TAX POLICY, ACQUISITION ACTIVITIES
AND
EARNINGS RETENTION BEHAVIOR:
AN EXPLORATORY ECONOMIC FRAMEWORK

(REDRAFT OF CHAPTERS I-III)

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I. INTRODUCTION

This paper explores two key tax policy issues with the objective of developing testable economic hypotheses regarding them: 1) the effects of tax policy (reorganization provisions) on acquisition activities and 2) the effects of tax policy (especially "double taxation of dividends") on corporate earnings retention behavior. The succeeding chapters present, in turn: a critique of these issues as they are handled in select key articles in the literature; the development of an economic evaluation framework within which various hypothesized relationships involving these issues can be tested; the delineation of precisely which hypothesized relationships are amenable to testing, given the constraints that an economically-valid framework imposes and data availability/quality allow; and the setting-forth of ideas regarding the approach which further studies may adopt to test these hypotheses, which testing is outside the scope of the present study.
II. CRITICAL REVIEW OF LITERATURE

A. Introduction

The legal and economic literature analyzing merger and acquisition behavior is expansive and profuse. For purposes of this study we focus on two fundamental public policy issues—the effects of tax policy upon mergers and acquisitions (reorganization provisions) and the effects of income tax policy on retained earnings. Toward this end we review four articles.


Two conflicting views of the impact of tax policy on merger and acquisition behavior are presented by Hellerstein (1957) and Steiner (1975). Since most of Steiner's article is germane to the focal issue, we analyze his entire chapter 4 entitled "Synergy II: Tax Incentives to Merger" with one exception: subordinated debenture tax incentives. Since the Tax Reform Act of 1969 eliminated this presumed incentive to merge, we do not consider it in our analysis of the current tax structure. Hellerstein, on the other hand, presents a number of related though not directly relevant issues from which this review necessarily abstracts. For example, although it is interesting to speculate on and advocate changes in the tax policy, for purposes of our analysis, we must take the tax structure as a given. On this basis we need not comment on Hellerstein's explanation of: 1) the legal origins and rationale for the reorganization provisions, 2) the income tax law's treatment of general income realization and recognition, 3) the 1954 American Law Institute proposed change in the statutes and its (ultimately rejected) manifestation—H.R. 8300, 4) his proposed taxation of merger exchanges, 5) changes in the nature of the business and 6) taxation of the transferor corporation. Having thus dispensed with these interesting though irrelevant topics, our review of Hellerstein focuses on the analysis contained in his subsections entitled: 1) the tax advantages afforded mergers, 2) changes in economic position, and 3) arguments in favor of nonrecognition.

2. Sherman and the ALI Project: Income Tax Policy and Retained Earnings

In the second part of this literature review we examine the importance of the differential taxation of capital gains and dividends. Some have argued that such a tax scheme generates behavior which, from an economic point of view, is different from that which would obtain in a tax-free environment. In Feld (1979), the American Law Institute's Federal Income Tax Project, Tentative Draft No. 2 (1979), and Sherman (1977), some aspects of this issue are raised.

In our subsequent review, the validity of some of the arguments in the above-mentioned works is examined. An attempt is also made, in some cases, to explain other situations in which those arguments are ostensibly relevant, but in quite a different framework from that typically employed in these discussions.
The two key questions, therefore, which subsection C below addresses are:

1. Does the double taxation of dividends lead to earnings retention in excess of that associated with an identical but tax-free environment?

2. If such excessive retention exists, are some of the extra funds being employed to finance more merger and acquisition activity than would otherwise have occurred?

B. Effects of Reorganization Provisions on Merger and Acquisition Behavior

Steiner (1975) and Hellerstein (1957) provide thorough analyses of the effects of tax policy on merger and acquisition behavior. The major tax considerations regarding mergers are usually discussed under the general headings of "taxable" versus "tax-free" exchanges. The primary distinguishing feature of these exchanges is whether: (a) the seller must immediately pay tax on the gain obtained from the "taxable" cash transaction or (b) this tax may be deferred by merely exchanging, on a "tax-free" basis, stock in the selling company for stock in the buying company*. Since it can be shown that shareholders in the buying company typically prefer taxable transactions while holders of the selling firm generally prefer tax-free exchanges, the equilibrating form of the exchange depends on relative market strengths and preferences of purchaser and seller. It is this bargaining process which permits econometric modeling and statistical testing, as discussed in subsequent sections of this report (see chapters III and IV below).

At this stage, for ease of exposition and coherence of construction, we choose to review these two articles as they relate to first the demand for acquisitions and then the supply of acquisition candidates. In other words, we first consider the impact of tax policy on the buying firm and then on the selling firm. In this context Steiner concentrates primarily on the demand side tax incentives while Hellerstein discusses supply side effects.

1. Demand for Acquisitions

Steiner extensively analyzes the tax incentives to acquire, viewed basically from the buyer's perspective. In this context, he observes that

* Though the only cases of real interest in this report can be clearly classified into one of these two polar classes of transactions, the tax law admits other types of transactions that belie this simple dichotomy. For example the transferee can enjoy the tax benefit of a stepped-up basis (as in a taxable exchange) while the selling corporation can avoid the gain recognition (as in a tax-free exchange) under a "plan of liquidation" allowed by the tax law. However, selling shareholders would still be subject to the capital gains tax, as in a taxable exchange.
there are two generic types of effects—those independent of the acquisition's form and those strictly related to its form. Since at the outset of this study we agreed to work with "ground rules" which precluded burdening the text with discussions of obvious tax incentives to acquisitions, we simply restate, with qualification, Steiner's observations with respect to the former ("carryover" provisions) and examine the latter (reorganization provisions) in greater detail.


First, regardless of the form of the acquisition, Steiner observes that the buying firm enjoys exploiting various tax advantages held by the selling firm. There are two major types of such advantages—tax loss carryovers and depletion allowances. Under current law, if the selling firm possesses un-utilized tax loss carryovers, then the only route by which the firm can be dissolved, while maintaining the tax benefits of such carryovers, is via acquisition or merger. Similarly, accumulated depletion allowances of the selling firm can only be used by the acquiring firm if the former is to be dissolved. These provisions are the only available salvation for the tax advantages when the selling firm ends its independent existence.

Effectively, Steiner asserts that the carryover provisions unambiguously favor reorganizations of either the tax-free or taxable form. Technically, this assertion is inaccurate in that the form of the reorganization or liquidation affects the carryover characteristics of the transaction. Generally, the carryover of most tax attributes is allowed only if the transaction is of the tax-free type. Also, a firm with tax losses will not have its attributes affected if it should acquire the assets of, or a controlling interest in, a profitable firm. However, should a profitable firm purchase a firm with tax loss carryovers for cash (hence, a taxable transaction), then carryover of the tax attributes of the purchased firm will generally be denied.

b. Reorganization Provisions

The more interesting cases involve tax incentives to the buyer for "taxable" rather than "tax-free" reorganizations. Since the buying firm wants a larger basis against which to garner larger future depreciation write-offs, the form of reorganization which provides the highest depreciable tax basis is unambiguously preferred by the buyer. In a taxable reorganization the buyer obtains the assets of the seller at the market price whereas in a tax-free reorganization the buyer obtains the seller's assets at the seller's basis. Thus, for the buyer, the choice of the reorganization's form pivots on the relationship between market price and the seller's basis. If the basis exceeds the market price, the buyer prefers a tax-free reorganization. Conversely, if the market price exceeds the basis, the buyer benefits from a taxable exchange in the form of future enhanced depreciation levels.

This wedge between historic basis and market price can be caused, as Steiner observes, by two phenomena—one artificial and the other very real. Due to the provision for accelerated depreciation, the historic basis may be
artificially diminished. On the other hand, inflation in asset values may expand the nominal market price of the selling firm.

Based primarily on their own historic experience, Steiner and Hellerstein view this issue from different perspectives. Influenced by the accelerating inflation of the late 1960's and 1970's (measured most appropriately by the Gross National Product implicit price deflator for fixed nonresidential investment* which soared 4.7 percent per year in the last 2 decades), Steiner expects market price to exceed historic basis and thus concludes buyers always prefer taxable exchanges. The increasing adoption of accelerated depreciation by firms over the last 20 years also contributes to further understatement of asset book values. Conversely, Hellerstein—conditioned by the rather modest price behavior of the 1950's when the inflation in fixed nonresidential investment averaged 2.9 percent per year and when firms tended to use slower depreciation schedules—expected the historic basis to exceed market price and thus the buyer to prefer tax-free reorganizations.

c. Conclusions

Thus, with respect to the buyer, we conclude that: 1) carryover provisions unambiguously favor acquisitions, at least of the tax-free form and 2) the form of acquisition which provides the higher depreciation base is preferred by the buyer. However, with respect to the form of the reorganization, the preference between taxable or tax-free exchange depends critically on the depreciation method used and on the degree of historical price inflation in nonresidential investment goods.

