$

From (7) it is clear that the original bondholders' post-rearrangement returns $\tilde{Y}'$ can never be greater than pre-rearrangement returns $\tilde{Y}$ and they will be less whenever $\tilde{X}<\hat{Y}+\hat{Y}_n$. Therefore, in a perfect capital market the value of the original bonds will decline.

The same result can be demonstrated within the context of the Sharpe (1964)-Lintner (1965)-Mossin (1966) capital asset pricing model (CAPM). According to the CAPM, the equilibrium market price of risky security i, D_i, may be expressed as[3]

$$D_i=\left[E\left(\tilde{Y}_i\right)-\lambda\operatorname{cov}\left(\tilde{Y}_i,\tilde{R}_m\right)\right]/R_f, \tag{8}$$

where $E(\tilde{Y}_i)$ is the expected value of the end-of-period gross dollar return to the holders of security i, λ is the market price of risk, $\operatorname{cov}(\tilde{Y}_i,\tilde{R}_m)$ is the covariance between $\tilde{Y}_i$ and one plus the value-weighted average rate of return on the market portfolio, and R_f is one plus the riskfree rate of return.

Since the firm's old bonds are risky securities, the magnitude of the wealth transfer in (4) can be expressed as

$$\begin{aligned} D-D' &= \left[E(\tilde{Y})-\lambda\operatorname{cov}\left(\tilde{Y},\tilde{R}_m\right)\right]/R_f-\left[E(\tilde{Y}')-\lambda\operatorname{cov}\left(\tilde{Y}',\tilde{R}_m\right)\right]/R_f \\ &= \left[E(\tilde{Y}-\tilde{Y}')-\lambda\operatorname{cov}\left(\tilde{Y}-\tilde{Y}',\tilde{R}_m\right)\right]/R_f. \end{aligned} \tag{9}$$

Since $\tilde{Y}'$ can never be greater than $\tilde{Y}$ and will be less than $\tilde{Y}$ in the (post-rearrangement) default states, the original bondholders' post-rearrangement expected return (which is the average return across all states) is strictly less than the pre-rearrangement expected return, i.e., $E(\tilde{Y})-E(\tilde{Y}')=E(\tilde{Y}-\tilde{Y}')>0$. The effect on the original bondholders' risk can be seen from (7), which shows that as $\tilde{X}$ decreases, $\tilde{Y}-\tilde{Y}'$ increases. Thus, $\tilde{Y}-\tilde{Y}'$ is negatively correlated with $\tilde{X}$. Hence, $\operatorname{cov}(\tilde{Y}-\tilde{Y}',\tilde{R}_m)$ is also negative,[4] i.e., $\operatorname{cov}(\tilde{Y},\tilde{R}_m)<\operatorname{cov}(\tilde{Y}',\tilde{R}_m)$. The post-

3. This form of the CAPM has been used frequently by other authors. See, for example, Rubinstein (1973, p. 169) and Higgins and Schall (1975, p. 109).

4. This assumes that $\tilde{X}$ is positively correlated with $\tilde{R}_m$.

rearrangement bondholder risk per dollar of debt is larger with more debt, but the increase in the risk is shared equally between the new and old debt. Thus, the risk borne by the original bondholder is larger after the financial rearrangement. Since $E(\tilde{Y}-\tilde{Y}')>0$ and $\text{cov}(\tilde{Y}-\tilde{Y}',\tilde{R}_m)<0$, the numerator of (9) is positive and $D'<D$.

The foregoing analysis shows that in a perfect capital market, violation of the me-first rule yieids a windfall gain to the firm's shareholders and an equal and offsetting loss to its original bondholders. In essence, stockholders have sold claims to an income stream that originally belonged to old bondholders and have given the bondholders claims to an income stream with a lower market value. In the process, they have paid the difference to themselves.

B. *The Tax Case*

In this section we introduce corporate taxes into our analysis and examine two types of capital structure rearrangements. In the first, the firm issues new debt to retire a portion of its already outstanding debt. In the second, the firm issues new debt to retire common stock. Our motivation for examining the first type of rearrangement is to isolate the effect of a violation of the me-first rule on the market value of a firm's securities from the well-known effect of taxes when interest payments are tax-deductible. The second type of rearrangement is to provide consistency with the no-tax analysis and to anticipate our empirical investigation in which stockholders' returns are influenced by both a violation of the me-first rule and by corporate income taxes.

B.1. *New Debt Issued; Old Debt Retired*

Numerous authors[5] have demonstrated that in equilibrium the total market value of a firm whose securities are traded in a perfect capital market must be equal to the value that it would command if unlevered plus the market value of the tax subsidy provided by the tax deductibility of corporate interest payments. If we assume that the firm has outstanding consol bonds[6] and that the tax subsidy provided by the tax deductibility of interest payments is as certain or uncertain as the interest payments themselves,[7] the total market value of the firm prior to capital structure rearrangement may be expressed as

$$V = V_u + \tau D, \tag{10}$$

where V_u is the market value that the firm would command if unlevered and τ is the corporate income tax rate. Before the capital structure rearrangement is announced the firm has outstanding n bonds each valued at d (i.e., $D=nd$) so that its value may be expressed alternatively as

$$V = NP + nd. \tag{11}$$

Suppose the firm then issues new debt in the amount $D_n=\Delta nd'$ which is used to retire Δn old bonds at the post-financial structure rearrangement market price of d'

5. See Footnote 1.

6. The convention of consol bonds is used primarily for convenience of exposition. The same general propositions can be demonstrated using bonds of any maturity.

