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Hayn, Carla K., Ph.D.

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THE ROLE OF TAX ATTRIBUTES IN CORPORATE ACQUISITIONS

by

Carla Hayn

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Business Administration)
in The University of Michigan
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Doctoral Committee:

Professor Paul Danos, Chairman
Professor James Adams
Associate Professor Victor L. Bernard
Assistant Professor Susan Chaplinsky

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PREFACE

There have been numerous studies of the wealth effects of acquisition announcements. The explanation given for the market's upward revaluation of the involved firms' stock prices usually involves the notion of "synergy." The source of the synergy is illusive. Jensen and Ruback (1983, p. 23), in discussing various sources of gains, mention reductions in production or distribution costs such as economies of scale or adoption of a more efficient production/organizational technology, financial motivations which include the use of underutilized tax shields or increased leverage, greater market power in product markets and the elimination of inefficient target management.

To date, most of the work on acquisition incentives has focused on the market power hypothesis (Eckbo, 1983; Stillman, 1983; Wier, 1983). Recently, interest has turned to financial motivations, in particular tax advantages that may accrue to acquiring firms through acquisition (Auerbach & Reishus, 1980; Crawford, 1986; Gilson, Scholes & Wolfson, 1986; Niden, 1986; Robinson, 1981). The evidence on whether tax variables matter is contradictory. Some studies indicate that tax considerations are not very important in acquisitions

(Gilson, et al., 1986; Niden, 1986). Other studies (Auerbach & Reishus, 1986; Crawford, 1986; Robinson, 1981) note that tax factors appear to play a significant role in at least some acquisitions, but there are inconsistencies across studies as to which tax variables are important.

The purpose of this study is to further explore the relationship between acquisition period gains and tax variables, and to resolve some of the questions raised by previous findings. To do this, the relevant tax attributes are identified. Reasons why they may or may not prove to be a source of the gains are then discussed. Descriptive information is presented documenting the size of the attributes and their prevalence. Finally, empirical analyses are performed to determine if the acquisition period returns to target and/or acquiring firms are related to the tax attributes.

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CHAPTER I

ACQUISITION TAX STATUS AND TAX ATTRIBUTES OF INTEREST

Purpose of Study

A great deal of research has been done on corporate acquisitions. The results of studies in this area indicate that acquisitions generate substantial gains to the target firms' shareholders. The acquiring firms' shareholders also appear to benefit, although the gains are much smaller in magnitude.[1] Little is known about why these wealth changes occur. Jensen and Ruback (1983, p. 9) note that acquisition gains apparently come from "the realization of increased efficiencies or synergies, but the evidence is not sufficient to identify their exact source."

Many researchers suggest that tax benefits obtained in acquisitions may be one source of the gains (Eckbo, 1983; Jensen & Ruback, 1983; Lev, 1983; Steiner, 1975; Weston & Chung, 1983).[2] The most frequently discussed tax synergy is the utilization of tax shields that would not be fully utilized in the absence of an acquisition (Brealey & Myers, 1981, p. 661; Eckbo, 1983, p. 244; Jensen & Ruback, 1983, p. 24; Lee, 1985, p. 433; Lev, 1983, p. 9; Raby, 1978, p. 348; Weston & Copeland, 1986, p. 911). If tax attributes of the target firm are

an acquisition incentive, there must be market imperfections that prevent their value from being fully capitalized in the target firm's stock price prior to the acquisition announcement; the announcement must convey new information to the market about their value to the acquiring firm.

The purpose of this study is to document the magnitude and prevalence of these tax attributes. Possible market frictions are discussed that may preclude the full value of these attributes from being impounded in the target firm's stock price prior to an acquisition. Hypotheses are offered and tests are performed comparing announcement period returns for target and acquiring firms in taxable and tax-free acquisitions. The relationship between these returns and various tax attributes is then examined. Finally, the market's response to private rulings on the tax status of acquisitions and to a proposed change in the acquisition tax law that would potentially lessen one of the tax attributes available in acquisitions is observed.

The results of this investigation provide evidence about the importance of tax variables in acquisitions from a policy and a research perspective. Regarding the U.S. tax laws related to acquisitions, Congress originally passed some of these laws in an attempt to remove impediments (such as the immediate taxation of capital gains) to business combinations that have a legitimate

business purpose.[3] However, current sentiment holds that these tax laws are too lenient as evidenced by the following statement:[4]

> Concern is growing among tax experts and in Congress that the tax code is playing too big a part in fostering mergers, subsidizing deals that may not have any economic merit beyond beating the tax collector (Jonas, Crock, Ehrlich and Norman, 1985).