2. Supply of Acquisitions

On the supply side, the tax effects are considerably more ambiguous. Two general tacks are followed in the literature. First, if one views corporations as maximizing their own (balance sheet) net worth regardless of after-tax effects on their shareholders, it can be shown that there are limited incentives for sellers to be acquired in a tax free exchange. Second, even if one presumes corporations maximize their shareholders' after-tax net worth, the effects of tax policy on the seller's participation in acquisitions is ambiguous. Indeed even Steiner and Hellerstein, who follow this second tack, conclude that the tax incentives to be acquired are not significant.

a. Assuming Maximization of Acquired Firm’s Pre-Tax Net Worth

Following this first tack, van den Temple (1969) (and, earlier, the House Ways and Means Committee (1954)) explained that most publicly held corporations could be viewed as maximizing their own net worth without regard

* This price series, published by the U.S. Department of Commerce, comes closest to measuring the current market price level of plant and equipment spending—the most important elements of depreciable assets.
to the after-tax effects on their shareholders. From this perspective, if
tax-free exchanges lower the market premium paid to the seller, these
provisions provide a disincentive to be acquired. Tax-free reorganization
provisions would probably increase the premium offered to the sellers only if
such provisions provided a larger potential return to the buyers. As we saw
in the preceding discussion of demand for acquisitions, this situation occurs
if the historic basis for depreciable assets exceeds the market price. In
that case the buyer would likely "bargain down" until the acquisition premium
nearly approached the tax benefits of the inflated historic basis. Thus, only
when conservative depreciation methods provide a relatively large basis and
rather weak economic conditions permit relatively depressed stock market
prices, could one conclude that the tax-free reorganization provision results
in a higher premium. Only in this case can the supply of mergers be thought
of as expanding due to tax considerations. It is more often the case that, in
offering tax-free exchanges, the buyer cuts his offering premium to the seller
because the seller may net more by deferring tax on accrued but unrealized
capital gains. So, depending on the prevalent method of depreciation and the
prevailing or expected inflation rate in nonresidential business fixed
investment prices, the tax effects on merger behavior may be positive or
negative even if we view the selling firm as maximizing its pre-tax net worth.

b. Assuming Maximization of Selling Shareholders' After-Tax Net Worth

A more involved analysis leading to similarly ambiguous conclusions
obtains when we follow the second tack—that the selling firm aims to maximize
its shareholders' after-tax net worth. In this context, Hellerstein focuses
on three areas—closely held corporations, changes in the sellers' real
economic position and the effect of tax-free reorganizations on economic
welfare. After reviewing these peripheral issues, we concur in his conclusion
that the data are insufficient to determine that tax free reorganization
provisions have been a major element in the sellers' determination to be
acquired. Steiner constructs, in a more logical economic framework, the
conditions under which the seller prefers tax free exchanges. He too
concludes, however, that the likely tax incentives to be acquired are
insignificant factors in the final business decision.

(1.) Hellerstein

Hellerstein discusses three issues which we categorize as possible
incentives for sellers to be acquired.

He first explains that owners of closely held corporations would like
to be acquired by a corporation having widely-traded stock for three reasons:
1) the sellers could thus avoid the accumulated earnings tax, 2) they would,
thereby, obviate estate tax valuation problems and 3) they would thus obtain
cash or liquid assets to pay inheritance taxes. While all of these issues may
be important considerations in the decision to be acquired or not, they are
unrelated to the form of the reorganization. So the provision for tax-free
reorganization cannot be thought of as necessary nor sufficient incentive for shareholders of closely-held corporations to merge. On the contrary, Hellerstein's arguments merely suggest such shareholders may want to be acquisition targets regardless of tax status.

In discussing the rationale for tax free reorganizations, Hellerstein argues that the selling shareholders' real economic position has changed. Although he presents this as an argument against granting tax free status for some reorganizations, it can also be interpreted as a tax incentive to be acquired. While it is true that the assets of the merged firm sometimes combine dissimilar industries, the sellers' relative proportional share of the merged assets must (as Steiner shows in equilibrium) approximate the sellers' pre-merger control of assets and the resultant income earned thereon. Consequently, one can think of the selling shareholders as maintaining their same relative position in their industries, thus maintaining their original "economic position" in regards to industry participation.

Finally, Hellerstein addresses the effect of tax-free exchanges on economic health. He introduces the strawman argument whereby some claim that the lure of eventual tax-free exchanges encourages entrepreneurial endeavor and, for this reason, such exchanges increase the general welfare. He responds that the logic of this argument is weak and the data do not support it. Instead, he suggests that the switch from 1) cash exchange dominance of merger activity in the 1940-47 period to 2) some stock exchange coupled with continuing strong cash exchange activity in mergers during the 1948-54 interval, demonstrates the strength of taxable transactions. He argues that, since tax-free reorganizations were not often chosen, they were, prima facie, therefore not necessary for economic health.

Such partial interpretation of data is dangerous and misleading since it fails to consider the complex interactions at work in the market for mergers and acquisitions. It may be, for instance, that these swings in emphasis in the type of reorganization have been induced by changes in the demand for acquisitions, as explained in the preceding section. Also, the impact of the wars (World War II and Korea) may have unduly influenced the form of reorganizations. Steiner's analysis, which we explain below, offers another theoretical interpretation for this switch in form. The only fair way to test the effects of these various forces on merger behavior is to control for them in a multivariate regression framework explained in chapter IV below.

(2.) Steiner

Steiner puts the supply side in a more rational economic context. He explains that if 1) the sellers' after-tax share of the premium from the additional depreciation obtained by the acquiring firm in a taxable reorganization exceeds 2) the seller's after-tax capital gains tax liability, then even the sellers prefer a taxable reorganization. The larger the effective corporate tax rate faced by the merged corporation and the smaller the capital gains tax rate faced by the seller, the more likely the seller is
to prefer a taxable reorganization. The ever-increasing proportion of stock held by shareholders not subject to any tax at all—such as pension funds and other fiduciaries, philanthropic institutions and foreign nationals—assures at least a large base of shareholders who are either indifferent to the form of the merger or clearly prefer taxable exchanges.

3. Conclusion

We might simply conclude this portion of our literature review by noting the similarity among various contributors to this literature. Hellerstein, although maintaining his interpretation that the tax laws encourage mergers, admits: "...we do not have the data from which to ascertain the importance of this tax advantage in encouraging mergers...". Steiner more forcefully concludes "...nothing that I have found or that they (the F.T.C.) present even remotely justifies the F.T.C. conclusion that the "tax laws create a significant institutional bias in favor of merger activity." The American Law Institute Federal Income Tax Project (1979) supports Steiner by observing: "Corporate acquisitions are almost always motivated by substantial non-tax factors."

C. Income Tax Policy and Earnings Retention

1. Relative Tax Rates, Rates of Return and "Double Dividend Taxation": The Retention Decision

a. Introduction

Total after-tax corporate profits are what remain after the imposition of the corporate profit tax on pre-tax income. The allocation of profits, after this first stage of taxation, between retained earnings and stockholder dividends is affected by many considerations. Certainly among them is the differential tax treatment of 1) stockholder's immediate dividend receipts versus 2) the long term capital gains arising from cumulative retained earnings. The former are subject to personal income tax rates ranging up to 70 percent, imposed in the quarter the dividends are paid. The latter are subject to a long term capital gains tax, which is generally 60 percent less than the income tax, imposed at the time the securities are sold. The tax on dividends, therefore, becomes a second stage of taxation—hence the term "double taxation of dividends"—since it is imposed on what is "left over" after the (first stage) corporate profit tax. Therefore, all other things equal, stockholders should prefer that earnings be retained rather than paid as dividends, if only because of these tax effects.

One might expect this differential tax treatment to affect a firm's financial policies, assuming the firm acts to maximize the value of shareholders' equity. If this policy leads to excessive retention and investment of retained earnings, whether by internal expansion or acquisitions, firms may be employing capital in projects whose rate of return are less than the actual cost of the capital. This would mean that, all else
being equal, capital is being misallocated: resources would be misused which could probably be employed more productively elsewhere at the same cost. It makes little sense, however, to discuss precisely which departures from economically-optimal financing decisions and investment allocations firms are likely to make in the light of the tax code if we do not first define what is meant by an optimum allocation of capital resources and, specifically, what is meant by an optimal level of retention.

b. Derivation of Necessary Conditions for Relative Tax Rates and Returns vis-a-vis the Retention Decision

It is a well known result of the Miller-Modigliani propositions (see Fama and Miller (1972)) that, in a world without taxes or transactions costs, there exists no optimal capital structure. This implies, for dividend policy, that there should not exist an optimum rate of retention (or, obversely, dividend payout) which maximizes the value of shareholder equity. Taxes may change the picture, however, in that they alter the relative cost to the firm of new equity, new debt, and retained earnings; erstwhile altering the stockholders' net after-tax rate of return on equity.