7. This assumption is necessary for (10) when the firm faces a positive probability of bankruptcy. See Brewer and Michaelson (1965) and Modigliani and Miller's reply (1965).

per bond. Again, the new market prices of bonds and common stocks are attained as soon as the financial structure rearrangement plan is announced.

The total market value of the firm following the capital structure rearrangement must be

$$V' = NP' + (n - \Delta n)d' + D_n$$

$$= NP' + nd'. \tag{12}$$

Alternatively, the new total market value of the firm may be expressed as

$$V' = V_u + \tau(D' + D_n), \tag{13}$$

where $D' = (n - \Delta n)d'$.

To analyze the effect of the capital structure rearrangement on the price of common stock, we can substitute (10) into (13) to yield

$$V' = V + \tau(D' + D_n - D). \tag{14}$$

Then using the equality $D' + D_n - D = n(d' - d)$ and substituting equations (11) and (12) into (14) gives

$$P' = P + (1 - \tau)(d - d')n/N. \tag{15}$$

From (15) it can be observed that $P' \gtrless P$ depending upon whether $d' \lesseqgtr d$. If the income claims of the original bondholders are subordinated to those of the new bondholders, then the cash returns available to the old bondholders after the rearrangement can be no greater in *any* state than the cash returns before the rearrangement and they will be less in the states in which the firm is bankrupt. The old bondholders' post-rearrangement returns distribution will be stochastically dominated by the pre-rearrangement distribution. The market value of the old bonds will decline and the market value of common stock will increase.[8]

It should be noted, however, that when corporate income taxes are introduced, the windfall loss to old bondholders that results from a violation of the me-first rule is not transferred in its entirety to stockholders. In this case there are two parties who share the gain. Because the income to shareholders is taxable at the rate τ, the government reaps a windfall gain of $\tau(d - d')n$. Only the remainder of the old bondholders' windfall loss accrues to shareholders.

B.2. *New Debt Issued; Common Stock Retired*

In the second type of capital structure rearrangement, the firm issues new debt in the amount D_n and uses the proceeds to repurchase $\Delta N = D_n/P'$ shares of common

8. When new debt is issued to retire already outstanding debt, the value of the old bonds will fall only if new bondholders are given claims that are prior to those of old bondholders. If both groups are given equal claims, then the replacement of old debt with new debt merely represents an exchange of identical claims which will have no effect on the distribution of earnings available to old bondholders. On the other hand, if the new bondholders are given claims that are subordinated to those of the original bondholders then the post-rearrangement distribution of earnings available to the old bondholders will stochastically dominate the pre-rearrangement return distribution, and the market value of the old bonds will increase at the expense of common stockholders. This latter type of rearrangement will not be undertaken by shareholder-wealth-maximizing firms.

stock at their new market price P'. The post-rearrangement market value of the firm again will equal the total market value of common stock plus debt

$$V' = (N - \Delta N)P' + nd' + D_n$$

$$= NP' + nd'. \tag{16}$$

Since $D' = nd'$ in this case, $D' + D_n - D = n(d' - d) + D_n$. By substituting this and equations (11) and (16) into (14) we obtain

$$P' = P + (1 - \tau)(d - d')n/N + \tau D_n/N. \tag{17}$$

Due to the increased tax subsidy from additional debt, stockholders will reap a benefit of $\tau D_n/N$ per share even if the me-first rule has not been violated.[9] If, however, new bondholders are given income claims that are *equivalent* (or prior) to those of original bondholders, then the post-rearrangement return distribution owned by old bondholders will be dominated stochastically by their pre-rearrangement distribution. The market value of old debt will decline and stockholders will receive a bonus windfall gain of $(1 - \tau)(d - d')n/N$ per share. Thus, when the firm is able simultaneously to increase its debt-financing *and* violate the me-first rule, stockholders will gain at the expense of the government and at the expense of old bondholders.

II. Some Empirical Evidence on Me-First Rule Violations: Formation of the Captive Finance Subsidiary

In the previous section we examined the effect of a me-first rule violation on the market value of the outstanding common stocks and bonds of a firm whose securities are traded in a perfect capital market. The analysis showed that a violation of the me-first rule will result in a windfall gain to stockholders and a windfall loss to bondholders.

In actuality, most bond indenture agreements contain restrictive covenants identifying the priority status of the firm's security holders and prohibiting blatant shifts of wealth from one group of security holders to another. However, there exist situations in which firms may be able to violate the me-first rule without breaching the legal terms of the indenture agreement. One such situation exists when firms form captive finance subsidiaries.[10]

9. The benefit of $\tau D_n/N$ per share will be realized in its entirety if, as we assume, bankruptcy is costless. If, however, bankruptcy costs are material, then the increased probability of bankruptcy that results from the increased use of leverage will increase the present value of bankruptcy costs. The incremental increase in the present value of bankruptcy costs will offset, at least in part, the market value of the additional tax subsidy. Thus, when the me-first rule is not violated, the net benefit from the increased leverage is likely to be less than $\tau D_n/N$ per share.