Although the research on taxes as a motivation for acquisition is limited and there appears to be little factual information supporting statements such as this, the Tax Reform Act of 1986 attempts to restrict the tax benefits available through acquisition.[5] This study, by identifying whether the target and/or acquiring firms' shareholders benefit from tax variables, provides evidence as to whether tax benefits are an impetus behind the current merger wave.

From a research standpoint, this study provides information about the tax status of the offer (taxable or tax-free), the type of offer (tender offer or merger) made to affect the acquisition and the consideration paid by the acquiring firm.[6,7] For example, different wealth effects have been observed in tender offers and mergers. Tax effects, in particular the capital gains tax levied on target firms' shareholders in some acquisitions, may give rise to this difference.[8]

In the remainder of Chapter I, taxable and tax-free acquisitions are described and the tax attributes examined in this study are discussed. Chapter II consists of a

review of the relevant studies on the role of tax variables in acquisitions. In Chapter III, the factors considered in valuing the tax attributes prior to the acquisition announcement are explored and hypotheses are presented. The models, data and methodology used to examine the hypotheses are contained in Chapter IV. The results are presented in Chapter V. They are discussed in Chapter VI and plans for future research are outlined.

Taxable and Tax-free Acquisitions

The tax attributes examined in this study are associated with either taxable or tax-free acquisitions. Acquisitions are classified as taxable or tax-free (nontaxable) by the Internal Revenue Service (IRS) based on various characteristics of the acquisition transaction. These characteristics include such things as the type of consideration offered in payment by the acquiring firm (equity, cash, debt, etc.), the property received by the acquiring firm (stock or assets), the reason for the acquisition and the status of the target firm after acquisition (merged into the acquiring firm, operated as a separate entity, etc.).[9]

The terms "taxable" and "tax-free" apply to the nature of the target firm's shareholders' tax liabilities on any gain or loss realized upon acquisition. In a taxable acquisition, the target firm's shareholders recognize a realized gain or loss for tax purposes in the year of the sale. In a tax-free acquisition, the

recognition of a realized gain or loss is deferred until a subsequent, taxable transaction occurs.

All acquisitions are presumed to be taxable by the IRS. Stringent conditions must be met for the acquisition to be considered tax-free. Three of these conditions are specified in the Internal Revenue Code (IRC); the fourth one arises from the judicial system. These are briefly outlined in Appendix A.

Basically, tax-free acquisitions are those in which the acquiring firm offers primarily voting stock to the target firm's shareholders in exchange either for their voting stock or the target firm's assets. Taxable acquisitions may be very similar to tax-free ones except that they fail to meet one of the four required conditions. Or, they may be very different in that the acquiring firm may offer cash, debt instruments, equity securities or some combined form of consideration to acquire the stock or assets of the target firm. While statutory and practical mergers that satisfy the reorganization definitions set forth in Section 368, IRC, and that also meet the restrictions specified in Sections 354 or 361, IRC, are tax-free acquisitions, other such mergers that fall outside of the reorganization requirements are taxable.

In this study, the following types of acquisitions are considered:

Taxable Acquisitions	Tax-Free Acquisitions
(1) Cash Purchases	(1) Statutory Mergers and Consolidations (Type A Reorganizations)
(2) Purchases for Primarily Non-Equity Securities	(2) Stock-for-Stock Exchanges (Type B Reorganizations)[11]
(3) Taxable Stock Purchases[10]	(3) Stock-for-Asset Exchanges (Type C Reorganizations)

Tax Attributes

As noted above, the nature of the target firm's shareholders' tax liabilities differs in taxable and tax-free acquisitions. In addition, the treatment of several other tax attributes varies depending on the tax status of the transaction. Those considered in this study include: (1) the tax liability at the shareholder level, (2) the tax basis of the target firm's assets after acquisition, (3) depreciation recapture provisions, (4) a net operating loss carryforward of the target firm and (5) the target firm's unused investment and foreign tax credits. The last four attributes occur at the corporate level. The treatment of these attributes in taxable and tax-free acquisitions is described below and shown in Table 1. (A more detailed discussion of the role of these attributes in explaining the announcement period returns is presented in Chapter III.)

