DIVIDEND VALUATION:

THE ECONOMIC RECOVERY TAX ACT OF 1981

AND DIVIDEND REINVESTMENT PLANS

By

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ABSTRACT

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Numerous studies have argued that dividend policy should be irrelevant but the evidence is unclear. Corporate dividend policy may, however, produce a tax clientele effect. An interesting phenomenon relating dividends and gains is the dividend reinvestment plan (DRP). The DRP appears to allow the investor to "enjoy" immediate taxation while accumulating gains. Obviously the DRP must appeal to a clientele which finds that it offers something of value.

The Economic Recovery and Tax Act of 1981 introduced dislocations which may have affected equilibrium. The law increased and then decreased the personal tax bias favoring gains, it allowed investors to convert dividends reinvested in qualified utilities into capital gains, and it subsequently ended the tax preference granted earlier to utilities. These tax changes provide a unique look at the classic question of dividend relevance.

This research develops a theory of the effect on dividend valuation that should be expected from ERTA, compares existing evidence with the theory, and tests the theory empirically.

Static tests found that utilities, particularly qualified ones, had ex-day statistics significantly greater than one while nonutility statistics were significantly less than one. Dynamic tests revealed little support for dividend tax clientele theory except among qualified utilities. Their ex-day statistics changed consistently and significantly in agreement with tax clientele theory when tax law was altered. The magnitudes of ex-day statistics for qualified utilities, thus, did not fit the usual expectations of tax clientele theory while their changes did. And, while both utilities and nonutilities had statistics that were negatively related to beta, the statistics of utilities were positively related to yield while those of nonutilities might not be.

The results are consistent with some non-tax-induced clientele effect(s) setting the general levels of ex-day statistics while superimposed tax clienteles are affected by changes in tax regimes. They illustrate the fact that static tests of ex-day statistics may detect a clientele effect but dynamic tests of shifts in ex-day statistics that result from genuine changes in tax regimes are necessary to determine whether or not a tax clientele effect has been found.

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INTRODUCTION

In this study, a new data set involving equities affected by the Economic Recovery Tax Act of 1981 was employed to reexamine the perennial question of whether dividend policy matters. Chapters One and Two review prior theories of dividend relevance in perfect and imperfect markets. Chapter Three summarizes the empirical evidence concerning dividend policy and firm value. Chapter Four provides a background on dividend reinvestment plans and discusses prior studies investigating such plans. Chapters Five and Six develop this study's theory relating to market imperfections, particularly taxation and dividend reinvestment plans, which leads to the hypotheses of Chapter Seven. In Chapter Eight the methodology used in the empirical testing of these hypotheses is discussed. Chapters Nine and Ten describe the empirical findings and conclusions.

Prior studies found that the highest yield decile(s) had ex-day statistics (drop/dividend) that were greater than one, unlike all other deciles. This study has shown, however, that the top yield decile phenomenon is due to utilities. Furthermore, the effect is due to the utilities which qualified under ERTA. Even where nonutility and utility yields overlapped, the nonutility statistics were less than one while the utility statistics were larger than one. Apparently, the puzzling ex-day behavior of the highest yield decile that was found by other researchers is an industry effect. If others had excluded utilities in their studies, the effect might not have been found.

Prior research has also found ex-day statistics to be negatively related to beta and positively related to yield. The present data significantly confirmed the findings on beta and the all company sample supported the prior findings on yield. Breaking the sample down into its components, however, produced more evidence of an industry effect. For the nonutilities, few of the yield coefficients were significant and for the subperiod 1982-85, none were significant.

A graph of the data on the yield--ex-day statistic plane with beta factored out first reveals why yield was a significant predictor in the all company sample even when it was not significant for nonutilities. Nonutilities vastly outnumber utilities so the slope of the all company regression was positive, the same as for nonutilities. Unqualified utilities, and especially qualified utilities, had centroids that were above the right end of the nonutility line and tilted its slope upward raising its significance. Thus, even if the ex-day statistics of the nonutility subgroup were not significantly related to yield, those of the all company sample were significant. Prior studies, thus, may have found beta-adjusted yield significant due to the inclusion of utilities which behave differently on ex days than do other equities.

The theory developed in this study predicted several hypotheses to be tested. The first hypothesis was that the excess supply of dividends relative to the tax preferences of investors before 1982 would produce an ex-day drop less than the dividend. Nonutilities and the all company sample supported this hypothesis but utilities and qualified utilities rejected it. It can be concluded that before 1982, beta and yield explained part of ex-day behavior. Utility prices, however, reacted differently to dividends than did the prices of nonutilities even after these two variables were removed. Ex-day statistics before 1982 cannot, therefore, be explained solely by tax preferences and yield.

In June of 1981, the maximum gains rate dropped and tax clientele theory and Hypothesis Two predicted that ex-day statistics would drop. This study found that the ex-day statistics of most equities rose and only those of qualified utilities declined.

At the beginning of 1982, the top dividend tax bracket was lowered. Hypotheses Three and Four predicted that the ex-day statistics of unqualified and qualified dividends would rise. Hypothesis Three was unsupported but the evidence strongly supported Hypothesis Four. The substantial reduction in dividend taxation impacted qualified dividends but not unqualified ones. It is possible that investors in qualified utilities faced higher taxation on ordinary income than on gains but so strongly preferred dividends for some non-tax-induced reason that they bid ex-day statistics greater than one. A decline in dividend taxation then made dividends even more desirable to these investors so the ex-day drop increased. The fact that ex-day statistics for unqualified utilities, also a high-yield group, dropped nonsignificantly while the qualified utility statistics rose significantly suggests that it was qualification not the top dividend bracket change that was the cause.

During the 1982-1985 period, unqualified dividends were predicted by Hypothesis Five to have ex-day statistics less than one due to the greater taxation of dividends. This hypothesis was supported significantly by nonutilities and nonsignificantly by unqualified utilities. It should be noted that prior to 1982, the latter had ex-day statistics nonsignificantly greater than one.

Hypothesis Six predicted that the ability to treat qualified utility dividends as stock dividends would produce ex-day statistics equal to one. This test was rejected by statistics that were significantly greater than one.

Removing the effects of beta and yield from 1982-1985 data had no impact on the nonutility and all company samples but lowered the ex-day statistics of all three utility subgroups. The statistics of unqualified utilities, which were nonsignificantly less than one, became significant and the all utility statistics changed from significantly greater than one to significantly less than one. The unadjusted statistics for qualified utilities were significantly greater than one. After adjustment, they were lower but still significantly greater than those for nonutilities. If portfolios of utilities were formed from 1982-1985 with betas and yields that were average for all equities, utility ex-day statistics would be less than one but still greater than for nonutilities. The same adjustment made on data from 1980-1981 had less effect. Part of the utility industry effect that existed prior to ERTA disappeared with its passage. Further research should examine data after dividend qualification expired in December of 1985 to determine if the effect returned.

Qualified utilities produced an additional observation of interest. In June of 1981, the top gains tax rate dropped and in January of 1982, the top rate on ordinary income dropped. The ex-day statistics for qualified utilities were significantly greater than one for all three periods but they declined significantly during the last half of 1981 and rose significantly in 1982. The LEVELS of the ex-day statistics provide evidence of some kind of clientele effect but the type cannot be determined. However, the CHANGES significantly support the tax clientele hypothesis. Investors in these equities may have preferred dividends for non-tax-induced reasons and the tax law changes only affected their relative preference.

This study uncovered several areas for further research including:

(1) Prior studies found that the highest yield decile had an ex-day statistic greater than one. This study found that if utilities were extracted, the remaining nonutilities did not exhibit this behavior even when similar yields were examined. It should be determined if this is a peculiarity of the 1980-1985 interval or if it is true of other periods.

(2) One part of this study adjusted utilities for their unusually low betas and high yields and found that for 1982-1985 the adjusted ex-day statistics were less than one but still larger than those of nonutilities. From 1980-1981 the adjustment had a much smaller effect. This industry effect should be investigated to determine if it is due to the time period or whether it recurs.

(3) It should be determined whether other industries besides utilities exhibit unique ex-day behavior.

(4) The makeup of dividend clienteles should be pursued to determine whether utilities are unique. Is it possible that

utility investors so desire dividends that they bid ex-day statistics greater than one even though they are taxed more heavily on dividends and only consider differential taxation as an adjustment to ex-day statistics that are otherwise greater than one? If so, why?

(5) L&V developed their metric to reduce the heteroskedasticity encountered by the E&G statistic. This study found both to have larger variances for lower yield equities. A more homoskedastic statistic should be developed which would sharpen conclusions.

CHAPTER ONE

DIVIDEND (IR)RELEVANCE IN PERFECT CAPITAL MARKETS

The relevance or irrelevance of a firm's dividend policy has been a recurring issue in finance and may never be settled to the satisfaction of all parties. Although the "real" world has numerous imperfections, a logical starting point in the discussion of dividend policy is the "ideal" world of perfect capital markets. For purposes of this study let market perfection be defined as atomistic competitors in frictionless markets. In particular, the perfect market conditions listed by Haley and Schall (1979) will be assumed:

(1) costless capital markets,

(2) neutral personal taxes,

(3) competitive markets,

(4) access to capital markets on the same terms to all participants,

(5) homogeneous expectations,

(6) no information costs,

(7) no financial distress costs, and

(8) salability of tax losses.

MILLER AND MODIGLIANI

Miller and Modigliani (1961) (M&M) showed that under two sets of assumptions dividend policy is irrelevant to the value of the firm in perfect capital markets. They first treated the case of rational behavior with perfect certainty. Their rational behavior assumption means that all investors prefer greater wealth to less but are indifferent as to the form of that wealth while the perfect certainty assumption implies that a firm's debt and equity are indistinguishable, reducing the firm's securities to just one class--stock. This scenario leads to M&M's fundamental principle of valuation:

> The price of each share must be such that the rate of return (dividends plus capital gains per dollar invested) on every share will be the same throughout the market over any given interval of time. (pg. 412)

To express the total value of the firm $V(t)$ at the start of period t in terms of the risk-free rate $R_f(t)$ during the period t, they let

$n(t)$ = the number of shares of record at the start of t and

$m(t+1)$ = the number of new shares (if any) sold during t at the ex-dividend closing price $P(t+1)$

so that

$$n(t+1) = n(t) + m(t+1),$$

$$v(t) = n(t)P(t)$$

= the total value of the enterprise, and

$$D(t) = n(t)d(t)$$

= the total dividends paid during t to holders of record at the start of t,

and obtained

$$V(t) = \frac{1}{1 + R_f(t)}[D(t) + n(t)P(t+1)]$$

$$= \frac{1}{1 + R_f(t)}[D(t) + V(t+1) - m(t+1)P(t+1)]. \qquad (1)$$

M&M further assumed that the firm's future dividend and investment policies are known and independent of D(t). Since V(t+1) does not depend on the past, the valuation effect of any dividend policy would be reflected in the first and third terms in the square brackets of Equation (1). Expressing the third term as a function of this period's investment I(t) and net profit X(t) gives

$$m(t+1)P(t+1) = I(t) - [X(t) - D(t)]. \tag{2}$$

Combining Equations (1) and (2) and simplifying gives

$$V(t) = \frac{1}{1 + R_f(t)}[X(t) - I(t) + V(t+1)].$$

Thus, firm value at the beginning of period t is a function of period t's net income and investment and the value of the firm ex period t's dividend, all of which are independent of D(t). By a similar argument, using mathematical induction, they extended the result to show that firm value at time $t = 0$ is unaffected by D(t) for any $t \geq 0$.

> It is, after all, merely one more instance of the general principle that there are no "financial illusions" in a rational and perfect economic environment. Values are determined solely by "real" considerations--in this case the earning power of the firm's assets and its investment policy--and not by how the fruits of the earning power are "packaged" for distribution. (pg. 414)

M&M's second case retained market perfection but relaxed the certainty assumption which necessitated discarding the fundamental valuation principle. With uncertainty there is no reason to expect the discount rates for different firms to be the same for any given time period or for the flows of a particular firm to be viewed identically by different investors. M&M further generalized the rational behavior assumption by replacing it with imputed rationality and symmetric market rationality.

> An individual trader...satisfies the postulate of "imputed rationality" if, in forming expectations, he assumes that every other trader in the market is (a) rational in the previous sense of preferring more wealth to less regardless of the form an increment in wealth may take, and (b) imputes rationality to all other traders....A market as a whole satisfies the postulate of "systematic market rationality" if every trader behaves rationally and imputes rationality to the market. (pg. 427)

Symmetric market rationality seemed plausible to M&M but its existence is an empirical question.

M&M then postulated "for convenience" the existence of two firms which investors view as identical with respect to earnings and investment from the time $t = 0$ onward and with respect to dividends from $t = 1$ onward. The flows are unknown at $t = 0$ but will be the same for the two firms with the possible exception of the dividend at the end of period $t = 0$. The current shareholders of firm One will receive a total dollar return $\tilde{R}_1(0)$ at the end of period $t = 0$ given by:

$$\tilde{R}_1(0) = \tilde{D}_1(0) + \tilde{V}_1(1) - \tilde{m}_1(1)\tilde{P}_1(1). \qquad (3)$$

In other words, they will receive an unknown return consisting of period $t = 0$ dividends and the ex-dividend value of the company's stock less the ex-dividend value of any new equity sold to finance investment and dividends. Equation (2) relating new equity to this period's investment, earnings, and dividends still holds. Substituting in Equation (3) and simplifying gives

$$\tilde{R}_1(0) = \tilde{X}_1(0) - \tilde{I}_1(0) + \tilde{V}_1(0).$$

Similar reasoning leads to an analagous equation for $\tilde{R}_2(0)$, the return to holders of firm Two. By assumption $\tilde{X}_1(0) = \tilde{X}_2(0)$ and $\tilde{I}_1(0) = \tilde{I}_2(0)$ and by symmetric market rationality $\tilde{V}_1(1) = \tilde{V}_2(1)$. Therefore, $\tilde{R}_1(0) = \tilde{R}_2(0)$ and a rational market will equate $\tilde{V}_1(0) = \tilde{V}_2(0)$. Applying mathematical induction, the values of the two firms at $t = 0$ will be equal regardless of dividend policy in any subsequent period. Dropping the "convenience" of two firms, the two could be thought of as two choices of dividend policy being considered by the owners of a single firm.

M&M did not rule out a change in value resulting from a change in dividend policy. However, they claimed it is not the dividend policy per se but the information content as to management's opinion of future firm prospects with respect to investments and income which would be the proximate cause of the change in value.

GORDON

M&M's theory has been criticized for its strong ceteris paribus assumption that dividend payout has no effect on the economic activities of the firm and its seeming implication of constant perceived riskiness for all future dividends (Borch, 1963. Gordon, 1962). Arguing from the "bird in the hand" principle, which implies that the riskiness of future dividends is an increasing function of time, Gordon (1962, 1963) presented a proof that even in perfect capital markets dividend payout matters. M&M had neutralized investment policy by holding the value of investment constant. Gordon constrained the net present value of new investment to equal zero by requiring it to be at the marginal cost of capital. This leads to the well-known Gordon Valuation Model:

$$P_0 = \sum_{t=0}^{\infty} \frac{D(t)}{\sum_{i=0}^{t} (1 + k_i)}$$

$$= \sum_{t=0}^{\infty} \frac{D(t)}{(1 + k)^t} \qquad (4)$$

where

k_i = the appropriate discount rate for period t, and

k = the average discount rate over $0 \leq t < B$.

If dividends are growing at a constant rate of g, then the last summation in Equation (4) simplifies to:

$$P_0 = \frac{D(t)}{k - g}.$$

If the firm earns a constant return r on a constant fraction b of earnings Y(t) retained in period t, then:

$$g = br \tag{5}$$

$$D(t) = (1 - b)Y(t)$$

and

$$P_0 = \frac{(1 - b)Y(0)}{k - br}. \tag{6}$$

Concerning the discount rates Gordon concluded that:

> Under uncertainty an investor need not be indifferent as to the distribution of the one-period gain on a share between the dividend and price appreciation. Since price appreciation is highly uncertain, an investor may prefer the expectation of a $5 dividend and a $50 price to a zero dividend and a $55 price without being irrational. (1963, pg. 265)

> It seems plausible that (1) investors have an aversion to risk or uncertainty, and (2) given the riskiness of a corporation, the uncertainty of a dividend it is expected to pay increases with the time in the future of the dividend. It follows from these two propositions that an investor may be represented as discounting the dividend expected in period t at a rate of kt not independent of t. Furthermore, if aversion to risk is large enough and/or risk increases rapidly enough with time, kt increases with t. (1963, pg. 267)

If the k_t are not independent of time, then k is a statistical artifact--a weighted average of the k_t's with the weights dependent on the D(t)'s. A change in the retention ratio, b, will change the weights and thus alter the average k. In the constant growth case, then, k is a function of g or:

$\partial k/\partial g \neq 0.$

Taking the partial of Equation (5) with respect to b and assuming r is independent of b gives

$$\begin{aligned} \partial k/\partial b &= (\partial k/\partial g)(\partial g/\partial b) \\ &= (\partial k/\partial g)r \neq 0. \end{aligned} \tag{7}$$

Taking the partial of Equation (6) with respect to b and again assuming r is independent of b gives

$$\frac{\partial p}{\partial b} = \frac{Y[r - k - (1 - b)(\partial k/\partial b)]}{(k - br)^2}$$

which simplifies to:

$$\frac{\partial p}{\partial b} = \frac{-Y(1 - b)(\partial k/\partial b)]}{(k - br)^2} \tag{8}$$

$$\neq 0$$

if r = k. Gordon concluded, then, that if r is independent of b then P is dependent on b and, therefore dividend policy affects value.

BRENNAN

Subsequent to the above articles, Brennan (1971) published a flaw in Gordon's dividend relevance argument and derived M&M's irrelevance theorem from somewhat relaxed assumptions. To obtain his final step, Equation (8) above, Gordon assumed r = k which implies

$$\partial r/\partial b = \partial k/\partial b,$$

but he had already shown that

$$\partial r/\partial b = 0$$

implies

$$(\partial k/\partial g)r \neq 0, \tag{7}$$

which is contradictory.

M&M (1963) had claimed that Gordon had confounded dividend policy with investment policy by failing to neutralize the latter, a claim denied by Gordon (1963). Brennan explained that confounding

> means presumably that the change in the amount of investment which accompanies the change in dividend policy in Gordon's Model would of itself have effected a change in share price, regardless of how it was financed, and that Gordon is mistakenly attributing to dividend policy the effect of the change in investment policy: in other words M-M are disputing that the net present value of the marginal investment is zero, even when r is set equal to k. (pp. 1118-9)

Brennan noted that a change in b implies a change in all subsequent investment levels changing the average k, unless all k_t are equal. He expresses the net present value of the change in investment policy, NPV, in terms of the change in period t's investment, I(t), as:

$$NPV = \sum_{t=1}^{\infty} \frac{I(t)}{(1 - k_t)^t}\left[-1 + r \sum_{T=1}^{\infty} \frac{1}{(1 + k_{t+T})^T}\right]. \quad (9)$$

Gordon claimed that setting $r = k$ results in $NPV = 0$, but that is not the case unless all $k_t = k$ so that the last summation in Equation (9) becomes

$$\sum_{T=1}^{\infty} \frac{1}{(1 + k_{t+T})} = \frac{1}{k}$$

$$= \frac{1}{r}.$$

Therefore, Gordon's approach only neutralizes investment policy in the one case which he claimed is most unlikely, equal k_t's!

Having indicated the error in Gordon's work, Brennan then proceeded to reestablish M&M's dividend irrelevance theorem without their assumption of symmetric market rationality. He posited

> a more direct set of assumptions leading to the same conclusion [as M&M which] might be called the "independence ofirrelevant information" which requires that:

(a) investors are rational in the above [M&M] sense, and
(b) shares are valued only on the basis of their future prospects, and
(c) at least some investors know from experience that this is so. (pg. 1120)

Since the future prospects of the firms M&M assumed to be identical, $\tilde{V}_1(1) = \tilde{V}_2(1)$ will be anticipated by at least some investors who will arbitrage away any difference in return until $\tilde{R}_1(0) = \tilde{R}_2(0)$.

> Thus any denial of the irrelevance of dividend policy must rely upon a rejection of the principle of symmetric market rationality, and the assumption of the independence of irrelevant information. To reject the latter assumption requires one of the following three assertions: either that:
> (a) investors are not rational, or
> (b) stock prices depend on past events as well as on their expected future prospects, or
> (c) there exist no investors who understand the security valuation process. (pg. 1121)

HIGGINS

While Brennan met the criticism concerning M&M's strong ceteris paribus assumption, it remained for Higgins (1972) to deal with the problem of increasing perceived riskiness of dividends through time. In perfect capital markets he showed that even if the firm is growing and future dividends are perceived as more risky, if dividend changes are financed by issuing or repurchasing equity, the dividend change is irrelevant. The maintenance of the level of equity immunizes investment. He argued that if a higher payout were desired by investors, they could costlessly create "homemade dividends" by selling shares. Implicit, though not discussed, is the possibility of investors who preferred gains buying additional shares (in the manner of Dividend Reinvestment Plans). Since in a perfect market investors can costlessly transform a high (low) payout stock into a low (high) payout one, they will be indifferent as to the level set by management.

CHAPTER TWO

DIVIDEND (IR)RELEVANCE IN IMPERFECT CAPITAL MARKETS

MILLER AND MODIGLIANI

In their 1961 article M&M charted the course of much future research on dividend policy. In their last two pages they noted that there are an almost limitless number of combinations of imperfections which might be examined. To narrow the field, however, they noted that to have a significant effect on dividend policy any imperfection must have two characteristics: (1) the impact must systematically affect the preference between a dollar of dividends and a dollar of gains; and (2) even if an imperfection is systematic, it must have a permanent impact on the relative pricing of dividends versus gains. Any unsystematic effect is captured by the error term in real-world applications of theoretical models, and any price effect that is not permanent will result in a shift to a new equilibrium with each firm attracting its own clientele eliminating any price differential.

M&M suggested transaction costs as an example that may systematically cause "young 'accumulators' [to] prefer low-payout shares and retired persons [to] lean toward 'income stocks'..." (pg.431). Ownership would shift until firms had clienteles of investors who preferred their payouts. Only if investor preferences were concentrated at one end of the payout spectrum where few firms matched their needs would the imperfection be permanent. M&M commented that only the personal tax bias in favor of gains "would seem to be even remotely capable of producing such a concentration..." (pg. 431). This bias would be opposite to the effect predicted by Gordon and might be offset by corporate investors with a tax bias for dividends over gains and tax-free investors such as institutions and low-income retirees.

HALEY AND SCHALL

In their book, Haley and Schall (1979) (H&S) listed a variety of observed market imperfections:

(1) investor trading costs,

(2) limitations on personal borrowing,

(3) personal tax structure bias,

(4) information access and cost,

(5) issue or flotation costs,

(6) costs of financial distress,

(7) agency costs,

(8) asset indivisibilities, and

(9) limited markets.

Although H&S discussed each of these imperfections, the theoretical framework that they developed followed the conclusions of M&M and concentrated on personal tax biases (pp. 363-441). Part of H&S's emphasis on personal taxes is due to their observation that some other imperfections may be unsystematic. They singled out investor trading costs as an example which would

> limit the degree to which arbitrage can operate....Hence the value-additivity principle would hold only as an approximation; the extent of the approximation is dependent on the type of transaction required and the magnitude of the resulting costs. Unsystematic departures from the perfect-market assumptions

> introduce some vagueness into what would otherwise be exact relationships. (pp. 364-365)

Secondly, some imperfections may lack materiality: "A difficult quality to assess since it involves comparisons between alternatives ....[and] is definitly an empirical issue." (pg. 365) The costs of issuing debt were given as an example which might be material in choosing between a public bond issue and a bank loan, but not material if the proceeds were used to retire stock which "(under simplifying assumptions) would predict an increase in the value of the firm..." (pg. 365).

Finally, H&S were interested in a problem that was tractable.

> The general impact of imperfections on individuals is to make their investment-consumption decisions much more complex, dependent on past decisions regarding their asset portfolios, and more dependent on personal circumstances. To put it more succinctly, the individual's problems are messy and very difficult to treat analytically. (pg. 365)

In their analysis, H&S assumed perfect capital markets (see page seven for their listing) except for personal tax structure biases with all investors facing a different tax rate on ordinary income TI than on gains TG. They also assumed saleability of tax losses, given tax rates constant over time, given investment policy, corporate deductibility of interest but not dividend payments, and shareholder wealth maximization.

Since the market is assumed free of transaction costs, in any change in dividend policy the cum-dividend value of the shares would be arbitraged to equal the after-tax ex-dividend wealth of the original shareholders. This leads to the development of measures of the advantage of debt over (1) internal equity and (2) external equity. With both measures, whether debt is preferred is a function of the corporate tax rate T and the personal tax rates T_I and T_G.

H&S then discussed unspecified studies that estimated the U. S. personal tax rate on ordinary income to be $T_I = .32$ and inferred an effective gains tax, allowing for deferral, of approximately $T_G = .10$. Given the assumptions of their model, they concluded that there is a modest advantage of debt over internal equity for large corporations ($T = .48$) but not for small ones ($T = .20$), and internal equity is preferred over external equity.

It is evident that in markets that are perfect except for investor tax biases, dividend policy, whether to sell new shares to finance dividends to the old shares, is a question of the inter-relationships between investor tax rates on ordinary income and gains, and on corporate tax rates.

In H&S's analytic framework reviewed above, all investors were assumed to have identical tax rates. H&S then extended their study to include investors with differing tax rates, but limited to the case where the marginal tax rate on gains is less than that on dividends. They continued to assume capital markets that are perfect except for investor tax biases.

Their conclusion was that investor income taxes biased in favor of gains imply that external equity should never be used and dividend policy should follow the pure residual dividend theory. They noted that flotation costs would strengthen their conclusions but that in some cases investor transaction costs (for those needing current income) and information costs (for those viewing dividend payout reduction as a signal of declining prospects) might compensate to dictate another policy.

As noted by M&M (1961), however, for some investors (corporations) the tax rate is higher on gains than on dividends, and for others (investment institutions and low-income retirees) the tax rates on both are equal to zero. H&S's theory that investor tax biases favor internal equity over external equity is therefore open to question. More will be said about H&S later as a basis for the new DRP and ERTA theory developed in this study.

MILLER AND SCHOLES

Miller and Scholes (1978) (M&S) presented the levered use of tax-free or tax-deferred devices as a means of eliminating, or at least greatly reducing, the tax bias favoring gains over dividends. Without discussing the details of their procedure, the basic principle they used was to borrow to purchase tax-favored assets, using the interest on the loans as a tax shield to shelter other taxable income, as from dividends. Their numerous examples (life insurance, independent retirement accounts, Keogh plans, investment in human capital) illustrate how one may use the IRS Code to immunize dividend income from ordinary tax, while data on the sizes of these tax-favored accumulation devices suggest the extent of their use. The tax shelter provided by dividend reinvestment plans of qualified utilities has been estimated to cost the U. S. Treasury between $130 and $450 million dollars per year in lost revenues (Tax, 1982, Appendix A).

For purposes of the current proposal, the implication is that the clientele effect of dividend policy should not be expected to exhibit the clear-cut high-low bracket dichotomy suggested by other writers.

In fact, many "taxable" investors may be knowledgeable or clever enough to be indifferent as between dividends and gains and DRP's may be a factor assisting them.

DeANGELO AND MASULIS

DeAngelo and Masulis (1980) employed arguments similar to Haley and Schall to demonstrate that if some individuals are taxed more favorably on debt than on equity income and others are taxed more favorably on equity than on debt income, that both types of securities will be demanded and supplied. To the individual firm, capital structure will be irrelevant but aggregate supplies will be socially relevant.

To examine the relevance of dividend policy, they first split corporate earnings into dividends and gains components, as is done by Haley and Schall. When they assumed that dividends are taxed more heavily than gains, they found that both debt and gains dominate dividends so no dividends would be supplied or demanded. Even the ability to shelter dividend income, as in the Miller and Scholes case, will not be sufficient to produce positive dividends. They noted that introduction of the dividend exclusion would produce a demand for and supply of dividends, but not to the extent observed in the markets.

> When dividend-specific personal tax shelters (e.g., the exclusion) exist, equilibrium prices will adjust to imply that any given firm is indifferent among all debt, dividend, and capital gains packages of earnings. (pp. 453-454)

MILLER AND ROCK

Standard financial models assume information symmetry but in the real world insiders often have superior knowledge. Miller and Rock

(1985) showed that information asymmetry leads to less than optimal levels of investment. Contractual provisions requiring insiders to divulge secrets and prohibiting them from profiting from them can overcome the losses due to asymmetry but they, too, lead to inefficiencies.

Asymmetries lead to signalling of various sorts. Earnings announcement effects are generally accepted but dividend announcement effects, apart from simultaneous earnings effects, are just being demonstrated. There is an incentive for some firms to display false signals.

> No one is fooled....The damage is caused by the POSSIBILITY (italics theirs) of deception, which the market allows for, not by the deception itself. And it shows up, not as wealth transfers, but as lost opportunities whose consequences are borne by all shareholders, sellers and nonsellers alike. (p. 1045)

Miller and Rock showed that at equilibrium the cost of dividend signalling (including dividend payment costs, new capital issuance costs, and personal taxation on the dividends) is worth it to "good news" firms to confirm earnings numbers. It is not worth it to "bad news" firms who develop reputations.

CHAPTER THREE

DIVIDEND POLICY, FIRM VALUE AND THE CLIENTELE EFFECT: EVIDENCE

Many investors and analysts believe dividend policy matters (Dorfman, 1986) but whether dividend policy actually does affect firm value or create dividend clienteles is an empirical question.

FRIEND AND PUCKETT

In 1964, Friend and Puckett (1964) (F&P) reviewed several earlier studies (Durand, 1959. Gordon, 1959. Graham and Dodd, 1934) which used linear regression models of the form:

$$P_i = a_i + bD_i + cR_i + e_i; \tag{10}$$

where

P_i = the price per share of firm i,

D_i = the dividends per share,

R_i = the retained earnings per share,

a_i = a constant for firm i,

b = the dividend multiplier, and

c = the retained earnings multiplier.

Results of these earlier studies generally indicated that the dividend multiplier was as much as four times as great as the retained earnings multiplier implying that a dollar of dividends had more value than a dollar of gains. F&P believed that such studies were flawed and proceeded to describe numerous statistical problems with the methods used and provided rationale for why the earlier results were contrary to expectations.

F&P began by noting the logical inconsistency that:

> Even those who believe that a higher b than c--the typical result--indicates investor preference for dividends seem nonetheless to feel that the optimal earnings payout ratio is normally less than one. (pg. 660)

In fact, the above model implies either a unique optimal payout of zero if $b < c$, or 100% if $b > c$, or else indifference if $b = c$. On the other hand;

> Theory would suggest that regardless of the optimum payout for any individual company, at that optimum $1 of dividends would on the average have the same effect on stock price as $1 of retained earnings. Any difference between the values of b and c therefore represents either a disequilibrium payout position or a statistical limitation of the analysis employed, including most notably a correlation of dividends or retained earnings with omitted factors affecting price. (pp. 660-661)

Risk and externally financed growth were suggested as possible omitted factors. Since these early studies did not hold risk constant, the model implicitly assumed that risk was uncorrelated with payout. F&P believed, however, that "high risk may RESULT in both low payout and low price-earnings ratios....[which] could conceivably impart a substantial upward bias to the dividend coefficient..." (pp. 661-662). Omitting the variable of externally financed growth could weaken the relationship between firm price and retained earnings, imparting a downward bias to the retained earnings coefficient. Diversity in accounting procedures would further degrade the preciseness of earnings and hence retained earnings, amplifying this effect.

Another argument F&P presented was that if (1) dividends are more stable than retained earnings and (2) "the elasticity of shareholder expectations with respect to short-run income movements is unity..." (pg. 664), then such a regression model will weight the dividend term more heavily than the more eratic retained earnings term.