10. Other situations exist in which the same phenomenon may be at work. One such situation is the sale-and-leaseback arrangement, wherein a firm sells an asset to another firm and then "leases-back" the same asset. This arrangement gives the lessor firm a claim to the income of the lessee firm that takes precedence over the claims of the lessee firm's old bondholders.

A second situation has been documented recently by *Forbes* (June 15, 1975). According to the article,

The usual procedure followed by firms that form wholly-owned finance subsidiaries is to organize the finance company which then issues debt in its own name, but which is guaranteed by the assets and earnings of the parent company. The proceeds of the debt issue are then used to purchase the parent company's accounts receivable. Thereafter, the creditors of the subsidiary have first claim to the income produced by the sales contracts owned by the finance company. Only after the claims of the subsidiary's creditors are met in full may any funds be transferred from the wholly-owned subsidiary to the parent company to pay its creditors. This rearrangement of the asset and liability structure of the firm essentially creates a new class of security holders with claims that are superior to those of the old bondholders.

The claims of the parent company's old bondholders may be weakened in at least two ways. First, the price at which the existing and future receivables are sold to the subsidiary is determined arbitrarily and may be set at an artificially low (i.e., below market) level. Andrews (1966, p. 55) has alluded to this possibility.

> "Recall that a true captive does not compete in the open market for acquisition of receivables on terms established competitively. It receives its earning assets on the basis of negotiated transfer prices.... Terms governing transactions between parent and subsidiary in effect are capable of regulating intercorporate capital transfers."

Secondly, the creditors of the parent company may be disadvantaged because of the guarantee arrangements between parent and subsidiary. In most cases, the parent company guarantees the debt obligations of the subsidiary, but not vice versa.[11] Thus, when the parent company defaults on its debt obligations, the claims of its creditors to the income and assets of the finance company are not clearly established. Lewellen (1972, p. 25) has commented on this point.

> "The relevant funds movements (between parent and subsidiary) pursuant to spin-off may, it should be recognized, be a great deal less than completely free...it is not likely that the captive's creditors would stand idly by while the parent company bled-off large amounts of cash from its subsidiary in times of stress..."

In an efficient capital market, this form of me-first rule violation should yield a windfall loss to the old bondholders of the parent company and a simultaneous windfall gain to the firm's stockholders.[12] This and the following sections examine empirically the returns to the common stockholders and bondholders of firms that have formed captive finance subsidiaries.

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in 1971 Milwaukee Land Company, a subsidiary of Chicago Milwaukee Corporation, "...ceased paying dividends to its parent and began making loans instead. The effect of the ploy was to deprive bondholders of $12 million in contingent interest payments." *Forbes* attributed this occurrence to a "loophole" in the company's charter that "...enabled (Chicago Milwaukee Corporation) to curtail its interest payments to bondholders while [Milwaukee] Land Company business was booming."

11. Additionally many parent-subsidiary agreements require that the parent repurchase any sales contracts on which payments are defaulted. Hagaman (1969) contains a discussion of the various forms of guarantees that parent companies extend to their finance affiliates.

12. Andrews (1964, p. 90) has stated: "If the notes receivable of a captive finance company are prime liquid assets and premium collateral, it follows that the attractiveness of its parent to a creditor is diminished. Thus the position of a parent company's creditors, both short- and long-term seems materially weaker than before formation of the captive."

A. *Methodology for Stockholder Returns*

In order to measure excess returns to stockholders, it is necessary to adjust security returns for risk. The capital-asset-pricing model (CAPM) provides a formal statement of the relationship between expected return and risk. However, a two-factor model is consistent theoretically with the CAPM and has been shown by Black, Jensen, and Scholes (1972) and Fama and MacBeth (1973) to perform better than the CAPM in explaining the returns to securities listed on the New York Stock Exchange (NYSE).[13]

The tests on stockholder returns employed the following two-factor model:

$$\tilde{R}_{jt} = \tilde{\gamma}_{0t} + \tilde{\gamma}_{1t}\beta_{jt} + \tilde{\epsilon}_{jt}, \qquad j = 1,2,\ldots,N, \tag{18}$$

where

$\tilde{R}_{jt}$ = rate of return on security j in time period t,

$\tilde{\gamma}_{0t}, \tilde{\gamma}_{1t}$ = parameters representing the risk-return relationship for the overall market in time period t; the market parameters may vary from period to period,

β_{jt} = the relative risk of security j in time period t,

$\tilde{\epsilon}_{jt}$ = a random error term in the return on security j in time period t; $E(\tilde{\epsilon}_{jt}) = 0$; $\text{cov}(\beta_{it}, \tilde{\epsilon}_{jt}) = \text{cov}(\tilde{\epsilon}_{jt}, \tilde{\epsilon}_{it}) = 0$, for $i \neq j$.

According to this model, the return on security j in time period t is dependent upon the market-wide variables $\tilde{\gamma}_{0t}$ and $\tilde{\gamma}_{1t}$ and the variables β_{jt} and $\tilde{\epsilon}_{jt}$ specific to the particular security.