As noted earlier, the Tax Reform Act of 1986 makes a number of changes in the tax laws governing acquisitions. Because this law has been in effect such a short time, acquisitions occurring under this law are not included in

TABLE 1

TREATMENT OF TAX ATTRIBUTES
IN TAXABLE AND TAX-FREE ACQUISITIONS*

Tax Variable	Tax Status of Acquisition: Taxable	Tax Status of Acquisition: Tax-free
Tax Liability of Target Firm's Shareholders	Gain or loss resulting from acquisition is recognized in current period (Sec. 1001(c)).	Gain or loss resulting from acquisition is not recognized until taxable transaction occurs (Secs. 354 and 361).
Tax Basis of Target Firm's Assets After Acquisition	Basis is revalued at acquiring firm's cost (Sec. 1012).	Basis transfers to acquiring firm (Secs. 358 and 362(b)).
Depreciation Recapture Taxes	A portion of any gain attributable to past depreciation deductions is subject to tax at ordinary income rates (Secs. 1245 and 1250).	Recapture of any gain arising from past depreciation deductions is deferred until a subsequent, taxable transaction occurs (Secs. 354 and 361).
Net Operating Loss (NOL) Carryforward of Target Firm	Carryforward ceases to exist upon acquisition and is thus not available to acquiring firm.	Carryover transfers to acquiring firm (Sec. 381), subject to restrictions (Secs. 368(a)(1), 382 and 269).**
Unused Investment and Foreign Tax Credits of Target Firm	Credits cease to exist upon acquisition and are thus not available to acquiring firm.	Credits transfer to acquiring firm (Sec. 381), subject to restrictions (Secs. 368(a)(1), 382 and 269).**

* This table describes the tax provisions prior to the changes made by the Tax Reform Act of 1986. The relevant sections of the Internal Revenue Code are given in parentheses.

** Section 381 does not apply to Type B reorganizations, one of the types of tax-free acquisitions. (See Appendix A.)

this study. Instead, acquisitions entered into prior to the passage of this act are examined and the tax rules prevailing prior to its enactment are explained below.

Tax Liability of Target Firm's Shareholders

If the payment received by the target firm's shareholders exceeds the tax basis of their holdings, then they realize a gain from the sale regardless of whether the acquisition is taxable or tax-free. In a taxable acquisition, the gain is recognized. That is, it is taxed in the period of the sale, usually at the capital gains tax rate. (See Appendix B for an explanation of the capital gains rate.) If the acquisition is tax-free, the gain is still subject to taxes, but the liability is deferred until a taxable transaction occurs. (The term "tax-free" is thus somewhat of a misnomer.)[12] For example, if the target firm's shareholders receive stock in the acquiring firm in a tax-free exchange, they do not have to pay a tax on any gain realized until they sell this stock in an open market transaction or to another firm via a taxable transaction. In contrast, if the target firm's shareholders receive cash from the acquiring firm in a taxable transaction, they must pay taxes on any gain in the year of the sale.[13] Losses are treated in a similar manner. In the event of a taxable acquisition, a loss must be recognized in the current period. A loss resulting from a tax-free acquisition is deferred until a subsequent, taxable exchange occurs.[14]

The aggregate capital gains liability of the target firm's shareholders is of concern to the acquiring firm if, in a taxable acquisition, it has to compensate these shareholders for the immediate recognition of this liability through a higher premium. Several researchers (see endnote 7) have suggested that acquiring firms do, on average, bear the brunt of this liability and that this may explain the difference in acquisition premiums across different groups of firms.

Tax Basis of the Target Firm's Assets After Acquisition

In taxable acquisitions, the acquiring firm's tax basis of the depreciable assets purchased from the target firm is the amount paid to acquire those assets. Further, any assets put into use after the passage of the Economic Recovery Tax Act of 1981 (ERTA) are depreciable under the Accelerated Cost Recovery System (ACRS) which usually shortens the depreciation period considerably.

The difference between the acquiring and target firms' tax basis is often referred to as the "step-up." The asset basis is "stepped-up" and the acquiring firm takes depreciation on a larger amount than did the target firm. Use of the term "step-up" implies that the purchase price exceeds the target firm's tax basis which frequently occurs if the target firm uses accelerated depreciation methods in computing taxes and/or if asset values have appreciated due to the effects of inflation. However, the reverse also occurs in which case the basis of the assets

on the acquiring firm's books is "stepped-down" and the acquiring firm takes depreciation on a smaller amount than that available to the target firm.

In tax-free acquisitions, the tax basis of the target firm's assets transfers to the acquiring firm and the acquiring firm continues to take depreciation on this amount. There is thus no step-up in tax-free acquisitions.

The high inflation rates of the 1970s led many to believe that the increase in the current costs of assets over their book values serves as an acquisition incentive. Firms with potentially large step-ups are supposedly purchased so that the acquiring firm can take advantage of the increased depreciation deductions available from revaluation of the target firm's asset basis.[15]

Depreciation Recapture Taxes

The depreciation recapture provisions are evoked only in taxable acquisitions. The IRC specifies that a portion of any gain received by the target firm attributable to depreciation deductions must be recaptured as ordinary income and taxed accordingly.[16] Recapture taxes thus prevent substitution of the capital gains tax rate for the ordinary income tax rate.[17] Upon paying the recapture tax, the target firm's tax basis in the assets giving rise to the tax increases by the amount of the tax, reducing the potential step-up.