F&P considered the possibility of individually including the omitted variables but concluded that they were too "slippery" to be measured. They then lumped together all firm-specific variables F_i in an extension of Equation (10):

$$P_{it} = a_t + b_t D_{it} + c_t R_{it} + F_i + e_{it}, \tag{11}$$

where the subscript t refers to time. On the assumption that F_i is time invariant, a similar equation derived for the prior period can be subtracted from Equation (11) giving a model without firm effects. Unfortunately, the error terms become quite large, serial correlations inhibit interpretation, and firm effects are probably multiplicative and not additive.

Assuming multiplicative firm effects they wrote

$$P_{it} = (k_t + f_i)E_{it}$$

where

k_t = the average price-earnings ratio for a sample,

f_i = the firm effect multiplier, and

E_{it} = the earnings of firm i in period t.

If the f_i are time invariant, then

$$\begin{aligned} f_i &= f_{it} = f_{i(t-1)} \\ &= P_{i(t-1)}/E_{i(t-1)} - k_{t-1} \\ &= (P/E)'_{i(t-1)}, \end{aligned} \tag{12}$$

which is the individual firm's deviation from the average price-earnings ratio for the previous period and which should capture all firm-specific variables. Substituting Equation (12) into Equation (11) gives a price model

$$P_{it} = a + bD_{it} + cR_{it} + d(P/E)'_{i(t-1)} + \text{error}.$$

This, together with the dividend supply model

$$D_{it} = e + fE_{it} + gD_{i(t-1)} + h(P/E)'_{i(t-1)} + \text{error}$$

and

$$E_i = D_{it} + R_{it}$$

gives

$$P_{it} = [a + e(b - c)] + [c + f(b - c)]E_{it} +$$
$$[g(b - c)]D_{i(t-1)} + [d + h(b - c)](P/E)_{i(t-1)}. \qquad (13)$$

To normalize earnings, F&P used a market approach assuming that "price and dividends are always...'normal', and that short-run earnings abnormalities sum to zero over the sample of corporations in question..." (pg. 668). Any variation in

$$(E/P)_{it}/(E/P)_{kt}, \qquad (14)$$

where the denominator is the average for the sample must be due to short-run variations in earnings for firm i. After plotting Equation (14) they concluded that the linear form

$$(E/P)_{it}/(E/P)_{kt} = a_i + b_{it} + e_{it}$$

was appropriate. The normalized ratio

$$(E/P)n_{it} = (a + b_{it})(E/P)_{kt} \qquad (15)$$

can then be multiplied by P_{it} to get normalized earnings and D_{it} can be subtracted from that to give normalized retained earnings.

F&P finally applied the normalized earnings derived from Equation (15) together with Equation (13) to a sample from five industries for two years and found that the retained earnings coefficient rose with respect to the dividend coefficient and in some "growth" industries the former exceeded the latter. They concluded that their

> analysis suggests that there is little basis for the costomary view that in the stock market generally...a dollar of dividends has several times the impact on price of a dollar of retained earnings. (pp. 679-680)

BLACK AND SCHOLES

At the time of Friend and Puckett's study there was no risk-return model available. Ten years later, Black and Scholes (1974) (B&S) used a variant of the Capital Asset Pricing Model (CAPM) to test whether there was a difference in risk-adjusted returns between high and low payout stocks. B&S referred to an earlier work by Black, Jensen, and Scholes (1972) which showed that the standard CAPM:

$$E(\tilde{R}_i) = R_f + [E(\tilde{R}_m) - R_f]\beta_i,$$

where:

R_f = the short-term risk-free rate,

$\tilde{R}_m$ = the market return, and

β_i = the beta of firm i

did not describe post-war returns as well as:

$$E(\tilde{R}_i) = \gamma_0 + [E(\tilde{R}_m) - \gamma_0]\beta_i, \qquad (16)$$

where γ_0 was significantly larger than R_f. This difference would imply that high (low) beta stocks are over (under) valued. To Equation (16) B&S added a term reflecting dividend yield obtaining:

$$E(\tilde{R}_i) = \gamma_0 + [E(\tilde{R}_m) - \gamma_0]\beta_i + \gamma_1(\delta_i - \delta_m)/\delta_m,$$

where δ_i and δ_m are the dividend yield on stock i and the market. In this form they were able to separate the effect of risk from that of dividend yield. If γ_1 was significantly different from zero and γ_0 was not significantly different from R_f, then the effect found by

Black, Jensen, and Scholes would be due to dividend policy. If, however, the opposite combination occurred, then no dividend policy effect would be indicated.

B&S did not perform a customary cross-sectional regression analysis because of bias that would have been introduced by assuming independence among observations that were dependent. To avoid this they constructed portfolios using information available at the start of each year, rolling the portfolios forward one year at a time. Each year they used five years of data to rank the securities by dividend yield to form five groups, and then by beta within each of the groups to form five sub groups, a total of twenty-five intermediate portfolios. B&S then calculated the beta, variance, and dividend yield of the intermediate portfolios and their market--an equally-weighted portfolio of all of their securities.

The results indicated that with the effect of beta removed, the alpha of a portfolio was independent of yield.

> For the entire period and for every sub period, the estimate of γ_1 is insignificantly different from zero. This means that the expected returns on high yield securities are not significantly different from the expected returns on low yield securities, other things equal. (pg. 17)

The difference between γ_0 and R_f remained, however, indicating positive (negative) alphas for low (high) beta stocks.

ROSENBERG AND MARATHE

Rosenberg and Marathe (1978) redid the Black and Scholes study with more efficient statistics. They omitted grouping into portfolios, thereby retaining more information, and instead of ordinary least squares used an instrumental variables approach. Unlike the earlier B&S study, they found the dividend term to be significant.

LITZENBERGER AND RAMASWAMY (79)

Both Black and Scholes and Rosenberg and Marathe used last year's dividend as a proxy for next year's. This ignores the fact that with typical quarterly dividends the ex-dividend months' yields are underestimated and the other months' yields are overestimated. Litzenberger and Ramaswamy's (1979) (L&R) analysis developed an after-tax CAPM model, similar to one used earlier by Brennan (1970), but incorporating progressive taxation at different rates on income and gains and both income and wealth constraints on borrowing. Ex-dividend months were separated with dividend yield in other months set equal to zero. Their assumptions include

(1) concave utility functions in after-tax wealth,

(2) multivariate normal security returns (together with (1) implying a mean-variance world),

(3) frictionless securities markets,

(4) homogeneous expectations,

(5) marketable assets,

(6) a risk-free rate R_f,

(7) end-of-month dividends are known at the beginning of the month,

(8) continuously progressive income taxes on dividends,

(9) no tax on gains, and

(10) borrowing is limited in that interest cannot exceed dividends and margin is restricted to a fixed fraction of total assets.

L&R proceeded by determining the mean and variance of the investor's after-tax income subject to the income and margin constraints on borrowing. The LaGrangian satisfying appropriate constraints and market equilibrium conditions yields the expected return on security i, an after-tax CAPM:

$$E(\tilde{R}_i) = R_f + a + b\beta_i + c(d_i - R_f) \tag{17}$$

where:

R_f = the risk-free rate,

β_i = $cov(\tilde{R}_i, \tilde{R}_m)/var(\tilde{R}_m)$,

d_i = the dividend yield on security i

= end-of-month dividend/beginning of month price,

and where:

> "d" is the excess return on a zero beta portfolio (relative to the market) whose dividend yield is equal to the riskless rate....If "c" is interpreted as a tax rate, b may be viewed as the expected after-tax rate of return on a hedged portfolio which is long the market portfolio and short a portfolio having a zero beta and a dividend yield equal to the riskless rate of interest.... (pp. 170-171)

In the above model, c represents the tax advantage of gains over dividends. On the supply side, firms could increase their market value by decreasing (increasing) dividend payout if $c > 0$ ($c < 0$) until $c = 0$. The after-tax CAPM in Equation (17) becomes

$$E(\tilde{R}_i) = R_f + a + b\beta_i$$

or

$$E(\tilde{R}_i) = (a + R_f)(1 - \beta_i) + E(\tilde{R}_m)\beta_i$$

which is the same as the before-tax CAPM.

> Even though the before tax and after-tax individual mean variance frontiers are not identical,...prices are found as if there is no tax effect. (pg. 173)

Because covariances between returns are non-zero and variances across securities are heteroskedastic, ordinary least squares estimators are inefficient. Maximum likelihood estimators avoid these problems. Furthermore, grouping into portfolios, as done by Black and Scholes, does not make efficient use of information so L&R avoided that too.

Results showed a significant clientele effect with gains preferred by more holders of low-yield stocks than by holders of high-yield ones. The dividend yield effect was even detected in the non-ex-dividend months. "[F]or every percentage point [increase] in yield the implied tax rate for ex-dividend months declines by 0.069." (pg. 189) The data also

> indicate that there is a strong positive relationship between before tax expected returns and dividend yields....[such that] for every dollar increase in return in the form of dividends, investors require an additional 23 cents in before tax return (pg. 190).

Although the significance of the dividend coefficient was contrary to Black and Scholes' findings, its magnitude and direction were consistent with that study.

LITZENBERGER AND RAMASWAMY (80)

A second article by the same authors (1980) extended their findings to markets with short selling restrictions. Brennan had shown that the existence of "dividends is inconsistent with the required return per unit of dividend yield being zero" (Litzenberger, pg. 469) in a market with no borrowing limits. The earlier article by L&R demonstrated that an expected return per unit of dividend yield being zero is consistent with positive dividends if constraints are imposed on either borrowing or on the deductibility of margin interest. This article presented new evidence as well as results from other studies that was consistent with this conclusion. They further showed that if short sales are restricted "that tax-induced clienteles form and the incremental expected return per unit of dividend yield is a decreasing function of dividend yield" (pg. 471).

Bar-YOSEF AND KOLODNY

Bar-Yosef and Kolodny (1976) contended that the logic used in adding a dividend payout term to the CAPM is faulty. Although they referred to the 1972 work by Black, Jensen and Scholes, the criticism applies equally to the approaches of Black and Scholes (1974), Rosenberg and Marathe (1978), and Litzenberger and Ramaswamy (1979, 1980) discussed above. Letting:

$E(\tilde{R}_i)$ = the expected return on security i,

$E(\tilde{d}_i)$ = the portion of $E(\tilde{R}_i)$ from dividends, and

$E(\tilde{g}_i)$ = the portion of $E(\tilde{R}_i)$ from gains,

then:

$$E(\tilde{R}_i) = E(\tilde{d}_i) + E(\tilde{g}_i). \tag{18}$$

Substituting Equation (18) into the covariance term of the CAPM:

$$E(\tilde{R}_i) = R_f + \frac{[E(\tilde{R}_m) - R_f]}{\sigma_m^2}\text{cov}(\tilde{R}_i,\tilde{R}_m) \tag{19}$$

yields:

$$\begin{aligned}\text{cov}(\tilde{R}_i,\tilde{R}_m) &= \text{cov}((\tilde{d}_i + \tilde{g}_i),\tilde{R}_m)\\ &= \text{cov}(\tilde{d}_i,\tilde{R}_m) + \text{cov}(\tilde{g}_i,\tilde{R}_m).\end{aligned} \tag{20}$$

If the investor expects the dividend yield to be proportion a_i of the total return, then Equation (20) becomes

$$\begin{aligned}\text{cov}(\tilde{d}_i,\tilde{R}_m) + \text{cov}(\tilde{g}_i,\tilde{R}_m) &= \text{cov}(a_i\tilde{R}_i,\tilde{R}_m) + \text{cov}((1 - a_i)\tilde{R}_i,\tilde{R}_m)\\ &= a_i\text{cov}(\tilde{R}_i,\tilde{R}_m) + (1 - a_i)\text{cov}(\tilde{R}_i,\tilde{R}_m).\end{aligned}$$

> Thus it follows that, for a given expected return, both the marginal rate of substitution between dividend yield and capital gains and, at the same time, the marginal rate of substitution between the risks associated with these components is constant and equal to minus one. (pg. 183)

Since the effect of dividend yield is built into the CAPM,

> it is not, therefore, statistically justified to add an additional incorrect criterion to serve as the only surrogate for the dividend effect and ignore the effect inherent in other variables (pg. 184).

Bar-Yosef and Kolodny suggested an alternative approach to the issue by grouping samples of industrials exhibiting similar dividend policies and deriving the Security Market Line (SML):

$$E(\tilde{R}_i) = R_f + \frac{[E(\tilde{R}_m) - R_f]}{\sigma_m^2} \mathrm{cov}(\tilde{R}_i, \tilde{R}_m) \qquad (19)$$

for each group. If dividend policy is irrelevant, the SML's for the various groupings should be colinear. Their data, however, indicated that higher payout was related to lower overall pre-tax return in both bull and bear markets. Similar results were obtained with a sample of utilities. The implication is that management should set higher payouts to increase stock value. This conflicts with the studies immediately above.

MORGAN

Other researchers examined the relative value of dividends and gains using dividend yields computed from actual dividends received. Morgan (1982) used predicted dividends based on historical information available before announcement dates. Morgan also used differences in dividend yields between portfolios and the market rather than yields themselves since the differences are less sensitive to fluctuations in prices and therefore easier to predict. The study found that results were robust to the choice of actual or predicted dividends, choice of market proxy, and method of analysis. The bottom line was that "abnormal return is positively correlated to dividend yield, realized or forecast, as the after-tax version of the CAPM requires" (pg. 1085) if it is assumed that the tax rate on dividends exceeds that on gains.

LONG

The Citizens Utilities Company has had two classes of common stock since 1956, one paying only cash dividends and the other paying "equivalent" stock dividends. Citizens is the only US company with an IRS ruling excluding the stock dividends from ordinary income taxation. In general, the tax code stipulates that if a holder of a company's stock is given the choice between cash and stock dividends, the stock dividends are taxable as if received in cash. Citizens, thus, is a laboratory-perfect example of two "firms", one paying cash dividends and the other paying stock dividends, but otherwise identical. The situation is similar to utilities qualifying under the Economic Recovery Tax Act of 1981.

Long (1978) examined the returns to the two classes of stock after adjusting for two minor complications. First, the cash dividends are quarterly whereas the stock dividends are semiannual, so the dividends paid in cash were treated as if they were costlessly reinvested in the company until the stock dividends were paid. Second, the stock dividends have amounted to about ten percent more than the cash dividends in each year and so a conversion factor was necessary. The two classes of stock were found to be nearly perfect substitutes as far as beta was concerned, but the shares paying cash dividends demanded a slight but significant premium in the market. "There is a significant demand for cash dividends in spite of a generally lower after-tax total return to investors holding claims to these dividends." (pg. 263) Also, the cash dividend class was held predominantly by small individual investors while the stock dividend class was held by larger investors and institutions.

MEHTA, MOSES, DESCHAMPS, AND WALKER

Whereas other researchers examined the relevancy of debt and dividend policies separately, Mehta, et al (1980), tested tested the two simultaneously. They developed a CAPM including both debt and preferred stock leverage, deductibility of interest payments, and estimated growth. They used book value of debt as a surrogate for market value since some debt is privately placed and the latter is not readily available.

Using both ordinary least squares and instrumental variable statistics, they could not reject the null that financial leverage is irrelevant but did reject the null that dividend policy is irrelevant. Over their test period, 1968-1972, they found that investors' preference for dividends over gains had increased. One caveat was that

> it is by no means clear that the results of this study necessarily imply dividend relevance in general. Utilities characteristically provide generous dividends and, hence, attract a clientele preferring dividends to earnings retention or growth. (pg. 1185)

ELTON AND GRUBER (70)

Elton and Gruber (1970) (E&G) examined the price drop when stocks go ex dividend to estimate the marginal investor's average marginal tax bracket. "In a rational market the fall in price on the ex-dividend day should reflect the value of dividends vis-a-vis capital gains to the marginal stockholders." (pg. 69) Therefore, the after-tax value of a marginal investor's holdings should be the same the day before and the day the stock goes ex dividend so:

$$(P_b - P_a)(1 - T_g) = D(1 - T_d)$$

or

$$(P_b - P_a)/D = (1 - T_d)/(1 - T_g) \tag{21}$$

where:

P_a = the price the day before the stock goes ex dividend,

P_b = the price the day the stock goes ex dividend,

D = the dividend, and

T_g and T_d = the marginal tax rates on gains and dividends.

E&G tacitly assumed that the market price is set by long-term investors. They further assumed that T_g is the lower of $.5T_d$ or 25%, and used closing prices on the respective dates. Since the NYSE automatically adjusts share prices by the amount of the dividend at the beginning of the ex-dividend day, beginning prices would be biased. To account for the fact that the market may have been moving up or down over the one-day period, the test statistic:

$$(P_b - P_a)/D \tag{22}$$

was calculated on both a raw and a market-adjusted (NYSE Index) basis using data from 1966-1967. The two types of results were consistent and both significantly (.01 level) different from unity. The aggregate price drop was 77.67% or 78.68% of the dividend implying a marginal tax rate of 36.4% or 35.1% before or after market adjustment.

E&G then examined the issue of a dividend clientele effect. The price drop was found to be significantly (.01 level) positively correlated to both the dividend yield and dividend payout implying an inverse relationship between marginal tax brackets and either yield or payout.

A similar analysis could be employed to determine whether DRP features affect the ex-dividend day price drop. ERTA provisions, for example, might lower the effective dividend tax brackets of long-term investors in qualified utilities so that the price drop would more closely approximate the dividend.

ELTON AND GRUBER (84)

In a second article, E&G (1984) examined over a dozen non-standard CAPM models including those which incorporate differential dividends and gains taxation. They found that each can be derived directly from an assumption about what market portfolio is efficient. Different assumptions as to which market portfolio is efficient and how to define market returns generate different non-standard CAPM's.

After-tax CAPM's assume differential taxation of dividends and gains and investors which use after-tax returns to make portfolio decisions.

> Investors in different tax brackets will face a different efficient frontier and a different riskless lending and borrowing rate in the relevant after tax (sic) terms....With a constant lending and borrowing rate the tangency portfolio is optimal for each investor and...the Sharpe Lintner equation holds between each assets (sic) expected after tax (sic) return and each investor's tangency portfolio....(pg. 921)

Thus, the after-tax CAPM's state that an asset's equilibrium return may be a function of dividend yield and tax rates. It further implies that dividend clienteles form.

GILSTER AND GILMER

Gilster and Gilmer (1985) argued that

> Elton and Gruber's empirical results can be interpreted to support almost any dividend clientele hypothesis (not necessarily tax clienteles), and that empirical evidence contradicting the tax clientele hypothesis can be interpreted to support almost any other dividend clientele hypothesis (as long as it is not tax motivated). (pg. 1)

As an example of evidence that supports almost any other dividend clientele hypothesis except taxation, they cited the ex-day behavior of the top yield decile(s). E&G (1970), Kalay (1982) and Gilster and Gilmer all found that the top yield equities had ex-day statistics greater than one. Gilster and Gilmer pointed out that this implies negative tax brackets, contradicting the tax clientele hypothesis. Actually this only implies negative tax brackets if one assumes that taxation on dividends is higher than on gains for all investors. Their main point remains true, however, that evidence may support the existence of some clientele effect but not necessarily a tax-induced one.

COPELAND AND WESTON

Copeland and Weston (1980) noted that nothing in E&G's analysis would prevent arbitragers, who as traders would not get the favorable capital gains treatment of profits, from moving in to reduce the difference between the dividend and the ex-dividend price drop. For such persons the tax rates in Equation (21) are the same and therefore:

$$(P_b - P_a)/D = 1 \tag{23}$$

or the price drop would be arbitraged to equal the dividend. Neither E&G nor Copeland and Weston modeled the effect of transaction costs so Equations (21) and (23) would hold only as approximations.

KALAY

Kalay (1982) modeled ex-dividend day behavior of stock prices by extending E&G to include transaction costs, arbitragers and long-term investors. Even in the presence of transaction costs, "large" differences between the dividend and the price drop offer opportunities for arbitrage. In particular, the difference can range between ± the expected transaction costs of a round trip if short-term investors set prices. Thus the statistic used by E&G must lie in the range:

$$1 - \alpha P/D \leq (P_b - P_b)/D \leq 1 + \alpha P/D \tag{24}$$

where αP is the expected transaction costs of a round trip. If the statistic is outside this range, something besides taxes is at work.

If a significant number of long-term investors have chosen "to buy (or sell) the stock near its ex-dividend day, for reasons unrelated to the dividends, [they] can choose to trade cum dividend or ex dividend without affecting their transaction costs" (pg. 1063) and will drive

$$(P_b - P_a)/D = (1 - T_d)/(1 - T_g) \tag{21}$$

but only as long as the statistic is within the bounds described above.

In addition, Kalay showed that E&G's methodology contained biases which exaggerated results. E&G used closing ex-dividend day prices discounted for average market returns to avoid the artificial opening prices set by the exchange. Kalay noted that this adjustment gives an ex-dividend day price that is biased upward for stocks with higher expected returns or lower yields. Kalay discounted the ex-dividend closing price using a martingale model and a time-series model. In both cases the ex-dividend day drop was larger than that found by E&G but still less than one and the correlation between the ex-dividend day price drop and the dividend yield was still positive. The width of the range implied expected transaction costs that were far lower than those paid by ordinary investors and of the same order of magnitude as those incurred by members of the NYSE.

Kalay's study implies that marginal tax brackets of marginal investors cannot be inferred from the ex-dividend day price drop, but that his results are consistent with a population that pays higher taxes on dividends than on gains.

LAKONISHOK AND VERMAELEN

Lakonishok and Vermaelen (1983) (L&V) applied an analysis similar to E&G and Kalay to a change in Canadian tax law that affected the relative values of dividends and gains. The change, which went into effect in 1972, increased the value of dividends relative to gains for taxable investors. The dividend clientele theory of E&G would therefore predict an increase in the statistic:

$$(P_b - P_a)/D. \tag{22}$$

At the same time the law decreased short-term profits of traders who were members of the Canadian exchanges. L&V claimed that the short-term trading effect theorized by Kalay would therefore predict a decrease in the above statistic.

L&V used both opening ex-dividend day prices and closing prices adjusted for the average market return for the day, and both raw dividends and dividends rounded to the nearest eighth. They tested both E&G's statistic and their alternative:

$$p = \frac{\sum_{i=1}^{n} \Delta P_i / P_i}{\sum_{i=1}^{n} D_i / P_i}, \tag{25}$$

where

$\Delta P_i = P_b - P_a$ for security i ($i = 1,\ldots,n$) and

P_i = the closing price of i on the last day cum dividend.

The former statistic (Equation (22)) is heteroscedastic since error is proportional to price but not to dividend. The latter statistic (Equation (25)) is equivalent to the average price drop divided by the average dividend yield and is adjusted for heteroscedasticity since the price change is scaled for the security's price.

L&V found no significant differences in results between opening and market-adjusted closing prices and did not attempt to use closing prices adjusted for individual security returns. Since the choice of opening or adjusted prices did not affect conclusions, market-adjusted closing prices were used in reporting results. The price drop relative to the dividend decreased between 1971 and 1972 consistent with the short-term trading hypothesis and inconsistent with the tax clientele hypothesis. Median tests and Spearman-rank correlations with dividend yield deciles did find that drops were significantly (.1 level) positively correlated with dividend yield.

L&V claimed the short-term trading hypothesis explains why the drop is less than the dividend, why the E&G statistic is lower in Canada than in the US, and why the price drop is related to dividend yield. L&V's study did not explain why the price drop was only about 30% of the dividend in Canada in 1972.

BOOTH AND JOHNSTON

Whereas L&V used the Canadian experience to support the short-term trading hypothesis, Booth and Johnston (1984) (B&J) drew the opposite conclusion. B&J outlined several possible models and used the Canadian tax law changes of the 1970's to test them. The realized capital gains tax clientele hypothesis was the one developed by E&G which states that at equilibrium long-term investors planning to sell near the ex-dividend date will only be indifferent if

$$(P_b - P_a)/D = (1 - T_d)/(1 - T_g). \tag{21}$$

For those preparing to buy near the ex-dividend date the equilibrium condition is

$$(P_b - P_a)/D = (1 - T_d)/(1 - T_g/(1 + k)^n) \tag{26}$$

where

n = the investors' holding period and

k = the appropriate discount rate.

For buyers with short holding periods, Equation (26) reduces to Equation (21).

The unrealized capital gains tax clientele hypothesis assumes that the ability to defer capital gains and choose the timing of their realization effectively equates $T_g = 0$ further reducing Equation (21) to

$$(P_b - P_a)/D = 1 - T_d.$$

The institutional short-term trading hypothesis leads to the bounds given by Kalay

$$1 - \alpha P/D \leq (P_b - P_b)/D \leq 1 + \alpha P/D \tag{24}$$

Finally, the professional short-term trading hypothesis adapts Equation (21) to the professional floor trader who takes losses as a business expense and not as a capital loss.

The Toronto Stock Exchange differs from the NYSE in several significant points. Individuals account for 50% of the trading value versus 20% on the NYSE, specialists trading for their own account are virtually nonexistant, and brokerage rates are still fixed. Because of these differences, B&J rejected the setting of ex-dividend day prices by professionals or institutions. Their data show that the E&G statistic is significantly different from zero (.01 level) and from one (.05 level). The marginal tax bracket implied by the statistic is significantly greater than the highest in the Canadian code so the realized capital gains tax model is rejected. The only model of the four not rejected by the data is the clientele model with $T_g = 0$. An even better fit is found with a nationality clientele hypothesis. Stocks also listed on the NYSE, AMEX, or NASDAQ show relative price drops that are unresponsive to Canadian tax law changes and imply a US tax bracket of 44%. Stocks solely listed on the TSE show increasing relative price drops consistent with Canadian tax law changes and the unrealized capital gains tax clientele hypothesis.

POTERBA AND SUMMERS

One of the difficulties in researching the effects of taxation on the valuation of dividends and gains is that most US tax code changes have been evolutionary. Poterba and Summers (1984) used British data to examine several radical tax law changes relating to dividends and gains and affecting individuals, institutions, and arbitragers. Using an after-tax CAPM and other tests they found

> clear evidence that taxes affect the equilibrium relationship between dividend yields and market returns. These findings suggest that taxes are important determinants of security market equilibrium and deepen the puzzle of why firms pay dividends. (pg. 1397)

They concluded that dividend taxation reduces the relative value attached to dividends by investors. Changes in gains taxation had no pronounced effect on the ex-dividend day price drop but changes in dividend taxation had a substantial effect. The short-term trading hypothesis--that the ex-dividend day drop is determined by arbitragers--was rejected by the evidence following changes in British law affecting short-term traders. The tax-effects hypothesis--that the ex-dividend day drop is determined by the relative taxation of dividends and gains--was supported. Use of a squared yield term to capture non-linear clientele effects found that the clientele effect is larger when dividend tax rates are higher.

> These findings suggest that the major tax reform in 1973 did not lead to changes in security returns for only a few days around the ex-day. Rather, they suggest a more persistent effect which can be traced in monthly returns. (pg. 1412)

> [O]ur findings that the valuation of dividends CHANGES (italics theirs) across tax regimes provides strong evidence that taxes account for part of the positive relationship between yields and stock market returns....and further emphasize(s) the need for tests which rely upon genuine variation in the tax system in studying dividends and taxes. (pp. 1412-1413)

MILLER AND MODIGLIANI

M&M's 1961 article first suggested the possibility of a dividend clientele effect with high bracket investors preferring gains, corporate investors preferring 85% excludable dividends, and indifferent tax-free individuals and financial institutions arbitraging away any difference in value. They believed that the existence of a clientele effect might give management reason to maintain consistent dividend policy, but if a wide range of payouts and investors were available, the dividend policy of a particular corporation should be irrelevant.

PETIT

In 1977, Petit made use of a data base from Purdue containing information on 914 actual investor accounts as well as demographics on the investors to examine the clientele effect. Petit ran a multiple regression between portfolio dividend yield as the dependent variable and beta, client's age, three-year average family income, and the difference between the client's income and gains tax rates. He found that holding risk constant, higher dividend yield is more preferred by investors who (1) are older, (2) have lower income, and (3) are in lower tax brackets. Since the data were from one large brokerage firm and since some clients might have more than one account or might own some shares in their own name, the data may have some unknown statistical biases.

BLACK AND SCHOLES

In their 1974 article (described more fully elsewhere), Black and Scholes' (B&S) explanation of why some might prefer dividends despite the apparent gains tax preference is reminiscent of M&M's. Those who might prefer dividends include

> (a) corporations, because they generally pay higher taxes on realized gains than on dividend income, (b) certain trust funds in which one beneficiary receives the dividend income and the other receives the capital gains, (c) endowment funds from which only the dividend and interest income may be spent, and (d) investors who are spending from wealth and who find it cheaper

> and easier to receive dividends than to sell or borrow against their shares. (pg. 2)

B&S also refer to the large group of tax-exempt individuals and intermediaries as being indifferent.

RUNDLE

A class of investors preferring dividends may be behind the recent pickup in activity of some high-dividend stocks. Rundle (1984) noted that several stocks have trading volumes up to fifteen times normal near ex-dividend dates despite lack of news or even rumors. These transactions are for cash, do not pass over the trading floor, seem to involve a repurchase agreement, and do not appear to affect prices. Eighty percent of the trades involve one brokerage firm operating for unnamed clients who appear to be taking advantage of the eighty-five percent exclusion of dividends from corporate taxable income.

DOLAN

Another interesting example of the formation of dividend clienteles was reported by Dolan (1985). Since corporate investors are exempted from taxation on eighty-five percent of dividends received, they sometime use "dividend plays", buying just before and selling just after the ex day to capture the tax benefit. One high-dividend company was observed to have had trading volume one hundred times its normal level but with its closing price unchanged. At least for a short period, the firm's dividend clientele changed due to the complexities of the IRS Code.

WOOLRIDGE

Woolridge (1983) examined dividend changes in an attempt to determine whether wealth transfer effects or signalling effects dominate. Wealth transfer theories state that an unexpected increase in dividends shifts part of the corporation's value from bondholders, with incomplete or limited protective covenants, to shareholders. Dividend signalling models claim that information asymmetries exist and insiders use dividend changes to signal their more complete information to outsiders. Both sets of theories are supported by several prior studies which found a positive relationship between dividend changes and stock returns on announcement dates. The two camps, however, predict different reactions in bond and preferred stock returns. Wealth transfer implies that an unexpected increase in dividends hurts bond and preferred stock holders whereas dividend signalling implies bond and preferred stock holders will benefit along with stock holders. Woolridge used simultaneous results from these three types of securities to ascertain that the signalling effect dominates although wealth transfer is not ruled out.

LINTNER

Even if dividend policy has no effect on firm value, management might operate as if it did. Lintner (1956) employed interviews with officers of twenty-eight firms to determine how they set dividends. Since the companies were not a random sample but were carefully selected to represent the diversity of relevant characteristics, the results of his initial study lack statistical significance. However, "in view of the extent of the diversity built into the selection... some [non-statistical] significance can be attached to such uniformities in policy as were observed" (pg. 99). He found that management: (1) focused on changes in dividend payout rather than on payout levels, (2) avoided changes that might have to be reversed, (3) reacted to gross changes in earnings, and (4) ignored the residual dividend theory. In particular, twenty-six of the twenty-eight companies either had explicit target payout ratios and target adjustment rates or acted as if they did.

Based on these observations, Lintner suggested a model equivalent to:

$$D_{it} = a_{it} + cD^*_{it} + (1 - c)D_{i(t-1)} + u_{it}$$

where

D_{it} = the dividends for firm i for period t,

D^*_{it} = the target dividends for firm i for period t,

= rY_{it},

r = the target payout ratio,

Y_{it} = the earnings of firm i for period t,

$a_{it} \geq 0$ to represent the reluctance to reduce dividends,

c = the adjustment rate or the proportion of the indicated dividend change to be reflected in the first year, and

U_{it} = the error term.

The data from his selective sample fit the model quite well. As noted, no statistical tests are possible with this kind of sample but in eighty-five percent of the company-years represented the dividends set by management were explainable by the model, allowing for rounding to the nearest five cents. In fact, only two of the twenty-six changed their target payout ratios (r) and two changed their adjustment rates (c) over the postwar period. To test the model statistically, he fitted a regression line to data from 1918 through 1953 and its major subgroups. All periods gave coefficients which were consistent with the conclusion that the aggregate target payout ratio was r = .50 and the target adjustment rate was c = .30. Despite claims by some that post World War II dividends were unexplainably higher than those before 1941, Lintner's model fitted to 1918 through 1941 data predicts the first nine years of postwar dividends within two percent.