Using this model requires estimation of the overall market parameters $\tilde{\gamma}_{0t}$ and $\tilde{\gamma}_{1t}$ and the security-specific risk measure, β_{jt}. The methodology used to estimate these parameters is described in Fama and MacBeth (1973). Essentially, it is an updating procedure that periodically revised the estimates of $\tilde{\gamma}_{0t}$, $\tilde{\gamma}_{1t}$, and β_{jt}. The updated estimates were then used to adjust security returns in each month for security-specific risk and for overall market movements according to equation (19):

$$\hat{\epsilon}_{jt} = R_{jt} - \hat{\gamma}_{0t} - \hat{\gamma}_{1t}\hat{\beta}_{jt}, \tag{19}$$

where $\hat{\epsilon}_{jt}$ = an estimate of abnormal return on security j in month t,

R_{jt} = actual percentage rate of return in month t on security j,

$\hat{\gamma}_{0t}, \hat{\gamma}_{1t}$ = empirical estimates of overall market factors in month t,

$\hat{\beta}_{jt}$ = estimate of specific risk of security j; estimated by least squares regression using the last 60 monthly rates of return up to month t (i.e., $t-59$ to t).

After subtracting out the effect of security-specific risk $\hat{\beta}_{jt}$ and market-wide influences, $\hat{\gamma}_{0t}$ and $\hat{\gamma}_{1t}$, the remaining residual is a measure of the security's "excess" return in month t.[14]

We are interested in the excess returns to the stockholders (and bondholders) of firms that have formed captive finance subsidiaries. The month in which the

13. For a discussion of the theoretical distinctions between the CAPM and the two-factor model, see Black, Jensen, and Scholes (1972).

14. This methodology for examining excess returns has been used in various forms elsewhere. See, for example, Fama, Fisher, Jensen, and Roll (1969), Pettit (1972), and, more recently, Mandelker (1974).

finance subsidiary was incorporated is defined as month 0. Months $-1, -2, -3, \ldots$ represent one month, two months, three months, etc., before the month of incorporation. Likewise, month $+1$ is the month following the month of incorporation. In order to examine abnormal returns, the residuals, $\hat{\epsilon}_{jk}$, were averaged across firms in each month k (where k is measured relative to the month of incorporation)

$$\bar{e}_k = \frac{1}{N} \sum_{j=1}^{N} \hat{\epsilon}_{jk}, \tag{20}$$

where N = the number of firms that formed captive finance companies,
$\bar{e}_k$ = the average residual in relative month k for all N firms.

The average residuals were then summed to compute the cumulative average residual (C.A.R.):

$$\bar{\bar{e}}_t = \sum_{k=-K}^{t} \bar{e}_k, \tag{21}$$

where $\bar{\bar{e}}_t$ = the cumulative average residual (C.A.R.) from month $-K$ through month t.

B. *Data*

In order to be included in the sample, a company must have satisfied three requirements:

1. The company established a captive finance subsidiary[15] between 1940 and 1971.
2. The parent company's common stock was traded on the NYSE during the relevant period.
3. The parent company had long-term debt outstanding for at least twenty-four months prior to formation of the subsidiary and the same debt was outstanding for at least eighteen months following formation of the subsidiary. (This requirement was needed for the test on bondholder returns.)

The sample included twenty-four firms that met these three criteria.[16] To our knowledge this sample is exhaustive. The list of companies and the dates on which they formed their finance subsidiaries is given in the Appendix.

Moody's Industrial Manual was the primary source for determining incorporation dates. However, each incorporation date was cross-checked directly with either the parent company or the finance subsidiary. The CRSP (Center for Research in Security Prices) file was the source of the monthly stock return data.

C. *Empirical Results*

Table 1 presents the average residuals and the cumulative average residual (C.A.R.) over the period (-40 to $+40$) months relative to the month of incorpora-

15. A captive finance subsidiary is defined as a finance company formed for the purpose of financing the parent company's accounts receivable and whose common stock is wholly-owned by the parent company.

16. Also excluded were firms that formed international finance subsidiaries whose primary function was financing the parent company's overseas operations.

TABLE 1

AVERAGE AND CUMULATIVE AVERAGE RESIDUALS FOR COMMON STOCKS OF FIRMS THAT FORMED CAPTIVE FINANCE SUBSIDIARIES DURING THE PERIOD (−40 TO +40)