The cost of new equity is generally defined to be that rate of return stockholders require to make new equity investments, given expected future income flows and the level of risk or uncertainty in those flows. "Double taxation" of dividends may tend to increase the cost of equity to a firm paying out dividends, as stockholders will require a larger gross pre-tax flow amount to obtain their net after-tax required rate of return than they would if the flows were allowed to accumulate (via retained earnings) as capital gains.

Not in all cases, however, will the differential taxation of capital gains and dividends be important to stockholders vis-a-vis retention/payout policy. The necessary conditions for the differential to matter are related to the reinvestment opportunities available to firms versus the investment opportunities available to their shareholders.

Let: \( R \) = corporate pre-tax earnings
\[
R_c = \text{the rate of return on new investment possibilities available to the firm}
\]
\[
R_p = \text{the rate of return on new shareholders' investment possibilities}
\]
\[
R_t = \text{the shareholders' tax rate on investment income, this rate can go as high as 70 percent}
\]
\[
R_g = \text{the shareholders' tax rate on capital gains, typically 60 percent less the } R_t \]
\[
= (1 - t_g) + p
\]
\[ t_c = \text{the firm's profit tax rate} \]
\[ t_{pg} = \text{the tax rate on returns on shareholder re-investment}. \]

The key question is: under what circumstances will shareholder net income flows be the same under these two cases: 1) capital gains via total (100 percent retention rate) reinvestment of retained earnings by the firm or 2) reinvestment of dividends (100 percent payout rate) by shareholders directly in investment possibilities open to them?

(1.) All Earnings Retained—No Dividend Payout

The return to the shareholder from the total reinvestment of retained earnings (retention rate of 100 percent) will be taxed three times: 1) the original \( R \) will be taxed at the corporate rate, \( t_c \), 2) earnings obtained from the re-investment of \( R \) \( (R(1-t_c) r_c) \) will be taxed at the corporate rate, \( t_c \), and 3) the unrealized capital gains to the shareholder will be taxed at the rate \( t_g \) once they are realized.

Algebraically, this may be expressed as:

\[ S^R = \text{Shareholder Net Under 100\% Retention} = R(1-t_c)(1+r_c(1-t_c))(1-t_g). \]

(2.) All Earnings Paid-Out as Dividends

In this case, \( R \) will be taxed once at the corporate rate \( t_c \), once at the personal rate \( t_p \), and the earnings obtained from shareholder re-investment at rate of return \( r_p \) will be taxed at \( t_{pg} \) or

\[ S^D = \text{Shareholder Net Under 100\% Dividend Payout} = R(1-t_c)(1-t_p)(1+r_p(1-t_{pg})). \]

(3.) Relationship between \( S^R \) and \( S^D \) under Different Tax Rates

Consider the relationship of shareholder net in each of the two above schemes:

\[ S^R = R(1-t_c)(1+r_c(1-t_c))(1-t_g); \]
\[ R(1-t_c)(1-t_p)(1+r_p(1-t_{pg})) = S^D. \]

Canceling common factors on both sides, we obtain:

\[ (A) \quad (1+r_c(1-t_c))(1-t_g) = (1-t_p)(1+r_p(1-t_{pg})). \]

Assuming, for simplification, that the pre-tax rate of return available for direct shareholder re-investment \( (r_p) \) equals the corresponding firm's pre-tax rate of return \( (r_c=\frac{r}{r}) \), that the shareholder garners his re-investment income totally as ordinary income (i.e., \( t_{pg} = t_p \)) and (as
current law implies) that the capital gains rate is 60 percent less than the
personal income tax rate \( t_g = .4t_p \), (A) becomes:

\[
(B) \quad \left(1 + r(1-t_c)\right)(1-.4t_p) : (1-t_p)(1+r(1-t_p)).
\]

If, furthermore, the personal tax rate \( t_p \) exceeds the corporate
tax rate \( t_c \), then the left-hand side of (B) becomes:

\[
(1+r(1-t_c))(1-.4t_p) > (1+r(1-t_p))(1-.4t_p) > (1-t_p)(1+r(1-t_p)).
\]

That is, \( S^R \geq S^D \) which implies that if the personal tax rate \( t_p \) exceeds
the corporate tax rate \( t_c \), then shareholder net will be maximized by a
maximum retention of earnings (i.e., \( S^R \) exceeds \( S^D \)). Contrarily, even if
many shareholders face personal tax rates greater than \( t_c \), enough other
shareholders may face rates sufficiently below \( t_c \) so the firm could still
consider its "average" shareholder to be facing a personal tax rate below the
corporate rate. Consequently, the firm would maximize its "average"
shareholders' net by paying out, as dividends, as much earnings as it did not
otherwise "need" (e.g., to maintain the viability of the firm, to fund
investment, etc.).

(4.) Relationship between \( S^R \) and \( S^D \) Assuming Re-Investment is
Partially a Capital Gain

In this case, \( t_{pg} \) will exceed \( t_g \) but will be less than \( t_p \), so that
\( .4t_p < t_{pg} < t_p \). By manipulating (A) above, and assuming
\( r_c = r_p = r \), we obtain:

\[
(C) \quad \left(1 + r(1-t_c)\right)(1-.4t_p) : (1-t_p)(1+r(1-t_{pg})).
\]

Three cases for the corporate tax rate need be considered: a) it
exceeds the personal tax rate \( t_c > t_p \), b) it is less than the personal
tax rate but exceeds the shareholder re-investment tax rate \( t_{pg} < t_c < t_p \),
or c) it is less than the capital gains tax rate \( t_c < t_g = .4t_p \).

Case a: Relationship (C) becomes:

\[
1+r(1-t_c) < 1+r(1-t_{pg}),
\]

which implies that \( S^R < S^D \); meaning that, if the corporate tax rate
exceeds the personal tax rate then shareholders would prefer a maximum
dividend payout (minimum retention rate).

Case b: Relationship (C) takes on the identical form as in "case a"
above. Hence, the same conclusion applies as in that case.
Case c: The left-hand side of relationship (C) becomes:

\[(1+r(1-t_c))(1-.4t_p) > (1+r(1-.4t_p))(1-.4t_p) > (1+r(1-.4t_p))(1-t_p) > (1+r(1-t_p))(1-t_p)\],

which implies that \(S_R > S_D\); meaning that, if the corporate tax rate is less than the stockholder capital gains tax rate, then the stockholder would prefer a minimum dividend payout (a maximum retention rate).

(5.) Relationship between \(S_R\) and \(S_D\) under Other Conditions

Here we break the returns assumption adopted heretofore \((r_c = r_p)\) and consider two other cases: a) the corporate rate of return exceeds the personal rate of return \((r_c > r_p)\) and b) the opposite \((r_p > r_c)\).

Case a: It is not unlikely that more numerous and lucrative investment opportunities are available to firms than to individuals. Indeed, if this were not so, no individual, all else being equal, would invest in a firm since he could do at least as well on his own. Insofar as \(r_c\) is greater than \(r_p\), the bias in favor of retention is likely to be that much greater.

Case b: Certainly individuals in lower tax brackets would prefer maximum dividend payout under this case. However, even investors facing particularly high taxes on personal income (i.e., wealthy individuals) may find that the instruments of various tax-exempt institutions (e.g., state debts or municipal bonds) offer a return higher than that available for the potentially retainable funds. Accordingly, these individuals may also desire higher payouts in order to re-invest at a higher return.

As we saw earlier with respect to the "average" shareholder tax rate, the firm's stockholders may be a mixture of investor types such that, between mixes of various individual \(r_p\)'s, the average "\(r_p\)" which the firm must consider (that of its average shareholder) may not be all that different from \(r_c\). In this case, the desirability of retained earnings versus dividends becomes less clear, at least insofar as tax treatment effects are concerned.

c. Some Observations on Stock Market Factors

The above discussion of stockholder demand for various stocks offering different payout ratios requires us to consider what impact the existence of diverse shareholder financial and tax positions has on the firm's ability to 1) change its capital budgeting and financing policy (with attendant effects on its cost of new equity capital) or 2) maximize the wealth of its shareholders. The cost of new equity to a firm is the rate of return stockholders require, net of taxes on their investment. What would happen to this cost if a given firm, with a given set of financially diverse stockholders, altered its retention policy?
In a financial market as large as that of the United States, even the largest firm's equity is small in comparison to the value of all equities traded. If a firm alters its payout rate, it will change the after-tax return to its shareholders. In an efficient capital market, where financial instruments may be exchanged by all involved parties at what they feel is relatively low cost, some shareholders will sell or trade their equity for shares in another firm whose payout policy maximizes their return from investment. Others will buy the shares, perceiving them as now superior to previously available alternatives. If there are enough investors for every given payout policy a firm adopts for its equity, a firm may lose and gain shareholders for its equity such that the price of it will not change very much. It is worth repeating that if the potential market for a firm's stock is "large" relative to its value in the market as a whole, and if there are enough investors whose financial characteristics span the appropriate range of optimal payouts, it is fair to conclude that changes in the payout rates may alter only ownership patterns and returns such that the cost of equity capital to the firm is left largely unchanged.