It is interesting to speculate whether a company with a DRP would maintain the same target payout in terms of its gross dividends, or adjust its declared dividends upwards to maintain a constant net payout ratio.

FAMA AND BABIAK

Fama and Babiak (1968) used 1947-1964 data on 201 firms to estimate the parameters of several dividend prediction models. The models used terms for current and lagged earnings; cash flow; current and lagged depreciation; current, lagged and future capital spending; and lagged dividends. They performed Monte Carlo simulations under a variety of assumptions and concluded that for most firms suppressing the constant term ait in Lintner's model will provide better prediction even if the term is actually non zero. Suppressing a non-zero constant term introduced a small bias but that was more than overcome by reduced variance. The simulations found that the lagged earnings term has explanatory value but that its suppression resulted in better estimates of both r and c even when the simulation included lagged earnings as a generating variable. Simulations using autocorrelations that were small and negative fit the real world data well. They caused bias and dispersion in estimates of c, but "autocorrelation in the disturbances in the form of a first order process with $\rho = -.2$ apparently IMPROVES (italics theirs) the estimates of r." (pg. 689)

They tested the various models on 1947-1964 data from a holdout sample of 191 firms and on 1965 data. They found that: (1) net earnings provides a better fit and is a better predictor than either cash flow or earnings and depreciation entered separately; (2) lagged dividends beyond last year's do not improve fit or prediction; and (3) capital spending does not aid either fit or prediction. The two-variable Lintner model described above provided both a good fit to the holdout sample and good prediction into the next year. It was surpassed only slightly by a model excluding the constant term and including last year's earnings.

KHOURY AND SMITH

The preceeding two studies explained how firms appeared to set dividend policy but did not examine why they chose the policies they did. Khoury and Smith (1977) noted that the abrupt change caused by the 1972 Canadian tax revision provided a laboratory for the examination of how personal tax biases affect corporate dividend policy. The new code made fifty percent of (previously untaxed) capital gains taxable and slightly lowered the tax on dividends for most brackets.

They used samples of Canadian and US firms to obtain cross-sectional frequency distributions of percentage annual dividend (1) changes, (2) payouts, and (3) yields. The Lintner partial adjustment dividend model was employed to forecast next period's expected dividends. Forecasting error residuals were used to test (1) whether Canadian and US dividend policies were the same and (2) whether

Canadian dividend policies were unchanged after the new tax law took effect. Both payouts and yields were found to be significantly lower north of the border and average Canadian dividend changes rose from 5.0% prior to the new law to 10.1% after. The standard deviation of dividend changes was higher in Canada and the z-statistic for the difference between pre-post 1972 groups was significant only for Canada. In Lintner's model the term for past dividends tends to have a more significant coefficient than the earnings term due to the measurement error attached to the latter. This statistical anomaly was reduced in this study by using normalized earnings calculated as the simple mean of three year earnings. However, neither coefficient was as significant after the new tax law as before reflecting the discontinuity in dividend policy. Furthermore, dividend yields in Canada but not the US went down after January 1972 even though dividends and payouts went up. This suggests that investors were willing to pay more for the higher payouts after the personal tax bias favoring gains over dividends was reduced.

CHAPTER FOUR

DIVIDEND REINVESTMENT PLANS: BACKGROUND

Recently the securities markets have been undergoing fundamental changes in the flotation of new issues. Direct marketing has grown to as much as thirty-five percent of the size of underwritten distributions, a trend dramatized by Sears' offering of its notes directly to its 26 million card holders (Field, 1979) and Citicorp's offering of commission-free shares to its 17 million customers (Sebastian, 1985).

DIVIDEND REINVESTMENT PLAN DEVELOPMENT

Less dramatic than Sears' move, but perhaps more substantial in the long run, has been the rise of Dividend Reinvestment Plans (DRP's). The typical plan allows stockholders to have their dividends reinvested automatically in additional shares of the company and generally permits cash contributions as well. Mutual funds pioneered the concept in the twenties (Fredman and Nochols, 1980). The first non-financial DRP was introduced by Allegheny Power in 1968 (Born,1981) but it merely shifted ownership of its securities since the company's plan bought treasury stock to distribute to participants (Baker and Seippel, 1981). New capital DRP's first appeared in 1972 when Long Island Lighting distributed newly issued stock in its program (Fredman and Nichols, 1980).

In 1975, American Telephone and Telegraph added a five percent discount feature (Baker and Seippel, 1980) and payment of service fees and brokerage commissions (Fredman and Nichols, 1980). Discounts had been adopted by 43.1% of utilities with new capital DRP's surveyed in 1979, although none of the utilities that distributed old shares and only 8% of non-utilities offered discounts (Baker and Seippel, 1980).

> Most corporations, sensitive to their long-standing relationships with the underwriters and the continuing need for their support, have put in the $12,000 annual limit on additional cash that can be contributed to the plans and limit the 5% discount to shares bought with dividends to avoid stepping too heavily on brokers toes. ("From", 1977)

Part of the appeal of DRP's to corporations can be seen in the lower cost of raising new equity. Danneman and Lovejoy (1976) estimated the cost of DRP-generated equity at two to three percent whereas underwritten offerings were estimated to cost three to five percent. Smith (1977) noted the use of underwriting in ninty percent of all offerings even though he concluded that rights offerings were less costly. He suggested that management may obtain benefits from underwriting and that the agency costs of monitoring managers may exceed the costs of underwriting. A similar agency problem may explain the non use of DRP's by some firms.

DIVIDEND REINVESTMENT PLAN GROWTH

The growth of DRP's has been rapid. By 1979, there were 565 offered by companies on the combined NYSE-ASE (Baker and Seippel, 1980) and an estimated 900 in the US (Pernham, 1978) recapturing an estimated four percent of total corporate dividends (Baker and Seippel, 1980). The largest single group was utilities with 104 (Baker and Seippel, 1981). By 1981 there were an estimated 1200 plans (Dunn, 1983) and a November 1981 list distributed by the NYSE showed 728 DRP's on the Big Board alone ("Companies", 1981).

In dollar terms,

> of an estimated eight to nine billion dollars of new equity capital raised during 1978, approximately one billion, over ten percent, was obtained through dividend reinvestment plans. (Reilly and Nantell, 1979)

AT&T's plan raised $785 million of the total and General Public Utility's DRP met thirty percent of its equity needs in 1977-78 (Baker and Seippel, 1980). For electric utilities, median gross new capital DRP proceeds showed an annualized growth rate of almost thirty percent from 1976 to 1979 with forty percent of the 1978 proceeds generated by the cash payment option (Fredman and Nichols, 1980). DRP's have become so popular with utilities that they sold over $2 billion of the $7 billion in new equity raised by the industry in 1982 (Winslow, 1983). The plans have been too successful for some utilities which are beyond the growth stage. Several dropped their five percent discounts, started distributing treasury stock, or terminated their DRP's ("American", 1985).

When originally introduced, DRP's were viewed by management as a service for small investors. Their use by smaller investors is indicated by the 6.7 percent of outstanding shares versus the 13 percent of shareholders participating in 1978 (Fredman and Nichols, 1980). Utilities differ from non utilities in attracting a higher rate of participation, perhaps because of their more frequent offering of discounts and fee-less reinvestment (Baker and Seippel, 1980). Utility managers also view their DRP's as an efficient means of meeting massive equity needs while their non-utility counterparts see their plans as promoting stockholder goodwill. A number of authors have noted some apparent inconsistencies with DRP's. Baker and Seippel (1980) found that DRP's are most common among high payout, low risk companies with chief executive officers who view their firms as not fitting that description. The major users of DRP's, utilities, are often believed to appeal to investors with an income orientation whereas the plans are vehicles to generate investment growth. Part of the explanation may be found in the similarity between DRP's and dollar cost averaging. Pettway and Malone (1973) found that DRP's are most common among firms that have higher payouts, lower price-earnings and lower leverage, criteria similar to those suggested in Standard and Poor's (1981) "Stocks to Accumulate Via Dollar Cost Averaging."

REILLY AND NANTELL

Reilly and Nantell (1979) (R&N) examined analytically the discount-induced wealth shift described earlier by Stern (1978). They abstracted from any benefits of reduced transaction or issuance costs; assumed DRP's did not affect risk, capital structure, or availability of capital; and focused on the discount feature. The article modeled the effects of discounted DRP's on participants and non participants, and demonstrated that any benefit received by the former as a result of the discount feature was a wealth transfer from the latter. The greatest (smallest) per share benefit to participants and the smallest (greatest) per share loss to non participants occurs when participation approaches zero (one hundred) percent. Using their formulation they examined a selection of discounted DRP's in 1978 and noted total wealth shifts as high as $22.6 million for AT&T which amounted to a $.197 per share gain and a $.042 per share loss for participants and non participants respectively. At the time, AT&T's discount feature was only three years old and participation was still growing. With higher participation the annual wealth transfer from this one plan could have amounted to $39.4 million.

R&N concluded with policy statements: (1) shareholders should participate or invest elsewhere, (2) managers should eliminate the inequitable discounts, (3) tax authorities should be pleased with the incremental revenues, and (4) researchers should examine whether DRP's generate equity more efficiently than other means of floating new stock. If DRP's are more efficient, then statement (2) would be negated. In line with R&N's recommendations,

> Where a discount is offered...some fiduciaries feel compelled to reinvest the dividends on their investments which are subject to the prudent man provision of the Employee Retirement Income Security Act..., even if the new shares so acquired are immediately sold in the open market. (Fredman and Nichols, 1978)

Actually, since many plans will liquidate shares held in the plan without charge, investors not wishing to participate should participate and immediately request that their newly acquired shares be redeemed by the DRP.

MALONE

Academic studies of DRP's are sparse. A search of Comprehensive Dissertation Abstracts produced only three. The first was Automatic Dividend Reinvestment Plans of Nonfinancial Corporations by Malone in 1974. His surveys attempted to profile the differences between DRP and non-DRP firms among utilities and industrials. Malone attempted to find firm characteristics which correlated with DRP participation. Among utilities he found that shareholder participation correlated significantly with lower return on book value, and nonsignificantly with lower dividend payout and total assets and with higher growth. Share participation correlated significantly with lower dividend payout. Among industrials, holder participation correlated significantly with lower dividend payout and debt-to-equity ratio and with higher price-earnings ratio and number of shareholders. Share participation correlated significantly with lower payout and higher growth.

Malone made a common observation that from the buyer's view a DRP and a lower payout would appear to be equivalent. Given the tax code and administrative costs,

> (i)t would seem that the decision of an investor to participate in an automatic dividend reinvestment plan is inconsistent with the "clientele theory" and that participating shareholders would be better off in a comparable firm that pays little or no dividends. (pg. 118)

DRP participation apparently contradicts the clientele theory. His research, however, consistently found that participation (variously measured) was a negative function of payout ratio in both utilities and industrials--a finding that supports the clientele theory.

> Perhaps, investors who were unable to find the same risk-return characteristics in a firm with a lower dividend payout ratio, became ADR participants. (pg. 119)

In addition, with a DRP the participant can change the cash flow from the firm at will to match personal needs. Furthermore, a DRP may be an efficient means to raise or lower one's holdings, or may be viewed as a forced savings plan.

Malone also surveyed the opinions of the managers of firms with and without DRP's. Those with DRP's believed they reduced dividend payment costs by more than the extra administrative costs involved, reduced issuance costs compared with regular offerings, produced additional buying pressure on the firm's shares, provided easier access to capital, and reduced the cost of capital.

In suggesting that later DRP researchers examine any effects on the cost of capital and stability of stock price, he noted

> there would appear to be two ways that ADR plans might influence the cost of capital. One is that the generation of additional interest and buying pressure may lower the firm's cost of capital. Secondly, ADR plans may influence the variability of the market for the firm's stock. (pg. 116)

DUNN

In 1983, Dunn completed a dissertation which surveyed the electric utility and chemical industries to provide descriptions of typical DRP's. His primary finding was that all electric DRP's examined issued original shares whereas ninty-seven percent of those in the chemical industry used market plans issuing treasury stock.

The electric DRP's had higher participation rates than the chemical ones, but when only original issue plans were compared results were similar. Holder participation grew from eleven to eighteen percent between 1977 and 1981 for utilities and from seven to twelve percent for chemicals. Share participation grew from six to twelve percent and from one to two percent respectively over the same period. Studies were cited showing that in 1980 median holder participation was 9.5 percent for market plans and 15.6 percent for original issue plans. Average participation among utility investors with no more than two hundred shares was seventy-six percent. DRP's generated twenty-five percent of all equity raised by all firms and the same percentage for utilities. Of 1200 DRP's in 1981, 124 offered discounts with holder participation in the discounted plans averaging eighteen percent, a twenty-seven percent increase over 1979. The annual increase in common shares for utilities grew from 0.9 percent to 2.4 percent. Data for chemicals were too meager to be

Other than original issue versus market plans, "no conclusive evidence that the offering of a specific feature by a dividend reinvestment plan will have a measurable positive effect on participation" (pg. 128). An interesting observation is that although Dunn believed that low payout plans would have difficulty attracting investors, his own data shows that participation is a negative function of dividend size.

Forty-two percent of executives surveyed believed their DRP's provided upward pressure on the company's share price, in agreement with the conclusions of the Nathan Report ("Economic", 1978). The reduced effective payout was believed to increase prospects of future dividend increases. It might be noted, however, that DRP users appear to be signalling that they do not want dividends.

In his suggestions for further research, Dunn proposes examining ERTA's effects on participation, and whether original issue plans affect the firm's cost of capital.

PERUMPERAL

The last doctoral thesis located was An Empirical Analysis of the Effect of Automatic Dividend Reinvestment Plans on Common Stock Returns, dated March 1983. The study noted that DRP

> appeal to shareholders aside from reduced brokerage costs remains a mystery because no hard evidence exists as to their contribution in increasing either the value of the firm or the return to shareholders. (pg. 1)

Perumpral attempted to supply evidence by conducting an event study of announcement dates of new plans and plan revisions using cumulative average residuals and abnormal performance indices. Her hypotheses were that:

> H1: The market reacts positively to the announced intention by a firm to institute an ADRP.
>
> H2: The market reacts differently to the announced intention by a firm to institute Market Plans..., Original Issue Plans... and Discount Plans....
>
> H3: Shareholder reactions to the announced intention to institute an ADRP in high dividend yield firms differ from those in low dividend yield firms. (pp. 3-5)

One hundred sixty companies with DRP's were used for which Compustat Price-Dividends-Earnings file date were available and for which announcement dates could be assigned. The sample was subdivided by type of plan and by dividend yield. The single-factor market model and the market-adjusted returns model were used for their simplicity and ability to recognize abnormal performance.

Some changes in risk occurred between the pre- and post- announcement periods. Risk rose for the Market Plans sample and for all low dividend yield samples and dropped for the Original Issue Plans sample and most high dividend yield samples. Perumpral speculated on the reasons, but the differences were small and not highly significant.

Perumpral drew several conclusions from the data:

> 1. Though the announcement of the intent to institute an ADRP did produce an impact on the market, it was by no means universally well received as only little more than half of the securities had positive residuals in the event month.
>
> 2. The Market Plans appeared to have produced the most significant performance at their inception perhaps benefiting from the very novelty of the idea of an ADRP.
>
> 3. The reception awarded Original Issue Plans showed a market whose interest in these plans were [sic] limited at first...[, but which] increased over time....OIP announcements fared better in producing superior security performance when these plans replaced earlier plans which suggested that prior experience and knowledge of ADRP's among

the investing public helped them to better evaluate and distinguish between plan types.

4. Discount Plans, rumored to be the most successful in increasing plan participation and over which most of the controversy surrounding ADRP's have swirled, caused no reverberations in securities returns. Tax treatment of the discount, the offer of the discount at management's discretion and the packaging of the discount as an extension to existing ADRP's may all have servced to dull the impact of Discount Plans.

5. In general, it was the first plans offered by a firm that were best received.

6. ADRP announcements made by low dividend yield firms produced more of an impact....The behavior of security returns of high dividend yield firms...suggested that perhaps it was not so much the income as the information conveyed by dividend payments that were valued by investors. This behavior also suggested that the institution of ADRP's were [sic] attracting investors that were atypical of the firms [sic] normal clientele.

7. Original Issue Plans offered by firms with high dividend yields showed the greatest gains in security performance over the period surrounding the event which suggested market inefficiencies that a shrewd investor could possibly have capitalized on even after allowing for transaction costs and taxes. (pp. 156-8)

In examining Perumpral's methodology and conclusions, several points stand out:

1. Dichotomizing dividend yield reduces the discriminating power of the data.

2. An event study may not capture the market's valuation of plan features. At the time an ADRP is first instituted, participation is near zero. Even if the market values an ADRP feature, it may not impound the full valuation until participation rises to some higher level.

3. The lack of universal approval noted in conclusions #1 and #6 may be due to the existence of a clientele effect necessitating a shift in ownership in some cases.

4. The fact that Original Issue Plans produced more positive results when they replaced prior Market Plans may have been due to higher participation rates at the time the change was instituted.
5. The benefits conferred upon participants by the discount feature may have been perfectly offset by the loss suffered by non participants producing the lack of effect in conclusion #4.
6. Since utilities most often offer the combination of high dividend yields and Original Issue Plans, conclusion #7 may be industry specific.
7. The event month was not clearly established in most cases, blurring any effect.
8. Conclusions could not be universally interpreted since even when abnormal performance was detected, only a slight majority of securities in the sample were involved.

In Perumpral's "Suggestions for Further Research" she noted that participation in DRP's was higher among smaller shareholders than larger ones and higher among new shareholders than among older ones. This "raises the possibility that the plans are attracting a group of investors from the lower tax brackets to whom dividends are not an important source of income" (pg. 162). On the other hand, the provisions of the Economic Recovery Tax Act of 1981 which allow deferral of taxes on certain reinvested utility dividends may serve to attract higher bracket investors.

DIVIDEND REINVESTMENT PLAN TAXATION

Prior to the Economic Recovery Tax Act (ERTA) of 1981, the tax code posed an obvious challenge to the logic of a DRP. Why would investors choose a company with a high dividend payout, suffer the generally stiffer tax treatment, and then reinvest in the same firm? Hagin (1979) illustrated the anomaly with AT&T's 1978 dividend of $3 billion and DRP recapture of 26.7 percent. He examined two extremes: (a) AT&T chose not to pay a dividend, and (b) it paid out $3 billion and had one hundred percent DRP participation. Either way the company's position and each investor's share would be the same ignoring dividend processing and DRP administration costs, but at an average thirty percent tax bracket (b) would "contribute" $900 million to the IRS. "Imagine the joy of the shareholders in such circumstances if the directors were to double the dividend." (pg. 60) "It is out of Alice in Wonderland." (Buffett, 1977) Inclusion of the expenses of dividend payment and DRP administration would make the plans appear even less desirable.

Obviously, to be so popular DRP's must offer something to offset the traditionally observed personal tax bias against dividends. Perhaps they appeal to classes of investors for whom dividends are taxed lower than gains but who are accumulators, perhaps some participants are aware of the discount-induced wealth shift away from non participants while non participants are ignorant, or perhaps it is mass irrationality.

ECONOMIC RECOVERY TAX ACT OF 1981

The personal tax bias against dividends and DRP's had been discussed frequently prior to ERTA. Many authors contended that if dividends reinvested in new shares were to receive the same tax deferral as stock dividends, participation would rise markedly. The Nathan Report ("Economic", 1978) claimed that such tax treatment would result in:

1. $2.5 billion annually in new equity,
2. $2.7 billion annually in new Gross National Product,
3. $1 billion annually in new fixed investment,
4. 50,000 annually in new jobs, and
5. an IRS loss of $350 million the first year and gains of $600 million annually after the second year.

ERTA contained sweeping changes in the tax code in general and provisions specifically intended to provide the kind of DRP tax relief discussed above. The specific provisions subjected firms to complicated qualifications designed to limit the relief to utilities only, but which "virtually all public utilities will be UNable to satisfy..." (Johnson and Weber, 1982, pg. 39) [italics mine]. These qualifications were of two types relating to (1) the stock and (2) the firm. First, the stock must have been previously unissued, designated by the board for the purpose, priced at 95% to 105% of fair market value, and treasury stock transactions were restricted. This type of qualification could easily be met by most new capital DRP's once unacceptable treasury stock transactions (if any) were phased out.

Second, the firm must be a "public utility" as specified by the Act. This means that the company must have enough "public utility recovery property", very narrowly defined, and must use designated accounting procedures including normalization of certain book-tax differences. It was this second set of qualifications which most utilities failed to meet. Some firms whose plans were initally unqualified moved to comply, and the narrow letter of the law was liberalized to conform better with Congressional intent. The IRS announced on September 29, 1981 that utilities would not be disqualified on the normalization restriction alone (Stovall, 1981) and complex transitional rules were provided to provisionally qualify while adapting. Thus, at least temporarily, most electric utility new capital DRP's and twenty-four natural gas utility new capital DRP's complied. (Stovall, 1981) Since many natural gas utilities are also in other industries such as exploration and extraction they must be examined individually. Due to their shorter depreciation schedules, telephone utilities (including the largest utility with a DRP--AT&T) did not qualify. The unintended fuzziness of ERTA will require that sample selection and interpretation of results be done carefully.

For individual, non-alien investors, $750 ($1,500 for joint returns) of dividends per year from qualified utilities could be treated as if they were stock dividends for tax purposes. No tax was due in the year the dividends were "received", but the new shares would have a zero tax basis when sold. If held for more than a year, the proceeds would be taxable as long-term capital gains. However, to prevent circumvention of the intent of the Act, if any shares in the company were sold before the new stock was one year old, the investor was assumed to have disposed of the new shares and short-term gains at ordinary tax rates would result. The tax treatment applied only to qualified dividends reinvested through December 1985 when it terminated.

ERTA had other sections which may tangentially affect the study including: safe-harbor leveraged leasing (utilities often lease generating capacity from each other or from consortiums), tax credits for increases in qualified research and development (possibly for renewable energy sources), the All-Savers Certificate (a competing investment for the wealthy), and changes in the maximum personal capital gains tax rate. Although ERTA was signed into law August 13, 1981, the maximum personal capital gains rate was reduced from twenty-eight percent to twenty percent effective June 9, 1981. For those in marginal brackets above fifty percent, this temporarily increased the personal tax bias favoring gains over dividends. For the top bracket the previous forty-two percent (seventy percent minus twenty-eight percent) bias rose to fifty percent (seventy percent minus twenty percent) for seven months. The increase in the bias was then reversed January 1, 1982 by the reduction in the top bracket from seventy percent to fifty percent resulting in a new differential of thirty percent (fifty percent minus twenty percent). As with other portions of ERTA, this reduction in bias was "designed to redistribute funds away from economically unjustified tax shelters into savings and investment which it is hoped will spur economic development" (Ingram, 1981).

One example of the success of DRP's and the ERTA provision is the growth in participation in American Electric Power's DRP from twenty percent to thirty percent with the new Act (Slater, 1985). Another was found by a survey by the Edison Electric Institute at the end of 1985. "About 40 percent of all utility shareholders, some of them doubtless attracted by the tax break available at the time, took part in their companies' dividend reinvestment plans." ("Tax", 1986) This was despite the fact that over half of utility shareholders are over sixty-five and two-thirds had family incomes below $50,000.

PETERSON, PETERSON, AND MOORE

Peterson, Peterson, and Moore (1987) published an event study of the market reaction of firm shares when new capital DRP's were announced. They examined events around the time of the introduction of ERTA and found no significant market reaction to announcements by nonutilities. Before ERTA, utility announcements were received negatively while after ERTA was passed reactions were positive to qualified plans. This finding supports the belief that the option of treating cash dividends as if they were stock dividends for tax purposes has value in the market.

CHAPTER FIVE

MARKET IMPERFECTIONS AND DRP FEATURES--THEORY AND EVIDENCE

Although the topic of DRP's appears new, at the heart of this research is a variation of a classic and yet unanswered question of finance: Does dividend policy matter? The effect of personal tax bias and issuance costs would seem to be to prohibit the payment of dividends. The effect of transaction costs is unclear. Some researchers have noted that transaction costs are minor for a large participant who therefore can create "dividends" by selling shares or eliminate dividends by repurchases. A large investor should, then, be unconcerned about the payouts chosen by firms except for tax consequences. The same is not true for the small investor for whom transaction costs may consume an unacceptable percentage of his or her funds. DRP's reduce or erase transaction costs for the small investor allowing dividends to be eliminated through repurchases. Once shares have been reinvested, a DRP allows the participant to create "dividends" by costlessly disposing of plan shares. The tax differential between dividends and gains remained a problem until ERTA allowed the investor to choose to treat some reinvested utility dividends the same as stock dividends for subsequent capital gains treatment on sale.

The argument could be presented that a ERTA-sheltered DRP does not present any tax advantage that could not be obtained by simply choosing to invest in lower yielding stocks. Black and Scholes (1974, pg.3), however, have shown that if an investor limits a portfolio to either high or low yield stocks, full diversification cannot be achieved. Such a portfolio takes on some unnecessary unsystematic risk which is therefore not rewarded by the market.

The ability of a DRP to alter the effective payout of a firm without affecting any other firm-specific characteristics permits the investor to create an otherwise identical firm with the desired dividend policy while ERTA neutralizes tax bias. This peculiar set of circumstances makes it possible to examine the classical question in a new light.

Arguments such as M&M's (1961) have shown that in a perfect capital market dividend policy does not matter. In an imperfect market they further argue that to have a significant effect on share price and returns any imperfection must: (1) systematically affect the preference between a dollar of dividends and a dollar of gains; and (2) even if an imperfection is systematic, it must have a permanent impact on the relative pricing of dividends versus gains. Any unsystematic effect is captured by the error term in real-world applications of theoretical models, and any price effect that is not permanent will result in a shift to a new equilibrium with each firm attracting its own clientele eliminating any price differential.

In this examination of the theoretical effects of DRP features on the relative valuation of dividends and gains, the imperfections of personal tax bias, issuance costs, and transaction costs (which have been given as reasons for DRP existence) will be introduced one at a time into a DRP model in otherwise perfect capital markets. Existing evidence on DRP's will then be compared with the results predicted by the model. In the next chapter an ERTA model will be developed to try to determine the circumstances under which ERTA would and would not be expected to have an effect on the relative valuation of dividends and gains. In the subsequent chapter an examination of which of those circumstances is most realistic will lead to hypotheses for an empirical study.

PERSONAL TAX BIAS AND DIVIDEND POLICY

M&M (1961) examined several distinct approaches to the valuation of shares. In particular, they noted that the "stream of dividends" approach is "by far the most popular one in the literature of valuation....It does, however, have the disadvantage...of obscuring the role of dividend policy." (pg. 418) They demonstrated the equivalence of the "stream of earnings" approach where the value of the firm is the discounted value of the stream of expected earnings (economic not accounting) minus the stream of expected additional capital infusion.

In their analysis, summarized in Chapter Two, Haley and Schall (1979, pp. 391-398) (H&S) employed the latter approach to get at the differential taxability of dividends and gains. They assumed that all corporate income (after corporate taxes) is taxable to the investor whether paid out as dividends or retained to produce gains. They further assumed perfect capital markets (see page seven for their listing) except for personal tax structure biases. They let

D_0 = the dividends to be paid to the firm's present shareholders at $t = 0$,

S_0^{0*} = the cum-dividend value of the firm's present shares,

S_0^0 = the ex-dividend value of the firm's present shares,

T_I = the marginal tax rate on dividends and interest,

T_G = the marginal tax rate on gains (assumed paid when appreciation occurs or equivalently the "implied marginal tax rate on capital gains that reflects the expectations of marginal investors in the market as to when the gains will be realized" (pg. 391)),

T = the tax rate on corporate income for the firm examined,

and assumed saleability of tax losses, given tax rates constant over time, given investment policy, corporate deductibility of interest but not dividend payments, and shareholder wealth maximization.

The cum-dividend value of the old shares would be arbitraged to equal the after-tax ex-dividend wealth of the old shareholders:

$$S_0^{0*} = (1 - T_I)D_0 + S_0^0 - T_G(S_0^0 - S_0^{0*}).$$

Solving for S_0^{0*} gives

$$S_0^{0*} = \frac{(1 - T_I)D_0 + (1 - T_G)S_0^0}{(1 - T_G)}. \tag{27}$$

It should be noted that Equation (27) does not say how the cum- or ex-dividend value of the present shares is determined, but merely expresses the relationship between the two. Once one of the values is determined, by whatever approach, the other is known.

Since the denominator of Equation (27) is a constant, maximizing S_0^{0*} is equivalent to maximizing the numerator of the right-hand side. Letting the change in the numerator be called Δ,

$$\Delta = (1 - T_I)\Delta D_0 + (1 - T_G)\Delta S_0^0. \tag{28}$$

The ex-dividend value of the old shares, S_0^0, is equal to the ex-dividend value of all shares S_0 minus the value of any new shares S_0^n:

$$S_0^0 = S_0 - S_0^n. \tag{29}$$

Combining Equations (28) and (29) gives

$$\Delta = (1 - T_I)\Delta D_0 + (1 - T_G)(\Delta S_0 - WS_0{}^n). \tag{30}$$

If part of period t's earnings ($\tilde{E}_t$) is distributed and taxed as dividends ($\tilde{D}_t$) and part is retained and taxed as gains ($\tilde{G}_t$) (without necessarily assuming that \$1 retained equals \$1 in gains), then the value of those earnings to the shareholders is

$$V[\tilde{E}_t] = V[(1 - T_i)\tilde{D}_t + (1 - T_g)\tilde{G}_t]$$

and the stream of earnings valuation approach implies

$$V[\underline{\tilde{E}}] = V[(1 - T_i)\underline{\tilde{D}} + (1 - T_g)\underline{\tilde{G}}]$$

where underlined variables represent vectors.