Relative Time	Average Residuals	Cumulative Average Residuals	Relative Time	Average Residuals	Cumulative Average Residuals
−40	−0.0312	−0.0312	1	−0.0026	0.1816
−39	0.0143	−0.0169	2	−0.0012	0.1804
−38	0.0116	−0.0053	3	−0.0103	0.1701
−37	−0.0081	−0.0134	4	−0.0162	0.1540
−36	−0.0133	−0.0267	5	0.0305	0.1844
−35	0.0053	−0.0213	6	0.0022	0.1866
−34	0.0112	−0.0102	7	−0.0145	0.1721
−33	0.0129	0.0027	8	−0.0084	0.1637
−32	−0.0112	−0.0085	9	−0.0126	0.1511
−31	−0.0023	−0.0108	10	−0.0225	0.1286
−30	0.0187	0.0079	11	0.0246	0.1532
−29	−0.0250	−0.0171	12	−0.0176	0.1358
−28	0.0033	−0.0139	13	0.0020	0.1376
−27	−0.0137	−0.0275	14	−0.0018	0.1358
−26	0.0161	−0.0114	15	−0.0163	0.1195
−25	−0.0123	−0.0237	16	0.0162	0.1357
−24	−0.0135	−0.0372	17	0.0142	0.1499
−23	0.0143	−0.0229	18	0.0234	0.1733
−22	0.0212	−0.0017	19	−0.0155	0.1578
−21	−0.0068	−0.0085	20	−0.0273	0.1305
−20	0.0225	0.0140	21	0.0231	0.1536
−19	−0.0030	0.0110	22	−0.0191	0.1345
−18	0.0193	0.0303	23	−0.0041	0.1304
−17	0.0076	0.0380	24	0.0068	0.1372
−16	0.0086	0.0466	25	−0.0053	0.1319
−15	−0.0142	0.0323	26	0.0184	0.1503
−14	−0.0246	0.0078	27	−0.0150	0.1354
−13	0.0052	0.0130	28	0.0186	0.1540
−12	0.0076	0.0207	29	0.0045	0.1585
−11	0.0088	0.0294	30	0.0037	0.1622
−10	0.0287	0.0581	31	−0.0191	0.1431
−9	−0.0079	0.0503	32	0.0250	0.1681
−8	−0.0077	0.0426	33	0.0138	0.1819
−7	0.0120	0.0547	34	−0.0205	0.1615
−6	−0.0119	0.0428	35	−0.0076	0.1538
−5	0.0360	0.0788	36	0.0140	0.1678
−4	0.0128	0.0915	37	0.0097	0.1775
−3	0.0154	0.1070	38	0.0053	0.1828
−2	0.0208	0.1278	39	0.0036	0.1864
−1	0.0207	0.1485	40	−0.0161	0.1703
0	0.0357	0.1842			

tion.[17] If there were no excess returns to the shareholders of firms that formed captive finance companies, we would expect to observe an equal number of

17. Since the monthly return data ended in June 1972, there were insufficient data to compute the complete 40 months of residuals following the incorporation date for the four subsidiaries formed later than January 1969. The number of firms included in computing the average residuals and CAR declined by one as the data for a particular firm became unavailable.

positive and negative average residuals and we would expect the C.A.R. to vary little from zero in any period (i.e., we would expect the average residuals to be randomly distributed around a mean of zero).

Examination of Table 1 shows that there were 19 positive and 16 negative average residuals over the period (−40 to −6) months. However, over the 6 months immediately preceding and including the month of incorporation, the average residual was positive in each period. In the 40 months following the month of incorporation, we observe 21 negative average residuals and 19 positive average residuals.

Examination of the C.A.R. shows that it became positive in the twentieth month prior to the month of incorporation and remained positive thereafter. By month 0 stockholders had earned an average excess return of approximately 18.4%. However, the bulk of this return occurred between months (−5 and 0). In the six months from month (−5 to 0), stockholders earned an average excess return of 2.4% per month. In the months following the month of incorporation, the C.A.R. did drop-off, but by the fortieth month following the incorporation, the C.A.R. was approximately at the same level as in month (0). That is, in contrast to the preceding 40 months, over the period (0 to +40), the C.A.R. showed almost no change.

In sum, the C.A.R. was relatively small and moved in a random fashion until month (−5) after which it increased substantially until month (0). After month (0) the C.A.R. again moved in a random pattern.

D. *Further Tests on Stockholder Returns*

One potential statistical problem with the methodology used to examine excess returns for common stocks is that the firm-specific risk measure β_{jt} may be changing over time, particularly around the time at which the finance subsidiary is formed. For example, if the β_{jt}'s were increasing over time, we would expect to observe a positive C.A.R. because β_{jt}'s were estimated using returns for the 59 months immediately preceding month t. In an effort to control for non-stable β_{jt}'s, the test was re-run using β_{jt}'s estimated with return data for 29 months before and 30 months following each relative month t (i.e., using months $t-29$ to $t+30$).

The results obtained using the revised $\hat{\beta}_{jt}$'s were similar to the results in Table 1. Table 2 compares the C.A.R. obtained in selected months using both estimation procedures. The table shows that the results were very similar.

TABLE 2

COMPARISON OF C.A.R. USING DIFFERENT ESTIMATION PROCEDURES FOR β_j'S

	Month			
	−16	−8	0	+8
C.A.R. Using Pre-β_j	.0466	.0426	.1842	.1637
C.A.R. Using Pre- and Post-β_j	.0494	.0420	.1796	.1866

The results in Tables 1 and 2 indicate that stockholders of firms that have formed captive finance companies have on average earned excess returns. This evidence is

consistent with the results that are expected when the me-first rule is violated. Furthermore, the excess returns were achieved prior to the actual formation of the finance subsidiary. Thus, these results are supportive of the notion of an efficient capital market in which information is impounded in security prices as it becomes available. However, the excess returns may be the result of operating or financial synergies that are expected to result from the formation of a captive finance subsidiary. For example, if the firms in our sample increased their use of debt financing during the formation of their finance subsidiaries, our theoretical analysis indicates that stockholders would have gained at the expense of the government even if the me-first rule were perfectly effective.[18] In order to provide more conclusive evidence on me-first rule violations, it is necessary to examine the returns to the bondholders of these firms.

III. Returns to Bondholders of Firms That Formed Captive Finance Subsidiaries

This section examines the returns to the bondholders of firms that have formed captive finance subsidiaries. The methodology used is a paired-comparison procedure that computes measures of abnormal or "excess" returns for bonds that are similar to the average residuals and cumulative average residuals computed for common stocks.