In tax-free acquisitions, depreciation recapture provisions are not triggered since the tax basis of the target firm's assets carries over to the acquiring firm. Depreciation recapture is deferred until the acquiring firm sells the assets in a taxable transaction.

The amount that must be recaptured in taxable acquisitions depends on the type of property sold. For Section 1245 property (which generally includes depreciable assets such as machinery) and Section 1245 recovery property (which includes commercial depreciable real estate), the lower of the recognized gain or the post-1961 depreciation is recaptured as ordinary income. For Section 1250 property (which involves depreciable real property other than 1245 and 1245 recovery property), the "excess depreciation," defined as any positive difference between the amount depreciated using an accelerated method and the depreciated amount using straight-line depreciation, must be recaptured as ordinary income.

Depreciation recapture taxes are, in effect, a cost of acquisition. While the direct responsibility of the target firm, these costs may influence the acquiring firm's acquisition decision to the extent that they can be "passed through" to the acquiring firm in the form of a higher premium.

Net Operating Loss Carryforwards

The target firm's net operating loss (NOL) carryforwards are made available to the acquiring firm to

offset income earned subsequent to the acquisition in the event of tax-free acquisitions; they cannot be used by the acquiring firm to recapture past taxes. The one exception to the transfer rule occurs in Type B reorganizations where the target firm is maintained as a separate operating entity after the acquisition. In this case the carryforward does not transfer to the acquiring firm even though the acquisition is tax-free; rather it is maintained by the target firm. If the target firm is liquidated after a Type B reorganization within a certain time period and an NOL carryforward is present, the carryforward transfers to the acquiring firm at the time of liquidation.

In taxable acquisitions, NOL carryforwards are not available to the acquiring firm. In effect, they cease to exist after the acquisition.

Of the tax attributes examined, NOL carryforwards are the most commonly cited tax incentive for acquisition. Acquiring firms with large tax bills are believed to acquire firms with carryforwards in order to offset future taxes. The following quote illustrates a frequently expressed belief about NOL carryforwards:

> Net operating loss carryovers have been pure gold to dealsters and acquisitors, a means of turning losses into cash...Used to shelter subsequent profits, the carryforwards are a dealmaker's best friend (Saunders, 1986).

Unused Investment and Foreign Tax Credits

A number of the target firm's other tax attributes are available to the acquiring firm upon a tax-free acquisition.[18] (The exception noted above pertaining to Type B reorganizations also applies here.) The ones of interest in this study are those that can be used to reduce taxes subsequent to the acquisition: unused investment and foreign tax credits. As is the case with NOL carryforwards, these cease to exist in taxable acquisitions and thus are not available to the acquiring firm.

In the next chapter, studies examining tax variables in acquisitions and other related studies are reviewed.

Notes to Chapter I

[1] The evidence consistently indicates that acquiring firms involved in successful tender offers earn positive, statistically significant, abnormal returns during the acquisition announcement period (Dodd & Ruback, 1978; Bradley, 1980; Jarrel & Bradley, 1980; Bradley, Desai & Kim, 1982). However, there is still some question as to whether acquiring firms involved in successful mergers benefit. Most studies document small positive, statistically insignificant, abnormal returns during the announcement period (Asquith, 1983; Eckbo, 1983; Dodd, 1980; Malatesta, 1983). One study shows larger positive, statistically significant, abnormal returns to acquiring firms during the announcement period (Asquith, Bruner and Mullins, 1983). (See Table 3.)

[2] Practitioners, too, often cite taxes as a motivation for acquisition. The following quote from an article discussing the changes brought about by the Tax Reform Act of 1986 is typical:

> Until now, the price that an acquiring company was willing to pay and that a seller was prepared to accept in a takeover was heavily dependent on the tax breaks built into the deal (Business Week, September 22, 1986, p. 83).

[3] See Reynolds (1983), Cohen (1969), and Gregory v. Helvering, 293 U.S. 465 (1935).

[4] Similar statements are made in The Wall Street Journal (January 29, 1986) and in Saunders (for Forbes, December 29, 1986).

[5] Among other things, the Tax Reform Act of 1986 limits the transfer of net operating loss carryforwards in tax-free acquisitions, eliminates the capital gains tax, reduces the value of the step-up in the asset basis to acquiring firms and removes the option of not recognizing depreciation recapture taxes in taxable acquisitions.

[6] Jensen and Ruback (1983, p. 46) note that there is little information about the determinants of an acquisition offer such as "the structure, timing, type of offer and tax effects."