Indeed, any other situation might very well be incompatable with equilibrium in the financial market. For any one firm, therefore, there may exist no incentive whatsoever to search for an optimal payout ratio: in an efficient market such as we have described—with low transactions costs, and perfect information about the tax laws—there may not be any such unique ratio for any firm.

2. Critique of Select Literature: Tax Policy and Earnings Retention

a. Feld

Feld (1979, pp. 9-11) seems to argue that maximized retention rates always maximize shareholder return. Consider his case where the corporation pays taxes at a rate of 46 percent on earnings, but the shareholder pays only 1) 25 percent on personal income and 2) as the present capital gains law implies—.4 x .25 = 10 percent on capital gains. Feld asserts that a policy of 100 percent retention maximizes shareholder wealth in this case.

Remembering that the tax on re-investment of earnings is a crucial factor, we see that for 100 percent retention in Feld's case, we obtain net shareholder after-tax returns of:

\[ R(1-.46)(1+r_c(1-.46))(1-.1) = .486R + .26244 Rr_c, \]

and with 100 dividend payout we obtain net returns of:

\[ R(1-.46)(1-.25)(1+r_p(1-.25)) = .405R + .303 Rr_p. \]

Whether payout or retention is more favorable cannot be clearly ascertained from the above. In fact, there exist combinations of \( r_c \) and \( r_p \) whereby the stockholder is indifferent between 100% retention or 100%
payout! As we saw earlier, even if \( r_c \) is greater than \( r_p \), the differential may still favor payout. Feld ignores the problem of the tax rate applicable to returns from reinvestment of dividends, and more generally, he does not consider how dividends and recognized capital gains might be spent. This last issue's importance becomes evident when we consider the many forms investment takes.

Reinvestment funds can be used to acquire additional financial instruments. However, they can also be used to acquire durable goods as direct investment in real assets versus financial assets, or spent directly on consumption goods. Discussions of earnings and relevant tax rates cannot ignore that the goal of all production is, ultimately, someone's consumption. The "returns" from driving a Rolls-Royce purchased with dividends are not taxable, but we may be quite sure they are real. Dividend returns may, despite their higher personal income tax rates, generate more immediate utility upon being spent (depending on the rate at which a person discounts future utility) than future utility gained from waiting for a capital gain flow, even though it is taxed at a rate lower than that applicable to dividends.

This is hardly a trivial case to consider. Milton Friedman, for example, has used this analysis to explain the relatively large number of Rolls-Royces purchased in Great Britain, notorious for its high rates of tax, relative to the United States where per capita real disposable personal income is much higher. The extent to which earnings are paid now, instead of retained and taxed at the corporate rate, may increase the net present value of the utility a stockholder derives from his investment. When this fact is combined with the tax-free status of pension funds, the bias which tax laws levy against dividends—and in favor of capital gains via retention—may be far less than Feld seems to believe exists. This hypothesis may not seem verifiable; but an examination of consumption behavior of individuals facing diverse tax rates and having different investment possibilities might shed some light on this issue.

Friedman, in "Capitalism and Freedom", has argued that double taxation induces mal-investment of resources by encouraging firms to retain funds and expand internally at a greater rate than would occur under a system in which all earnings were attributed immediately and taxed as income of the shareholders. Potentially more industry market concentration occurs under double taxation than otherwise would result in a tax-free environment—one in which all corporate earnings are attributed to shareholders' earnings, and taxed accordingly. This proposal, dubbed "full integration", is considered by many, according to the AII (pps. 1-35), as the theoretically optimal system.

b. Sherman

Sherman, in "How Tax Policy Induces Conglomerate Mergers", has argued that a merged firm has an investment possibilities advantage over a one-product firm of equal size. A conglomerate's retained funds need not be unprofitably invested in the same narrow markets, but can be diverted to
different and new projects in different market sectors; the funds reallocation within the firm being accomplished at little additional cost. However, if a one-product-line firm's stockholders wish to reallocate their funds, the capital must first be removed from corporate solution by a dividend declaration or a sale of shares, both of which are taxable events. In this case, a shareholder's wealth would be better preserved by having the one-product firm invest, through purchase, in other firms.

Sherman forgets, however, that income received by corporations from ownership of other corporation's stock is largely tax free. Surely it would be simpler for any firm finding itself with funds, but no suitable internal investment opportunities, to buy a high-yield portfolio of stocks: the returns from on would be largely tax free to the firm and ultimately to its shareholders; the gains on which could be recognized eventually as capital gains. In fact, 85 percent of intercorporate dividends received are tax-exempt; for 80 percent subsidiaries, 100 percent of such dividends are exempt. Of course, purchasing another firm's shares could be viewed as yet another way for the purchasing corporation to get its funds out of corporate solution without paying additional dividends, thereby transferring these potential dividends to the other firm's shareholders as capital gains. The viability of this option is indicated by the ALI's examination (pp. 174-181) of just how the tactic might be proscribed by law:

In short, existing law creates an unjustified bias in favor of corporate investments in shares of other corporations, that could be corrected either by denying the dividend received deduction or by imposing the compensating excise. (One) proposal...would combine these approaches, denying the dividend-received deduction for portfolio investments and subjecting any acquisition of a direct investment to the provisions in (other) proposals...for nondividend distributions. The proposed line between direct and portfolio investments is partly elective, making the excise a price to be paid for subsequent enjoyment of the dividend-received deduction. (ALI, page 175.)

c. American Law Institute Federal Income Tax Project

A fact whose implications do not appear to have been fully considered by other commentators is that there are many ways to take funds from corporate solution and transfer them to stockholders. A quick perusal of the ALI proposal (pps. 83-90) reveals several techniques, as listed below, by which funds may be removed from corporate solution to shareholders at the generally more favorable capital gains rates:

1. A substantially disproportionate redemption of shares by the corporation.

2. Distribution in complete or partial liquidation of a corporation.
3. If the distribution of shares of a subsidiary is judged to be a "mere division of capital", the division itself is not taxable, and subsequent sales are taxable only as capital gains.

4. Repurchase of shares on the market by a firm or directly through a tender offer. This would have substantially the same effect as purchasing another firm's shares, in terms of removing funds from corporate solution, as noted above.

In addition, a stock dividend that affects no change in the proportionate interest of shareholders is not taxed at all until the gain is actually recognized.

The point of this litany is simply that, under certain broad conditions, "double taxation" of dividends presents no compelling incentive to firms for retention. Indeed, in many cases, it might be said that some firms are paying what are, essentially, dividends but taxable at capital gains rates. In fact, much of the ALI proposal is based on this observation (see pps. 96-130 where changes in the tax code which might eliminate the above "tax avoidance" methods are discussed in some detail).

In closing this section, it is worth noting that the ALI tax proposal avoids the errors we have picked out in Feld and Sherman, if only to substitute a few of its own. The ALI's proposal appears to be an examination as to how revenue, presently lost to the IRS, might be reclaimed. It concentrates, therefore, on what happens to a given company or a given set of shareholders, while not fully accounting for the macroeconomic impact of some of its proposals.

Several ALI proposals suggest excises on various non-dividend distributions, arguing that, without such compensatory levies, funds will escape corporate solution at unmeritously low rates of tax (pp. 155-158). While it is true that non-dividend distributions escape corporate solution, they may simply move from one corporation to another via reinvestment. Earnings reinvested in the corporation from which they were generated are not, under the ALI proposal, subject to a special levy; why the transfer of funds from one corporate solution to another should be subject to a special excise is therefore not altogether clear.

Furthermore, the ALI work explicitly assumes that "corporate acquisitions are almost always motivated by substantially non-tax factors" and that its excise proposals will therefore leave the number of economically efficient mergers unaffected. An example is given on p. 156 of such a case. While it is true that for some firms, the merger will occur even with the excise on the acquisition funds, this cannot be true for all firms. For the marginal firm, the least-favorable acquisition which the market completed, it is by definition assumed that the benefit just equaled the cost. The imposition of an excise on such a firm would be expected to have a detrimental effect on the consumption of the acquisition. If so, then economically-efficient acquisitions might well will be blocked by the ALI excise proposals.
3. Macroeconomics and the Retention Decision

One issue which seems to be ignored by Sherman (1977), Feld (1979), and the ALI (1979) is the impact of changes in the economy, as a whole, on the retention decision. It is, surely, hard to imagine an actual market in which such changes—study of which is the subject of macroeconomic theory—have no impact on behavior of the firm.

For the retention decision, the macroeconomic factors are relevant in that they may, for example, affect the real supply and demand for loanable funds. Loanable funds are the resources available to the firm from which the firm finances its projects. Through a combination of selling debt, raising equity and retaining earnings, a firm will try to obtain those resources necessary for the execution of its plans.