To examine the effect of a perpetual debt issue ΔB_0 at the time of the dividend with a cash flow drain of $(1 - T)\Delta\underline{\tilde{R}}$ after taxes, H&S noted that if

$$\begin{aligned} S_0 &= V[\underline{\tilde{E}}] \\ &= V[(1 - T_i)\underline{\tilde{D}} + (1 - T_g)\underline{\tilde{G}}], \end{aligned}$$

then the change in S_0 is

$$\Delta S_0 = V[(1 - T_I)\Delta\underline{\tilde{D}} + (1 - T_G)\Delta\underline{\tilde{G}}].$$

If the new debt service is met entirely by dividend reduction (internal financing),

$$\Delta\underline{\tilde{G}} = 0$$

$$\Delta\underline{\tilde{D}} = -(1 - T)\Delta\underline{\tilde{R}}$$

and the change in value due to the internal financing is

$$\begin{aligned} (\Delta S_0)_D &= V[-(1 - T_I)(1 - T)\Delta\underline{\tilde{R}}] \\ &= -(1 - T_I)(1 - T)V[\Delta\underline{\tilde{R}}]. \end{aligned} \tag{31}$$

If the new debt service is met entirely by reduction in gains (external financing),

$$\Delta\underline{\tilde{D}} = 0$$

$$\Delta\underline{\tilde{G}} = -(1 - T)\Delta\underline{\tilde{R}}$$

and the change in value due to external financing is

$$(\Delta S_0)_G = V[-(1 - T_G)(1 - T)\Delta\tilde{R}]$$

$$= -(1 - T_G)(1 - T)V[\Delta\tilde{R}]. \qquad (32)$$

Therefore, any combination of internal and external financing can be expressed as a weighted average

$$\Delta S_0 = \alpha_D(\Delta S_0)_D + \alpha_G(\Delta S_0)_G \qquad (33)$$

with $0 \leq \alpha_D \leq 1$, $0 \leq \alpha_G \leq 1$, and $\alpha_D + \alpha_G = 1$. Substituting Equations (31) and (32) into (33) and noting that

$$\Delta B_0 = (1 - T_I)V[\Delta\tilde{R}]$$

gives

$$\Delta S_0 = -[\alpha_D(1 - T_I) + \alpha_G(1 - T_G)](1 - T)\frac{\Delta B_0}{(1 - T_I)}$$

$$= -[\alpha_D + \alpha_G\frac{(1 - T_G)}{(1 - T_I)}](1 - T)\Delta B_0. \qquad (34)$$

If debt is used instead of internal equity,

$$\Delta {S_0}^n = 0 \text{ and}$$

$$\Delta D_0 = \Delta B_0.$$

Combining Equations (30) and (34) with the above gives

$$\Delta = \{(1- T_I) - (1 - T_G)(1 - T)[\alpha_D + \alpha_G\frac{(1 - T_G)}{(1 - T_I)}]\}\Delta B_0$$

$$= \{\phi\}\Delta B_0. \qquad (35)$$

On the other hand, if debt is used instead of new external equity,

$$\Delta D_0 = 0 \text{ and}$$

$$\Delta {S_0}^n = -\Delta B_0.$$

Combining Equations (30) and (34) with the above gives

$$\Delta = \{(1 - T_G) - (1 - T_G)(1 - T)[\alpha_D + \alpha_G\frac{(1 - T_G)}{(1 - T_I)}]\}\Delta B_0$$

$$= \{\psi\}\Delta B_0. \qquad (36)$$

In Equations (35) and (36), ϕ and ψ represent the advantage of debt over internal and new external equity. In the words of H&S,

> It follows that:
> (1) $\phi > 0$ implies debt financing is preferred to internal financing (issue debt and pay dividends)
> (2) $\phi = 0$ implies shareholders would be indifferent between debt and internal financing
> (3) $\phi < 0$ implies internal financing is preferred to debt (pg. 396)

and

> (4) $\psi > 0$ implies debt is preferred to [new] stock
> (5) $\psi = 0$ implies shareholders are indifferent between debt and [new] stock
> (6) $\psi < 0$ implies [new] stock is preferred to debt. (pg. 397)

The difference

$$\psi - \phi = T_I - T_G$$

represents the advantage of internal over external equity. Thus, if $T_I > T_G$ ($T_G > T_I$) then internal (external) equity is preferred over external (internal) equity. Any of the cases (1) through (6) may occur depending on the values of the three tax rates, but certain combinations are not possible. For example, if $T_I > T_G$ and either (1) or (2) holds, then (4) must follow.

H&S then discussed unspecified studies that estimated the U. S. personal tax rate on ordinary income to be $T_I = .32$ and inferred an effective gains tax, allowing for deferral, of approximately $T_G = .10$. Given the assumptions of their model, they concluded that there is a modest advantage of debt over internal equity for large corporations ($T = .48$) but not for small ones ($T = .20$). Given $T_I = .32$ and $T_G = .10$, internal equity is preferred over external equity and H&S's work can be extended by solving Equations (35) and (36) for the break-even rates $T = .43$ and $T = .24$ above which debt is preferred to internal and external equity respectively.

H&S did not examine the corporate investor. If, however, the "individual" shareholder is a corporate individual, gains are taxed higher than dividends. For a corporate investor in the top bracket at the time of H&S's book, gains were taxed at 28% or $T_G = .175$ (using the same discount factor they used to reduce .16 to .10 to represent deferrals) whereas 85% of dividends were excludable from taxable income for $T_I = (1 - .85).48 = .072$. Given any $T_G > T_I$, external equity is preferred to internal equity and solving Equations (35) and (36) shows debt is preferred to equity whenever $T \geq 0$. Even if $T_I = T_G = 0$, as with some investment companies and low-income retirees, solving Equations (35) and (36) leads to the conclusion that debt is preferred as long as $T > 0$.

It is evident that in markets that are perfect except for investor tax biases, dividend policy, whether to sell new shares to finance dividends to the old shares, is a question of the inter-relationships between investor tax rates on ordinary income and gains, and on corporate tax rates.

In H&S's analytic framework reviewed above, all investors were assumed to have identical tax rates. H&S then extended their study to include investors with differing tax rates, but limited to the case where the marginal tax rate on gains is less than that on dividends ($T_G{}^i < T_D{}^i$) for investor I owning proportion αi of the firm. They continued to assume capital markets that are perfect except for investor tax biases.

A change of ΔD_0 in the firm's dividend results in an after-tax return of $(1 - T_D{}^i)\alpha_i \Delta D_0$ and a capital gain of $\Delta S_0{}^0$ produces an after-tax return of $(1 - T_G{}^i)\alpha_i\Delta S_0{}^0$. The change in wealth of shareholder i on the date of the dividend change is

$$\Delta W_i = (1 - T_D{}^i)\alpha_i\Delta D_0 + (1 - T_G{}^i)\alpha_i S_0{}^0. \tag{37}$$

If a given new investment I_0 is financed by new equity $S^n > 0$ or dividend reduction $\Delta D_0 < 0$ with no change in debt, then

$$\Delta D_0 = S^n - I_0. \tag{38}$$

Assuming that the new investment changes the value of the firm V_0 without changing the value of the firm's debt, the value of the old shares changes by

$$\Delta S_0{}^0 = V_0 - S^n. \tag{39}$$

Substituting Equations (38) and (39) into Equation (37) gives

$$\begin{aligned}\Delta W_i &= (1 - T_D{}^i)\alpha_i\Delta D_0 + (1 - T_G{}^i)\alpha_i\Delta S_0{}^0 \\ &= (1 - T_D{}^i)\alpha_i(S^n - I_0) + (1 - T_G{}^i)\alpha_i(\Delta V_0 - S^n) \\ &= \alpha_i\{(T_G{}^i - T_D{}^i)S^n + [(1 - T_G{}^i)\Delta V_0 - (1 - T_D{}^i)I_0]\}.\end{aligned} \tag{40}$$

Since $\alpha_i > 0$ and ΔV_0 and I_0 are independent of dividend policy, ΔW^i is maximized by maximizing

$$w_i = (T_G{}^i - T_D{}^i)S^n \tag{41}$$

H&S assumed that $T_G{}^i < T_D{}^i$ for each investor I, so w_i, and hence ΔW_i, is maximized when $S^n = 0$. Their conclusion, then, was that investor income taxes biased in favor of gains imply that dividend policy should follow the pure residual dividend theory. They noted that flotation costs would strengthen their conclusions but that in some cases investor transaction costs (for those needing current income) and information costs (for those viewing dividend payout reduction as a signal of declining prospects) might compensate to dictate another policy.

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As noted by M&M (1961), however, for some investors (corporations) $T_G^i > T_D^i$ and for others (investment institutions and low-income retirees) $T_G^i = T_D^i = 0$. H&S's theory that investor tax biases favor internal equity over external equity is therefore open to question.

PERSONAL TAX BIAS, DIVIDEND POLICY, AND MARKET EQUILIBRIUM

H&S, in an appendix (pp. 435-440), used a state-preference arbitraging argument to demonstrate that if some investors have tax brackets favoring debt income over stock income and other investors have tax brackets favoring stock income over debt income, that at equilibrium "the firm will be indifferent with regard to its capital structure" (pg. 435). A similar argument can be applied to internal versus external equity. Assume

(1) perfect capital markets except for investor tax biases such that for some investor I, holding proportion α_i of the firm, $T_G^i < T_D^i$ and for some other investor J, holding proportion α_j of the firm $T_G^j > T_D^j$;

(2) competitive capital markets for both firms and investors;

(3) given debt and investment policy and debt value independent of dividend policy as long as dividends are paid after debt is serviced;

(4) all firm income Y (in after firm tax dollars) is taxable to shareholders whether paid as dividends D_0 or held as capital gains ΔS_0^0; and

(5) the firm has complete flexibility to set dividend policy $0 \leq D_0 \leq Y$.

For individual I, Equations (37) through (41) from the previous section all hold so maximizing investor I's wealth W_i is equivalent to maximizing

$$w_i = (T_G{}^i - T_D{}^i)S^n. \tag{41}$$

A similar development for investor J leads to maximizing

$$w_j = (T_G{}^j - T_D{}^j)S^n. \tag{42}$$

For all firms in the economy, let

v_D = the value of \$1 of dividends D_0,

v_G = the value of \$1 of gains $\Delta S_0{}^0$, and

π = $v_D - v_G$

= the premium (discount if negative) of a dollar of dividends over a dollar of gains.

For a firm considering changing its dividend by ΔD_0, let

ΔV_0 = the change in the value of the firm, and

Y = $D_0 + \Delta S_0{}^0$

= the after-corporate-tax income of the firm "distributed" to owners as dividends D_0 and capital gains $\Delta S_0{}^0$.

Therefore:

$$\begin{aligned}\Delta V_0 &= v_D D_0 + v_G \Delta S_0{}^0\\ &= v_D D_0 + v_G(Y - D_0)\\ &= (v_D - v_G)D_0 + v_G Y.\end{aligned} \tag{43}$$

Since the last term in Equation (43) is independent of dividend policy, maximizing firm value is equivalent to maximizing

$$\begin{aligned}v &= (v_D - v_G)D_0\\ &= \pi D_0.\end{aligned} \tag{44}$$

To establish an equilibrium condition, two cases must be considered: (1) $\pi > 0$ and (2) $\pi < 0$. If $\pi > 0$, then by Equation (44) all firms will payout all earnings in dividends. But, by Equation (41), investors of type I will demand capital gains and will bid up the price of gains until

$$
\begin{aligned}
\pi &= v_D - v_G \\
&\leq 0. \qquad (45)
\end{aligned}
$$

If $\pi < 0$, then by Equation (44) all firms will withhold all income to maximize capital gains but, by Equation (42), investors of type J will demand dividends and will bid up the price of dividends until

$$
\begin{aligned}
\pi &= v_D - v_G \\
&\geq 0. \qquad (46)
\end{aligned}
$$

At equilibrium, then, (45) and (46) must both hold and

$$
\begin{aligned}
\pi &= v_D - v_G \\
&= 0.
\end{aligned}
$$

Therefore, at equilibrium, the value of $1 of dividends must equal the value of $1 of capital gains, and firms will be indifferent as to dividend policy. Once equilibrium is achieved, no firm would benefit by a change in dividend policy unless: (a) the distribution of investor preferences is concentrated at one end of the payout spectrum where there are few firms, or (b) Black and Scholes (1974) are correct that a diversified portfolio cannot be constructed without including both high and low payout securities. A change by one firm would merely necessitate changes by other firms and by investors rebalancing their portfolios to reach a new equilibrium.

PERSONAL TAX BIAS AND DRP'S

This theory leads to the conclusion that, in a world of perfect capital markets except for personal tax biases, DRP's would serve no purpose at equilibrium unless they addressed one of the cases above.

In the hypothesized world, the first can be easily dismissed. If firms chose high payouts and investors preferred low payouts, investors could costlessly reinvest dividends without DRP's. If the reverse were the case, investors could costlessly sell shares to generate "homemade dividends". Non-discounted, non-qualified DRP's would not provide any service investors could not duplicate with market transactions, and investors would be stuck with the personal tax consequences of firm dividend policies. The second case is also easily dismissed. Even if B&S are right about diversification, DRP's would not provide any means to avoid the problem.

ISSUANCE COSTS AND DRP'S

Issuance costs are an imperfection that might be systematic and permanent. Haley and Schall noted that, in a capital market that is perfect except for personal tax bias, whether internal equity is favored over external equity is a function of the corporate tax rate T, the tax rate on gains T_G, and the tax rate on dividends T_D. Their argument can be extended to include the effect of issuance costs. Their assumptions, discussed in "Personal Tax Bias and Dividend Policy" above, can be amended to include c, the after-tax issuance costs for new equity as a percent of value, assumed constant and positive. If issuance costs for debt are assumed to be zero, their analysis discussed in the above section remains unchanged through Equation (31).

If new debt service is met entirely by reduction in gains (external financing), the analysis must include flotation costs:

$\Delta \tilde{D} = 0$ and now

$$\Delta\underline{\tilde{G}} = -\frac{(1 - T)}{(1 - c)}\Delta\underline{\tilde{R}}$$

since each dollar of after-tax debt service requires the issuance of $1/(1 - c)$ dollars in new stock to net one dollar after flotation. Thus Equation (32) becomes:

$$\begin{aligned}(\Delta S_0)_G &= V[(1 - T_G)\Delta\underline{\tilde{G}}] \\ &= V[-(1 - T_G)\frac{(1 - T)}{(1 - c)}\Delta\underline{\tilde{R}}] \\ &= -(1 - T_G)\frac{(1 - T)}{(1 - c)}V[\Delta\underline{\tilde{R}}]. \qquad (47)\end{aligned}$$

As before, any combination of internal and external financing can be expressed as a weighted average

$$\Delta S_0 = \alpha_D(\Delta S_0)_D + \alpha_G(\Delta S_0)_G \qquad (33)$$

with $0 \leq \alpha_D \leq 1$, $0 \leq \alpha_G \leq 1$, and $\alpha_D + \alpha_G = 1$. Substituting Equations (31) and (47) into (33) and noting that

$$\Delta B_0 = (1 - T_I)V[\Delta\underline{\tilde{R}}]$$

gives

$$\begin{aligned}\Delta S_0 &= -[\alpha_D(1 - T_I) + \alpha_G\frac{(1 - T_G)}{(1 - c)}](1 - T)\frac{\Delta B_0}{(1 - T_I)} \\ &= -[\alpha_D + \frac{\alpha_G(1 - T_G)}{(1 - c)(1 - T_I)}](1 - T)\Delta B_0. \qquad (48)\end{aligned}$$

If debt is used instead of internal equity,

$$\Delta S_0{}^n = 0 \text{ and}$$

$$\Delta D_0 = \Delta B_0.$$

Combining Equations (30) and (48) with the above gives

$$\begin{aligned}\Delta &= \{(1 - T_I) - (1 - T_G)(1 - T)[\alpha_D + \frac{\alpha_G(1 - T_G)}{(1 - c)(1 - T_I)}]\}\Delta B_0 \\ &= \{\phi'\}\Delta B_0.\end{aligned}$$

The factor in braces (ϕ') is almost the same as the ϕ found without issuance costs, except for the factor $(1 - c)$ in the denominator of the second term. Since the second term is larger than before and is subtracted,

$$\phi' < \phi.$$

In other words, the advantage of debt financing over internal equity is reduced since new shares issued to maintain dividends at $t = 1, 2, \ldots$ suffer flotation costs.

On the other hand, if debt is used instead of new external equity,

$\Delta D_0 = 0$ and now

$$\Delta S_0{}^n = -\frac{\Delta B_0}{(1 - c)},$$

since the debt issue replaces the net proceeds of issuing new shares. Combining Equations (30) and (48) with the above gives

$$\Delta = \{\frac{(1 - T_G)}{(1 - c)} - (1 - T_G)(1 - T)[\alpha_D + \frac{\alpha_G(1 - T_G)}{(1 - c)(1 - T_I)}]\}\Delta B_0$$

$$= \{\psi'\}\Delta B_0.$$

The quantity in braces, ψ', can be rewritten as

$$\psi' = \frac{1}{(1 - c)}(1 - T_G)[1 - (1 - T)\alpha_G\frac{(1 - T_G)}{(1 - T_I)}]$$

$$- (1 - T_G)(1 - t)\alpha_D,$$

which is the same as ψ except for the factor $1/(1 - c)$ in the first term. Since $(1 - T_G)$ is positive, $\psi' > \psi$ if the term in square brackets is positive. It in turn is positive if

$$(1 - T)\alpha_G(1 - T_G) - (1 - T_I)$$

is positive. Thus, with flotation costs on new equity, the advantage of debt over new equity is an increasing function of α_G and T_I and a decreasing function of T and T_G.

The advantage of internal over external equity with flotation costs is

$$\psi' - \phi' = \frac{1 - T_G}{1 - c} - (1 - T_I)$$

$$= \frac{T_I - T_G}{1 - c} + \frac{c(1 - T_I)}{1 - c}$$

$$> \frac{T_I - T_G}{1 - c}$$

$$> T_I - T_G$$

$$> \psi - \phi$$

> the advantage of internal over external equity without flotation costs.

Therefore, flotation costs increase the advantage of internal over external equity but whether internal or external equity is best is still a function of the corporate tax rate, the personal tax rates on gains and dividends, and now the flotation costs.

If DRP's are more efficient than underwriting in raising new capital, the advantage of internal over external equity is less than it otherwise would be. Danneman and Lovejoy (1976) estimated the cost of DRP-generated equity at two to three percent whereas underwritten offerings were estimated to cost three to five percent. This would give DRP's an advantage over underwriting but whether external equity should be used at all is still a function of the three tax rates and flotation costs.

PERSONAL TAX BIAS AND DISCOUNTED DRP'S

If DRP's existed in the theoretical world above, the only function of a discounted plan would be as a substitute for a stock split since shares could be costlessly issued in any quantity. If some firm did offer discounts, all shareholders would participate to avoid being on the losing end of the wealth shift described by Reilly and Nantell (1979), and no net benefit would be received by either firms or investors.

TRANSACTION COSTS AND DRP'S

The existence of transaction costs means that differences from the equilibrium conditions established in the above sections cannot be completely arbitraged away so formulas hold only as approximations. This introduces a certain fuzziness to decisions and supports the clientele hypothesis and the need to maintain consistent dividend policy. Since transaction costs can consume a large part of the small investor's dollar, small investors who wish to reinvest dividends may be drawn to firms with DRP's. It does not, however, alter the substance of the earlier conclusions.

SUMMARY OF MARKET IMPERFECTIONS AND DRP'S

If the only imperfection was personal tax bias, the equilibrium level of dividends in a market would be a function of the corporate tax rate and the personal tax rates on dividends and gains. At equilibrium, however, a firm could not increase its value or reduce its cost of equity by altering its dividend payout. In such a world the value of one dollar of gains would equal the value of one dollar of dividends, whether or not discounts or ERTA qualification existed.

The addition of stock flotation costs to the above world provides sufficient reason for the existence of DRP's if they are more efficient than other means of issuance.

Finally, addition of transaction costs muddies the picture without altering the basic conclusions: DRP's might be valuable as a means of reducing issuance costs, assuming external equity is appropriate.

DRP THEORY AND EXISTING EVIDENCE

Some empirical evidence is available from the works of Dunn (1983); Malone (1974); Perumperal (1983); and Peterson, Peterson, and Moore (1987) and numerous surveys to verify or refute these theoretical findings. All three dissertations concluded that participation by investors was higher in DRP's offered by low payout firms, Malone found that participation was positively related to growth and price-earnings ratio, and Perumperal noted that the new plans of low-yield firms had the greatest impact on share price. Peterson, Peterson, and Moore found new issue plans were rewarded if they produced tax benefits. All of the above observations are consistent with the concept of dividend clienteles. If low-payout, high growth firms appeal to investors preferring gains to dividends, for whatever reasons, those investors will not require the cash for immediate consumption and may choose to convert what dividends are paid into additional shares.

Studies, incuding Dunn's, have shown that DRP participation is primarilly a small investor phenomena. This is consistent with the observation that the small investor faces high transactions costs as a percentage of investment. Small investors not needing dividends for immediate consumption may use DRP's as an efficient means of reinvesting. The question to be answered is why the investors in this and the last paragraph chose dividend-paying firms in the first place. Both the tax code and signalling provide answers. The dividend exclusion, although small in dollar terms, is significant to the small investor. Some may be investing in just enough dividend-paying shares to meet the limit. Signalling theory suggests that both small and large investors may value some level of dividends as supportive evidence of the firm's accounting income. They may be willing to face dividend taxation as the cost of obtaining verification. Signalling may also help to explain the aggregate level of dividends that some believe to be too high.

The efficiency of a DRP in generating new equity is supported by managerial opinion. Those surveyed by Malone believed that a plan reduced issue costs, provided buying pressure on the firm's price, and reduced the cost of capital. Dunn noted that investors also indicated their preference for original issue plans through their higher participation rates and Perumperal found that high yield original issue plans had the greatest impact on market price.

CHAPTER SIX

PERSONAL TAX BIAS AND ERTA-QUALIFIED DRP's--THEORY

MARKET EQUILIBRIUM AND ERTA

Returning to the theoretical model developed above, if ERTA qualification existed for all firms and applied to all investors with no holding period requirements, equilibrium conditions might change. Investor I with $T_G^i < T_D^i$, would participate in DRP's with all shares and claim T_G^i as the tax rate on dividends. Equations (37), (40), and (41) above would simplify with investor I's objective function becoming:

$$\begin{aligned} w_i &= (T_G^i - T_D^i)S^n \qquad (41) \\ &= (T_G^i - T_G^i)S^n \\ &= (0)S^n \\ &= 0. \end{aligned}$$

Investor I would, therefore, be indifferent as to the firm's dividend policy and would liquidate shares for cash needs. Investor J, with $T_G^j > T_D^j$, would not need to participate in DRP's to reinvest costlessly and, if DRP's were used, the ERTA provision would not be. For investor J, Equation (42) would remain unchanged so investor J would still try to maximize:

$$w_j = (T_G^j - T_D^j)S^n. \qquad (42)$$

Since investor I would be indifferent and investor J would demand dividends, all firm income would be paid out. Investor I would use qualified DRP's and investor J would be indifferent as to their existence. If $\pi = v_D - v_G < 0$, investor J would bid up the price of dividends until

$$\pi = v_D - v_G$$
$$\geq 0.$$

If $\pi > 0$, investor I would arbitrage away the difference until

$$\pi = v_D - v_G$$
$$= 0.$$

At equilibrium, therefore, the value of one dollar of dividends would equal the value of one dollar of gains, and investors could respond quickly to a change in exogenous variables (such as tastes and taxes) without firms changing their dividend policies.

If ERTA qualification existed only for certain firms, investor J's situation would remain unchanged. For firms that qualified for ERTA, investor J would demand dividends until all such firms paid out all earnings. Investor I would be indifferent as to dividend policy and the equilibrium condition for such firms would be the same as immediately above. At that point a dollar of qualified dividends would have the same value (v_{Dq}) as a dollar of gains since J would bid

$$\pi_q = v_{Dq} - v_G$$
$$\geq 0,$$

and I would arbitrage away any difference until

$$\pi_q = v_{Dq} - v_G$$

$$= 0. \tag{49}$$

For firms that did not qualify for ERTA, investor I would not be indifferent but would prefer gains. The equilibrium with these firms would be the same as if no ERTA existed. Investor J would bid up the price of unqualified dividends (v_{Du}) until

$$\pi_u = v_{Du} - v_G$$
$$\geq 0$$

while investor I would do the opposite until

$$\pi_u = v_{Du} - v_G$$
$$\leq 0$$

producing an equilibrium at

$$\pi_u = v_{Du} - v_G$$
$$= 0. \tag{50}$$

Thus, at equilibrium both Equation (49) and (50) would hold and therefore

$$v_{Du} = v_{Dq} = v_G. \tag{51}$$

If a holding period requirement applied to ERTA qualification, investor I's situation would be muddied. Shares liquidated early would be taxed at $T_D{}^i$ so I would be indifferent as to whether those dollars were received as dividends or reinvested. There would be no impact on relative prices, however, as long as I did not intend to liquidate all dividends.

TAX DISEQUILIBRIUM AND ERTA

The theory developed above suggests that if the capital market is perfect except as indicated, that at equilibrium introduction of ERTA should not have any impact on the relative valuation of gains, unsheltered dividends, and sheltered dividends and firms should still be indifferent as to dividend policy. To determine if there are conditions under which ERTA might have an effect on the relative valuation of dividends and gains, extend the theory to include tax disequilibrium by assuming:

(1) ERTA applies to some firms which are free to distribute their income in any mix of qualified dividends and gains (of course, the earlier discussion leads these firms to issue all their income as dividends to let investors decide on the preferred mix);

(2) ERTA does not apply to some other firms which are free to distribute their income in any mix of unsheltered dividends and gains which can be sold separately;

(3) a given firm's mix of dividends and gains can be altered, but only slowly (perhaps stickiness is the result of avoiding improper signalling or disruption of clienteles);

(4) ERTA and non-ERTA firms are interchangeable in the sense that for every firm of each type there is at least one firm of the other type that is identical except for dividend policy (firms, however, cannot change their ERTA status);

(5) three sets of investors exist due to tax law: investors I with $T_D{}^i > T_G{}^i$, investors J with $T_D{}^j < T_G{}^j$, and investors K with $T_D{}^k = T_G{}^k$;

(6) the total value of the securities supplied equals the total value demanded;

(7) the mix of dividends and gains supplied at any time may not be the mix demanded (perhaps due to an exogenous shock affecting demand more rapidly than supply can adjust); and

(8) even if the mix supplied is the mix demanded, it may not be optimal in the sense that some other mix might be preferred by investors if some market imperfection could be reduced.

In addition to the notation above, let

S_{Du} = the supply of unqualified dividends,

S_{Dq} = the supply of ERTA qualified dividends,

S_D = S_{Du} + S_{Dq}

= the total supply of dividends,

S_G = the supply of gains,

D_D = the demand for dividends by investors J who prefer dividends for tax reasons, and

D_G = the demand for gains by investory I who prefer gains for tax reasons.

Three cases, with subcases, are possible and will be examined below.

CASE Ia: $S_D \geq D_D$ and $S_G \geq D_G$ WITHOUT ERTA

Case I would be if the supply of dividends at least satisfied investors J, preferring dividends, and the supply of gains at least satisfied investors I, preferring gains. Without ERTA (Case Ia), investors I would only buy dividends if the price was low enough to compensate for the tax differential, bidding

$$v_G\frac{(1 - T_D^i)}{(1 - T_G^i)} \leq v_{Du} \tag{52a}$$

and

$$v_G\frac{(1 - T_D^i)}{(1 - T_G^i)} \leq v_{Dq} \tag{52b}$$

where the tax rates are for the marginal investor of type I and the tax factor is less than one. (Since ERTA does not apply, there is only one class of dividends--the two classes here identify which firms would be in each class if an ERTA were introduced.) Similarly, investors J would only buy gains if the price was low enough to compensate for the tax differential, bidding

$$v_{Du} \leq v_G \frac{(1 - T_D{}^j)}{(1 - T_G{}^j)} \tag{53a}$$

and

$$v_{Dq} \leq v_G \frac{(1 - T_D{}^j)}{(1 - T_G{}^j)} \tag{53b}$$

where the tax rates are for the marginal investor of type J and the tax factor is greater than one. They would also be indifferent between the two types of dividends and bid

$$v_{Du} = v_{Dq}. \tag{53c}$$

These conditions collectively imply

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} = v_{Dq} \leq v_G \frac{(1 - T_D{}^j)}{(1 - T_G{}^j)}. \tag{54}$$

Investors K would be indifferent between dividends and gains and their market clearing action would ensure that Equation (51) held

$$v_{Du} = v_{Dq} = v_G. \tag{51}$$

DRP's would be used by investors J and K who hold dividends for tax purposes but prefer the cash flow pattern of gains for other reasons and find DRP's to be an efficient means of converting. An exogenous shock causing a marginal decrease in the demand for gains or dividends by I or J, respectively, could be satisfied by market clearing action by the investors without any firm changing its dividend policy. Values of the three distributions would decrease, but their relative equality in Equation (51) would remain. Therefore, dividend policy would be irrelevant. A marginal increase in the demand for either could be similarly satisfied with the same results as long as the respective supply was strictly larger than the original demand. A marginal increase in demand for either when the corresponding supply was limiting would produce either Case II or Case III below.

CASE Ib: $S_D \geq D_D$ and $S_G \geq D_G$ WITH ERTA

With ERTA (Case Ib), investors I could hold qualified dividends as well as gains, but there are enough gains without doing so and the two types of firms are otherwise identical so they would have no incentive to do so. At equilibrium, ERTA would serve no purpose, no one would campaign for its passage, and no one would lament its demise. DRP's would still be used as in Case Ia.

CASE IIa: $S_G < D_G$ WITHOUT ERTA

Case IIa would be if the supply of gains was indadequate to meet the demand of investors I, preferring gains and ERTA did not exist. The supply of dividends would more than satisfy investors J preferring dividends, since total supply equals total demand, and an undersupply of one flow implies a strict oversupply of the other. Investor bidding would still produce the conditions of Equations (52a) through (53c) and, thus, Equation (54)

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} - v_{Dq} \leq v_G \frac{(1 - T_D{}^j)}{(1 - T_G{}^j)}. \tag{54}$$

would still be valid. Investors K would enter the gains market if

$$v_{Du} - v_{Dq} > v_G,$$

and would bid until

$$v_{Du} - v_{Dq} \leq v_G.$$

This time, however, the supply of dividends exceeds the total demands of investors J and K. The excess supply will only clear the market when the price of dividends is bid down producing

$$v_{Du} - v_{Dq} < v_G.$$

which together with Equations (52a) and (54) implies

$$v_G\frac{(1 - T_D^i)}{(1 - T_G^i)} \leq v_{Du} - v_{Dq} \leq v_G\frac{(1 - T_D^j)}{(1 - T_G^j)}. \tag{55}$$

which differs from Equation (54) only in that the second to the last inequality becomes strictly less than. Investors J and K would obtain dividends at a bargain and reap superior incomes while all firms would find dividend policy relevant and would adjust slowly to decrease payouts unless non-tax factors dominate. DRP's would still be used as in Case Ia.

CASE IIb: $S_G < D_G$ but $S_G + S_{Dq} \geq D_G$ WITH ERTA

Case IIb would be if the supply of gains was indadequate to meet the demand of investors I, preferring gains, but the supplies of gains and qualified dividends, together with the existence of ERTA, were adequate. The supply of dividends would more than satisfy investors J preferring dividends as noted in Case IIa. Equation (54)

$$v_G\frac{(1 - T_D^i)}{(1 - T_G^i)} \leq v_{Du} - v_{Dq} \leq v_G\frac{(1 - T_D^j)}{(1 - T_G^j)}. \tag{54}$$

would still be valid but if

$$v_{Dq} < v_G,$$

investors I and K would bid up the former until

$$v_{Dq} \geq v_G.$$

On the other hand, if

$$v_{Dq} > v_G,$$

investors I and K would bid up the latter until

$$v_{Dq} \leq v_G.$$

At equilibrium, then,

$$v_{Du} = v_{Dq} = v_G. \tag{51}$$

ERTA would be used by investors I to satisfy their demands and would be a sufficient condition for dividend irrelevance without any action by corporations. DRP's would still be used as in Case Ia.

CASE IIc: $S_G < D_G$ and $S_G + S_{Dq} < D_G$ WITH ERTA

Case IIc would be if the supply of gains was indadequate to meet the demand of investors I, preferring gains, and the supplies of gains and qualified dividends, together with the existence of ERTA, would still be inadequate. The supply of dividends would more than satisfy investors J preferring dividends as noted in Case IIa. Investors I would not buy unqualified dividends unless they were priced low enough to compensate for the tax difference, so Equation (52a)

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} \tag{52a}$$

would still be valid. This, time, however, if

$$v_G < v_{Dq},$$

investors I would bid up the price of the former until

$$v_G \geq v_{Dq}.$$

Conversely, if

$$v_G > v_{Dq},$$

they would bid up the price of the latter until

$$v_G \leq v_{Dq}$$

and therefore

$$v_G = v_{Dq}. \tag{56}$$

In the market for dividends, if

$$v_{Du} > v_{Dq},$$

investors J and K would enter the bidding for qualified dividends until

$$v_{Du} \leq v_{Dq},$$

Since there are more unqualified dividends than investors J and K would collectively demand, the market will not clear unless their price is bid down until

$$v_{Du} < v_{Dq}$$

which together with Equations (52a) and (56) imply

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} < v_{Dq} = v_G \leq v_{Du} \frac{(1 - T_G{}^i)}{(1 - T_G{}^i)} \qquad (57)$$

As in Case IIa, investors J and K would obtain unqualified dividends at a bargain and reap superior incomes. ERTA would be used by investors I to try, unsuccessfully, to satisfy their demands. It would be a helpful feature to expidite approaching dividend irrelevance, but would not be sufficient. Unqualified firms would find dividend policy relevant and would adjust slowly to decrease payouts unless non-tax factors prevailed. DRP's would still be used as in Case Ia.