[7] Wansley, Lane and Yang (1983, p. 20) suggest two reasons why cash may be preferred over stock: (1) to prevent dilution in reported earnings of the acquiring firm and (2) to avoid the process of obtaining SEC approval of the registration, thereby speeding up the acquisition process. DeAngelo, DeAngelo and Rice (1984) note that cash may be the preferred medium of exchange if

the acquiring firm's managers feel that their firm's stock is undervalued. Asquith, Bruner and Mullins (1986) alsc address the form of financing.

[8] Mandelker (1975) notes that part of the premium paid in acquisitions may result from the existence of capital gains taxes. Bradley, Desai and Kim (1984) find that the abnormal wealth gain to target firm's shareholders in tender offers is positively related to the percentage of shares purchased by the acquiring firm. They attribute this to capital gains tax-induced supply inelasticities.

[9] The tax status of an acquisition is related to the accounting method used to account for business combinations. Accounting Principles Board (APB) Opinions 16 and 17 provide for the pooling and purchase methods of accounting for business combinations. The rules for use of the pooling method are even more restrictive than those for tax-free acquisitions. Thus, in general, if the pooling method is used for financial reporting purposes, a tax-free acquisition (Type A or Type B reorganization) has been affected. The pooling method is mandatory if the various rules are met. Firms using the purchase method have thus been involved in either tax-free or taxable acquisitions. (Wheeler (1981, pp. 340-346) provides a thorough discussion of the twelve pooling requirements.)

[10] The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) provides that an acquiring firm has three options following a taxable stock purchase where the acquiring firm purchases at least 80% of the target firm's voting and nonvoting stock (other than preferred stock) within a twelve-month acquisition period (Section 338, IRC). First, it can do nothing (neither liquidating the target firm nor electing to treat the transaction as an asset purchase) thereby obtaining a step-up in the asset basis as well as the target firm's tax attributes. Second, the target firm can be liquidated under Section 332, IRC, again allowing the acquiring firm to account for the target firm's assets at cost and to obtain the target firm's tax attributes. Third, the transaction can be treated as an asset purchase in which case the rules pertaining to taxable transactions apply (i.e., assets accounted for at cost and no transfer of the target firm's tax attributes). These options apply only to acquisitions occurring after August 31, 1982. Transfer of any NOL carryforwards in stock purchases is eliminated after June 30, 1984. This limitation led many to speculate that 1982 and 1983 would be "boom" years for acquiring firms with NOL carryforwards (see Milefsky, 1982, p. 41). For taxable stock purchases occurring prior to August 31, 1982, the acquired firm must be liquidated within two

years of the acquisition if the acquiring firm is to achieve a step-up in the asset basis.

[11] As noted in the discussion and in Table 1, the tax attributes of the target firm are not available to the acquiring firm in Type B reorganizations where the target firm is maintained. Rather, the asset basis, NOL carryforwards and other tax attributes remain with the target firm. However, if the target firm is liquidated after a Type B reorganization, the transaction is usually considered a Type C reorganization and these items do transfer to the acquiring firm.

[12] The term "tax-free" is accurate if the taxpayer does not choose to sell the assets giving rise to the gain in a taxable transaction during his/her lifetime. Upon the death of the taxpayer and the transfer of the assets to the heirs, the assets acquire a new basis under Section 1014, IRC, equal to their fair market value at that time. Thus, the deferred gain (or loss) is not reflected on either the decedent's income tax return or those of the heirs.

[13] Long-term capital gains can be offset by long-term capital losses (see Appendix B). If the taxpayer can fully offset the gains, then no taxes will be owed on them. A number of empirical studies assume that taxpayers take advantage of these factors and thereby indicate that the effective capital gains tax rate is about 5%. Similarly, theoretical analyses show that appropriate investment strategies can reduce the effective capital gains tax rate to zero. (See Poterba (1985) for a review of the research on capital gains taxes.) Poterba (1985), using capital gains realization data from the 1982 IRS Individual Tax Model, finds that only about one-fifth of the investors reporting capital gains take advantage of the offset provision to reduce their tax liability. The capital gains liability thus appears to be "real." Poterba (p. 19) notes that "the majority of investors who realize capital gains do not adopt sophisticated tax reduction strategies. Many realized gains, therefore, are taxed at substantial marginal rates."

[14] While deferring the tax liability on a capital gain is advantageous, deferring the benefit form a loss is obviously not to the taxpayer's advantage.

[15] Assets put into service after December 31, 1980 are depreciated under the Accelerated Cost Recovery System (ACRS). Thus another potential benefit of buying assets in place is that their depreciable life is shortened.