Of all macroeconomic problems, inflation is the one with which, in the past decade, we have all become painfully familiar. One might expect this problem to induce alterations in firm activity. An obvious example of this is inflation's impact on the level of depreciation charged off against earnings. Amortizable goods are usually carried on the balance sheet at historical cost, depreciation rates being charged against these historical values. However, with chronic inflation, the replacement cost of those assets will generally be higher than net historical value—considerably so if inflation has occurred for some time at a high rate, as has been recently occurring in the United States. Consequently, insufficient depreciation may be charged against earnings. Firms will seem to retain more earnings than they "actually" do since much of what is recorded as earnings really reflects under-depreciation of capital. Therefore, retention rates will be over-stated to the extent they represent un-recaptured consumption of (or disinvestment of) capital stock.

Inflation has had a considerable impact on consumer behavior also. The drop in the savings rate over the last decade is a well-publicized fact. What such behavior generates is a real decrease in the supply of loanable funds. The real cost of new debt and new equity financing to the firm has, thereby, been increased. The cost of retained earnings, however, may have declined.

When most firms first obtained their equity, equity cost was probably lower than currently since the real supply of loanable funds has basically decreased since then. Accordingly, the replacement cost of retained earnings has quite likely increased—but firms have not necessarily recognized it. The notion that the cost of equity and the cost of retained earnings from old equity are not necessarily equal may appear confusing, in that the cost of retained earnings is generally understood to be the replacement cost of equity (i.e., the rate of return investors require for incremental purchases of new equity). This, however, assumes that firms account for cost at replacement values. A little reflection indicates this is not so.

With capital goods, for example, firms depreciate against historical cost even though the market price for a comparable asset is, due to inflation, considerably higher. Similarly, firms can cost their debt much
lower than replacement value. A firm which once offered 5 percent on its debt may, due to inflation premiums, have to offer 10 percent to obtain new debt. In calculating its "true" cost of debt firms will typically recognize only what rate it had to pay to attract that debt, not what its current replacement cost is. So with the cost of retained earnings: the firm will likely judge that cost on its historical value, not on the basis of the replacement value of equity.

Inflation, therefore, may have changed the relative cost of internal versus external financing, to the disadvantage of the latter. This would be a strong incentive for firms to retain earnings.

It might seem impossible for a stockholder's capital to be held captive by a firm which is, in its investment and financing decisions, assessing it below its "true" value. After all, should it not be possible for the stockholder to liquidate his investment and buy another firm's equity for which he will be paid a fair return on his capital? If, however, due to unanticipated inflation, all firms find they have obtained equity at prices which, ex post, are below replacement cost, no firm may want to issue new equity if it has enough earnings to retain.

It is important to note, furthermore, that if there is any increase in replacement cost of real assets or equity for which balance sheet figures are not adjusted, the nominal retention rate will, all else being equal, likely overstate the true level of retained earnings financing. Examination of information available in the "Quarterly Financial Report" published by the FTC, reveals that the ratio of net income retained in business to net profit after Federal taxes has climbed steadily. For all manufacturing, as can be seen in Exhibit 1, this ratio, interrupted by intermittent recessions has gone from an annual average in 1955 of 40 percent to its present (1980) level of 70 percent, nearly 75 percent increase in little over twenty years.

If we look at the other Exhibits (2-6), we note this trend holds, to greater and lesser extents, for various other industries as well. This becomes important when we consider how capital gains tax rates have varied over that period. Increases (decreases) in the capital gains tax tend to heighten (lower) the required after-tax rate of return on equity to shareholders, the cost of new equity capital to the firm, and the retention rate. Retention rates, however, are seen to have moved upward regardless of the changes in capital gains tax rates; remaining high and, in some cases, even increasing in 1979 and 1980, despite a major (20 percent-plus) capital gains tax rate reduction in late-1978. This raises the suspicion that tax laws may not impact as strongly on the retention decision many commentators seem to feel. The "problem" of double taxation, after all, is whether it tends to encourage more retention than normally would occur. Therefore the important issue from a tax perspective is whether retention rates seem to be on a secular rise in many industries but whether, in any given period, retention is higher than it otherwise might be because of the supposed tax incentives to "over-retain".
EXHIBIT 1
RETENTION RATE, ALL MANUFACTURING
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
EXHIBIT 2
RETENTION RATE, ELECTRICAL MACHINERY
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
EXHIBIT 3
RETENTION RATE, PETROLEUM & COAL
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
EXHIBIT 4

RETENTION RATE, CHEMICALS
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
EXHIBIT 5
RETENTION RATE, NONELECTRICAL MACHINERY
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
EXHIBIT 6
RETENTION RATE, PRIMARY METALS
PERCENT

SOURCE: FTC QUARTERLY FINANCIAL REPORTS; MERRILL LYNCH ECONOMICS INC.
III. ECONOMIC EVALUATION FRAMEWORK

A. Introduction

Without drawing definitive tax policy conclusions from the preceding review of relevant literature, we may fairly observe that the impact of tax laws on mergers and acquisitions is ambiguous. It is useful, then, to construct an economic evaluation framework within which we may develop testable hypotheses. Since performing the quantitative tests is beyond the scope of this report we limit our analysis to the construction of a reasonable behavioral model which is capable of subsequent testing.

Steiner provides us with a basic outline of this evaluation framework. So, we first review and summarize his mathematical model and then develop a major modification and generalization which, at once, render his model more realistic and leave his conclusions testable. Finally, we demonstrate that the current tax policy could be neutral with respect to mergers, closing with a discussion of issues that could lead to a disequilibrium phenomena in acquisition activity.

B. Summary of Steiner's Model

Steiner posits pre-merger, pre-tax anticipated annual income streams of the buyer and seller companies as $I_B$ and $I_S$, respectively. He then assumes no production efficiencies, economies of scale, synergies or other real advantages to the combined firm so that the pre-tax income of the merged company is simply $(I_B + I_S)$. If the buyer firm, capitalized at $n_B$ shares, pays $n_S$ shares of the new company to acquire the $n_S$ shares of the selling company, then both classes of shareholders should be indifferent to the acquisition if their share of merged income is the same as their anticipations of pre-merged income. Thus:
Setting the stage for introduction of tax regimes, he defines the sellers' gain \( G \) as the difference between the selling price \( (k_n S) \) and the sellers' cost which Steiner assumes is the book value of the firm \( (B) \) (i.e., \( G = k_n S - B \)). He then lets \( T \) be the corporate tax rate, \( T_1 \) be the personal tax rate paid on ordinary income and \( T_2 \) the effective capital gains tax rate (where \( T > T_1 > T_2 > 0 \) and \( 0 < T < 1 \)). He then shows that sufficient conditions for taxable reorganizations to be preferred to nontaxable ones are: 1) the buyer benefits whenever he obtains a higher basis for depreciation, which higher basis usually applies in an inflationary environment; and 2) the seller prefers taxable transfers if the seller's after-tax gain from the added depreciation (subsumed in the selling price) exceeds his capital gains tax. After a good deal of algebraic simplification, these conditions are summarized as:

\[(3) \quad gG > 0\]

\[(4) \quad (1-T_4)(1-T)(k_n S/(n_B+k_n S))gG > bT_2 G\]

where \( gG \) represents, as a flow over time, the advantage of depreciating the acquired firm's assets at the higher purchase price, \( T_4 \) is an average present-value of stockholders' tax liability on their company's after-tax earnings and \( bT_2 \) represents, as a flow over time, the seller's effective tax liability on his capital gain obtained in being acquired.

The first condition stated in equation (3) above is self-evident and, as explained in the preceding section of this report, satisfied in periods of rapid inflation and/or when accelerated depreciation was overwhelmingly
popular. The second condition portrayed in equation (4) is considerably more complicated. It indicates that the taxable form of exchange is preferred if the seller's share of the after-tax advantage of depreciating the acquired firm's assets at the higher purchase price exceeds its costs, represented by the capital gains tax liability of the seller.

C. Generalization of Steiner's Model

In this section, we derive a more generalized set of criteria governing the economic behavior of seller and buyer in the face of taxable versus tax-free forms of acquisition transactions. This generalization is necessary to specify realistic and meaningfully testable hypotheses in an environment of changing rates of return, dividend payout ratios, expected earnings growth rates, and the acquisition premium \((k > 1)\) or discount \((k < 1)\).