CASE IIIa: $S_D < D_D$ WITHOUT ERTA

Case IIIa would be if the supply of dividends was indadequate to meet the demand of investors J, preferring dividends and ERTA did not exist. The supply of gains would more than satisfy investors I, preferring gains, since total supply equals total demand, and an undersupply of one flow implies a strict oversupply of the other. Investor bidding would still produce the conditions of Equations (52a) through (53c) and, thus, Equation (54)

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} = v_{Dq} \leq v_G \frac{(1 - T_D{}^j)}{(1 - T_G{}^j)}. \qquad (54)$$

would still be valid. Investors K would enter the dividends market if

$$v_G > v_{Du} = v_{Dq},$$

and would bid until

$v_G \leq v_{Du} - v_{Dq}$.

This time, however, the supply of gains exceeds the total demands of investors I and K. The excess supply will only clear the market when the price of gains is bid down producing

$v_G < v_{Du} - v_{Dq}$

which together with Equations (53a) and (54) implies

$$v_{Du}\frac{(1 - T_G^i)}{(1 - T_D^j)} \leq v_G < v_{Du} - v_{Dq} \leq v_G\frac{(1 - T_D^i)}{(1 - T_G^j)} \tag{58}$$

Investors I and K would obtain gains at a bargain and reap superior incomes while all firms would find dividend policy relevant and would adjust slowly to increase payouts unless non-tax factors dominate. DRP's might still be used as in Case Ia, but their use would be limited by the fact that even investors J, who prefer dividends, will be forced into the gains market.

CASE IIIb: $S_D < D_D$ WITH ERTA

Case IIIb would be if the supply of dividends was indadequate to meet the demand of investors J, preferring dividends and ERTA existed. The supply of gains would more than satisfy investors I preferring dividends, since total supply equals total demand, and an undersupply of one flow implies a strict oversupply of the other. With ERTA, investors I could hold qualified dividends as well as gains, but there are enough gains without doing so and the two types of firms are otherwise identical so they would have no incentive to do so. At equilibrium, ERTA would serve no purpose, no one would campaign for its passage, and no one would lament its demise. In fact, the opposite concept is needed. An ANTI-ERTA would allow investors J to convert unwanted gains into dividends, bidding up the price of gains until equilibrium is reached at

$$v_{Du} = v_{Dq} = v_G. \tag{51}$$

DRP's might still be used as in Case Ia, but their use would be limited by the fact that even investors J, who prefer dividends, will be forced into the gains market.

NON-TAX-INDUCED DEMAND

It is possible that dividends are demanded for non-tax reasons in addition to any tax-induced demand. For example, signalling theory has been developed to explain why some level of dividends will be demanded to certify the validity of reported earnings. Accounting income signalling is like people playing poker with play money. A player signals good news by raising the ante (a firm declares higher earnings) with costless play money (financial income is reported anyway). With no economic consequences to face, much bluffing (low quality earnings) is to be expected and often a friendly poker game degenerates into real gambling when a suspected bluffer is told to put his money where his mouth is (the firm finds it necessary to issue at least a token dividend, even when the funds are needed internally and must be recaptured). Even for the poker player with a good hand, the cost of playing "for real" is the opportunity cost of carrying the excess cash (the real good news firm must finance the dividend even if its stockholders subsequently reinvest, perhaps via a DRP). The bluffer in the real poker game faces the same opportunity cost plus the threat of economic loss if the bluff is called (the firm with poor quality earnings faces possible difficulties in issuing new securities in a disbelieving market if its holders take the cash and run).

Under tax laws without ERTA, a "good news" firm offers dividends whenever internal needs for cash exceed internal supplies (Perumpral, 1983, pp. 156-158). The dividend signalling, plus the firm's reputation, exerts upward pressure on the firm's shares and makes it easier to raise needed funds. The cost of signalling includes dividend issuance, investor taxation on dividends, and flotation costs on new (but higher priced) securities. These costs discourage complete dividend signalling of the "good news" and thus impede the efficient allocation of capital.

The firm which chronically tries to bluff by mimicing the "good news" firms is like the shepherd boy who cried wolf. It suffers the same dividend signalling costs but its share prices do not rise.

If dividend signalling exists, the aggregate volume of dividends would exceed the tax-induced demand and would raise the value of dividends with respect to gains and confound static relationships. This effect highlights the conclusion of Poterba and Summers (1984) quoted earlier and "emphasize(s) the need for tests which rely upon genuine variations in the tax system in studying dividends and taxes" (pp. 1412-1413).

Some of the hypotheses developed in the following chapter are static, as are most prior tests of dividend valuation. The substantial changes in tax law presented by ERTA, however, allow other hypotheses to test for changes in ex-day behavior. If non-tax-induced demand exists, it may confound the static tests but the dynamic tests should distinguish tax-induced demand from non-tax-induced demand.

TAX DISEQUILIBRIUM AND ERTA--SUMMARY

The theory developed in the early part of this chapter suggests that at equilibrium, even with certain imperfections, ERTA would serve no purpose. A more realistic model, including the possibility of exogenous shocks and sticky dividend policy, has revealed circumstances under which ERTA would have value and dividend policy would be relevant.

The model posits several testable predictions concerning:

(1) the relative values of unsheltered dividends, sheltered dividends, and gains;

(2) the formation of clienteles;

(3) the popularity of DRP's; and

(4) the popularity of ERTA

which lead to the hypotheses of the next chapter.

CHAPTER SEVEN

RESEARCH HYPOTHESES

THE MODEL

The specific intent of this research is to examine whether equities differ systematically as a consequence of the existence of the tax preferences allowed for gains and certain utility DRP's by the Economic Recovery Tax Act of 1981. The model developed in the previous chapter was designed to determine if there were conditions, including imperfections and tax disequilibrium (as defined in 1-8 below) under which ERTA might have an effect on the relative valuation of dividends and gains. The model assumed

(1) ERTA applies to some firms which are free to distribute their income in any mix of qualified dividends and gains (earlier discussion leads these firms to issue all their income as dividends to let investors decide on the preferred mix);

(2) ERTA does not apply to some other firms which are free to distribute their income in any mix of unsheltered dividends and gains which can be sold separately;

(3) a given firm's mix of dividends and gains can be altered, but only slowly (perhaps stickiness is the result of avoiding improper signalling or disruption of clienteles);

(4) ERTA and non-ERTA firms are interchangeable in the sense that for every firm of each type there is at least one firm of the other type that is identical except for dividend policy (firms, however, cannot change their ERTA status);

(5) three sets of investors exist due to tax law: investors I with $T_D{}^i > T_G{}^i$ ($T_D{}^i$ and $T_G{}^i$ are investor i's marginal rate on dividends and gains, respectively), investors J with $T_D{}^j < T_G{}^j$, and investors K with $T_D{}^k = T_G{}^k$;

(6) the total value of the securities supplied equals the total value demanded;

(7) the mix of dividends and gains supplied at any time may not be the mix demanded (perhaps due to an exogenous shock affecting demand more rapidly than supply can adjust); and

(8) even if the mix supplied is the mix demanded, it may not be optimal in the sense that some other mix might be preferred by investors if some market imperfection could be reduced.

The notation used included

v_g = the value (price) of \$1 of gains,

v_{Du} = the value of \$1 of unsheltered dividends,

v_{Dq} = the value of \$1 of ERTA-sheltered dividends,

S_{Du} = the supply of unqualified dividends,

S_{Dq} = the supply of ERTA qualified dividends,

S_D = $S_{Du} + S_{Dq}$

= the total supply of dividends,

S_G = the supply of gains,

D_D = the demand for dividends by investors J who prefer dividends for tax reasons, and

D_G – the demand for gains by investory I who prefer gains for tax reasons.

IMPLICATIONS OF THE MODEL

The model posits several testable predictions concerning: (1) the relative values of unsheltered dividends, sheltered dividends, and gains; (2) the formation of clienteles; (3) the popularity of DRP's; and (4) the popularity of ERTA. These predictions are summarized by case below.

Ia: $S_D \geq D_D$ and $S_G \geq D_G$ WITHOUT ERTA

In Ia, enough dividends are supplied to satisfy J and enough gains are supplied to satisfy I without ERTA. It predicts equal values for a dollar of dividends and gains so dividend policy is irrelevant. The ex-dividend day drop is predicted to equal the dividend for all types of firms. I holds only gains, J holds only dividends, and K holds both. DRP's will be used by J and K when they prefer the cash flow pattern of gains.

Ib: $S_D \geq D_D$ and $S_G \geq D_G$ WITH ERTA

Ib is the same as Ia except for the existence of ERTA. All of the above holds and ERTA would not be used by anyone.

IIa: $S_G < D_G$ WITHOUT ERTA

In IIa, not enough gains are supplied to meet the demand of I without ERTA. The supply of dividends would more than satisfy J. Gains would be valued more highly than dividends so dividend policy is relevant: firms should lower payouts. The ex-dividend day drop is predicted to be less than the dividend for all types of firms. I holds all the gains and some dividends, while J and K hold only dividends. DRP's will be used by J and K when they prefer the cash flow pattern of gains.

IIb: <u>$S_G < D_G$ but $S_G + S_{Dq} \geq D_G$ WITH ERTA</u>

In IIb, not enough gains are supplied to meet the demand of I, but qualified dividends, together with ERTA, are adequate to supplement them. The supply of dividends would more than satisfy J. Dividends and gains are valued equally so dividend policy is irrelevant. The ex-dividend day drop is predicted to equal the dividend for all types of firms. I holds gains and qualified dividends, which are ERTA sheltered, and J and K hold only dividends. DRP's will be used by J and K when they prefer the cash flow pattern of gains, but they are indifferent to ERTA.

IIc: <u>$S_G < D_G$ and $S_G + S_{Dq} < D_G$ WITH ERTA</u>

In IIc, the supplies of gains and qualified dividends, together with the existence of ERTA, are still inadequate to meet the demand of I. The supply of dividends would more than satisfy J. Qualified dividends and gains are valued equally and more highly than unqualified dividends, so dividend policy is relevant: unqualified firms should lower payouts. The ex-dividend day drop is predicted to equal the dividend for qualified firms and to be less than the dividend for unqualified firms. I holds gains; qualified dividends, which are ERTA sheltered, and unqualified dividends; and J and K hold only unqualified dividends.

DRP's will be used by J and K when they prefer the cash flow pattern of gains, but they are indifferent to ERTA.

IIIa: $S_D < D_D$ WITHOUT ERTA

In IIIa, the supply of dividends is indadequate to meet the demand of J. The supply of gains would more than satisfy investors I without ERTA. Gains are valued less than dividends so dividend policy is relevant: firms should raise payouts. The ex-dividend day drop is predicted to exceed the dividend for all types of firms. I and K hold only gains and J holds dividends and some gains. DRP's might be used by J when they prefer the cash flow pattern of gains, but their use will be limited by the fact that they are already forced to hold some gains.

IIIb: $S_D < D_D$ WITH ERTA

In IIIb, no one will use ERTA but there will be pressure for the opposite concept.

The conclusions of the various cases and subcases, together with existing evidence, provide clues as to which case most closely fits the capital market at any given date. Once a case is selected as being most representative, it provides further testable predictions which lead to the hypotheses for the empirical portion of the research. To decide which case is most realistic, four time intervals will be examined: (a) before June 9, 1981, (b) from June 9, 1981 through December 31, 1981, (c) from January 1, 1982 through December 31, 1985, and (d) after January 1, 1986.

CASE IIa: THROUGH 1981

In intervals (a) and (b), prior to 1982, ERTA did not shelter utility dividends so the choice is between Cases Ia, IIa, and IIIa. Case IIIa is rejected easily since it concludes that there would be no support for passage of ERTA but instead for passage of an ANTI-ERTA law. It also predicts that use of DRP's would be limited if not nonexistent. Case Ia is also unlikely. It is consistent with DRP use but also predicts no demand for ERTA-sheltered dividends. The most reasonable scenario is Case IIa. It is consistent with DRP useage and an ERTA campaign. It fits the generally accepted view that, for many investors, dividends are taxed more heavily than gains and the aggregate level of dividends is too large to be explained by the dividend exclusion (Woolridge, 1983).

A partial explanation for the excessive level of dividends is given by dividend signalling theory. If dividend signalling exists, the aggregate volume of dividends would exceed the tax-induced demand and Case IIa would result. In IIa, not enough gains are supplied to meet the tax-induced demand of I without ERTA but the supply of dividends would more than satisfy J. Gains would be valued more highly than dividends so dividend policy is relevant: firms should lower payouts. The ex-dividend day drop is predicted to be less than the dividend for all types of firms. I holds all the gains and some dividends, while J and K hold only dividends. DRP's will be used by J and K when they prefer the cash flow pattern of gains. DRP's may serve the function of reducing the costs of issuing new securities and ERTA would reduce the taxation costs and encourage "good news" firms to provide more complete signalling. The two would, thus, reduce impediments to the efficient allocation of capital.

HYPOTHESIS ONE

The acceptance of Case IIa as the most accurate representation of the pre-1982 market provides the testable hypothesis:

H1: Before 1982, gains were valued more highly by investors than dividends so the ex-dividend day drop was less than the dividend for all types of firms.

This hypothesis is supported for most of the companies studied by Litzenberger and Ramaswamy (1979, 1980), Bar-Yosef and Kolodny (1976), Elton and Gruber (1970), Kalay (1982), and Poterba and Summers (1984). The top two yield deciles, however, are typically anomolous. To the extent that non-tax-induced demand for dividends exists, tests of this hypothesis will be confounded by ex-day statistics higher than taxes alone would imply.

REDUCTION IN THE GAINS TAX RATE

Case IIa also predicts a discontinuity June 9, 1981, when the maximum gains rate dropped from twenty-eight to twenty percent. The relative pricing relationship that applies:

$$v_G\frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} - v_{Dq} < v_G \leq v_{Du}\frac{(1 - T_G{}^i)}{(1 - T_D{}^i)}. \tag{55}$$

places a lower boundary on the ratio of the value of dividends to gains and therefore the ratio of the ex-dividend day drop as a proportion of the dividend. The lower bound is

$$\frac{(1 - T_D{}^i)}{(1 - T_G{}^i)},$$

where the tax rates are those of the marginal investor I ($T_D^i > T_G^i$) who prefers gains for tax reasons, regardless of other preferences he or she might have. Since the boundary condition is a positive function of T_G^i, a decrease in the gains tax rate T_G^i implies a decrease in the lower boundary on the ratio of prices and on the ratio of the ex-dividend day drop as a proportion of the dividend.

Because the gains rate dropped on June 9, 1981, only for persons in the top bracket, the question is whether that change affected the marginal investor. Some investors in lower brackets were likely to hold relatively small stock portfolios with dividend receipts less than the one hundred dollars per person, two-hundred dollars per couple, exclusion and thus find themselves in set J. Other low-bracket investors were likely to receive dividends exceeding the exclusion and still have dividends taxed more heavily than gains.

HYPOTHESIS TWO

If the marginal investor of type I was in the top tax bracket, the gains tax rate for the marginal investor was affected by the June 9, 1981 change. This provides the testable hypothesis:

H2: On June 9, 1981, the relative valuation of gains rose, and hence the size of the ex-dividend day drop, fell.

A confounding factor is the result, found by Poterba and Summers (1984) using British data, that changes in gains taxation had no pronounced effect on the ex-dividend day price drop but changes in dividend taxation had a substantial effect. Unlike Hypothesis One, tests of this hypothesis should not be confounded by non-tax-induced demand. Such demand may raise the level of ex-day statistics, but Hypothesis Two predicts a change in whatever level exists.

REDUCTION IN THE DIVIDENDS TAX RATE

The relative pricing relationships that apply in Cases IIa and IIc, Equations (55) and (57), differ. Both, however, place the same lower boundary on the ratio of the value of dividends to gains and therefore the ratio of the ex-dividend day drop as a proportion of the dividend. The lower bound is

$$\frac{(1 - T_D{}^i)}{(1 - T_G{}^i)},$$

where the tax rates are those of the marginal investor I ($T_D{}^i > T_G{}^i$) who prefers gains for tax reasons, regardless of other preferences he or she might have. Since the boundary condition is a negative function of $T_D{}^i$, a decrease in the dividend tax rate $T_D{}^i$ implies an increase in the lower boundary on the ratio of prices and on the ratio of the ex-dividend day drop as a proportion of the dividend.

Because the dividend tax rate dropped on January 1, 1982, for most investors I, the question is whether that change affected the marginal investor. Some investors in lower brackets were likely to hold relatively small stock portfolios with dividend receipts less than the one hundred dollars per person, two-hundred dollars per couple, exclusion and thus find themselves in set J. Others, however were likely to exceed that limit. The marginal investor, then was probably affected by the change on that date

HYPOTHESIS THREE

Since all investors I received dividends in excess of the exclusion, the dividend tax rate for the marginal investor was affected by the January 1, 1982 change. This provides the testable hypothesis:

H3: On January 1, 1982, the ratio of the value of unqualified dividends to gains, and hence the size of the ex-dividend day drop, rose.

HYPOTHESIS FOUR

For qualified dividends two tax changes went into effect on January 1 1982: The tax rate dropped and some qualified dividends could be treated as stock dividends for tax purposes. If the marginal investor in qualified dividends received more than $750 ($1,500 per couple filing jointly) of such dividends, only the first change applies. If the marginal investor was under that limit, both changes apply. However, both effects lower the taxation of such dividends and make them more valuable so the size of the investor's portfolio is irrelevant to Hypothesis Four.

H4: On January 1, 1982, the ratio of the value of qualified dividends to gains, and hence the size of the ex-dividend day drop, rose.

The result, found by Poterba and Summers, that changes in dividend taxation had a substantial effect on the ex-dividend day price drop, supports both Hypothesis Three and Hypothesis Four. Again, these hypotheses examine changes so they are not confounded by non-tax-induced demand.

CASE IIc: 1982 THROUGH 1985

Given the assumption of Case IIa through December 31, 1981, the introduction of ERTA at that time implies a choice between Cases IIb and IIc for the succeeding period. Case IIc is supported by the belief, in Congress and elsewhere, that ERTA would increase the value of sheltered utility dividends and specifically benefit that industry. The continued excess supply of dividends would be suggested by dividend signalling theory and was verified by a weak but continuing campaign to extend ERTA to other industries.

In IIc, the supplies of gains and qualified dividends, together with the existence of ERTA, are still inadequate to meet the demand of I but the supply of dividends would more than satisfy J. Qualified dividends and gains are valued equally and more highly than unqualified dividends, as indicated by the relative pricing relationship:

$$v_G \frac{(1 - T_D{}^i)}{(1 - T_G{}^i)} \leq v_{Du} < v_{Dq} = v_G \leq v_{Du} \frac{(1 - T_G{}^i)}{(1 - T_G{}^i)} \tag{57}$$

so dividend policy is relevant: unqualified firms should lower payouts. The ex-dividend day drop is predicted to equal the dividend for qualified firms and to be less than the dividend for unqualified firms. I holds gains, qualified dividends, and unqualified dividends; and J and K hold only unqualified dividends. DRP's will be used by J and K when they prefer the cash flow pattern of gains, but they are indifferent to ERTA.

HYPOTHESES FIVE AND SIX

If Case IIc applies from 1982 through 1985, it provides the testable hypotheses:

H5: From January 1, 1982 through December 31, 1985, gains were valued more highly by investors than unqualified dividends so the ex-dividend day drop was less than the dividend for all unqualified firms.

and

H6: From January 1, 1982 through December 31, 1985, gains and qualified dividends were valued equally by investors so the ex-dividend day drop was equal to the dividend for all qualified firms.

Again, to the extent that non-tax-induced demand for dividends exists, tests of these hypotheses will be confounded by ex-day statistics higher than taxes would imply.

CASE IIa: AFTER 1985

Acceptance of Case IIa prior to December 31, 1981 implies Case IIb or IIc during the 1982 through 1985 interval. In both of these scenarios, the supply of gains is inadequate to satisfy investors I and the difference is in whether qualified dividends are sufficient to supplement their needs. Termination of ERTA would instantly eliminate the supply of convertible dividends and leave investors I even more unsatisfied. Furthermore, all of the arguments for Case IIa prior to 1982 apply here as well.

HYPOTHESIS SEVEN

The acceptance of Case IIa as the most accurate representation of the post-1985 market provides the testable hypothesis:

H7: After 1985, gains are once again valued more highly by investors than dividends so the ex-dividend day drop is less than the dividend for all types of firms.

This hypothesis is again supported by the studies of Litzenberger and Ramaswamy (1979, 1980), Bar-Yosef and Kolodny (1976), Elton and Gruber (1970), Kalay (1982), and Poterba and Summers (1984). Again, non-tax-induced confounding may occur.

THE HYPOTHESES--SUMMARY

The six hypotheses which follow from the model are summarized as follows:

H1: Before 1982, gains were valued more highly by investors than dividends so the ex-dividend day drop was less than the dividend for all types of firms.

H2: On June 9, 1981, the relative valuation of gains rose, and hence the size of the ex-dividend day drop, fell.

H3: On January 1, 1982, the ratio of the value of unqualified dividends to gains, and hence the size of the ex-dividend day drop, rose.

H4: On January 1, 1982, the ratio of the value of qualified dividends to gains, and hence the size of the ex-dividend day drop, rose.

H5: From January 1, 1982 through December 31, 1985, gains were valued more highly by investors than unqualified dividends so the ex-dividend day drop was less than the dividend for all unqualified firms.

H6: From January 1, 1982 through December 31, 1985, gains and qualified dividends were valued equally by investors so the ex-dividend day drop was equal to the dividend for all qualified firms.

and

H7: After 1985, gains are once again valued more highly by investors than dividends so the ex-dividend day drop is less than the dividend for all types of firms.

CHAPTER EIGHT

METHODOLOGY

The model developed in the previous chapters was intended to determine if there are conditions, including imperfections and tax disequilibrium, under which ERTA might have affected on the relative valuation of dividends and gains. Since each of the seven hypotheses which follow from the model is a prediction of the relative value of dividends and gains, the same general ex-dividend day methodology was used throughout. Numerous other researchers have approached the dividend policy question by examining ex-dividend day behavior. They include Elton and Gruber (1970), Copeland and Weston (1980), Kalay (1982), Lakonishok and Vermaelen (1983), Booth and Johnston (1984), Poterba and Summers (1984), and Gilster and Gilmer (1985). Their studies indicate several methodological issues which must be addressed.

EXISTENCE OF TRADERS

Elton and Gruber (1970) tried to imply marginal investor tax rates from ex-dividend day behavior but Kalay (1982) noted that this ignores the existence of traders and institutions who will act to arbitrage away any large difference between the ex-dividend day drop and the dividend. Booth and Johnston (1984) and Lakonishok and Vermaelen (1983) were able to assume away traders since they barely exist in the Canadian market. Traders are considered in the theory of the present study to be investors of type K with equal gains and dividend tax rates. The existence of arbitragers increases the need for sensitive statistics to detect small differences.

EX-DIVIDEND DAY PRICE

The Ex-dividend day price can be determined in several ways. The ex-dividend day opening price was rejected since exchanges automatically adjust it to reflect the dividend. The ex-dividend day closing price is biased in that it ignores one day's returns. A better estimate is to use the market-adjusted ex-dividend day closing price. Lakonishok and Vermaelen (1983) used this and opening price and obtained equivalent results. Elton and Gruber (1970) used this and closing price, again with no difference in conclusions. In this study, both the ex-day closing price and the closing price adjusted for one day's returns, using both an OLS beta and an aggregated beta (described below), were used. The one day adjustment, however, was not critical since it only affected the third or fourth significant digit of the ex-day statistics and had no impact on the statistical significance of any of the results. For this study only unadjusted statistics are reported.

TEST STATISTIC

Two different statistics have been used in earlier studies to measure the relationship between the ex-day drop and dividend. Elton and Gruber (1970) created the first:

$$d = (P_b - P_a)/D \qquad (22)$$

where

P_a = the price the day before the stock goes ex dividend,

P_b = the price the day the stock goes ex dividend, and

D = the dividend.

The statistic was also employed by Booth and Johnston (1984) and Lakonishok and Vermaelen (1983). The latter noted that this statistic is heteroskedastic since error is proportional to price but not to dividend. To avoid this, they scaled the numerator and denominator for price to obtain:

$$p = \frac{\sum_{i=1}^{n} \Delta P_i/P_i}{\sum_{i=1}^{n} D_i/P_i}, \tag{25}$$

which is the average proportionate drop over the average yield. When they compared the conclusions of the two statistics, they were equivalent. Both were employed in this study but, again, the choice of statistic did not affect results or conclusions.

BETA ESTIMATES

It is impossible to observe true betas so it is conventional to assume that they are stable over short time periods and to estimate them from past data. This study estimated each firm's daily beta using the prior two years' observations. Two types of beta were employed: The conventional OLS beta and an aggregated beta of the form developed by Cohen, et al (1983). The latter recognizes the possibility of leads and lags in the relationship between market returns and returns of individual equities. The Cohen beta is:

$$\hat{b}_j = \frac{b_j + \sum_{n=M}^{N} b_{j+n}}{1 + \sum_{n=M}^{N} b_{m+n}}$$

where

$\hat{b}_j$ = the aggregated beta estimator for equity j,

b_{j+n} = the OLS regression estimator of

$cov(\tilde{R}_{j,t+n},\tilde{R}_{M,t})/var(\tilde{R}_{M,t})$,

b_m = the aggregated beta for the market with itself,

b_{m+n} = the OLS regression estimator of

$cov(\tilde{R}_{M,t+n},\tilde{R}_{M,t})/var(\tilde{R}_{M,t})$,

$\tilde{R}_{i,t}$ = the daily return on equity j for day t,

$\tilde{R}_{m,t}$ = the daily return on the market for day t, and

n = the lag (lead if $n < 0$) between the market and equity j's response .

It should be noted that if there are no systematic leads and lags, the summations are zero and the aggregated beta is identical to the OLS beta.

Excess returns for the firms were regressed on excess market returns using:

$$\tilde{R}_{i,t} = \alpha_i + \tilde{R}_{m,t}\beta_i + \tilde{e}_{i,t}.$$

The two betas differ quite markedly in many cases. The OLS beta might be theoretically superior for the ex-day adjustment since only one day's normal returns are required but, as has been noted, the adjustment is not critical. For the hypothesis testing, beta was used to factor out the effects of any unknown market variables. For this purpose, the aggregated beta is more appropriate. To determine the effects of the two betas, both were used in both applications. The results and conclusions of this study, however, were essentially unaffected by the choice of beta except where noted, so only results using the aggregated beta are reported.

YIELD

As interest rates and other economy-wide variables change over time, the average dividend yield and its dispersion shift. Thus, if raw yield data are examined over time, any yield effect that is found may be a proxy for time or some other spurious time-related variable. To avoid this confounding of variables, yields were standardized for each quarter to a mean of 0.0 and standard deviation of 1.0. The standardized yield (S) can be expressed in terms of raw yield (y), average yield (Y) and standard deviation of yield (s_y) as

$$S = (y - Y)/s_y.$$

A similar adjustment was not necessary for betas since beta already is scaled by the variance of the market to a theoretical mean of 1.0.

SAMPLE

Three sets of companies were sampled for the empirical portion of this research: (a) utilities which qualified for ERTA sheltering, (b) utilities which did not qualify for ERTA sheltering, and (c) non-utilities. Prior to 1982 a company was identified as "qualified" if it subsequently became qualified under ERTA. Since some of the hypotheses apply specifically to utilities, the sample included firms from the electric, gas, water, and telephone industries. Only some of these firms qualified for ERTA sheltering--mostly the electrics-- and some qualified for only part of the interval. The others were included for comparison. In addition, nonutilities were also sampled to test appropriate hypotheses and expand the applicability of the results. SIC codes supplied by the CRSP tapes were used to distinguish between utilities and nonutilities. The CRSP tapes also contain codes to distinguish qualified dividends from unqualified ones. Both types of codes were also checked against Value Line, annual reports, and other sources. Although the CRSP codes were found to be generally accurate, eight companies, with a total of 178 dividends, appeared to be misplaced and were examined individually. Four companies with nonutility SIC codes but fifty-two qualified dividends, were found on lists of qualified utilities compiled by others. They had major utility subsidiaries and were grouped with qualified utilities for this study. Four others with nonutility SIC codes but twelve qualified dividends (according to CRSP codes) were not utilities. Two of the four were banks. These four were placed in the nonutility group.

Since some of the hypotheses apply to ERTA, they can only be tested with data from 1982 through 1985. Hill and Schneeweis (1983) found that the March, 1979 Three Mile Island incident produced immediate impacts on the shares of both General Public Utilities, the owner, and other electric utilities. Significant abnormal negative returns continued for two months for both nuclear and non-nuclear electric utilities and non-significant abnormalities extended beyond two months for those with nuclear exposure. For the above reasons, the time frame for examining electric utilities was limited to January 1, 1980 to the present.

The Center for Research in Security Prices (CRSP) Tapes were utilized as the source of data on individual firms and the CRSP Value Weighted Index was used as the market proxy. Both were adjusted for price changes and dividends. Since almost all ordinary cash dividends and qualified dividends were included (eleven dividends were excluded due to lack of full information), the sample was essentially a census of all NYSE and AMEX dividends from 1980 through 1985. A total of 24,144 dividends was included. A detailed listing of sample sizes by quarter is in Appendix One. A listing of the companies included and the number of dividends of each type is available on request.

RAW VERSUS AGGREGATED DATA

As noted above, beta was used to remove any unknown market-related effects. Yield has been found to be related to ex-day behavior and should also be removed before testing for other effects. Unfortunately these two variables are correlated and standard regression procedures produce "bouncing betas"-- sometimes one variable accounts for most of the power of statistical tests and at other times the other one does.

Black and Scholes (1974) noted the multicollinearity and developed a methodology to account for it. They ranked the data on one of the variables and subdivided into quintiles. They then ranked each quintile on the other variable and subdivided again by quintiles. (There is no theoretical reason not to use deciles, etc. except for sample size.)

The above procedure produces cell means which are (approximately) independent on the two variables. The dispersion of the cell means is also reduced, increasing the significance of further statistical tests. Unfortunately, the procedure also reduces the degrees of freedom offsetting some or all of the gains. The Black and Scholes procedure was employed in this study wherever aggregated data are discussed except that deciles were used instead of quintiles whenever the sample size exceeded one thousand.

Stepwise regression can be used to overcome multi- collinearity while avoiding the information loss that results from aggregation. With stepwise regression, one variable is entered at a time and tested for the incremental increase in prediction. Only the significance of the last variable added at each step is reported since it is the incremental contribution that is of concern. The statistical power of this procedure is maximized for two reasons. First, any aggregation destroys some information. Second, stepwise regression assigns all of the power of the total regression to the individual variables while standard regression does not. Standard regression only assigns to each variable the predicting power it would have if entered last, so some statistical power is lost.

One limitation of stepwise regression is that it can only be justified if there is theoretical reason to believe that there is a logical priority in the variables. Fortunately, in the present study it is possible to construct such a ranking. Since beta is a proxy for market-wide variables, it has priority over yield, which is a firm-specific variable. Also, this research was intended to repllicate prior studies which entered beta and yield in that order. The other variables were being tested to see if they added to the prediction found earlier with beta and yield and, therefore, they were added last.

A second limitation of unaggregated regression is logistical. Some of today's statistical packages are unable to handle such massive data bases and the B&S study was published in 1974. Fortunately, there is a way around this limit. For this study, a separate computer program was created to produce a matrix of correlations, means, and standard deviations for the variables for each time period. The matrix was then used as input for SPSS.

As with beta and the ex-day statistic, the use of raw or aggregated data did not substantially affect results. Complete regression equations for raw and aggregated data are reported in Appendices Three and Four respectively. Where incremental variables are not significant, it is indicated by the symbol "ns".

DATA AGGREGATED BY COMPANY

In an attempt to reduce the random variance of the data, the dividend information were aggregated by company. Regressions similar to the ones run on raw data were run on the company data:

(1) first for all companies and

(2) second for all companies with at least

   (a) two dividends,

   (b) three dividends,

   (c) etc.

Unfortunately, although this did reduce the variability of the data, it excluded companies systematically causing the coefficients to drift. Results are not summarized here.