[16] This study focuses only on depreciation that must be recaptured. However, investment tax credits may also be subject to recapture in the event of "early disposition" of Section 38 property as specified by Section 47(a)(1), IRC.

[17] The depreciation deduction generates a current deduction against ordinary income thus sheltering income that would otherwise be taxed at ordinary income rates. Upon the subsequent sale of the asset, any gain could qualify as a capital gain and would thus be taxed at the capital gains rate. Thus prior to the passage of the recapture provisions, taxpayers could effectively convert ordinary income into capital gains income and reduce their tax liability accordingly.

[18] Section 381, IRC, provides for the transfer of 27 of the target firm's tax attributes to the acquiring firm in a tax-free reorganization. In addition to those mentioned here, other items that transfer to the acquiring firm include the earnings and profits (or deficit) account, accounting methods, liabilities, and inventory and depreciation methods.

CHAPTER II

LITERATURE REVIEW

Several studies have been done on the role of tax variables in acquisitions. Gilson, Scholes and Wolfson (1986), in a theoretical study, examine the claim that the tax benefits available under the U.S. tax system "favor" acquisitions. This study is reviewed first because it raises several points that are relevant to the current study and because it provides a foundation from which to examine the role of tax variables in acquisitions.

The other four studies are empirical in nature and differ in the questions asked and the methodology used to address the questions. Robinson (1981) was the first to empirically examine tax attributes in acquisitions, investigating whether the premium paid to target firm's shareholders is related to various tax variables. Niden (1986) also examines the relationship between the premium and tax variables. Further, she develops a model to predict the tax status of an acquisition. Similarly, Crawford (1986) uses a model to predict acquisition tax status in terms of various tax attributes of the target firm.[1] Rather than examining the premium or the tax status of acquisition, Auerbach and Reishus (1986) attempt

to measure the size and availability of tax benefits accruing to acquiring firms through acquisitions.

In a related empirical study, Schipper and Smith (1986) examine the tax effects of management buyouts. Buyouts are similar to acquisitions in that a change in the ownership of the firm makes available certain tax benefits that are similar to those available in acquisitions. Other relevant empirical studies are those examining the wealth effects of tender offer and merger announcements. The results of these studies suggest that the premiums paid in taxable and tax-free acquisitions are systematically different. These related studies and the studies on tax variables are discussed individually in the sections below.

Studies on Tax Attributes in Acquisitions

Gilson, Scholes and Wolfson

Gilson et al., (1986) in examining the claim that the tax system favors acquisitions, discuss three different meanings of favoritism. The first interpretation and least powerful claim regarding the importance of tax variables in acquisitions is that acquisitions can result in pure tax gains defined as "an increase in after-tax cash flows from the combination of assets without any change in pre-tax cash flows." The second meaning of tax favoritism, reflecting a stronger claim, is that the tax gain in question is best achieved by an acquisition as opposed to the next best alternative. The third

definition and strongest claim of favoritism is that tax gains explain the size of premiums observed in acquisitions, i.e., tax gains explain the pricing of the transaction.

To examine these interpretations of tax favoritism, Gilson et al., develop an analytical framework and apply it to three tax variables associated with acquisitions: a step-up in the target firm's asset basis, the accelerated use of an NOL carryforward and the tax deduction for interest paid on funds borrowed to finance the acquisition. The analysis is first conducted in a perfect market setting where there are no information or transactions costs. Further, it is assumed that no operating efficiencies result from the acquisition. Each of these assumptions is then relaxed to determine its effect on the three definitions of favoritism for each of the three tax variables.

The analysis focuses on whether acquisitions are the sole means of realizing the tax benefits examined or whether the target firm can reap the benefits through alternative means. Because there are alternatives, in a perfect market setting the claim that the tax system favors acquisitions is false. However, in a world of transactions and information costs, Gilson et al., note that these costs may reinforce the results observed in a perfect market context making the potential tax gains from acquisitions a "mirage," or the costs may serve to make

acquisitions the most attractive means of securing tax benefits. They conclude that the claim of tax-motivated acquisitions is uncertain, yet possible in some situations.

The focus of this study is different than that of Gilson et al. The concern here is whether tax attributes are important in acquisitions that may not be undertaken for the sole purpose of realizing tax benefits. In a world where acquisitions result in non-tax-related synergies (such as operating efficiencies) and where transactions and information costs exist, do tax attributes play a role in explaining the announcement period returns? The critical issue here, which is addressed in the next chapter, is how significant the transactions and information costs are in influencing the market's assessment that the tax attributes will be realized in the absence of acquisition.