In addition to the terms described above we introduce the following:

- \(t_B^0\) = buying firm's initial-year pretax profits without acquisition.
- \(t_S^0\) = similar for selling firm.
- \(t_B\) = buying firm's expected long-term annual growth rate of pretax profit, \textit{ex ante} the acquisition.
- \(t_S\) = similar for selling firm.
- \(t'\) = similar for merged firm, \textit{ex post}.
- \(d_B\) = buying firm's dividend payout ratio, as a fraction of after-tax profit, \textit{ex ante}.
- \(d_S\) = similar for selling firm.
- \(d'\) = similar for merged firm, \textit{ex post}.
- \(r_B\) = discount rate applied to after-tax flows accruing to buying firm's shareholders, \textit{ex ante}. (Firm B's cost of equity capital.)
Consider the after-tax flows accruing to shareholders of the prospective buying firm, ex ante. These consist of an average annual dividend stream and an average annual capital gains stream:

\[
\text{dividend stream: } (1-T)\frac{\hat{p}_B^o}{B}(1+t_B)^i\hat{d}_B(1-T_1),
\]
\[
\text{capital gains stream: } (1-T)\frac{\hat{p}_B^o}{B}(1+t_B)^i(1-d_B)(1-T_2),
\]
where \( i \) = number of years from present.

For purposes of simplification, incremental capital gains (losses) are treated as if they are realized annually and are fully reflected in selling prices. Similar results, though of more opaque exposition, would apply if capital gains were assumed realized other than annually (or other than fully).
Since the *ex ante* market value capitalization of the buying firm \( m_B \) equals, by definition, the present value of all future after-after-tax streams (both dividends and capital gains) discounted by the buying shareholders' required rate of return \( r_B \), the following applies:

\[
\begin{align*}
    m_B &= \sum_{i=0}^{\infty} \frac{((\text{dividend stream in } i\text{-th year})/(1+r_B)^i) + ((\text{capital gains stream in } i\text{-th year})/(1+r_B)^i)}{1}
\end{align*}
\]

This reduces to:

\[
(5) \quad m_B = (1-T)I_B^0((1-d_B)(1-T_1) + (1-d_B)(1-T_2)(1+r_B)/(r_B-t_B),
\]

where \( r_B > t_B \).

The *ex ante* market value capitalization of the selling firm \( m_S \) is, similarly, given by equation (5').

\[
(5') \quad m_S = (1-T)I_S^0((1-d_S)(1-T_1) + (1-d_S)(1-T_2)(1+r_S)/(r_S-t_S),
\]

where \( r_S > t_S \).

2. **Analysis of Buying and Selling Shareholders' Flows: ex post**

**Tax-Free Acquisition**

Now consider the situation that applies if the buying company purchases the selling company in a tax-free transaction wherein the selling firm is purchased for \( kn_S \) as before. In this case, the purchasing shareholders receive a proportional share of the merged firm's flows, the proportion being: \( n_B/(n_B+kn_S) \). The *ex post* pre-tax profit flow in future year \( i \) would be: \( (1+r_B^0)(1+t')^i \). That is, we are allowing for the fact that the combined pre-tax profit growth could differ from \( t_B \).
or \( t_s \), reflecting either synergy of combined asset management, neutrality of combined asset management, or degradation of combined asset management (accordingly as: \( t' > \max(t_B, t_s) \), \( \min(t_B, t_s) < t' < \max(t_B, t_s) \), or \( t' < \min(t_B, t_s) \)). Allowing for the possibility that the dividend payout and the discount rate of the combined firm may differ from the original two firms (that is \( d'(d_B, d_S) \) and \( r'(r_B, r_S) \)) we obtain equation (6) relating the buying shareholder's share of the combined capitalization of the merged firm under a tax-free acquisition:

\[
(6) m_B = (1-T)(1-t_B)(n_B/(n_B+kn_S)).
\]

\[
((d'(1-T_1)+(1-d')(1-T_2))(1+r')/(r'-t'), \text{ where } r' > t'.
\]

The selling shareholders' share of the combined capitalization, \( m_S \), is given by (6').

\[
(6') m_S = (1-T)(1-t_S)(kn_S/(n_B+kn_S)).
\]

\[
((d'(1-T_1)+(1-d')(1-T_2))(1+r')/(r'-t').
\]

3. Analysis of Buying and Selling Shareholders' Flows: ex post

Taxable Acquisition

Now consider a taxable transaction from the viewpoint of the buying firm's shareholders. In this case, the depreciation base for the purchased firm's assets would be revalued from book value \( B \), to the purchase price, \( kn_S \) (assuming, as before, \( kn_S > B \), which is usually the case when rapid inflation results in historical underdepreciation). This revalued

* Here \( \min(\ldots) \) and \( \max(\ldots) \) denote, respectively, the lessor or greater of the two arguments shown in parentheses.
depreciation base provides an equivalent amount of dollar writeoffs against pre-tax profit. Assume this writeoff is taken evenly over the average remaining accounting life of acquired assets and that this average life is L years. Therefore, the average annual tax benefit flow accruing to the buying firm is \( T(k_{S} - B)/L \) per year for L years, provided the writeoff does not exceed pretax earnings: that is, \( (k_{S} - B)/L \leq (I_{S}^{D} + I_{B}^{0}) \). Assuming this flow is split between dividends and retained earnings with the dividend payout as in (6), the incremental discounted present value of this flow to the purchasing firm's shareholders, \( F_{B}^{''} \), is:

\[
F_{B}^{''} = T(k_{S} - B)(n_{B}/(n_{B} + k_{S}))(d'(1-T_{1}) + (1-d')(1-T_{2}))
\]

The summation sign term in equation (7) reduces the annuity factor \( A_{L} = ((1+r')^{L} - 1)/(r'(1+r')^{L}) \).

The amount represented by equation (7) is incremental to the amount of equation (6). Therefore, the buying shareholders' share of the combined capitalization of the merged firm in a taxable transaction, \( m_{B}^{''} \), is:

\[
m_{B}^{''} = m_{B}^{'} + F_{B}^{''}
\]

The selling shareholders simply receive in cash their capital, valued at the purchased price, \( k_{S} \), less capital gains taxes or:

\[
m_{S}^{''} = k_{S} - (k_{S} - p_{n_{S}})T_{2}
\]

* It is assumed that the capital to buy out the shareholders in cash is raised through a new equity issue of \( k_{n_{S}} \) dollars, thus diluting the earnings and equity as in a tax-free transaction.
D. Derivation of Supply and Demand Curves For Acquisitions

1. Analysis of Buyers' Acquisition Gain

We are now in a position to define the buyers' acquisition gain for a tax-free \( Z_B' \) or taxable \( Z_B'' \) merger as the respective corresponding ratios of the respective numbered equations: \( (6)/(5) \) and \( (8)/(5) \). To simplify the analysis at this stage, we will assume the following approximately hold: \( r' = r_B' \), \( d' = d_B' \), and \( t' = t_B' \):

\[
Z_B' = \frac{(1+\alpha) n_B}{(1+\beta) \left(n_B + k_B n_S \right)}
\]

\[
Z_B'' = \frac{k_B n_S - B}{A_L (1+\alpha') n_B + (1-\alpha') (n_B + k_B n_S) (1-T)}
\]

From the above we can make the following inferences. Equation (9) implies that, for a tax-free acquisition to be attractive to the buying company shareholders, the following must hold: \( Z_B' > 1 \). Otherwise, these shareholders would prefer their status quo, ex ante the acquisition, since \( Z_B' < 1 \) implies \( r_B' < r_E' \). They would be indifferent between the tax-free acquisition and no acquisition if \( Z_B' = 1 \); at which point equation (9) reduces to the simple Steiner condition expressed in equation (2).

Equation (10) implies that, for a taxable acquisition to be preferred (by shareholders of the buying company) to a tax-free acquisition (\( Z_B'' > Z_B' \)). Such a condition applies when \( A_L (k_B n_S - B) / L > 0 \), which is another way of expressing condition (3) if one takes \( G = k_B n_S - B \) and \( g = A_L / L \). This condition, in turn, implies \( k_B n_S > B \).

2. Demand Curves for Acquisitions

Equations (9) and (10), together with these side conditions, provide the basis for defining downward-sloping demand curves for acquisitions, having \( Z_B \) as the ordinate and \( k \) as the abscissa, of the following form:
To gain a familiarity with these acquisition demand curves, the reader is referred to Exhibit 7. Plotted there is the "general case" of inter-relationships between $Z_B$ and $Z_E$. Turning first to the tax-free state, $Z_B$ consists of a downward-sloping demand curve whose slope (as a function of $k$) is everywhere negative, approaching zero as $k$ increases, as the following partial derivative of equation (9) discloses:

\[ \text{slope of } Z_B = \frac{\partial Z_B}{\partial k} = \frac{(1^S + I^S)T_{0n}n_B (1 - T)}{L(l + r')} (\frac{Z_B}{k})^2. \]

The curve intercepts the vertical axis (where $k=0$) at $(1^S + I^S)/I^S$. It crosses the key cut-off line (where $Z_B=1$) as the acquisition price, $k$, approaches $1^S_{0n}/(1^S_{0n})$; at which price the purchasing firm's shareholders are indifferent between the acquisition and no acquisition (and at which point $k$ equals the ratio of the pre-tax price/earnings ratios of firm E to firm S.)