THE HYPOTHESES TESTS

The sets of companies used to test the hypotheses are indicated in Table 1.

TABLE 1

HYPOTHESES TESTS

	Test With		
Hypothesis	Qualified Utilities	Unqualified Utilities	Nonutilities
H1	X	X	X
H2	X	X	X
H3	-	X	X
H4	X	-	-
H5	-	X	X
H6	X	-	-
H7	X	X	X

CHAPTER NINE

FINDINGS

EX-DAY BEHAVIOR BY YIELD DECILES AND PERCENTILES

Prior studies (Elton and Gruber, 1970. Kalay, 1982. Gilster and Gilmer, 1985) had found that when dividends were ranked by yield, the highest yield decile(s) had ex-day statistics greater than one while all the other deciles had statistics less than one. Those studies attempted to explain the effect in terms of tax or other clienteles. A preliminary examination of the present data was performed to check for consistency with those findings. Tables 2 and 3 show E&G and L&V statistics for the five company groupings arranged by yield decile for the entire 1980-85 interval. (Subperiods prior to and after ERTA were examined and produced similar results.)

As seen in the tables, the data from this study confirmed prior findings. The top decile of the all company sample had ex-day statistics that were greater than one, whether measured by the E&G or L&V metric, all of the other deciles had ex-day statistics that were less than one, and all were significant except the second decile. It is equally obvious, however, that the all company effect was due to utilities. All of the nonutility deciles had E&G and L&V statistics less than one and all but the first decile were significant. On the other hand, most of the utility deciles had statistics significantly greater than one. It is further apparent that the utility effect was

TABLE 2

MEAN E&G STATISTICS BY YIELD DECILE
(1 = highest yield, 10 = lowest yield)

YIELD DECILE	NON-UTIL	UNQUAL UTIL	QUAL UTIL	ALL UTIL	ALL CO'S
1	.871	1.143	1.189***	1.129*	1.129*
2	.791*	1.112	1.147***	1.155*	.883
3	.766*	1.156	1.210***	1.196*	.813*
4	.663**	1.083	1.197***	1.136*	.732**
5	.703**	.929	1.128**	1.232**	.675***
6	.568***	.938	1.261***	1.158*	.625***
7	.777*	.762	1.166***	1.146*	.734**
8	.756*	.878	1.159***	1.071	.764**
9	.570***	.703	1.162***	.857*	.531***
10	.642***	1.571*	1.046	1.100	.718**
n/decile	2125	88	202	290	2414

* significant at .1
** significant at .01
*** significant at .001

Table 3

MEAN L&V STATISTICS BY YIELD DECILE
(1 - highest yield, 10 - lowest yield)

YIELD DECILE	NON-UTIL	UNQUAL UTIL	QUAL UTIL	ALL UTIL	ALL CO'S
1	.874	1.135	1.182***	1.190*	1.128*
2	.789*	1.112	1.146***	1.151*	.887
3	.767*	1.159	1.207***	1.193*	.812*
4	.670**	1.077	1.197***	1.139*	.732**
5	.696**	.920	1.131**	1.227**	.677***
6	.577***	.942	1.251***	1.159*	.629***
7	.783*	.795	1.166***	1.140*	.740**
8	.755*	.904	1.158***	1.066	.766**
9	.570***	1.198	1.156***	.885*	.542***
10	.618***	1.267	1.030	.979	.689***
n/decile	2125	88	202	290	2414

* significant at .1
** significant at .01
*** significant at .001

predominantly due to the qualified utilities. All of the qualified utility deciles had statistics greater than one and nine deciles were significant at .01 or better whether E&G or L&V statistics were used. The unqualified utilities had statistics that were mixed. Since two results out of twenty would be expected to be significant at $\alpha = .01$, the one unqualified utility statistic that was significant should be disregarded.

What cannot be determined from Tables 2 and 3 is whether it was a utility effect, per ce, or a yield effect since all but the lowest decile of qualified utilities had yields that were greater than the yield of the highest nonutility decile. The top four deciles of unqualified utilities had yields that were similarly higher than the highest decile of nonutilities. Fortunately, there was enough data in the 1980-85 period that the deciles could be subdivided into tenths, forming yield percentiles. A complete table of yield percentiles and the associated ex-day statistics for 1980-85 is in Appendix B.

Examination of the all-company data sorted by yield percentiles (Appendix B.5) also confirmed the conclusions of prior studies. The E&G and L&V statistics for the ten highest yield percentiles were all nonsignificantly greater than one while for the remaining ninty percentiles eighty-four E&G and eighty-three L&V statistics were less than one. Furthermore, of the ninty, twenty-one E&G statistics and eighteen L&V statistics were significantly less than one while only two E&G and one L&V statistics were significantly greater than one.

The nonutility percentiles (B.1) confirmed the results found with deciles. All statistics from the sixty highest nonutility yield percentiles were less than one, and these overlapped the top ninty-five yield percentiles for utilities with statistics that were predominantly greater than one. All eighteen E&G statistics and twenty L&V statistics that were significant were less than one. Only seven E&G statistics out of one hundred and four L&V statistics out of one hundred were greater than one.

For the qualified utility percentiles (B.3), ninty E&G statistics and ninty-one L&V statistics were greater than one, with forty-seven of the former and forty-five of the latter being significant. Only three statistics of each type were significantly less than one.

In the stepwise regressions performed on the data, dummies were added to represent utilities and ERTA qualification. For the entire period (C.5, D.6.5) and its subperiods (C.4.5, C.5.5, D.4.5, D.5.5), seven out of nine utility coefficients were positive including both significant ones. With OLS beta, eight out of nine were positive including all four significant ones. For the qualified dummies (C.4.4, C.5.4, C.6.4, D.4.4, D.5.4, D.6.4), seven out of nine were also positive but none were significant. Results were similar for OLS betas.

Apparently ex-day behavior is related to yield, but utilities do not act consistently with other equities. There appear to be two dividend clientele effects: one related to yield and the other an industry effect.

EX-DIVIDEND BEHAVIOR, BETA, AND YIELD

Previous studies indicated that ex-day statistics are negativly correlated with BETA and positivly correlated with YIELD. Both raw data and aggregated data were employed. For aggregated data, both E&G and L&V statistics were used for the dependent variable. The two statistics are equivalent for raw data. Thus, for each time period and company type there were two tests. Complete regression results for raw and aggregated data are reported in Appendices Three and Four respectively.

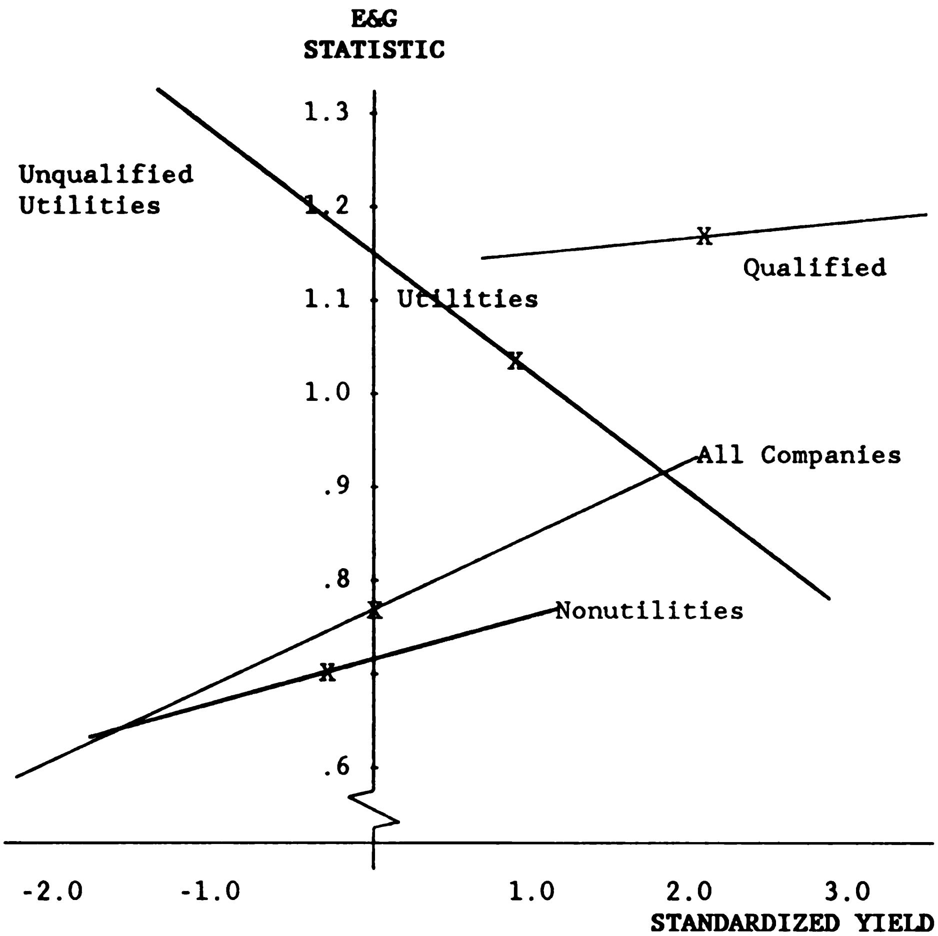
For the entire period from 1980-1985 (C.6, D.6), all BETA coefficients had the expected negative sign. All were significant except for two of the three coefficients for unqualified utilities. For 1980-81 (C.4, D.4), eleven of the signs were negative including all five significant ones. The coefficients which were positive were clustered in the unqualified utilities (3) and utilities(1). From 1982-85 (C.5, D.5), all of the coefficients were negative. With aggregated beta, all coefficients were significant. With OLS beta, all six of the tests with utilities and all companies were significant, but none of the others were.

It can be concluded, then, that the data of the present study confirm the results of prior work. Beta is negatively related to ex-dividend statistics. The average incremental R^2, however, is small; approximately .075. For qualified utilities during 1980-81, though, the R^2 using OLS beta was .400 for the E&G statistic and .469 for the L&V statistic.

In testing YIELD as a predictor of ex-day statistics, a stepwise regression procedure was employed, extracting the effect of BETA first to determine if YIELD added to the explanation provided by a risk measure (same Appendices as above). For the 1980-85 period, all yield coefficients were positive using aggregated beta except for two for unqualified utilities and one for utilities. The five out of fifteen that were significant had positive signs. For OLS beta, only one unqualified utility coefficient was negative and 13 were significantly positive. For 1980-81, ten coefficients were positive including all eight significant ones. All of the nonutility and all company coefficients were significantly positive. The negative signs were distributed among the three utility groups. For 1982-85, with aggregated beta, thirteen coefficients were positive including all four significant ones. For this period, the OLS results were more consistent. All yield signs were positive and ten were significant.

The data, thus, confirm the results of prior studies with respect to YIELD. The incremental R^2 was quite low, however, averaging .026. An interesting observation can be made about sample selection. For the entire period all six of the tests with the all companies group produced significant YIELD coefficients and four of six coefficients with each subperiod were significant. When nonutilities were tested, however, only two of six coefficients were significant; the best at .081. For 1982-85 none of the nonutility coefficients was significant. It is possible that if prior studies had excluded utilities and adjusted for risk, YIELD might not have been found to be a significant predictor.

A graph (Figure 1) of the data on the YIELD--E&G plane (or YIELD--L&V plane) with BETA factored out first reveals why YIELD is significant in the all company sample. Nonutilities vastly outnumber utilities so the direction of the slope of the regression line for all companies is the same as for nonutilities. Unqualified utilities have a center of gravity that is above the right end of the nonutility line which raises the all company average slightly and tilts its slope



* Each line segment is two standard deviations long.
The "x" on each line segment marks its centroid.
Aggregated beta has been removed.

FIGURE 1

E&G STATISTICS BY STANDARDIZED YIELD--1980-1985*

slightly upward, raising significance. The slope of the unqualified utility line is not significant since the data are so dispersed, so it has little effect. Qualified utilities have a center of gravity that is way above the right end of the nonutility line and almost two standard deviations to the right of the nonutility centroid. This and the upward slope of the qualified utilities both tilt the all company line upward still further, increasing its significance. Thus, even when the nonutility subgroup has an ex-day statistic that is not significantly related to YIELD, the all company sample may have a significant coefficient on YIELD.

Prior studies may have produced significant correlations between ex-day statistics and YIELD due to the inclusion of utilities which seem to have characteristics that cause them to lie off of the regression line for other equities.

For both BETA and YIELD, the results do not depend on which Beta measure or which ex-day statistic is used.

TESTS OF THE HYPOTHESES OF THIS STUDY

For tests of the five hypotheses developed earlier, both raw data and aggregated data was used. For the aggregated data, both E&G and L&V statistics were used for the dependent variable, whereas for the raw data only the E&G statistic was relevant.

For this examination of the data, results are grouped by hypothesis. Each of the hypotheses of the proposal is represented by several data sets except for the last which requires data since the end of 1985.

For notation, let:

E&G = the E&G drop/dividend statistic

L&V - the L&V drop/dividend statistic

BETA - the aggregated beta

YIELD - standardized dividend yield. (Mean - 0, standard deviation - 1.)

HYPOTHESIS ONE

Hypothesis One states that before 1982, gains were valued more highly by investors than dividends for tax reasons so the ex-dividend day drop was less than the dividend. Since this hypothesis involves only the dependent variable, Tables 4 and 5 will suffice to summarize the statistics. It first should be noted that the use of nonrandomly aggregated data, as in the Black and Scholes methodology employed here, may lower the estimate of the standard deviation of the sampling distribution making the tests appear to be more significant than they are. Using raw data for the estimate is probably a more conservative approach.

As can be seen from the data (from C.4, D.4), all of the drop statistics except for unqualified utilities are significantly different from one at .01. The nonutilities and the all companies groups support Hypothesis One. However, the statistics for all three utilities subgroups are greater than one and the statistics for utilities and qualified utilities are all significant. This indicates that some prior studies which found the drop to be less than the dividend may have been flawed by not treating utilities separately. Their behavior is not consistent with that of other equities.

Adjusting the ex-day drop for one day's return using an aggregated beta seems to make so little difference that only unadjusted

TABLE 4

E&G AND L&V STATISTICS (RAW)--1980-1981
(Using raw data to estimate
the standard deviation of the sampling distribution)

COMPANY TYPE	DROP STATISTIC	MEAN	ST.DEV. SAMPLING DISTRIB.	Z-STAT
Nonutilities	E&G--UNADJUSTED	.682	.0575	-5.53****
(n=7,785)	--ADJUSTED	.684	.0572	-5.52****
	L&V--UNADJUSTED	.704	.0575	-5.15****
	--ADJUSTED	.706	.0572	-5.14****
Unqualified	E&G--UNADJUSTED	1.165	.1984	.83
utilities	--ADJUSTED	1.164	.1963	.84
(N=247)				
	L&V--UNADJUSTED	1.041	.1984	.21
	--ADJUSTED	1.040	.1963	.20
Qualified	E&G--UNADJUSTED	1.190	.0287	6.62****
utilities	--ADJUSTED	1.190	.0286	6.64****
(n=605)				
	L&V--UNADJUSTED	1.181	.0287	6.31****
	--ADJUSTED	1.181	.0286	6.32****
Utilities	E&G--UNADJUSTED	1.182	.0625	2.91**
(n=852)	--ADJUSTED	1.182	.0619	2.94**
	L&V--UNADJUSTED	1.148	.0625	2.37**
	--ADJUSTED	1.148	.0619	2.39**
All companies	E&G--UNADJUSTED	.733	.0521	-5.12****
(n=8,637)	--ADJUSTED	.735	.0519	-5.11****
	L&V--UNADJUSTED	.755	.0521	-4.70****
	--ADJUSTED	.757	.0519	-4.68****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

TABLE 5

E&G AND L&V STATISTICS (AGGREGATED)--1980-1981
(Using aggregated data to estimate
the standard deviation of the sampling distribution)

COMPANY TYPE	DROP STATISTIC	MEAN	ST.DEV. SAMPLING DISTRIB.	Z-STAT
Nonutilities (n=7,785)	E&G--UNADJUSTED	.682	.0813	-3.90****
	--ADJUSTED	.685	.0805	-3.91****
	L&V--UNADJUSTED	.704	.0591	-5.01****
	--ADJUSTED	.706	.0583	-5.04****
Unqualified utilities (n=247)	E&G--UNADJUSTED	1.180	.1824	.99
	--ADJUSTED	1.179	.1789	1.00
	L&V--UNADJUSTED	1.041	.0931	.44
	--ADJUSTED	1.040	.0918	.43
Qualified utilities (n=605)	E&G--UNADJUSTED	1.191	.0297	6.42****
	--ADJUSTED	1.191	.0297	6.43****
	L&V--UNADJUSTED	1.181	.0315	5.74****
	--ADJUSTED	1.181	.0315	5.75****
Utilities (n=852)	E&G--UNADJUSTED	1.183	.0568	3.22***
	--ADJUSTED	1.183	.0556	3.29***
	L&V--UNADJUSTED	1.148	.0358	4.14****
	--ADJUSTED	1.148	.0356	4.15****
All companies (n=8,637)	E&G--UNADJUSTED	.733	.0662	-4.04****
	--ADJUSTED	.735	.0657	-4.04****
	L&V--UNADJUSTED	.755	.0482	-5.09****
	--ADJUSTED	.757	.0478	-5.11****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

drops will be reported henceforth. (Examination of other statistics shows similar equivalence.)

Since the groups varied dramatically on both BETA and YIELD, it was possible that any differences on ex-days were due entirely to these two variables. To determine whether this was the case, the regressions for each subset's E&G and L&V statistics were adjusted to a BETA of 1.0 and a standardized YIELD of 0.0, their theoretical means. Regressions for both OLS beta and aggregated beta were used. The results are reported in Table 6. If BETA and YIELD explain all of ex-day behavior, there should be no differences remaining between sample subgroups.

As can be seen from the table, adjusting for BETA and YIELD makes very little difference in the statistics or conclusions except for one point. The unusually low OLS betas and high yields of the qualified utilities distorted their ex-day statistics. Once the effects of these two variables were removed, qualified utilities had drop statistics that were significantly (.0001) less than one, but still significantly (.0001) larger than nonutilities. Aggregated betas did not produce the same effect. It can be concluded that from 1980-1981, BETA and YIELD explained part of ex-day behavior. Utility prices, however, reacted differently to dividends than did the prices of nonutilities even after the effects of these two variables are removed. Why utilities had ex-day statistics greater than one cannot, therefore, be explained solely by taxes and YIELD. If non-tax-induced demand for dividends was present, it appears to have impacted all three utility groups heavily but nonutilities very little or not at

TABLE 6

ADJUSTED E&G AND L&V STATISTICS--1980-1981
(Adjusted to a beta of 1.0 and standardized yield of 0.0)

	DROP STAT	DATA TYPE	UNADJ STAT	ADJUSTED STATISTIC OLS BETA	AGG BETA
Nonutilities (n=7,785)	E&G	RAW	.682****	.701****	.742****
	E&G	AGG	.682****	.696****	.741***
	L&V	AGG	.704****	.715****	.758****
Unqualified utilities (n=247)	E&G	RAW	1.164	1.252	1.274*
	E&G	AGG	1.180	1.260*	1.228
	L&V	AGG	1.041	1.037	1.049
Qualified utilities (n=605)	E&G	RAW	1.190****	.840****	1.147****
	E&G	AGG	1.191****	.852****	1.046*
	L&V	AGG	1.181****	.776****	.971
Utilities (n=852)	E&G	RAW	1.182**	1.227***	1.269****
	E&G	AGG	1.183***	1.199***	1.188***
	L&V	AGG	1.148****	1.075*	1.060*
All companies (n=8,637)	E&G	RAW	.733****	.713****	.753****
	E&G	AGG	.733****	.708****	.754***
	L&V	AGG	.755****	.735****	.778****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

all. Since tests of this hypothesis were static, it is impossible to determine at this point if the tax clientele hypothesis is correct.

HYPOTHESIS TWO

Hypothesis Two states that when the maximum gains rate decreased from twenty-eight percent to twenty percent on June 9, 1981, the relative valuation of gains rose, and hence the size of the ex-dividend day drop, fell. Letting:

JUNE = 1 for dividends after that date and

= 0 for dividends before that date

stepwise regressions were performed on the 1980-81 data with E&G and L&V statistics as the dependent variables and with BETA and YIELD removed first (C.3, D.3). The intent was to determine if the June 1981 date added to the explanatory power provided by the prior variables.

The coefficients of the JUNE dummy variable using an aggregated beta were split in these tests with ten positive and five negative. Upon closer examination, however, the coefficients of the nonutilities, unqualified utilities, and all companies were all positive with two unqualified utility coefficients significant. However, all three qualified utility coefficients were significantly negative. With OLS beta, twelve of fifteen coefficients were positive including all four significant ones. The average incremental R^2 was low at .046. The negative coefficients contributed more with an average R^2 of .112. However, using aggregated data and aggregated betas, the R^2's of the negative coefficients for qualified utilities were .33 and .34, and these were after BETA and YIELD had extracted higher R^2's than average.

Apparently, the June, 1981 date increased the ex-day drop of most equities but significantly reduced the drop statistic for those utilities which would subsequently become qualified in January of 1982. The high level of the ex-day statistics of qualified utilities may be due to non-tax-induced demand, but they moved consistently with the tax clientele theory developed earlier while other companies did not.

HYPOTHESES THREE AND FOUR

Hypothesis Three states that when the top dividend tax rate dropped from seventy percent to fifty percent on January 1, 1982, the ratio of the value of unqualified dividends to gains, and hence the size of the ex-dividend day drop, rose. Hypothesis Four predicts the same rise for qualified dividends. Letting:

ERTA = 1 for dividends after that date and

= 0 for dividends before that date

stepwise regressions were performed on the 1980-85 data with E&G and L&V statistics as the dependent variables and with BETA and YIELD removed first. The intent was to determine if the January 1982 date added to the explanatory power provided by the prior variables.

Hypothesis Three appears to be unsupported. For nonutilities (C.6.1, D.6.1) one coefficient was positive and two were negative while for unqualified utilities (C.6.2, D.6.2) all three coefficients were negative and none of the coefficients were significant. Apparently the reduction in the maximum dividend tax rate from seventy percent to fifty percent did not affect unqualified dividends.

The ex-day statistics rose for qualified utilities (C.6.3, C.6.3). One of the coefficients was nonsignificantly negative but the two that were positive were significant at .023 and .018, one with the E&G statistic and the other with the L&V statistic. If investors in qualified utilities are taxed more heavily on dividends than gains but so strongly prefer dividends for some non-tax-induced reason that drops exceed the dividend, a decline in the dividend tax rate or ERTA qualification would make these dividends even more preferable. The impact could have been due to either the drop in the top bracket or to the ability to treat cash dividends as stock dividends for tax purposes. Since all coefficients of unqualified utilities with similar high yields were nonsignificantly negative, it suggests that ERTA qualification was the cause.

HYPOTHESES FIVE AND SIX

Hypotheses Five states that from 1982 through 1985, gains were valued more highly by investors than dividends for unqualified firms so the ex-dividend day drop was less than the dividend. Hypothesis Six states that for the same period, gains and dividends were valued equally for qualified firms so the ex-dividend day drop was equal to the dividend. Since these hypotheses involve only the dependent variable, Table 7 (from C.5, D.5) will suffice to summarize the statistics.

As can be seen from the data, all of the drop statistics except for unqualified utilities were significantly different from one. Hypothesis Five is significantly supported by nonutilities and nonsignificantly supported by unqualified utilities. Prior to 1982,

TABLE 7

MEAN E&G AND L&V STATISTICS--1980-1981 AND 1982-1985

	DROP STAT	BEFORE 1982	1982-1985
Nonutilities (n=7,785/ 13,496)	E&G	.682****	.728****
	L&V	.704****	.711****
Unqualified utilities (n=247/ 649)	E&G	1.164	.961
	L&V	1.041	.973
Qualified utilities (n=605/ 1,362)	E&G	1.190****	1.162****
	L&V	1.181****	1.153****
Utilities (n=852/ 2,011)	E&G	1.182**	1.099****
	L&V	1.148**	1.100****
All companies (n=8,637/ 15,507)	E&G	.733****	.776****
	L&V	.755****	.760****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

the unqualified utilities had ex-day statistics nonsignificantly greater than one.

The statistics for qualified utilities were all significantly greater than one. This rejects Hypotheses Six. Again, it indicates that qualified utilities and utilities in general, behave differently than other equities.

Since the subgroups varied dramatically on both BETA and YIELD, it is possible that any differences in ex-day behavior were due solely to these two variables. To determine whether this was the case, each subset's regressions were again adjusted to a BETA of 1.0 and a standardized YIELD of 0.0. The results are reported in Table 8.

This time, adjusting for BETA and YIELD made an important difference. Because of the unusually low betas and high yields of the utilities, their drop statistics were distorted. Once the effects of these variables were removed, all of the utility drop statistics were significantly (.0001) less than one, but still significantly (.0001) greater than for nonutilities. For all of the tests of both the unqualified and qualified utilities the adjustment reduced the ex-day statistics. For unqualified utilities, the metrics dropped from nonsignificantly less than one to significantly less than one in five tests out of six. For qualified utilities, the metrics droped from significantly greater than one to mixed, with one significantly greater than one, two significantly less than one, and three not significantly different from one. This time, both OLS and aggregated betas and both of the ex-day statistics produced the same effect.

Before ERTA, the adjustment produced little effect except on some tests of qualified utilities. After ERTA, the adjustment

TABLE 8

ADJUSTED E&G AND L&V STATISTICS--1982-1985
(Adjusted to a beta of 1.0 and standardized yield of 0.0)

				ADJUSTED STATISTIC	
	DROP STAT	DATA TYPE	UNADJ STAT	OLS BETA	AGG BETA
Nonutilities	E&G	RAW	.728****	.719****	.743****
(n=13,496)	E&G	AGG	.727****	.719****	.742****
	L&V	AGG	.711****	.720****	.735****
Unqualified	E&G	RAW	.916	.823*	.893
utilities	E&G	AGG	.972	.852**	.867**
(n=649)	L&V	AGG	.973	.849***	.843***
Qualified	E&G	RAW	1.162****	1.026*	1.004
utilities	E&G	AGG	1.157****	.966	.964*
(n=1,362)	L&V	AGG	1.153****	.985	.945***
Utilities	E&G	RAW	1.099***	.869****	.883****
(n=2,011)	E&G	AGG	1.104****	.879****	.898***
	L&V	AGG	1.100****	.860****	.895****
All companies	E&G	RAW	.776****	.755****	.782****
(n=15,507)	E&G	AGG	.776****	.761****	.781****
	L&V	AGG	.760****	.753****	.765****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

effects were more pronounced and consistent. If portfolios of utilities were formed with betas and yields that were average for all equities, utility prices dropped less than the dividend but still more than nonutilities.

QUALIFIED UTILITIES AND TAX CHANGES

Qualified utilities produced an additional observation of interest. In June of 1981, the top gains tax rate dropped and in January of 1982, the top rate on ordinary income dropped. Table 9 summarizes these tax rates and the resulting ex-day behavior of qualified utilities.

The ex-day statistics were significantly greater than one for all three periods using both metrics and either raw or aggregated data. As can be noted, however, with any of the four tests the statistics and their significance declined during the last half of

TABLE 9

QUALIFIED UTILITY STATISTICS

	TAX RATES		E&G		L&V	
INTERVAL	DIV	GAIN	RAW	AGGREGATED	RAW	AGGREGATED
1/80-6/81	.70	.28	1.229****	1.229****	1.229****	1.213****
7/81-12/81	.70	.20	1.122**	1.122*	1.122**	1.124**
1/82-12/85	.50	.20	1.162****	1.157****	1.162****	1.153****

* significant at .1
** significant at .01
*** significant at .001
**** significant at .0001

1981 and rose in 1982. For each of the two dates, dummy variables were entered following beta and yield to determine if the changes were significant. All three tests found a significant drop in the qualified utility statistic in June 1981 with the significance ranging from .016 to better than .001. Two of three tests found the January 1982 increase significant at .018 and .023.

The levels of the ex-day statistics of qualified utilities did not support tax clientele theory. As indicated by Gilster and Gilmer (1985), a study that examines the LEVELS of ex-day statistics can provide evidence of some kind of clientele effect but cannot determine what kind of clientele has been found. A study of CHANGES in tax law can make that distinction. If investors in these equities preferred dividends for non-tax-induced reasons the resulting ex-day statistics would be higher than taxes alone would imply and tax law changes would affect their relative preference. If it can be argued that wealth is concentrated so that the marginal investor in qualified utilities is in the top bracket, the changes described above support the tax clientele hypothesis.

CHAPTER TEN

CONCLUSIONS

Prior studies have found that the highest yield decile had ex-day statistics that were greater than one while the statistics of all other deciles were less than one. The present data with the all company sample for 1980-85 confirmed that result with the statistics of all but one of the deciles being significant. This study has shown, however, that the top yield decile phenomenon is due to utilities. All of the nonutility deciles had ex-day statistics less than one and nine were significant. Most of the utility deciles were significantly greater than one. Furthermore, the effect is due to the utilities which qualified under ERTA. All of the qualified utility deciles had statistics greater than one with nine significant. The choice of the E&G or L&V measure did not influence the results and similar results were found with data from subperiods before and after ERTA.

To test whether the results were due solely to the generally higher yields of the utilities, yield percentiles were examined. Even where nonutility and utility yields overlapped, the nonutility statistics were less than one while the utility statistics were larger than one.

Apparently, the puzzling ex-day behavior of the highest yield decile that was found and discussed by other writers is an industry effect. If others had excluded utilities in their studies, the effect might not have been found.

Prior research has also found ex-day statistics to be negatively related to beta and positively related to yield. The present data significantly confirmed the findings on beta for the entire period and for subperiods, for both OLS beta and an aggregated beta, and for both E&G and L&V metrics.

With the effect of risk removed first using stepwise regression, the all company sample significantly supported the prior findings on yield. Even after adjusting for risk, yield was positively related to ex-day statistics. The choice of risk measure and ex-day metric was irrelevant. Breaking the sample down into its components, however, produced more evidence of an industry effect. With the all company sample, all yield coefficients were significantly positive. For the nonutilities, however, only one of three was significant at .081. Furthermore, for the subperiod 1982-85, none of the nonutility coefficients were significant. Again, the choice of beta or ex-day metric did not affect results.

A graph of the data on the yield--ex-day statistic plane with beta factored out first reveals why yield was a significant predictor in the all company sample even when it was not significant for nonutilities. Nonutilities vastly outnumber utilities so the slope of the all company regression was positive, the same as for nonutilities. Unqualified utilities, and especially qualified utilities, had centroids that were above the right end of the nonutility line and tilted its slope upward raising its significance. Thus, even if the ex-day statistics of the nonutility subgroup were not significantly related to yield, those of the all company sample were significant.

Prior studies, thus, may have found beta-adjusted yield significant due to the inclusion of utilities which behave differently on ex days than do other equities.

The theory developed in earlier chapters predicted several hypotheses to be tested. The first hypothesis was that the excess supply of dividends relative to the tax preferences of investors before 1982, would produce an ex-day drop less than the dividend. The nonutility and the all company samples supported this hypothesis but utilities and qualified utilities rejected it. To determine whether the utility results were due solely to beta and yield, their regression lines were adjusted by the theoretical averages of those two variables. The only effect of this adjustment occurred with qualified utilities. After adjustment, the ex-day measures of this group changed from significantly greater than one to significantly less than one for OLS beta only. It can be concluded that before 1982, beta and yield explained part of ex-day behavior. Utility prices, however, reacted differently to dividends than did the prices of nonutilities even after these two variables were removed. Ex-day statistics before 1982 cannot, therefore, be explained solely by tax preferences and yield and may have been partly due to non-tax-induced demand that only applied to utilities.

In June of 1981, the maximum gains rate dropped. Traditional tax clientele theory and Hypothesis Two predicted that ex-day statistics would drop. This study found that the ex-day drop of most equities rose but the drop of qualified utilities declined. Qualified utility statistics, thus, may have been greater than one but their changes agreed with the tax clientele theory developed above.