Robinson

Robinson (1981) attempts to explain the premium paid to the target firm's shareholders in terms of four tax attributes: (1) whether the target firm's asset basis transfers to the acquiring firm or is stepped-up, (2) whether or not the target firm has an NOL carryforward, (3) whether or not the acquiring firm has an NOL carryforward,[2] and (4) whether or not a gain realized by the target firm's shareholders is recognized for tax purposes in the current period or deferred. Based on a

model where binary variables are used to indicate the presence or absence of the independent variables as described in Table 2A, he finds that part of the premium serves to compensate the target firm's shareholders in taxable acquisitions who have to recognize their capital gains liability as a result of the acquisition.

Robinson's study is the first to empirically address the influence that tax attributes might have in pricing target firms. It thus contributes to the research by identifying various tax attributes that may be important in acquisitions. However, it is limited primarily because of the data used to examine the hypotheses. Data on carryforwards is obtained from Compustat. However, Compustat reports primarily the amount of the carryforward reported for financial reporting purposes, not the amount available for tax purposes which is the relevant amount. The presence of a carryforward for financial reporting purposes does not necessarily mean that a carryforward exists for tax purposes nor are the magnitudes of the book and tax carryforwards likely to be the same.[3] Robinson's measure of the NOL variable may thus lead to some firms being categorized as having carryforwards when they do not and vice versa.

Concerning both the step-up and the capital gains variables, these are assigned a value of one if a taxable acquisition occurs and zero otherwise. However, not all taxable acquisitions give rise to a step-up or a capital

TABLE 2A

EMPIRICAL STUDIES OF TAX ATTRIBUTES IN ACQUISITIONS

Study: Robinson (1981)

Purpose: To explain premium paid to target firm's shareholders

Sample: Firms reported in the Federal Trade Commission's Large Merger Series (1974-1978) (n=153)

TAX VARIABLES	MEASURE USED	SIGNIFICANT
NOL Carryforward of Target Firm	Variable that equals 1 if Compustat shows a carryforward and 0 otherwise	No
NOL Carryforward of Acquiring Firm	Variable that equals 1 if Compustat shows a carryforward and 0 otherwise	No
Step-Up in Asset Basis	Variable that equals 1 if a step-up is allowed and 0 otherwise	No
Capital Gains Liability	Variable that equals 1 if capital gains tax is deferred and 0 if tax must be recognized in current period	Yes

gain. Regarding the capital gain, if the target firm's stock price has fallen since the time the shareholders purchased the stock, they may still realize a loss upon acquisition even if they sell their stock at a premium over the current market price. Similarly, just because an acquiring firm can technically step-up the target firm's assets does not mean that a step-up is available if the price paid for the assets does not exceed their taxable basis. Robinson's sample consists of acquisitions entered into in 1974-78. The two things that contribute most to the potential to step-up the target firm's asset basis, accelerated depreciation and inflation, were not nearly as significant then as they were after this period.[4] Thus it is unlikely that all taxable acquisitions resulted in a step-up in the target's basis as implied by the binary measure.

Niden

Niden (1986) focuses on the target firm's shareholders aggregate capital gains liability in an attempt to predict the acquiring firm's preference for a taxable or tax-free acquisition and to explain the premium offered to acquire the target firm. She also considers the step-up in the target firm's asset basis, NOL carryforwards of the target and acquiring firm and the acquiring firm's motivation to reduce taxes. Because this study is the most similar to the current study, it is

critiqued in more detail than are the other empirical studies.

In examining the tax status of acquisition, Niden hypothesizes that the acquiring firm will prefer a taxable acquisition:

(1) the smaller the target firm's shareholders' aggregate capital gains tax liability,

(2) the more capital intensive the target firm and the greater the difference between book and market value of the target firm's assets, and

(3) the higher the acquiring firm's effective tax rate.

Regarding tax-free acquisitions, she hypothesis that:

(4) if either the target or acquiring firm has an NOL carryforward, the acquiring firm may prefer a tax-free acquisition.

The premium offered to the target firm's shareholders in taxable acquisitions is hypothesized to vary positively with:

(5) the magnitude of capital gains taxes for a particular target shareholder clientele and

(6) the capital intensity of the target firm and the difference between the book and market value of its assets.

The variables used to examine these hypotheses are presented in Table 2B.