A. *Methodology for Bondholder Returns*

The paired-comparisons test used to examine returns to bondholders required that bonds be selected that possessed the same risk-return characteristics as each of the outstanding bonds of firms that formed captive finance companies. That is, for each bond issued by a company that formed a finance subsidiary, we selected one bond that had similar risk-return characteristics, but that was issued by another company that did not form or own a finance subsidiary. Thus, each of the bonds in the control group may be considered a risk-adjusted index with which a similar bond issued by a firm that established a finance subsidiary can be compared.

Alternatively, the control group of matching bonds may be considered a "portfolio" with the same risk characteristics as the "portfolio" of bonds issued by companies that later formed finance subsidiaries. If the two "portfolios" had identical risk characteristics, they would be expected to yield equal returns in each relative month. This procedure was adopted to alleviate problems that might arise in comparing bond returns with stock market indexes or with bond indexes that do not reflect similar risk characteristics.

The control group of index bonds was selected to match the bonds of firms that formed finance subsidiaries on four characteristics:

1. Bond rating as determined by Moody's bond rating service.
2. Term-to-maturity.

18. Furthermore, the demonstrated excess returns may be the result of a selection bias. That is, those firms that have been successful and are likely to continue being successful are the ones that formed captive finance subsidiaries. However, in order for the occurrence of the excess returns to have coincided with formation of the subsidiary, it also must have been that its formation contained informational content about the success of the firm that was not previously available. The results from the later bond test tend to argue against this conclusion.

3. Coupon interest rate.
4. Coupon interest payment dates.

The justifications for matching the bonds on these characteristics are both theoretical and empirical.

Bond rating was used because it is the most widely recognized measure of bond default risk and because Johnson (1967) and Hickman (1960) found a positive relationship between bond ratings and bond default frequencies. Furthermore, the statistical bond rating models of Pogue and Soldofsky (1969) and Pinches and Mingo (1973) have shown bond ratings to be consistent with various financial variables usually employed as measures of a firm's financial stability.

Term-to-maturity and coupon interest rates were used because the evolving theoretical literature on "duration" indicates that bond yields [Hopewell and Kaufman (1973)] and bond covariance-risk [Boquist, Racette, and Schlarbaum (1975)] are a function of these variables. Additionally, the recent empirical evidence of Katz (1974) showed these variables to be significant in explaining bond "yields." Finally, the bonds were matched according to interest payment dates to circumvent the need to adjust returns for accrued interest.

After selecting the control bonds, monthly rates of return on the two groups were compared. Again, using the month of incorporation of the finance subsidiary as month (0), we computed monthly rates of return on each bond over the period (-23 to $+12$) months surrounding the month of incorporation. Monthly returns were computed by dividing the month-end bond price plus coupon interest payments (if paid in that month) by the beginning of the month bond price. The monthly rate of return on each index bond was then subtracted from the monthly returns earned in the same calendar month on the outstanding corollary bond of a company that formed a finance subsidiary. The average of these differences was then computed for each relative month as

$$\bar{b}_k = \left[\sum_{i=1}^{M} (R_{ik} - C_{ik}) \right] / M, \tag{22}$$

where $\bar{b}_k$ = average difference in rates of return across pairs of bonds in relative month k,

R_{ik} = rate of return on the ith bond in relative month k issued by a firm that formed a finance subsidiary,

C_{ik} = rate of return in relative month k on a bond with risk-return characteristics similar to bond i,

M = number of pairs of bonds in the sample.

The measure $\bar{b}_k$ may be thought of as the average "excess" or abnormal return to the bondholders of firms that formed finance subsidiaries when each bond is compared with its own index bond.

The average differences were then summed to compute the cumulative average difference (C.A.D.) in rates of return between the two groups of bonds over the entire period (-23 to $+12$) months

$$\bar{\bar{b}}_T = \sum_{k=-23}^{T} \bar{b}_k, \tag{23}$$

where $\bar{\bar{b}}_T$ = cumulative average difference (C.A.D.) in rates of return from relative month -23 through month T.

B. *Data*

The bond sample contained all of the bonds of companies that formed finance subsidiaries for which monthly prices were available in either *Moody's Bond Guide* or *Standard and Poor's Bond Guide* over the period (-24 to $+12$) months. Because the bonds of some companies did not trade actively over the entire period, these companies were excluded from the bond sample. If a company had more than one long-term bond issue outstanding at the time of incorporation of its finance subsidiary, all bond issues were included in the analysis.[19] The bonds included in the analysis and their matching index bonds are given in the Appendix.

C. *Results*

Table 3 presents the average differences and the C.A.D.'s for the period (-23 to $+12$) months. If the two groups of bonds were identical in their risk-return characteristics and if there were no violation of the me-first rule, we would expect to observe an equal number of positive and negative average differences and we would expect to find that the average differences and the C.A.D.'s varied little from zero in any period. In other words, the average differences would be expected to be randomly distributed around a mean of zero.

Table 3 shows that in the first sixteen months (i.e., month -23 to -8), the average difference was positive in exactly one-half the months and negative in one-half the months. However, in the next eight months (-7 to 0), the average difference was negative in seven out of eight observations and 0.0 in the remaining one. Following the month of incorporation the average differences continued to be predominantly negative, but their magnitudes were relatively small.