At the beginning of 1982, the top dividend tax bracket was lowered. Based on this tax change, Hypothesis Three and Four predicted that the ex-day statistics of unqualified and qualified dividends would rise. Hypothesis Three was unsupported since the coefficients of the nonutilities and unqualified utilities were mixed and not significant. The substantial reduction in dividend taxation did not impact these companies.

Hypothesis Four was strongly supported by qualified utilities whose ex-day statistics rose. It is possible that investors in qualified utilities faced higher taxation on ordinary income than on gains but so strongly preferred dividends for some non-tax-induced reason that they bid ex-day statistics greater than one. A decline in dividend taxation would then make dividends even more desirable to these investors so the ex-day drop would increase. There were two tax changes on this date for these dividends, a drop in the top tax bracket and the ability to treat cash dividends as stock dividends for tax purposes. However, the fact that ex-day statistics for unqualified utilities, also a high-yield group, dropped nonsignificantly while qualified utility statistics rose significantly suggests that it was ERTA qualification not the top dividend bracket change that was the cause.

Hypothesis Five predicted that from 1982-1985 unqualified dividends would have ex-day statistics less than one due to the greater taxation of dividends. This hypothesis was supported significantly by nonutilities and nonsignificantly by unqualified utilities. It should be noted that prior to 1982, the latter had ex-day statistics nonsignificantly greater than one.

Hypothesis Six predicted that the ability to treat qualified utility dividends as stock dividends would produce ex-day statistics equal to one. This test was rejected by statistics that were significantly greater than one.

A second test of the last two hypotheses was made by first removing the effects of beta and yield. This adjustment had no effect on the nonutility and all company samples but lowered the ex-day statistics of all tests of all three utility subgroups. The statistics of unqualified utilities, which were nonsignificantly less than one, became significant and the all utility statistics changed from significantly greater than one to significantly less than one. The unadjusted statistics for qualified utilities were significantly greater than one. After adjustment, all were lower with two-thirds less than one including two-thirds of the significant coefficients.

If portfolios of utilities were formed from 1982-1985 with betas and yields that were average for all equities, their prices dropped less than the dividend but still more than those of nonutilities. The same adjustment made on data from 1980-1981 had less effect. Part of the utility industry effect that existed prior to ERTA disappeared with its passage.

Finally, the behavior of qualified utilities over the period 1980-1985 illustrated a important requirement of tests of any tax clientele hypothesis. The LEVEL of ex-day statistics can provide evidence of some kind of clientele effect but a test of CHANGES in tax regimes is necessary to determine whether it is evidence of tax clienteles. The ex-day statistics of the qualified utilities were significantly greater than one during the entire period in seeming contradiction of the tax clientele hypothesis. However, when the tax treatment of dividends and gains changed abruptly, the ex-day statistics of this group of equities made significant changes in agreement with tax clientele theory. Apparently, some other clientele effect also affects qualified utilities and combines to obscure the level of ex-day drops that would be caused by taxes alone.

This study uncovered several areas for further research including:

(1) Prior studies found that the highest yield decile had an ex-day statistic greater than one. The present study found that if utilities are extracted, they have statistics that are predominantly greater than one while the remaining nonutilities did not exhibit this behavior even when similar yields are examined. It should be determined if this is a peculiarity of the 1980-1985 interval or if it is true of other periods.

(2) One part of this study adjusted utilities for their unusually low betas and high yields and found that for 1982-1985 the adjusted ex-day statistics were less than one although still larger than those of nonutilities. From 1980-1981 the adjustment had a much smaller effect. This industry effect should be investigated to determine if it is due to the time period or whether it recurs.

(3) It should be determined whether other industries besides utilities exhibit unique ex-day behavior.

(4) The makeup of dividend clienteles should be pursued to determine whether utilities are unique in some respect that causes ex-day statistics to be larger than beta, yield, and taxes would predict. Is it possible, for example, that they are unique in their proportions of individual and institutional ownership or in their composition of individual or institutional ownership? Perhaps individual investors in utilities are high bracket retirees who value dividends as income that does not require decision making as selling shares would. Is the differential taxation and large ex-day drop a price that is willingly paid for regret aversion?

(5) L&V developed their metric to reduce the heteroskedasticity encountered by the E&G statistic. This study found both to have larger variances for lower yield equities. Can a more homoskedastic statistic be developed which would sharpen conclusions?

APPENDICES

APPENDIX A

SAMPLE SIZE BY QUARTER AND PERIOD

QUARTER		NONUTIL	UNQUAL UTILS	QUAL UTILS	UTILS	ALL COS
	1980					
1	I	994	35	77	112	1,106
2	II	999	32	74	106	1,105
3	III	1,016	36	75	111	1,127
4	IV	948	34	73	107	1,055
	1981					
5	I	959	35	77	112	1,071
6	II	968	32	75	107	1,075
7	III	986	34	78	112	1,098
8	IV	893	31	76	107	1,000
	1982					
9	I	896	36	87	126	1,022
10	II	956	37	85	125	1,081
11	III	945	36	87	126	1,071
12	IV	874	36	88	127	1,001
	1983					
13	I	845	34	96	134	979
14	II	831	30	86	120	951
15	III	835	30	87	121	956
16	IV	827	30	83	117	944
	1984					
17	I	824	39	88	130	954
18	II	852	36	83	122	974
19	III	863	38	81	122	985
20	IV	790	36	78	117	907

QUARTER		NONUTIL	UNQUAL UTILS	QUAL UTILS	UTILS	ALL COS
1985						
21	I	798	45	85	133	931
22	II	821	45	82	130	951
23	III	801	45	84	132	933
24	IV	742	40	82	125	867
PERIOD						
1-5		4,916	172	376	548	5,464
7-8		1,879	65	154	219	2,098
1-8		7,763	269	605	874	8,637
9-24		13,484	609	1,414	2,023	15,507
1-24		21,247	878	2,019	2,897	24,144

APPENDIX B

EX-DAY STATISTICS BY DIVIDEND YIELD: 1980-1985

B.1--NONUTILITIES
(n = 21,247)

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
1	2.259	.878	.881	31	.119	.734	.733
2	1.656	.981	.973	32	.097	.786	.777
3	1.446	.838	.839	33	.076	.576	.578
4	1.288	.782	.788	34	.056	.773	.785
5	1.179	.946	.946	35	.034	.470*	.478*
6	1.082	.954	.950	36	.012	.705	.712
7	1.000	.844	.852	37	-.009	.724	.734
8	.927	.851	.845	38	-.030	.461*	.469*
9	.861	.805	.813	39	-.052	.831	.840
10	.801	.835	.832	40	-.075	.572	.589
DECILE	1.250	.871	.874	DECILE	.023	.663**	.670**
11	.744	.745	.742	41	-.099	.630	.616
12	.693	.833	.828	42	-.121	.611	.611
13	.652	.908	.895	43	-.140	.852	.848
14	.610	.720	.735	44	-.160	.786	.766
15	.570	.717	.714	45	-.180	.730	.732
16	.532	.890	.884	46	-.200	.745	.725
17	.496	.884	.884	47	-.220	.512*	.463*
18	.462	.669	.654	48	-.240	.857	.858
19	.431	.779	.778	49	-.259	.564	.580
20	.397	.766	.766	50	-.277	.746	.763
DECILE	.559	.791*	.789*	DECILE	-.190	.703**	.696**
21	.369	.913	.900	51	-.296	.669	.684
22	.340	.872	.891	52	-.316	.598	.612
23	.311	.833	.819	53	-.336	.416*	.415*
24	.285	.795	.804	54	-.355	.441*	.431*
25	.258	.617	.606	55	-.376	.452*	.470*
26	.232	.781	.776	56	-.395	.605	.611
27	.209	.662	.681	57	-.414	.580	.578
28	.188	.765	.742	58	-.434	.670	.658
29	.166	.608	.591	59	-.454	.679	.697
30	.143	.811	.837	60	-.473	.572	.626
DECILE	.250	.766*	.767*	DECILE	-.385	.568***	.577***

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
61	-.494	.543*	.529*	81	-.922	.156**	.263*
62	-.514	1.001	1.009	82	-.943	.204*	.249*
63	-.533	.728	.745	83	-.966	.534	.490*
64	-.553	.779	.783	84	-.987	.260	.360*
65	-.573	.685	.708	85	-1.012	.612	.589
66	-.593	.977	.999	86	-1.038	1.006	1.023
67	-.614	.926	.937	87	-1.063	.350*	.356*
68	-.635	.683	.668	88	-1.087	.666	.710
69	-.656	.940	.891	89	-1.113	.809	1.000
70	-.675	.501*	.553	90	-1.140	1.105	.860
DECILE	-.584	.777*	.783*	DECILE	-1.027	.570***	.570***
71	-.695	.625	.542*	91	-1.173	.487*	.536*
72	-.718	.944	.915	92	-1.208	1.438	1.385
73	-.739	.752	.725	93	-1.243	1.185	.978
74	-.760	1.006	1.021	94	-1.281	.667	.457*
75	-.784	.955	1.003	95	-1.320	1.344	1.166
76	-.807	.491*	.635	96	-1.360	-.357***	-.531**
77	-.830	.830	.849	97	-1.409	.524*	-.001**
78	-.852	.886	.891	98	-1.462	.230*	.953
79	-.875	.076**	.028**	99	-1.534	.130**	.289*
80	-.898	.756	.755	100	-1.685	.780	.540*
DECILE	-.796	.756	.755	DECILE	-1.367	.642***	.618***

* significant at .1
** significant at .01
*** significant at .001

B.2--UNQUALIFIED UTILITIES
(n = 878)

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
1	4.037	1.476	1.445	31	1.646	1.154	1.161
2	3.001	1.200	1.202	32	1.605	1.042	1.030
3	2.758	1.178	1.176	33	1.545	1.724	1.718
4	2.593	1.002	.987	34	1.555	.775	.768
5	2.495	1.013	1.003	35	1.525	1.148	1.117
6	2.445	.868	.849	36	1.481	.811	.816
7	2.401	1.153	1.160	37	1.452	.949	.950
8	2.335	1.237	1.229	38	1.429	.902	.902
9	2.286	1.215	1.206	39	1.401	1.098	1.082
10	2.260	1.384	1.362	40	1.380	1.205	1.199
DECILE	2.509	1.143	1.135	DECILE	1.508	1.083	1.077
11	2.231	1.336	1.332	41	1.353	.826	.812
12	2.204	1.209	1.190	42	1.323	.926	.929
13	2.161	.907	.916	43	1.299	1.230	1.230
14	2.135	1.139	1.160	44	1.257	1.317	1.271
15	2.113	1.044	1.046	45	1.226	1.059	1.082
16	2.083	1.052	1.054	46	1.205	.635	.602
17	2.054	1.007	.998	47	1.175	.587	.586
18	2.037	1.163	1.158	48	1.145	.945	.943
19	2.010	1.255	1.228	49	1.120	.685	.692
20	1.977	.989	.993	50	1.087	1.062	1.008
DECILE	2.102	1.112	1.112	DECILE	1.221	.929	.920
21	1.951	1.346	1.326	51	1.064	.855	.816
22	1.918	.971	.981	52	1.034	1.055	1.042
23	1.889	1.038	1.061	53	1.002	1.055	1.062
24	1.851	1.133	1.123	54	.971	1.082	1.039
25	1.815	.601	.645	55	.923	1.044	1.040
26	1.791	1.261	1.268	56	.900	.834	.859
27	1.763	1.807	1.776	57	.863	1.034	1.022
28	1.736	.850	.898	58	.819	.741	.755
29	1.706	1.128	1.129	59	.763	.745	.759
30	1.675	1.472	1.474	60	.718	.910	.964
DECILE	1.811	1.156	1.159	DECILE	.906	.938	.942

%ILE	STAND YIELD	E&G STAT	L&V STAT
61	.688	.754	.763
62	.639	.394	.368
63	.596	.650	.681
64	.550	.749	.768
65	.496	.453	.457
66	.459	.967	1.027
67	.416	1.220	1.327
68	.354	-.261*	-.090*
69	.289	1.594	1.602
70	.238	1.164	1.241
DECILE	.475	.762	.795
71	.195	.425	.529
72	.144	.404	.390
73	.098	1.914	1.909
74	.060	1.423	1.463
75	.032	.700	.861
76	-.025	.618	.565
77	-.078	.357	.397
78	-.140	1.784	1.700
79	-.200	.420	.397
80	-.262	.685	.755
DECILE	-.015	.878	.904

%ILE	STAND YIELD	E&G STAT	L&V STAT
81	-.324	1.097	1.100
82	-.362	.406	.461
83	-.414	1.020	.972
84	-.482	.729	.802
85	-.546	1.109	1.166
86	-.589	2.087	2.365
87	-.642	.038	-.079
88	-.709	-.103*	-.053
89	-.747	-.338*	-.336*
90	-.786	1.193	1.198
DECILE	-.557	.703	.763
91	-.836	3.506	3.014
92	-.873	.100	-.105*
93	-.897	3.473	3.128
94	-.970	.812	.195
95	-1.045	-.906*	-1.091**
96	-1.162	1.919	1.596
97	-1.259	1.157	.829
98	-1.335	5.224	4.774
99	-1.402	-1.236**	-1.227**
100	-1.553	1.955	1.797
DECILE	-1.131	1.571*	1.267

B.3--QUALIFIED UTILITIES
(n = 2,019)

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
1	3.955	1.047	1.059	31	2.300	1.035	1.036
2	3.389	1.105	1.110	32	2.289	1.320*	1.324*
3	3.215	1.100	1.092	33	2.275	1.151	1.152
4	3.065	1.406**	1.395**	34	2.262	1.222*	1.218*
5	3.000	1.308*	1.301*	35	2.248	1.087	1.081
6	2.937	1.162	1.158	36	2.235	1.334*	1.356**
7	2.880	1.042	1.037	37	2.222	1.086	1.081
8	2.833	1.082	1.076	38	2.211	1.274*	1.275*
9	2.793	1.290*	1.291*	39	2.196	1.171	1.164
10	2.754	1.349**	1.341**	40	2.181	1.307*	1.309*
DECILE	3.086	1.189***	1.182***	DECILE	2.242	1.197***	1.197***
11	2.717	1.304*	1.307*	41	2.166	1.268*	1.271*
12	2.688	1.086	1.097	42	2.152	1.123	1.121
13	2.657	1.221*	1.208*	43	2.141	1.232*	1.239*
14	2.623	.925	.913	44	2.128	1.209*	1.209*
15	2.596	1.326*	1.316*	45	2.115	1.188*	1.199*
16	2.575	1.353**	1.348**	46	2.103	1.033	1.031
17	2.555	1.017	1.019	47	2.092	1.066	1.072
18	2.527	1.066	1.070	48	2.080	.797*	.791*
19	2.507	1.180	1.175	49	2.068	1.077	1.075
20	2.490	.979	.986	50	2.057	1.275*	1.286*
DECILE	2.594	1.147***	1.146***	DECILE	2.111	1.128**	1.131**
21	2.470	1.335*	1.340**	51	2.038	1.303*	1.287*
22	2.452	1.321*	1.325*	52	2.021	.975	.956
23	2.436	1.247*	1.222*	53	2.004	1.351**	1.341**
24	2.421	1.151	1.146	54	1.993	1.267*	1.277*
25	2.404	1.184	1.188*	55	1.980	1.306*	1.308*
26	2.386	1.153	1.153	56	1.972	1.382**	1.387**
27	2.368	1.042	1.049	57	1.957	1.204*	1.178
28	2.349	1.267*	1.250*	58	1.940	1.210*	1.200*
29	2.327	1.188*	1.180	59	1.923	1.294*	1.282*
30	2.318	1.205*	1.200*	60	1.901	1.309*	1.302*
DECILE	2.394	1.210***	1.207***	DECILE	1.973	1.261***	1.251***

%ILE	STAND YIELD	E&G STAT	L&V STAT
61	1.887	1.151	1.164
62	1.875	1.456***	1.464***
63	1.861	1.376**	1.369**
64	1.841	1.152	1.157
65	1.825	1.117	1.114
66	1.812	1.078	1.065
67	1.793	1.018	1.016
68	1.776	1.114	1.095
69	1.759	.986	1.002
70	1.742	1.218*	1.215*
DECILE	1.817	1.166***	1.166***
71	1.729	1.148	1.159
72	1.711	1.126	1.134
73	1.696	1.381**	1.380**
74	1.673	1.012	1.011
75	1.655	1.144	1.132
76	1.636	1.092	1.106
77	1.620	1.175	1.180
78	1.599	1.326*	1.309*
79	1.580	1.073	1.068
80	1.563	1.117	1.104
DECILE	1.647	1.159***	1.158***
81	1.540	1.049	1.048
82	1.515	1.335*	1.313*
83	1.489	1.219*	1.219*
84	1.465	1.220*	1.208*
85	1.436	.990	.988
86	1.394	1.083	1.058
87	1.355	1.192*	1.185
88	1.311	1.120	1.123
89	1.261	1.229*	1.229*
90	1.215	1.197*	1.195*
DECILE	1.399	1.162***	1.156***
91	1.169	1.057	1.057
92	1.116	1.275*	1.288*
93	1.036	.910	.913
94	.969	.949	.937
95	.894	1.087	1.088
96	.764	1.238*	1.247*
97	.604	.706*	.737*
98	.353	.511**	.552**
99	.081	1.074	1.065
100	-.348	1.655***	1.526***
DECILE	.665	1.046	1.030

B.4--UTILITIES
(n = 2,897)

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
1	4.244	1.144	1.161	31	2.195	1.156	1.156
2	4.432	1.055	1.053	32	2.174	1.323	1.326
3	3.175	1.106	1.094	33	2.158	1.077	1.081
4	3.022	1.379*	1.374*	34	2.143	1.201	1.203
5	2.942	1.242	1.238	35	2.129	1.181	1.188
6	2.863	1.037	1.035	36	2.114	1.192	1.201
7	2.806	1.243	1.238	37	2.100	.984	.986
8	2.753	1.281	1.278	38	2.086	.938	.942
9	2.705	1.312	1.314	39	2.071	1.049	1.048
10	2.664	1.312	1.314	40	2.056	1.263	1.269
DECILE	2.832	1.129*	1.190*	DECILE	2.123	1.136*	1.139*
11	2.620	1.002	.985	41	2.038	1.199	1.187
12	2.587	1.300	1.290	42	2.019	1.025	1.003
13	2.560	1.125	1.130	43	2.001	1.356*	1.349
14	2.525	1.093	1.093	44	1.986	1.271	1.283
15	2.501	1.095	1.104	45	1.973	1.259	1.263
16	2.476	1.187	1.183	46	1.958	1.277	1.180
17	2.455	1.196	1.201	47	1.938	1.180	1.166
18	2.434	1.241	1.223	48	1.917	1.257	1.258
19	2.415	1.112	1.113	49	1.895	1.274	1.275
20	2.393	1.201	1.198	50	1.880	1.223	1.234
DECILE	2.497	1.155*	1.151*	DECILE	1.961	1.232**	1.227**
21	2.372	1.086	1.094	51	1.864	1.429*	1.421*
22	2.345	1.214	1.208	52	1.840	1.021	1.084
23	2.322	1.192	1.177	53	1.823	1.085	1.087
24	2.304	1.188	1.190	54	1.805	1.062	1.056
25	2.288	1.207	1.207	55	1.785	1.078	1.082
26	2.273	1.127	1.129	56	1.764	1.127	1.106
27	2.257	1.255	1.245	57	1.746	1.178	1.176
28	2.240	1.232	1.234	58	1.730	1.123	1.148
29	2.225	1.258	1.261	59	1.710	1.143	1.150
30	2.211	1.203	1.199	60	1.691	1.334	1.338
DECILE	2.284	1.196*	1.193*	DECILE	1.776	1.158*	1.159*

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
61	1.667	1.087	1.077	81	1.012	.786	.796
62	1.647	1.172	1.171	82	.962	1.165	1.136
63	1.625	1.083	1.094	83	.908	.914	.935
64	1.603	1.243	1.227	84	.837	1.060	1.051
65	1.584	1.364*	1.347	85	.746	.971	1.005
66	1.563	1.001	.996	86	.660	.668	.682
67	1.539	.979	.973	87	.572	.643*	.668
68	1.512	1.326	1.306	88	.464	.756	.782
69	1.481	1.137	1.136	89	.336	.629*	.719
70	1.456	1.065	1.070	90	.222	.986	1.055
DECILE	1.568	1.146*	1.140*	DECILE	.675	.857*	.885*
71	1.428	.989	.983	91	.112	1.031	1.022
72	1.391	1.132	1.111	92	.008	.924	.984
73	1.357	1.068	1.059	93	-.127	1.093	1.049
74	1.321	1.051	1.060	94	-.273	1.077	1.053
75	1.280	1.276	1.259	95	-.420	.839	.832
76	1.235	1.159	1.169	96	-.583	.894	1.031
77	1.201	.917	.901	97	-.748	.333**	.277**
78	1.157	.946	.969	98	-.888	1.888***	1.465*
79	1.118	1.133	1.134	99	-1.124	1.000	.629*
80	1.065	1.039	1.015	100	-1.415	1.952***	1.817**
DECILE	1.257	1.071	1.066	DECILE	-.543	1.100	.979

B.5--ALL COMPANIES
(n = 24,144)

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
1	3.095	1.176	1.171	31	.310	.841	.836
2	2.609	1.108	1.104	32	.280	.749	.755
3	2.418	1.149	1.149	33	.251	.648	.644
4	2.267	1.199	1.196	34	.224	.734	.722
5	2.143	1.132	1.133	35	.199	.765	.775
6	2.031	1.141	1.136	36	.176	.658	.641
7	1.907	1.142	1.137	37	.150	.711	.734
8	1.784	1.093	1.092	38	.124	.766	.762
9	1.670	1.099	1.095	39	.099	.781	.775
10	1.561	1.051	1.037	40	.076	.664	.665
DECILE	2.149	1.129*	1.128*	DECILE	.189	.732**	.732**
11	1.454	.985	.985	41	.054	.659	.687
12	1.342	.920	.921	42	.029	.567*	.565*
13	1.239	.931	.925	43	.006	.707	.719
14	1.154	.998	1.004	44	-.018	.645	.655
15	1.069	.976	.968	45	-.042	.620	.625
16	.994	.778	.781	46	-.067	.695	.713
17	.924	.951	.946	47	-.092	.674	.663
18	.859	.822	.825	48	-.118	.525*	.529*
19	.797	.836	.836	49	-.140	.925	.911
20	.738	.729	.728	50	-.162	.738	.724
DECILE	1.057	.883	.887	DECILE	-.055	.675***	.677***
21	.686	.849	.841	51	-.184	.813	.823
22	.642	.875	.882	52	-.206	.530*	.475*
23	.598	.713	.720	53	-.229	.765	.757
24	.556	.784	.775	54	-.250	.767	.765
25	.515	.855	.853	55	-.271	.601*	.633
26	.476	.809	.808	56	-.292	.723	.734
27	.442	.674	.667	57	-.314	.623	.634
28	.406	.844	.839	58	-.336	.437*	.444*
29	.373	.856	.847	59	-.358	.434*	.423*
30	.342	.869	.891	60	-.381	.552*	.568*
DECILE	.504	.813*	.812*	DECILE	-.282	.625***	.629***

%ILE	STAND YIELD	E&G STAT	L&V STAT	%ILE	STAND YIELD	E&G STAT	L&V STAT
61	-.402	.460*	.466*	81	-.869	.490*	.437*
62	-.424	.778	.781	82	-.894	.727	.650
63	-.446	.626	.601	83	-.919	.409*	.488*
64	-.468	.514*	.572*	84	-.944	.262**	.330*
65	-.491	.625	.632	85	-.969	.155**	.145**
66	-.513	1.005	1.007	86	-.993	.647	.685
67	-.535	.752	.756	87	-1.023	.830	.720
68	-.557	.589*	.647	88	-1.051	.358*	.477*
69	-.580	.924	.927	89	-1.078	.819	.819
70	-.602	1.066	1.085	90	-1.107	.610	.783
DECILE	-.502	.734**	.740**	DECILE	-.985	.531***	.542***
71	-.626	.698	.695	91	-1.137	1.118	.915
72	-.649	.676	.631	92	-1.174	.590*	.656
73	-.671	.672	.698	93	-1.212	1.864**	1.680*
74	-.694	.615	.566*	94	-1.253	.335*	.340*
75	-.719	.978	.935	95	-1.296	.849	.612
76	-.742	.735	.726	96	-1.339	1.495*	1.282
77	-.766	1.159	1.021	97	-1.389	-.176***	-.792***
78	-.792	.469*	.570*	98	-1.445	.148**	.709
79	-.819	.960	1.012	99	-1.518	.730	.660
80	-.843	.683	.727	100	-1.673	.226**	.236**
DECILE	-.732	.764**	.766**	DECILE	-1.344	.718**	.689***

APPENDIX C

REGRESSION RESULTS--RAW DATA

For regressions with the raw data, the L&V statistic collapses into the E&G statistic. All regressions are done with E&G as the dependent variable. The L&V statistic is reported for the group as a whole only.

For the mean of the dependent statistic, the significance level is determined using:

$S_X = S_x/n^{.5}$

where

S_X = the standard deviation of the distribution,

S_x = the standard deviation of the sample, and

n = the sample size.

For stepwise regressions, the significance reported with each independent variable is that with the variables to its left entered first. For that reason, only the significance of the last variable in each step is reported. Non-significant coefficients are indicated with "ns". The change in R^2 is the increase in explanation caused by inclusion of the last variable. For the constant term, the significance reported is that for c = 1.0.

Let:

DROP - The ex-day statistic

- E&G for the Elton-Gruber statistic

- L&V for the Lakonishok-Vermaelen statistic

CONST - the regression constant

OLS B - OLS beta

AGG B - aggregated beta

YIELD - standardized dividend yield

JUNE - 0 for quarters 1-5

- 1 for quarters 7-8

ERTA - 0 for quarters 1-8

- 1 for quarters 9-24

UTIL - 0 for nonutilities

- 1 for utilities

QUAL - 0 for unqualified

- 1 for qualified

R^2 - the change in R^2 due to the introduction of the last variable on the right.

C.1--QUARTERS 1-5: 1st QUARTER OF 1980--1st QUARTER OF 1981

C.1.1--NONUTILITIES (N=4,929)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.677								
	(.000)								
E&G	.645								
	(.000)								
	1.073	-.419	---						.001
		(.009)							
	.942	-.259	---	.190					.001
				(.050)					
E&G	.990	---	-.258						.001
			(.044)						
	.880	---	-.148	.220					.001
				(.016)					

C.1.2--UNQUALIFIED UTILITIES(N=159)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.831								
	ns								
E&G	.882								
	ns								
	1.019	-.200	---						.001
		ns							
	.458	.423	---	.250					.004
				ns					
E&G	1.176	---	-.343						.004
			ns						
	1.020	---	-.210	.078					.001
				ns					

C.1.3--QUALIFIED UTILITIES (N=376)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.213								
	(.000)								
E&G	1.229								
	(.000)								
	1.477	-.695	---						.031
		(.001)							
	1.715	-.823	---	-.096					.006
				ns					
E&G	1.293	---	-.157						.006
			ns						
	1.461	---	-.224	-.071					.003
				ns					

C.1.4--UTILITIES (N=535)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.113								
	(.062)								
E&G	1.120								
	(.052)								
	1.356	-.512	---						.010
		(.024)							
	1.183	-.347	---	.063					.001
				ns					
E&G	1.310	---	-.347						.001
			(.027)						
	1.132	---	-.225	.073					.001
				ns					

C.1.5--ALL (N=5,464)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.715								
	(.000)								
E&G	.692								
	(.000)								
	1.156	-.479	---						.002
		(.001)							
	.950	-.206	---	.175					.001
				(.025)					
E&G	1.092	---	-.318						.002
			(.003)						
	.881	---	-.150	.201					.001
				(.007)					

C.2--QUARTERS 7-8: 3RD QUARTER OF 1981--4TH QUARTER OF 1981

C.2.1--NONUTILITIES (N=1,885)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.832								
	(.069)								
E&G	.739								
	(.011)								
	1.114	-.413	---						.001
		ns							
	1.027	-.283	---	.165					.001
				ns					
E&G	.867	---	-.115						.000
			ns						
	.787	---	-.005	.222					.001
				ns					

C.2.2--UNQUALIFIED UTILITIES (N=59)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	2.055								
	(.028)								
E&G	2.000								
	(.034)								
	1.077	1.108	---						.018
		ns							
	5.896	-3.150	---	-2.033					.129
				(.005)					
E&G	1.332	---	.631						.011
			ns						
	5.154	---	-1.929	-1.779					.132
				(.005)					

C.2.3--QUALIFIED UTILITIES (N=154)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.124 (.005)								
E&G	1.122 (.005)								
	1.524	-1.057 (.000)	---						.102
	1.220	-.868	---	.113 ns					.012
E&G	1.142	---	-.286 (.003)						.055
	.807	---	-.189	.160 (.051)					.024

C.2.4--UTILITIES (N=213)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.276 (.045)								
E&G	1.383 (.009)								
	.859	1.019 (.018)	---						.026
	3.272	-.977	---	-.850 (.000)					.055
	3.360	-1.016	---	-.821				-.163 ns	.001
E&G	1.225	---	.436 (.056)						.017
	2.997	---	-.574	-.861 (.000)					.069
	3.231	---	-.678	-.821				-.372 ns	.003

C.2.5--ALL (N-2.098)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.892								
	ns								
E&G	.806								
	(.031)								
	1.146	-.392	---						.001
		ns							
	1.035	-.264	---	.104					.000
				ns					
	.984	-.266	---	.016			.510		.001
							ns		
	1.015	0.292	---	.070			1.191	-.096	.001
								ns	
E&G	.951	---	-.140						.000
			ns						
	.812	---	-.005	.160					.001
				ns					
	.734	---	.018	.080			.511		.001
							ns		
	.792	---	-.028	.115			1.166	-1.070	.001
								ns	

C.3--QUARTERS 1-5,7-8: 1ST QUARTER OF 1980--4TH QUARTER OF 1981

C.3.1--NONUTILITIES (N=6,814)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.714 (.000)								
E&G	.671 (.000)								
	1.090	-.423 (.002)	---						.001
	.976	-.276	---	.180 (.028)					.001
	.948	-.265	---	.183	.067 ns				.000
E&G	.956	---	-.223 (.035)						.001
	.861	---	-.119	.218 (.006)					.001
	.826	---	-.107	.221	.074 ns				.000

C.3.2--UNQUALIFIED UTILITIES (N=218)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.033								
	ns								
E&G	1.189								
	ns								
	.881	.425	---						.003
		ns							
	1.255	.040	---	-.168					.002
				ns					
	1.450	-.552	---	-.350	1.230				.026
					(.018)				
E&G	1.014	---	.192						.001
			ns						
	1.470	---	-.164	-.230					.004
				ns					
	1.494	---	-.497	-.344	1.248				.027
					(.015)				

C.3.3--QUALIFIED UTILITIES (N=530)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.189								
	(.000)								
E&G	1.198								
	(.000)								
	1.489	-.799	---						.045
		(.000)							
	1.603	-.863	---	-.045					.001
				ns					
	1.612	-.845	---	-.041	-.085				.003
					ns				
E&G	1.243	---	-.145						.008
			(.043)						
	1.220	---	-.137	.010					.000
				ns					
	1.336	---	-.218	-.009	-.179				.011
					(.016)				

C.3.4--UTILITIES (N-748)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.148 (.017)								
E&G	1.195 (.003)								
	1.170	.054 ns	---						.000
	1.464	-.214	---	-.107 ns					.002
	1.466	-.308	---	-.133	.292 (.064)				.005
	1.412	-.292	---	-.162	.292			.133 ns	.001
E&G	1.197	---	-.003 ns						.000
	1.457	---	-.166	-.115 ns					.002
	1.341	---	-.117	-.102	.251 ns				.003
	1.281	---	-.099	-.127	.255			.130 ns	.001