The demand curve for taxable acquisitions, $Z_B''$, intercepts the vertical axis ($k=0$) below the $Z_B'$ intercept by the magnitude of the expression indicated in Exhibit 7. Its slope is everywhere negative but less steeply inclined than the slope of $Z_B'$, as shown in the partial derivative analysis of equation (13)

\[ \text{slope of } Z_B'' = \frac{\partial Z_B''}{\partial k} = \frac{n_S n_B T (\frac{r - t}{r}) A_s (n_B - B)}{L(1 + r')(n_B + k n_S)^2 (1 - T)} \]

$\geq \frac{\partial Z_B'}{\partial k}$ = slope of $Z_B'$. 

\[ \text{(11) } Z_B'^{\text{max}} := (Z_B', Z_B''', 1) \]
ACQUISITION DEMAND CURVES, $Z_B$

GENERAL CASE

$z_n = \max \{ z_h, z_h', 1 \}$

Legend:
- $z_h$:                (tax-free)
- $z_h'$:               (taxable)

\[
\left\{ \begin{array}{l}
\left( \frac{T_S + T_R}{T_R} \right) \\
-\frac{BT(r'-r)A_L}{L(1+r')(1-T)T_R}
\end{array} \right\}
\]

\[
\left\{ \begin{array}{l}
z_h' = 1 \\
k = 0
\end{array} \right\}
\]

\[
\left\{ \begin{array}{l}
0 < k = \frac{n}{n_S} \frac{T_S n}{T_S n} \\
k = \frac{T_S n}{T_S n}
\end{array} \right\}
\]

\[
\left\{ \begin{array}{l}
\frac{T_S n}{T_B n} < k = \frac{n_B}{n_S} \left[ \frac{T_S n}{T_S n}(1+r')(1-T) - BT(r'-r)A_L \right]
\end{array} \right\}
\]

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Therefore, the graph of $Z_B''$ starts below $Z_B'$ but eventually crosses above it when $k$ exceeds the ratio of the target firm's book value to its market value ($k=E/n_S$). As drawn in Exhibit 7, we have assumed that $B/n_S < I_{S}^{0}n_B/(I_{B}^{0}n_S)$, which states that the ratio of the selling firm's book value to market value is less than the aforementioned relative price/earnings ratios of firm B to firm S. Under this condition, the overall demand curve kinks from the steeper $Z_B'$ curve to the shallower $Z_B''$ curve at $k=B/n_S$ before reaching the $Z_B=1$ line. Also under this condition, the $Z_B''$ curve crosses the key $Z_B=1$ line beyond the point at which the $Z_B''$ curve does (that is beyond $k=I_{S}^{0}n_B/(I_{B}^{0}n_S)$), in fact crossing at the point:

$$k = \frac{n_B\left(I_{S}^{0}n_B(1+r')(1-T)-BT(r'-t')A_L\right)}{n_S\left(I_{B}^{0}n_B(1+r')(1-T)-Tn_B(r'-t')A_L\right)} > I_{S}^{0}n_B/(I_{B}^{0}n_S),$$  

as shown in Exhibit 7.

Under this set of conditions, the demand curve $Z_B$ consists of $Z_B'$ until $k=E/n_S$. It then switches to $Z_B''$ until it crosses the $Z_B=1$ line at the point where $k$ equals the magnitude of equation (14). Thereafter, the demand curve coincides with the $Z_B=1$ line.

This case (where $B/n_S < I_{S}^{0}n_B/(I_{B}^{0}n_S)$) is the most "general" since it allows the demand curve to be generated by each tax treatment. It is first governed by the tax-free status (for $0 \leq k \leq B/n_S$), then the taxable status (for $B/n_S < k \leq$ equation (13)), and finally, the
"no-acquisition" status where \( Z_B = 1 \) (for \( k > \text{equation (14)} \)). The complementary case (where \( B/n_S > I_{S_B}^D/(I_{B_S}^D) \)) is less general since the demand curve will only include the tax-free status \( (Z_B) \) and the "no-acquisition" status \( (Z_B=0) \) since \( Z_B \) will cross above \( Z_B \) only where \( Z_B < 1 \).

In summary, the acquisition demand curve falls into two cases: the "general case" where \( B/n_S < I_{S_B}^D/(I_{B_S}^D) \) and the "special case" where \( B/n_S > I_{S_B}^D/(I_{B_S}^D) \). Accordingly, the demand curve of equation (11) becomes:

**General Case:** \( B/n_S \leq I_{S_B}^D/(I_{B_S}^D) \)

\[
Z_B = \begin{cases} 
Z_B^*; & 0 \leq k \leq B/n_S \\
1; & k \geq \text{equation (14)} 
\end{cases}
\]

**Special Case:** \( B/n_S > I_{S_B}^D/(I_{B_S}^D) \)

\[
Z_B = \begin{cases} 
Z_B^*; & 0 \leq k \leq I_{S_B}^D/(I_{B_S}^D) \\
1; & k > I_{S_B}^D/(I_{B_S}^D) 
\end{cases}
\]

3. **Analysis of Sellers' Acquisition Gain**

From the selling shareholders' viewpoint we may similarly define the sellers' acquisition gain for a tax-free transaction \( (Z_S^0) \) as the respective corresponding ratio: (equation (6'))/(equation (5'))), again assuming \( r' = r_S, d' = d_S \) and \( t' = t_S \):

\[
(9') Z_S = (I_{B_S}^D I_{S_B}^D k_{n_S})/(I_{S_B}^D(n_S + k_{n_S}))
\]

The sellers' acquisition gain for a taxable transaction \( (Z_S^T) \) is simply the ratio: (equation (8'))/\( n_S \), or:
Equation (9') for selling shareholders can be analogously interpreted as equation (9) was for buying shareholders. For example, equation (9') states that, for a tax-free acquisition to be attractive to the selling company shareholders, the following must hold: \( Z_S' > 1 \). Otherwise, these shareholders would prefer their status quo, ex ante the acquisition, since \( Z_S' < 1 \) implies \( n_S > e_S \). They would be indifferent between the tax-free acquisition and no acquisition if \( Z_S' = 1 \); at which point equation (9') reduces to the simple Steiner condition expressed in equation (1).

Equations (9') and (10') imply that, for a taxable acquisition to be preferred (by shareholders of the selling company) to a tax-free transaction \((Z_S' > Z_S'^{\prime})\), then

\[
k-(k-p)T_2 > (I_0^O + I_0^C)k e_S/(I_S^O(n_S + \kappa n_S)) > 1
\]

4. Supply Curves for Acquisitions

Equations (9') and (10'), together with these various side conditions, provide the basis for defining upward-sloping supply curves for acquisitions, having \( Z_S \) as the ordinate and \( k \) as the abscissa, of the following form:

\[
(11') \quad Z_S = \max\{Z_S, Z_S^{'}, 1\}
\]

Exhibit 8 displays the "general case" of inter-relationships between the supply curves \( Z_S' \) and \( Z_S'' \), analogous to the "general case" discussed above for the demand curves of Exhibit 7. The acquisition supply
EXHIBIT 8

ACQUISITION SUPPLY CURVES, ZS

GENERAL CASE

\[ Z_S = \max \left\{ Z'_S, Z''_S, 1 \right\} \]

Legend:
- \( Z'_S \): (tax-free)
- \( Z''_S \): (taxable)

\[ \begin{cases} 
Z_S = 1 \\
pT_2 \\
k = 0 \\
0 < k = \frac{I^B_1}{I^{BH}_S} \\
\frac{I^B_1}{I^{BH}_S} < k = \frac{1-p_{T_2}}{1-T_2} \\
k > \frac{1-p_{T_2}}{1-T_2} 
\end{cases} \]
curve for the tax-free state, $Z^*_S$, intercepts the vertical (k=0) axis at $Z^*_S=0$. It is positively sloped, has a negative second derivative, and gradually approaches a zero-slope condition, as the following first and second derivatives of equation (9') disclose:

\[(12') \text{slope of } Z^*_S = \frac{\partial Z^*_S}{\partial k} = n_B n^*_S (1^o_B + 1^o_S) / 1^o_S (n_B + kn^*_S) \geq 0\]

\[(12'') \text{curvature of } Z^*_S = \frac{\partial^2 Z}{\partial k^2} = -2n_B n^*_S (1^o_B + 1^o_S) / (1^o_S (n_B + kn^*_S)^3) < 0\]

The curve crosses above the critical cutoff line, where $Z^*_S=1$, as the acquisition price, k, approaches the relative pre-tax price-earnings ratio: $1^o_S n^*_B / (1^o_B n^*_S)$. Recall that this is the same critical value of k at which the tax-free acquisition demand curve crosses below the $Z^*_B=1$ line.

(See Exhibit 7).

The taxable acquisition supply "curve", $Z''_S$, is simply the linear equation (10'), having positive slope $(1-T_2)$ and positive intercept $pT_2$.