Looking at the C.A.D., we find that it became negative in month (-21) and remained negative throughout, but that it had declined to a level of only -1.2% by month (-8)—up from a level of -2.6% in month (-15). From months (-7 to 0) the C.A.D. declined from -1.2% to -8.5%. The average excess loss to the bondholders over this period was approximately -1.0% per month. The C.A.D. continued to decline sharply until month ($+2$), but over the eleven months from month ($+2$) to month ($+12$) the C.A.D. declined only an additional 2.0%.

In short, the C.A.D. tended to move in a random fashion until month (-7) after which there was a substantial decline until month ($+2$). After ($+2$), the C.A.D. again stabilized and tended to move in a random pattern.[20]

The results support the hypothesis that the "old" bondholders of firms that formed captive finance subsidiaries suffered a "windfall" loss relative to the owners of a group of similar bonds. Furthermore, the loss began to occur at approximately the same relative time as the excess gain to stockholders of the same firms. Apparently, information about the impending formation of the finance subsidiary

19. Because bonds issued by the same company may not yield independent observations we also examined returns by including only one bond from each company in the analysis. See section D.2.

20. The observation that bonds appear to continue to adjust for two months following incorporation of the subsidiary is consistent with the results of Katz (1974). He found that complete adjustment of bond prices to rating changes lagged the actual rating change by four to six weeks.

TABLE 3

AVERAGE AND CUMULATIVE AVERAGE DIFFERENCES FOR BONDS OF FIRMS THAT FORMED CAPTIVE SUBSIDIARIES DURING THE PERIOD (−23 TO +12)

Relative Time	Average Differences	Cumulative Average Differences
−23	0.003	0.003
−22	0.002	0.005
−21	−0.013	−0.008
−20	−0.007	−0.015
−19	−0.011	−0.025
−18	0.010	−0.016
−17	0.008	−0.008
−16	−0.006	−0.014
−15	−0.012	−0.026
−14	0.004	−0.023
−13	0.009	−0.014
−12	0.004	−0.010
−11	−0.001	−0.010
−10	−0.002	−0.013
−9	−0.004	−0.017
−8	0.004	−0.012
−7	−0.016	−0.029
−6	−0.015	−0.044
−5	−0.019	−0.063
−4	−0.008	−0.071
−3	0.000	−0.071
−2	−0.004	−0.075
−1	−0.009	−0.084
0	−0.001	−0.085
1	−0.002	−0.086
2	−0.013	−0.100
3	−0.007	−0.106
4	0.007	−0.100
5	−0.011	−0.111
6	−0.003	−0.113
7	−0.003	−0.116
8	−0.001	−0.117
9	−0.005	−0.122
10	0.011	−0.110
11	−0.005	−0.115
12	−0.006	−0.120

began to reach the market (and stockholders and bondholders began to react to the information) about seven months prior to the actual incorporation.

D.1. *Further Tests: A Second Control Group*

In an effort to validate the results on the bond test, a second group of similar bonds was selected. The average differences and the cumulative average differences

TABLE 4

AVERAGE AND CUMULATIVE AVERAGE DIFFERENCES FOR BONDS OF CONTROL GROUP 1 VERSUS CONTROL GROUP 2 DURING THE PERIOD (−23 to +12).

Relative Time	Average Differences	Cumulative Average Differences
−23	0.004	0.004
−22	0.001	0.005
−21	−0.001	0.004
−20	0.003	0.006
−19	0.001	0.007
−18	−0.001	0.006
−17	−0.008	−0.002
−16	0.000	−0.002
−15	0.001	−0.001
−14	−0.001	−0.003
−13	0.003	0.001
−12	0.001	0.002
−11	−0.004	−0.003
−10	−0.001	−0.004
−9	−0.004	−0.008
−8	0.004	−0.004
−7	−0.003	−0.007
−6	0.002	−0.005
−5	0.001	−0.004
−4	−0.007	−0.011
−3	0.005	−0.007
−2	−0.000	−0.007
−1	−0.001	−0.008
0	0.004	−0.005
1	0.004	−0.000
2	−0.000	−0.001
3	−0.003	−0.004
4	0.003	−0.001
5	0.005	0.004
6	−0.003	0.001
7	−0.000	0.001
8	0.000	0.001
9	0.006	0.007
10	−0.002	0.004
11	0.001	0.006
12	−0.003	0.002

(C.A.D.) of the monthly rates of return between the first control group and the second control group were computed over the months (−23 to +12) by subtracting the monthly returns on control group 2 from the monthly returns on control group 1. This procedure was adopted to insure that the negative C.A.D. reported in Table 3 actually resulted from abnormal returns to the bonds of companies that

formed finance subsidiaries rather than from abnormal returns to the group of control bonds. The second control group is listed in the Appendix.

The results of this analysis are reported in Table 4. Examination of the average differences over the sixteen months from month (−23 to −8) shows nine positive and seven negative average differences. Over the eight months from month (−7 to 0), we observe four positive and four negative differences, while over the months (+1 to +12) we again have an equal number of positive and negative average differences. Furthermore, the C.A.D. shows no trend over the entire period. These results indicate that the two control groups yielded approximately equal monthly returns over the period (−23 to +12) months.