C.3.5--ALL (N=7,562)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.759								
	(.000)								
E&G	.724								
	(.000)								
	1.161	-.465	---						.002
		(.000)							
	.989	-.283	---	.151					.001
				(.021)					
	.954	-.270	---	.154	.086				.000
					ns				
	.930	-.263	---	.130	.086		.161		.000
							ns		
	.933	-.263	---	.143	.087		.342	-.294	.000
								ns	
E&G	1.048	---	-.271						.001
			(.002)						
	.868	---	-.120	.185					.001
				(.003)					
	.825	---	-.106	.190	.090				.000
					ns				
	.793	---	-.093	.169	.092		.158		.000
							ns		
	.803	---	-.099	.181	.092		.349	-.313	.000
								ns	

C.4--QUARTERS 1-8: 1ST QUARTER OF 1980--4TH QUARTER OF 1981

C.4.1--NONUTILITIES (N=7,785)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.704								
	(.000)								
E&G	.682								
	(.000)								
	1.067	-.393	---						.001
		(.003)							
	.984	-.283	---	.134					.000
				(.089)					
E&G	.927	---	-.195						.000
			(.053)						
	.853	---	-.111	.174					.001
				(.021)					

C.4.2--UNQUALIFIED UTILITIES (N=247)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.041								
	ns								
E&G	1.164								
	ns								
	.915	.339	---						.003
		ns							
	1.243	.009	---	-.147					.001
				ns					
E&G	1.044	---	.130						.001
			ns						
	1.467	---	-.193	-.212					.004
				ns					

C.4.3--QUALIFIED UTILITIES (N=605)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.181								
	(.000)								
E&G	1.190								
	(.000)								
	1.436	-.673	---						.032
		(.000)							
	1.613	-.773	---	-.069					.004
				ns					
E&G	1.210	---	-.071						.002
			ns						
	1.222	---	-.075	-.006					.000
				ns					

C.4.4--UTILITIES (N=852)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.148								
	(.009)								
E&G	1.182								
	(.002)								
	1.168	.030	---						.000
		ns							
	1.445	-.218	---	-.099					.002
				ns					
	1.389	-.202	---	-.130				.141	.001
								ns	
E&G	1.182	---	.001						.000
			ns						
	1.406	---	-.137	-.099					.002
				ns					
	1.347	---	-.119	-.124				.129	.001
								ns	

C.4.5--ALL (N=8,637)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.755								
	(.000)								
E&G	.733								
	(.000)								
	1.137	-.435	---						.002
		(.000)							
	1.001	-.288	---	.121					.000
				(.054)					
	.974	-.281	---	.090			.199		.000
							ns		
	.976	-.282	---	.100			.337	-.224	.000
								ns	
E&G	1.018	---	-.242						.001
			(.004)						
	.866	---	-.113	.157					.001
				(.010)					
	.831	---	-.100	.130			.192		.000
							ns		
	.839	---	-.105	.140			.342	-.246	.000
								ns	

C.5--QUARTERS 9-24: 1ST QUARTER OF 1982--4TH QUARTER OF 1985

C.5.1--NONUTILITIES (N=13,496)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.711								
	(.000)								
E&G	.728								
	(.000)								
	.796	-.080	---						.000
		ns							
	.795	-.076	---	.008					.000
				ns					
E&G	.919	---	-.171						.000
			(.042)						
	.924	---	-.181	-.022					.000
				ns					

C.5.2--UNQUALIFIED UTILITIES (N=649)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.973								
	ns								
E&G	.961								
	ns								
	1.124	-.251	---						.002
		ns							
	.864	-.041	---	.127					.002
				ns					
E&G	1.238	---	-.341						.009
			(.015)						
	1.228	---	-.335	.005					.000
				ns					

C.5.3--QUALIFIED UTILITIES (N=1,362)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.153								
	(.000)								
E&G	1.162								
	(.000)								
	1.202	-.110	---						.001
		ns							
	1.130	-.104	---	.035					.001
				ns					
E&G	1.205	---	-.138						.007
			(.002)						
	1.139	---	-.135	.033					.001
				ns					

C.5.4--UTILITIES (N=2,011)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.100								
	(.000)								
E&G	1.099								
	(.000)								
	1.232	-.297	---						.005
		(.002)							
	1.022	-.153	---	.087					.003
				(.023)					
	.971	-.120	---	.069				.093	.001
								ns	
E&G	1.225	---	-.270						.011
			(.000)						
	1.123	---	-.226	.048					.001
				ns					
	1.098	---	-.215	.039				.051	.000
								ns	

C.5.5--ALL (N=15,507)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.760								
	(.000)								
E&G	.776								
	(.000)								
	.932	-.194	---						.000
		(.045)							
	.859	-.104	---	.083					.000
				(.051)					
	.805	-.084	---	.024			.291		.000
							(.055)		
	.800	-.079	---	.017			.196	.156	.000
								ns	
E&G	1.024	---	-.241						.001
			(.000)						
	.984	---	-.202	.046					.000
				ns					
	.935	---	-.188	-.008			.265		.000
							(.081)		
	.930	---	-.184	-.125			.193	.118	.000
								ns	

C.6--QUARTERS 1-24: 1ST QUARTER OF 1980--4TH QUARTER OF 1985

C.6.1--NONUTILITIES (N=21,281)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.712								
	(.000)								
E&G	.711								
	(.000)								
	.906	-.216	---						.000
		(.012)							
	.886	-.179	---	.060					.000
				ns					
	.863	-.173	---	.062		.029			.000
						ns			
E&G	.925	---	-.183						.000
			(.004)						
	.909	---	-.159	.056					.000
				ns					
	.887	---	-.155	.057		.028			.000
						ns			

C.6.2--UNQUALIFIED UTILITIES (N=896)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.989								
	ns								
E&G	1.025								
	ns								
	1.039	-.021	---						.000
		ns							
	1.043	-.025	---	-.002					.000
				ns					
	1.165	-.012	---	.016		-.211			.001
						ns			
E&G	1.185	---	-.189						.002
			ns						
	1.406	---	-.332	-.116					.001
				ns					
	1.524	---	-.325	-.100		-.200			.001
						ns			

C.6.3--QUALIFIED UTILITIES (N-1,967)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.163 (.000)								
E&G	1.170 (.000)								
	1.284	-.311 (.000)	---						.007
	1.242	-.300	---	.019 ns					.000
	1.263	-.300	---	.018		-.028 ns			.000
E&G	1.205	---	-.113 (.002)						.005
	1.165	---	-.106	.019 ns					.000
	1.183	---	-.105	.018		-.024 ns			.000

C.6.4--UTILITIES (N=2,863)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.115 (.000)								
E&G	1.124 (.000)								
	1.202	-.170 (.055)	---						.001
	1.146	-.127	---	.022 ns					.000
	1.209	-.131	---	.023		-.089 ns			.001
	1.151	-.099	---	.002		-.088		.110 ns	.001
E&G	1.205	---	-.173 (.001)						.004
	1.232	---	-.186	-.124 ns					.000
	1.287	---	-.184	-.010		-.084 ns			.001
	1.247	---	-.169	-.025		-.084		.081 ns	.000

C.6.5--ALL (N=24,144)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.762								
	(.000)								
E&G	.760								
	(.000)								
	1.012	-.296	---						.001
		(.000)							
	.920	-.188	---	.096					.000
				(.006)					
	.904	-.184	---	.097		.020			.000
						ns			
	.869	-.173	---	.053		.015	.236		.000
							(.051)		
	.869	-.172	---	.052		.015	.218	.030	.000
								ns	
E&G	1.023	---	-.242						.001
			(.000)						
	.947	---	-.172	.084					.000
				(.018)					
	.933	---	-.170	.085		.018			.000
						ns			
	.896	---	-.157	.046		.014	.217		.000
							(.074)		
	.895	---	-.157	.045		.014	.214	.006	.000
								ns	

APPENDIX D

REGRESSION RESULTS--AGGREGATED DATA

For regressions with the aggregated data, all regressions are done with both E&G and L&V as the dependent variable. Data are first ranked by standardized dividend yield and divided into deciles or quintiles. Second, each yield group is ranked by beta and divided into deciles or quintiles. In each case, deciles are used if at least one thousand data points are available and quintiles are used otherwise. Results for both OLS beta and aggregated beta are reported.

For the mean of the dependent statistic, the significance level is determined using:

$$S_X = S_x/n^{.5}$$

where

S_X = the standard deviation of the distribution of subset means,

S_x = the standard deviation of the subset means, and

n = the number of subsets.

For stepwise regressions, the significance reported with each independent variable is that with the variables to its left entered first. For that reason, only the significance of the last variable in each step is reported. Non-significant coefficients are indicated with "ns". The change in R^2 is the increase in explanation caused by inclusion of one more variable. For the constant term, the significance reported is that for c = 1.0.

Let:

DROP = The ex-day statistic

= E&G for the Elton-Gruber statistic

= L&V for the Lakonishok-Vermaelen statistic

CONST = the regression constant

OLS B = OLS beta

AGG B = aggregated beta

YIELD = standardized dividend yield

JUNE = 0 for quarters 1-5

= 1 for quarters 7-8

ERTA = 0 for quarters 1-8

= 1 for quarters 9-24

UTIL = 0 for nonutilities

= 1 for utilities

QUAL = 0 for unqualified

= 1 for qualified

R^2 = the change in R^2 due to the introduction of the last variable on the right.

D.1--QUARTERS 1-5: 1st QUARTER OF 1980--1st QUARTER OF 1981

D.1.1--NONUTILITIES (N=4,916)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.645								
	(.000)								
	1.056	-.402	---	.037					
		(.056)							
	.917	-.234	---	.192					.023
				ns					
E&G	1.058	---	-.309						.047
			(.030)						
	.947	---	-.199	.210					.043
				(.035)					
L&V	.677								
	(.000)								
	.940	-.257	---						.039
		(.050)							
	.827	-.120	---	.156					.038
				(.047)					
L&V	1.045	---	-.280						.059
			(.015)						
	.961	---	-.197	.157					.037
				(.050)					

D.1.2--UNQUALIFIED UTILITIES (N=172)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.890 ns								
	1.178	-.425 (.067)	---						.138
	.831	-.032	---	.151 ns					.044
E&G	1.206	---	-.382 ns						.061
	1.028	---	-.225	.087 ns					.010
L&V	.831 (.066)								
	1.387	-.822 (.001)	---						.380
	1.433	-.874	---	-.020 ns					.001
L&V	1.116	---	-.298 ns						.041
	.743	---	.030	.181 ns					.049

D.1.3--QUALIFIED UTILITIES (N=376)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.229								
	(.000)								
	1.488	-.726	---						.390
		(.001)							
	1.584	-.794	---	-.036					.010
				ns					
E&G	1.279	---	-.123						.090
			ns						
	1.171	---	-.073	.044					.024
				ns					
L&V	1.213								
	(.000)								
	1.505	-.818	---						.502
		(.000)							
	1.477	-.798	---	.011					.001
				ns					
L&V	1.297	---	-.206						.181
			(.034)						
	1.097	---	-.114	.082					.060
				ns					

D.1.4--UTILITIES (N=548)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.122 (.052)								
	1.346	-.490 (.043)	---						.166
	1.034	-.172	---	.109 ns					.036
	.709	-.075	---	-.077				.824 ns	.060
E&G	1.357	---	-.435 (.000)						.506
	1.187	---	-.310	.067 ns					.031
	1.127	---	-.294	.036				.143 ns	.004
L&V	1.113 (.019)								
	1.400	-.628 (.000)	---						.509
	1.212	-.436	---	.065 ns					.024
	.966	-.363	---	-.075				.624 (.081)	.065
L&V	1.339	---	-.425 (.000)						.495
	1.070	---	-.227	.105 (.055)					.079
	.942	---	-.194	.040				.306 ns	.020

D.1.5--ALL (N=5,464)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.692 (.000)								
	1.132	-.455 (.005)	---						.079
	.899	-.214	---	.191 (032)					.043
	.927	-.226	---	.212			-.161 ns		.001
	.920	-.222	---	.215			.032	-.229 ns	.000
E&G	1.112	---	-.334 (.006)						.075
	.896	---	-.162	.197 (.015)					.055
	.992	---	-.205	.248			-.418 ns		.008
	1.140	---	-.269	.218			-3.578	3.621 (.084)	.027
L&V	.715 (.000)								
	1.066	-.364 (.001)	---						.107
	.850	-.140	---	.178 (.003)					.078
	.852	-.141	---	.179			-.011 ns		.000
	.856	-.143	---	.177			-.123	.133 ns	.000

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.123	---	-.325 (.000)						.123
	.951	---	-.188	.156 (.009)					.060
	1.000	---	-.210	.182			-.211 ns		.004
	1.078	---	-.244	.166			-1.882	1.915 ns	.013

D.2--QUARTERS 7-8: 3RD QUARTER OF 1981--4TH QUARTER OF 1981

D.2.1--NONUTILITIES (N=1,879)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.737 (.017)								
	1.256	-.574 (.065)	---						.034
	1.230	-.575	---	.048 ns					.001
E&G	.892	---	-.139 ns						.007
	.841	---	-.071	.133 ns					.010
L&V	.832 (.054)								
	1.048	-.239 ns	---						.009
	1.107	-.326	---	-.106 ns					.005
L&V	.778	---	.057 ns						.002
	.792	---	.037	-.039 ns					.001

D.2.2--UNQUALIFIED UTILITIES (N=65)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	2.086								
	ns								
	1.425	.822	---						.013
		ns							
	8.819	-5.978	---	-2.952					.334
				(.003)					
E&G	1.668	---	.487						.010
			ns						
	6.545	---	-2.893	-2.300					.337
				(.003)					
L&V	2.055								
	ns								
	1.559	.616	---						.007
		ns							
	9.334	-6.534	---	-3.104					.347
				(.002)					
L&V	1.835	---	.195						.002
			ns						
	6.581	---	-3.094	-2.238					.313
				(.004)					

D.2.3--QUALIFIED UTILITIES (N=154)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.122 (.014)								
	1.492	-.983 (.001)	---						.406
	1.158	-.769	---	.124 ns					.061
E&G	1.139	---	-.308 (.012)						.245
	.816	---	-.200	.154 ns					.078
L&V	1.124 (.009)								
	1.479	-.944 (.001)	---						.412
	1.203	-.767	---	.102 ns					.046
L&V	1.137	---	-.301 (.013)						.238
	.826	---	-.197	.148 ns					.073

D.2.4--UTILITIES (N=219)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.388								
	(.040)								
	.715	1.307	---						.208
		(.022)							
	1.221	.880	---	-.176					.008
				ns					
	2.118	.547	---	.219				-1.945	.101
								(.092)	
E&G	1.228	---	.480						.140
			(.066)						
	2.360	---	-.186	-.550					.162
				(.034)					
	3.744	---	-.820	-.333				-2.156	.117
								(.052)	
L&V	1.276								
	(.048)								
	.711	1.098	---						.264
		(.009)							
	.314	1.433	---	.138					.009
				ns					
	.658	1.305	---	.290				-.745	.027
								ns	
L&V	1.140	---	.314						.135
			(.071)						
	1.443	---	.136	-.147					.026
				ns					
	1.738	---	.001	-.101				-.460	.012
								ns	

D.2.5--ALL (N-7,562)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.806								
	(.032)								
	1.196	-.454	---						.029
		(.088)							
	1.156	-.407	---	.037					.001
				ns					
	1.155	-.407	---	.035			.113		.000
							ns		
	1.151	-.393	---	.034			-.458	.559	.001
								ns	
E&G	.977	---	-.166						.016
			ns						
	.890	---	-.082	.096					.010
				ns					
	.870	---	-.076	.749			.135		.001
							ns		
	.887	---	-.111	.067			1.086	-1.089	.005
								ns	
L&V	.892								
	ns								
	1.071	-.208	---						.009
		ns							
	1.142	-.290	---	-.064					.003
				ns					
	1.070	-.294	---	-.188			.715		.014
							ns		
	1.068	-.288	---	-.189			.478	.283	.000
								ns	

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	.929	---	-.032 ns						.001
	.950	---	-.052	-.023 ns					.001
	.813	---	-.014	-.171			.926 (.049)		.040
	.843	---	-.076	-.185			2.601	-1.916 ns	.020

D.3--QUARTERS 1-5,7-8: 1st QUARTER OF 1980--4TH QUARTER OF 1981

D.3.1--NONUTILITIES (N=6,795)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.671								
	(.000)								
	1.128	-.462	---						.079
		(.004)							
	1.027	-.332	---	.153					.024
				ns					
	.243	-.031	---	.244	1.812				.022
					ns				
E&G	.950	---	-.219						.031
			(.080)						
	.856	---	-.117	.202					.048
				(.026)					
	.505	---	.005	.238	.731				.006
					ns				
L&V	.714								
	(.000)								
	1.002	-.291	---						.058
		(.016)							
	.943	-.215	---	.089					.015
				ns					
	.519	-.052	---	.139	.979				.012
					ns				
L&V	.948	---	-.182						.045
			(.034)						
	.898	---	-.128	.108					.029
				(.087)					
	.815	---	-.099	.116	.173				.001
					ns				

D.3.2--UNQUALIFIED UTILITIES (N=237)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.205 ns								
	.997	.290 ns	---						.015
	1.347	-.080	---	-.151 ns					.025
	1.553	-.682	---	-.339	1.234 ns				.057
E&G	1.173	---	.017 ns						.000
	1.688	---	-.399	-.253 ns					.051
	1.771	---	-.945	-.441	1.904 (.079)				.133
L&V	1.033 ns								
	1.209	-.245 ns	---						.033
	1.344	-.388	---	-.058 ns					.004
	1.424	-.620	---	-.131	.475 ns				.014
L&V	1.132	---	-.081 ns						.003
	1.242	---	-.170	-.054 ns					.004
	1.298	---	-.536	-.180	1.277 ns				.090

D.3.3--QUALIFIED UTILITIES (N=530)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.200								
	(.000)								
	1.487	-.795	---						.517
		(.000)							
	1.507	-.809	---	-.074					.000
				ns					
	1.496	-.842	---	-.013	.189				.004
					ns				
E&G	1.229	---	-.100						.062
			ns						
	.985	---	-.011	.108					.118
				(.088)					
	1.377	---	-.279	.023	-.480				.330
					(.001)				
L&V	1.189								
	(.000)								
	1.495	-.844	---						.563
		(.000)							
	1.447	-.811	---	.018					.003
				ns					
	1.444	-.818	---	.017	.025				.000
					ns				
L&V	1.233	---	-.150						.116
			(.096)						
	.938	---	-.043	.130					.143
				(.052)					
	1.376	---	-.343	.036	-.537				.340
					(.000)				

D.3.4--UTILITIES (N=767)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.194 (.002)								
	1.189	.010 ns	---						.000
	1.238	-.037	---	-.017 ns					.001
	1.225	.018	---	-.002	-.127 ns				.001
	1.141	.061	---	-.040	-.174			.198 ns	.004
E&G	1.210	---	-.033 ns						.005
	1.255	---	-.063	-.019 ns					.003
	1.456	---	-.160	-.049	-.375 ns				.102
	1.832	---	-.290	.107	-.322			-.824 (.090)	.122
L&V	1.148 (.000)								
	1.258	-.232 (.067)	---						.138
	1.169	-.147	---	.031 ns					.009
	1.101	.130	---	.106	-.632 ns				.068
	1.201	.079	---	.152	-.575			-.237 ns	.016

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.192	---	-.092 ns						.041
	1.009	---	.028	.079 ns					.056
	1.128	---	-.029	.062	-.221 ns				.042
	1.240	---	-.068	.108	-.205			-.245 ns	.013

D.3.5--ALL (N=7,562)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.724 (.000)								
	1.201	-.509 (.001)	---						.099
	1.051	-.349	---	.128 ns					.021
	.065	.004	---	.227	2.361 (.060)				.032
	.085	-.004	---	.250	2.371		-.158 ns		.001
	.048	.044	---	.275	2.591		1.333	-1.771 ns	.006
E&G	1.048	---	-.271 (.017)						.056
	.870	---	-.122	.175 (.027)					.047
	.462	---	.019	.220	.861 ns				.014
	.561	---	-.020	.262	.797		-.347 ns		.006
	.767	---	-.072	.240	.541		-3.582	3.669 (.100)	.025
L&V	.759 (.000)								
	1.116	-.380 (.000)	---						.119
	1.005	-.263	---	.094 ns					.024
	.382	-.040	---	.156	1.493 (.078)				.028
	.370	-.035	---	.143	1.487		.090 ns		.001
	.341	-.025	---	.149	1.536		.420	-.392 ns	.001

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.048	---	-.239 (.002)						.096
	.936	---	-.145	.110 (.036)					.040
	.731	---	-.074	.132	.433 ns				.008
	.741	---	-.078	.137	.426		-.036 ns		.000
	.865	---	-.110	.123	.271		-1.994	2.221 ns	.020

D.4--QUARTERS 1-8: 1ST QUARTER OF 1980--4TH QUARTER OF 1981

D.4.1--NONUTILITIES (N=7,763)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.682 (.000)								
	1.111	-.438 (.021)	---						.053
	1.035	-.339	---	.117 ns					.010
E&G	.934	---	-.201 ns						.023
	.859	---	-.118	.164 (.095)					.028
L&V	.704 (.000)								
	1.022	-.325 (.018)	---						.055
	.964	-.249	---	.090 ns					.012
L&V	.929	---	-.176 (.051)						.038
	.879	---	-.121	.110 (.100)					.027

D.4.2--UNQUALIFIED UTILITIES (N-269)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.180								
	ns								
	.949	.314	---						.025
		ns							
	1.094	.166	---	-.063					.002
				ns					
E&G	.933	---	.258						.023
			ns						
	1.100	---	.128	-.083					.005
				ns					
L&V	1.041								
	ns								
	1.065	-.032	---						.001
		ns							
	.851	.186	---	.093					.018
				ns					
L&V	.948	---	.132						.011
			ns						
	.812	---	.237	.067					.007
				ns					

D.4.3--QUALIFIED UTILITIES (N=605)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.191 (.000)								
	1.390	-.547 (.001)	---						.400
	1.422	-.570	---	-.012 ns					.002
E&G	1.198	---	-.031 ns						.011
	1.006	---	.040	.084 (.088)					.125
L&V	1.181 (.000)								
	1.409	-.628 (.000)	---						.469
	1.392	-.616	---	.006 ns					.001
L&V	1.200	---	-.076 ns						.052
	.957	---	.014	.107 (.052)					.152

D.4.4--UTILITIES (N-874)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.183 (.001)								
	1.171	.024 ns	---						.001
	1.238	-.039	---	-.023 ns					.003
	1.156	-.015	---	-.070				.212 ns	.007
E&G	1.190	---	-.018 ns						.002
	1.234	---	-.046	-.019 ns					.004
	1.456	---	-.122	.068				-.468 ns	.066
L&V	1.148 (.000)								
	1.210	-.129 ns	---						.059
	1.121	-.046	---	.031 ns					.012
	1.233	-.078	---	.095				-.288 ns	.034
L&V	1.170	---	-.054 ns						.033
	1.012	---	.048	.069 ns					.085
	.999	---	.052	.064				.027 ns	.000

D.4.5--ALL (N=8,637)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.733								
	(.000)								
	1.176	-.477	---						.103
		(.001)							
	1.061	-.353	---	.098					.014
				ns					
	1.076	-.358	---	.113			-.103		.001
							ns		
	1.086	-.360	---	.110			-.538	.514	.001
								ns	
E&G	1.019	---	-.243						.065
			(.010)						
	.872	---	-.118	.146					.046
				(.028)					
	.919	---	-.136	.181			-.251		.004
							ns		
	1.006	---	-.139	.187			-3.841	3.982	.035
								(.051)	
L&V	.755								
	(.000)								
	1.112	-.384	---						.126
		(.000)							
	1.015	-.280	---	.082					.019
				ns					
	1.005	-.277	---	.072			.072		.001
							ns		
	1.017	-.280	---	.067			-.459	.627	.002
								ns	

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.003	---	-.208 (.000)						.117
	.891	---	-.113	.112 (.006)					.065
	.889	---	-.112	.111			.007 ns		.000
	.934	---	-.113	.114			-1.855	2.066 (.099)	.023

D.5--QUARTERS 9-24: 1st QUARTER OF 1982--4TH QUARTER OF 1985

D.5.1--NONUTILITIES (N=13,484)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.727 (.000)								
	.798	-.082 ns	---						.005
	.796	-.077	---	.011 ns					.000
E&G	.916	---	-.169 (.049)						.039
	.921	---	-.179	-.020 ns					.001
L&V	.711 (.000)								
	.765	-.062 ns	---						.005
	.754	-.034	---	.054 ns					.013
L&V	.903	---	-.171 (.006)						.075
	.898	---	-.163	.017 ns					.001

D.5.2--UNQUALIFIED UTILITIES (N=609)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.972 ns								
	1.078	-.163 ns	---						.058
	.738	.114	---	.158 (.032)					.180
E&G	1.153	---	-.227 (.077)						.130
	1.007	---	-.140	.075 ns					.023
L&V	.973 ns								
	1.085	-.173 ns	---						.090
	.747	.102	---	.158 (.009)					.244
L&V	1.132	---	-.203 (.033)						.182
	.919	---	-.076	.109 ns					.085

D.5.3--QUALIFIED UTILITIES (N=1,414)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.157								
	(.000)								
	1.193	-.100	---						.009
		ns							
	1.085	-.089	---	.053					.039
				(.050)					
E&G	1.202	---	-.139						.076
			(.005)						
	1.095	---	-.131	.053					.034
				(.059)					
L&V	1.153								
	(.000)								
	1.192	-.109	---						.011
		ns							
	1.083	-.098	---	.053					.041
				(.042)					
L&V	1.197	---	-.141						.084
			(.004)						
	1.076	---	-.131	.060					.047
				(.025)					

D.5.4--UTILITIES (N-2,023)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.104								
	(.000)								
	1.216	-.250	---						.068
		(.009)							
	.930	-.051	---	.116					.098
				(.001)					
	.827	.014	---	.076				.202	.012
								ns	
E&G	1.223	---	-.262						.135
			(.000)						
	1.115	---	-.217	.051					.012
				ns					
	1.058	---	-.191	.026				.123	.002
								ns	
L&V	1.100								
	(.000)								
	1.221	-.270	---						.122
		(.000)							
	.924	-.064	---	.121					.160
				(.000)					
	.842	-.013	---	.089				.159	.011
								ns	
L&V	1.209	---	-.236						.168
			(.000)						
	1.074	---	-.179	.064					.029
				(.066)					
	1.022	---	-.156	.042				.110	.002
								ns	

D.5.5--ALL (N=15,507)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.776 (.000)								
	.922	-.181 (.077)	---						.032
	.835	-.074	---	.095 (.033)					.045
	.746	-.042	---	-.007			.488 (.048)		.037
	.745	-.047	---	-.011			.700	-.243 ns	.001
E&G	1.019	---	-.236 (.002)						.095
	.967	---	-.186	.055 ns					.012
	.889	---	-.163	-.031			.422 ns		.022
	.887	---	-.168	-.038			.727	-.343 ns	.001
L&V	.760 (.000)								
	.902	-.176 (.019)	---						.055
	.788	-.035	---	.125 (.000)					.139
	.721	-.011	---	.046			.374 (.028)		.040
	.720	-.014	---	.044			.522	-.170 ns	.001

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.014	---	-.247						.158
			(.000)						
	.940	---	-.175	.079					.039
				(.034)					
	.887	---	-.159	.020			.290		.016
							ns		
	.886	---	-.160	.019			.357	-.076	.000
								ns	

D.6--QUARTERS 1-24: 1st QUARTER OF 1980--4TH QUARTER OF 1985

D.6.1--NONUTILITIES (N=21,247)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.711 (.000)								
	.895	-.205 (.100)	---						.027
	.875	-.167	---	.059 ns					.007
	.070	.049	---	.131		.987 ns			.015
E&G	.929	---	-.179 (.004)						.080
	.904	---	-.156	.050 ns					.011
	1.265	---	-.221	.020		-.459 ns			.007
L&V	.712 (.000)								
	.842	-.144 (.052)	---						.038
	.818	-.100	---	.071 (.088)					.029
	.472	-.007	---	.102		.424 ns			.008
L&V	.906	---	-.168 (.000)						.127
	.888	---	-.141	.059 (.081)					.027
	1.109	---	-.181	.010		-.281 ns			.005

D.6.2--UNQUALIFIED UTILITIES (N=878)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.027 ns								
	1.029	-.004 ns	---						.000
	.907	.107	---	.054 ns					.017
	.961	.124	---	.067		-.111 ns			.003
E&G	1.198	---	-.203 ns						.078
	1.352	---	-.304	-.077 ns					.021
	1.517	---	-.295	-.055		-.279 ns			.015
L&V	.989 ns								
	1.082	-.139 ns	---						.083
	.860	.062	---	.099 (.076)					.125
	.993	.105	---	.131		-.275 ns			.035
L&V	1.172	---	-.224 (.033)						.182
	1.108	---	-.182	.032 ns					.007
	1.130	---	-.181	.035		-.038 ns			.001

D.6.3--QUALIFIED UTILITIES (N=2,019)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.167								
	(.000)								
	1.263	-.263	---						.086
		(.003)							
	1.179	-.236	---	.037					.026
				(.097)					
	1.227	-.238	---	.034		-.059			.004
						ns			
E&G	1.196	---	-.095						.057
			(.016)						
	1.104	---	-.077	.043					.031
				(.071)					
	.976	---	-.084	.049		.170			.048
						(.023)			
L&V	1.163								
	(.000)								
	1.264	-.280	---						.100
		(.001)							
	1.168	-.248	---	.043					.035
				(.049)					
	1.181	-.249	---	.042		-.016			.000
						ns			
L&V	1.194	---	-.104						.074
			(.006)						
	1.084	---	-.082	.052					.048
				(.023)					
	.960	---	-.089	.057		.166			.050
						(.018)			

D.6.4--UTILITIES (N=2,897)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	1.126 (.000)								
	1.197	-.155 (.059)	---						.036
	1.074	-.058	---	.047 ns					.019
	1.166	-.065	---	.048		-.130 ns			.006
	1.054	.012	---	-.018		-.191		.327 (.105)	.026
E&G	1.203	---	-.167 (.000)						.124
	1.180	---	-.155	.011 ns					.001
	1.050	---	-.158	.006		.199 (.086)			.027
	1.073	---	-.168	.016		.203		-.053 ns	.001
L&V	1.115 (.000)								
	1.213	-.215 (.001)	---						.110
	1.040	-.078	---	.067 (.009)					.061
	1.102	-.083	---	.067		.088 ns			.005
	1.001	-.014	---	.007		-.142		.294 ns	.033

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.184	---	-.145						.142
			(.000)						
	1.076	---	-.091	.049					.036
				(.041)					
	.951	---	-.093	.045		.191			.037
						(.036)			
	.847	---	-.046	-.001		.173		.243	.020
								ns	

D.6.5--ALL (N=24,144)

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
E&G	.760								
	(.000)								
	1.007	-.290	---						.082
		(.004)							
	.910	-.176	---	.098					.040
				(.037)					
	.523	-.075	---	.119		.469			.006
						ns			
	.530	-.075	---	.073		.414	.234		.007
							ns		
	.539	-.074	---	.075		.407	.018	.246	.000
								ns	
E&G	1.009	---	-.230						.166
			(.000)						
	.925	---	-.152	.088					.053
				(.012)					
	.953	---	-.157	.087		-.036			.000
						ns			
	.950	---	-.149	.037		-.093	.261		.014
							ns		
	.961	---	-.163	.018		-.128	1.321	-1.171	.007
								ns	
L&V	.762								
	(.000)								
	.968	-.242	---						.121
		(.000)							
	.859	-.114	---	.110					.108
				(.000)					
	.577	-.041	---	.126		.342			.007
						ns			
	.585	-.041	---	.074		.281	.258		.019
							ns		
	.592	-.040	---	.076		.276	.086	.196	.000
								ns	

DROP	CONST	OLS B	AGG B	YIELD	JUNE	ERTA	UTIL	QUAL	R^2
L&V	1.001	---	-.222 (.000)						.221
	.912	---	-.140	.094 (.001)					.085
	.909	---	-.140	.094		.003 ns			.000
	.906	---	-.132	.048		-.050	.240 ns		.017
	.914	---	-.143	.034		-.075	1.001	-.840 ns	.005

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