For the "general" case sketched in Exhibit 8, the line starts at a vertical intercept above that of $Z'_B$, with positive slope less steep than the initial slope of $Z''_S$, as shown in equation (13'):

\[(13') \text{slope of } Z''_S = \frac{\partial Z''_S}{\partial k} = (1-T_2)\]

\[\frac{Z''_S / k}{k=0} = \text{initial slope of } Z'_S = n_B n^*_S (1^o_B + 1^o_S) / (1^o_S n^*_B)\]

Because of the curvature of $Z'_S$, therefore, $Z''_S$ crosses it twice. As sketched in the "general" case of Exhibit 8, the crossings are, first, where $Z'_S < 1$ and, second, where $Z'_S > 1$. Finally, in the general case $Z''_S$ crosses the $Z^*_S=1$ line at $k=(1-pT_S) / (1-T_2)$ which is beyond the point at which $Z'_S$ crosses the $Z^*_S=1$ line $(k=1^o_S n^*_B / (1^o_B n^*_S))$. This assures that the $Z''$ curve crosses above $Z'_S$ at a point which is also above the $Z^*_S=1$ line.
This state of affairs is the "general case" since the combination of the initial-slope inequality of (13') and the $Z_s=1$ crossing order of the curves, where

\[
(14') \quad \frac{I_s B^0}{I_s B^0} < \frac{1-p_s}{1-T_2},
\]
geaures that the supply curve is generated by each tax treatment. It is first governed by "no acquisition" status where $Z_s=1$ (for $0 < k < \frac{I_s B^0}{I_s B^0}$). Then the tax free status curve ($Z_s$) dominates. And, finally, the taxable curve ($Z_s$) dominates. In the alternative case where condition (13') does not hold, then the taxable curve ($Z_s$) would everywhere dominate the tax-free curve and the theory would predict that no tax-free acquisitions should take place. In the case where (13') holds but the order of crossings of the $Z_s=1$ axis is reversed (that is, where condition (14') is violated), then the taxable supply curve ($Z_s$) still dominates the tax-free supply curve ($Z_s$) and the theory would again predict no tax-free acquisition.

In summary, then, the acquisition supply curve falls into two cases: the "general case" where condition (13') and (14') hold and a special case where (13') and/or (14') are violated. Accordingly, the supply curve of equation (11') becomes:

**General Case:** Conditions (13') and (14') hold

\[
(15') \quad Z_s = \begin{cases} 
1; & 0 \leq k \leq \frac{I_s B^0}{I_s B^0} \\
Z_s; & I_s B^0 (1-I_s B^0) < k < \frac{1-p_s}{1-T_2} \\
Z_s; & \text{otherwise}
\end{cases}
\]
Special Case: Either condition (13')
or (14') is violated or both

\[
(16') \quad Z_S = \begin{cases} 
1; & 0 \leq k \leq \frac{(1-pT_2)}{(1-T_2)} \\
Z''_S; & k > \frac{(1-pT_2)}{(1-T_2)} 
\end{cases}
\]

E. Market Equilibrium/Disequilibrium

1. Supply-Demand Curve Intersection

The supply and demand curves, presented above for the "general" case, theoretically span the situations posed by tax treatment of acquisitions. The next chapter poses some testable hypotheses arising from this analysis. But first we here elaborate on certain salient aspects of equilibrium: the "intersection" of these two sets of curves.

The "intersection" of the general demand and supply curves, shown in the respective Exhibits 7 and 8 and equations (15) and (15'), is in quotes for a good reason. These curves really define the domain of k over which tax-free, taxable or no-acquisition cases dominate. Unless these domains of k are shared by both the supply and demand curve, then no acquisition of one or more tax-treatment type should, theoretically, occur.

For example, the taxable domain of the demand curve overlaps the taxable domain of the supply curve only over the restricted intersection where both (17) and (18) hold:

(17) \( \frac{B}{n_0} \leq k \leq \text{equation (14)} \)

(18) \( k > \frac{(1-pT_2)}{(1-T_2)} \)

Similar combinations of demand and supply curve domains are apparent from various combinations of the general cases (equations (15) and (15')) and the
special cases (equations (16) and (16')) to yield a whole series of allowed and dis-allowed tax treatment regimes.

Generally, for any potential "marriage" to occur, the theory spells out whether or not the financial characteristics allow a taxable acquisition or a tax free acquisition or no acquisition at all. Of course, in the real world a whole host of other considerations may over-ride these theoretical considerations, some of which are discussed in the next subsection. In addition, the theory would allow for a more complicated set of situations arising from the relaxation of the simplifying assumptions, invoked in the above analysis and re-stated in equations (19), (20) and (21):

(19) $r' = r_B = r_S$, discount rate equality
(20) $d' = d_B = d_S$, dividend payout equality
(21) $t' = t_B = t_S$, long-run profit growth equality

For example, the combined firms might be expected to have a lower cost of equity capital or a higher rate of long-term growth than either of the separate firms, in which case $r' < \max(r_S, r_B)$ or $t' > \max(t_S, t_B)$. This might occur if the equity market expects that the earnings of the combined firm may be less volatile than either constituent firm because of diversification (negative correlation) or synergistic effects. Then, the above regime-defining conditions become modified or the respective curves shift. Among the shifts engendered might be to allow an acquisition in the "dis-allowed" range where $Z_S < 1$ or $Z_B < 1$ or both. These and other cases are discussed more fully in the next chapter.

The above-defined curves should logically cross at a point where the tax regimes are the same and where $Z_B = Z_S$. This crossing point would simultaneously and uniquely determine $k$ and $Z$. However, for any given pair of
firms, the bargaining process might not continue to the point where \( k \) clears demand and supply in a way that assures that selling and buying shareholders have an equivalent acquisition gain (so that \( Z_B = Z_S \)). This apparent inequality may also arise because conditions (19), (20) and (21) do not approximately apply or because of other factors discussed below.

2. Tax Neutrality

Finally, Exhibits 7 and 8 identify points of tax neutrality. These can be defined as the points at which the respective curves cross: that is, where \( Z_B'' = Z_B' \) and \( Z_S'' = Z_S' \). At these respective points, the demanding firm (supply firm) is indifferent to acquiring (being acquired) under a tax-free or taxable transaction. Generally, these neutrality points will not occur at the same value of \( k \) for both firms. Hence, the concept of tax neutrality, at least in the sense of indifference to the transaction's tax treatment, will be the exception rather than the rule. A more general concept of tax neutrality, discussed in the next chapter could also be tested. For example, one could also investigate whether the whole cohort of tax rates \( T, T_1, T_2 \), possibly differing for the three firms (acquiring, acquired and merged), might cause the demand or supply curves to shift, thus moving the crossing point of these curves out of the "dis-allowed" range (where \( Z < 1 \)). In this case, the occurrence (or non-occurrence) of the acquisition could be related to the relative tax rates, thus possibly identifying the merger as being feasible (infeasible) from the sheer effects of tax treatment.

3. Market Disequilibrium and Optimal Acquisition Behavior

Before leaving this evaluation framework, it may prove helpful to include a few comments on merger activity's potential contribution to capital market equilibrium.
Equilibrium—in which prices correspond to costs and no economic sector's output can be increased without decreasing another's—is, in a world subject to time and change, not always achieved. To first attain equilibrium, we often must first discover what information is needed. Opinions of market participants about the future—which future, though not unimaginable, must always remain unknown—are quite likely to diverge. Expectations, and therefore information, are likely to be nonhomogenous among the market's participants. A competitive market economy can therefore not be understood simply as efficiently allocating resources. Competition is a process. Activity which may seem inconsistent with an economically-optimal equilibrium may nonetheless be essential to its attainment. In a free market, we may not know where we are going until we get there.

That corporations may not be accurately costing the resources they employ is a possibility which has been examined in some detail in this paper. When we also remember that, in a world where production and investment decisions must be based on expectations—which expectations are often revealed ex post as incorrect—one would hope that there exist market mechanisms of equilibration which allow capital to be reshuffled, reordered and otherwise rearranged so as to bring the economy closer to an optimal state. Insofar as change is more rapid and alterations in the data of the market more volatile, we would expect, and indeed hope for, evidence that the "muddling-through" task of attaining equilibrium is being vigorously pursued.

To a large extent, therefore, merger and acquisition activity can be understood as one of the market's most powerful tools for hammering current prices into something more conductive to accurate accounting of values. This
issue goes beyond the basic, albeit important, notion that mergers generate internal cost efficiencies. The windfall gains accruing to shareholders could very well be the recognition of underpriced capital goods. Between shocks from energy and inflation, investors have had to stand and watch the value of their capital shrink.

The gains from mergers, acquisitions and reorganizations (which many are eager to tax or impede) may simply be the market's effort to adjust prices and, as an indirect result, restore to shareholders some of what inflation and historical cost accounting have taken away. If this is what much of the activity in question represents, one should hesitate before taking policy actions which would hamper it.