D.2. *Further Tests: Other Bond Comparisons*

The results presented in Table 3 included multiple bond issues of four companies. Because different bond issues of the same company may not be independent, the average differences and the C.A.D.'s were recomputed using different combinations of bonds which included only one issue from each company. Table 5 shows the C.A.D.'s for selected months using: (1) all bonds and control group 1; (2) the shortest maturity bond of each company and its matching bond from control group 1; (3) the longest maturity bond of each company and its matching bond from control group 1; and (4) all bonds and control group 2. In each case the results were very similar to those in Table 3.

TABLE 5

CUMULATIVE AVERAGE DIFFERENCES FOR OTHER BOND COMPARISONS

	Relative Month			
	−8	0	+2	+12
C.A.D.–Control No. 1 vs. all bonds	−0.012	−0.085	−0.100	−0.120
C.A.D.–Control No. 1 vs. shortest maturity bonds	−0.018	−0.079	−0.097	−0.130
C.A.D.–Control No. 1 vs. longest maturity bonds	−0.013	−0.072	−0.086	−0.125
C.A.D.–Control No. 2 vs. all bonds	−0.017	−0.089	−0.100	−0.118

These results confirm that the old bondholders of companies that formed finance subsidiaries did suffer windfall losses relative to the owners of similar bonds issued by companies that did not form captive finance companies.

IV. SUMMARY AND CONCLUSIONS

In this paper, we examined the effect of capital structure rearrangements that violate the me-first rule. We examined this phenomenon for the no-tax case and for

the tax case. In both cases, violation of the me-first rule should result in a windfall gain to stockholders and a windfall loss to bondholders.

We then examined one specific case in which the me-first rule was violated. When firms form captive finance subsidiaries and use their earnings and assets to support the borrowing of the subsidiary, they create a new class of security holders with income claims that are superior to those of their original bondholders. This form of capital structure rearrangement is a violation of the me-first rule.

The empirical evidence indicates that stockholders have on average earned excess returns and old bondholders have suffered windfall losses when firms have formed captive finance subsidiaries. The implications of the empirical results are threefold: First, the results support the theoretical analysis of the effect of a me-first rule violation.

Second, the results add to the growing evidence in support of an efficient stock market in which information is impounded in security prices as it becomes available. More importantly, the evidence is supportive of a relatively efficient bond market in which bond prices adjust relatively quickly to new information.

Third, the results emphasize the risks that bondholders bear because they wield no direct managerial control over a firm's operations until the firm actually defaults on its interest or principal repayment obligations. As discussed above, creditors' income claims may be abridged not only through formation of captive finance companies, but also through other financial manipulations that do not violate "normal" indenture agreements.

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THE APPENDIX: COMPANIES THAT FORMED CAPTIVE FINANCE SUBSIDIARIES, THE DATES ON WHICH THE SUBSIDIARIES WERE FORMED, AND THE MATCHING BONDS FROM CONTROL GROUPS 1 AND 2.

Company Name	Formation Date	Bonds Traded*	Control Group 1	Control Group 2
1. Allied Stores Corp	Nov 61	1	Tennessee Gas Trns	Mystic Valley Gas
2. Allis Chalmers	Jun 56	NT		
3. Associated Dry Goods Corp	Aug 69	1	Columbia Gas System	Ohio Power
4. Beech Aircraft	Oct 56	NT		
5. Boeing Company	Nov 65	1	National Tea Co	Bethlehem Steel
6. Boise Cascade Corp	Feb 70	NT		
7. Case (J. I.) Co	Mar 57	1	Sylvania Electric Prod	U.S. Steel Corp
8. Caterpillar Tractor Co	Apr 54	1	Erie Railroad	Public Service Indiana
9. Clark Equipment	May 54	NT		
10. Deere & Co	Jul 58	2	Pittsburgh Plate Glass Southwestern Gas & Elec	Assoc Investment Co Tennessee Gas Trns**
11. Evans Products Co	May 55	NT		
12. Fedders Corp	Aug 54	NT		
13. Gamble Skogmo Inc	Dec 64	1	State Loan & Finance	Philadelphia Elec Power
14. General Dynamics Corp	Jun 69	NT		
15. Grant W. T.	Jan 66	1	Louisiana Power & Light	Pennsylvania Power
16. Gulf Oil Corp	Jan 71	2	Ohio Edison Louisville Gas & Elec	Wisconsin Power & Light Blackstone Valley Gas
17. Honeywell Inc	Oct 67	2	California Elec Power Public Service-Okla	Northern Natural Gas Control Data Corp
18. R H Macy and Co Inc	Mar 61	1	Central Indiana Gas	Washington Wtr & Pwr
19. May Department Stores	Feb 68	3	Fireston Tire & Rubber Potomac Electric Power Southern California Gas	Transcont Gas Pipeline Texas Elec Service Michigan Bell
20. McCrory Corp	Dec 61	NT		
21. McDonnell Douglas Corp	Apr 68	1	General Tire & Rubber	Boston Edison
22. United Merch & Manuf Inc	Oct 58	NT		
23. Westinghouse Electric	Mar 54	1	Illinois Power	Denver and Salt Lake
24. White Motor	Jul 62	NT		

* NT indicates not actively traded.

** Each control group contains a different bond issue of Tennessee Gas, and the data were taken from non-overlapping time period.