Hypotheses one and five posit that the capital gains liability in taxable acquisitions is passed on to the acquiring firm in the form of a higher premium. Acquiring firms will thus choose to avoid this liability if it is large by entering into tax-free acquisitions. Hypotheses two and six concern the step-up. The larger the potential

TABLE 2B

EMPIRICAL STUDIES OF TAX ATTRIBUTES IN ACQUISITIONS

Study: Niden (1986)

Purpose: To predict tax status of acquisition and explain the premium paid to target firm's shareholders

Sample: Firms contained in databases compiled by Bradley (1980), Dodd (1980) and Dodd and Ruback (1977) and firms delisted from the CRSP Daily Return File (1963-1977) (n=548)

TAX VARIABLES		MEASURE USED	SIGNIFICANT Predictive (Explanatory)
Capital Gains Liability	(a)	Difference in price 5 days before acquisition announcement and lowest price over preceding 6-month period, divided by price 5 days before announcement	No (Yes)
	(b)	Ratio of shares held by institutions to total number of target shares outstanding	No (No)
	(c)	Natural logarithm of variance of target's stock returns over 200 trading days ending 40 days prior to announcement	No (Yes)
Step-Up in Asset Basis	(a)	Variable that equals 1 if target firm is in capital intensive industry as defined by its Standard Industry Code and 0 otherwise	No (No)
	(b)	Ratio of target firm's accumulated depreciation to total assets as reported by Compustat at year-end prior to year of acquisition announcement	Yes (No)
Acquiring Firm's Effective Tax Rate		Acquiring firm's federal taxes payable divided by pretax book income as reported by Compustat at year-end prior to year of acquisition announcement	No* (No)

TABLE 2B
(continued)

Study: Niden (1986) (continued)

TAX VARIABLES	MEASURE USED	SIGNIFICANT Predictive (Explanatory)
NOL Carryforward of Target and/or Acquiring Firm	Amount reported by Compustat at year-end prior to year of acquisition announcement or year-end two years prior to acquisition announcement	No (No)
NON-TAX VARIABLES		
Trading Volume	Ratio of target firm's shares traded during acquisition announcement month to total number of shares outstanding	No (No)
Percent Sought	Ratio of target firm's shares sought by acquiring firm to number of shares outstanding	Not Inc. (Yes)
Size	Natural logarithm of market value of target firm's stock five days prior to announcement	Mixed** (Mixed)

* Significant but not in the hypothesized direction

** This variable is significantly positive for one group of firms, significantly negative for another group of firms and not statistically significant for three other groups examined.

step-up, the greater the acquiring firm's preference for a taxable transaction (hypothesis two) and the more it will have to pay to acquire the target firm (hypothesis six). The third hypothesis attempts to capture the acquiring firm's demand for tax reduction. The higher its tax rate, the greater its preference for a taxable transaction that will make available increased depreciation deductions as a result of stepping up the target firm's asset basis. The fourth hypothesis concerning carryforwards asserts that when a carryforward is present, the acquiring firm may prefer a tax-free transaction.

In the model predicting the tax status of acquisition, the only tax variable that appears to be significant is that proxying for the step-up. While the variable representing the acquiring firm's effective tax rate is also statistically significant, the coefficient is negative rather than positive as hypothesized. Regarding the premium paid to the target firm's shareholders, there is weak evidence that a higher aggregate capital gains liability is associated with a higher premium.

It is difficult to interpret these results because of possible methodological problems. For example, the hypotheses do not lead to clear predictions for some cases. Suppose a target firm has an NOL carryforward, operates in a capital intensive industry and there is a large difference between the book and market value of its assets. Will the acquiring firm prefer a tax-free

acquisition because of the carryforward (hypothesis four) or will a taxable acquisition be preferred (hypotheses two and three)? Similarly, the third hypothesis does not lead to a clear-cut prediction. A tax-paying acquiring firm would always prefer to obtain tax shields as long as the benefits of sheltering income outweigh the costs of obtaining the shields. The acquiring firm's effective tax rate does not appear to influence its preference for a taxable acquisition per se since tax shields can also be obtained in tax-free acquisitions.[5]

Another potential problem may be present as a result of the assumption that all stock exchanges are tax-free events. As noted in Chapter I, if a stock transaction does not qualify for tax-free status, it is a taxable event. In the acquisitions examined, there may thus be taxable acquisitions where the NOL carryforward would not transfer to the acquiring firm. By assuming that these attributes do transfer, the results are biased against hypothesis three.

Finally, concerning the operationalization of the variables, the only variable that appears to be significant in the predictive model is the step-up. This is measured as the ratio of accumulated depreciation to total firm assets. It is unlikely that this construction of the variable captures the effect of the step-up since the step-up depends on the tax basis of the target firm's undepreciated assets as compared with their market value.

Further, as discussed in the next chapter, this measure of the step-up is from the target firm's point of view. The step-up measured from the acquiring firm's point of view is the appropriate amount to use in predicting its decision about tax status.

In addition to this potential problem, the measure for NOL carryforwards may fail to capture the actual magnitude of these tax attributes. Data on carryforwards is obtained from the Compustat Industrial File. However, as noted in discussing the Robinson study, Compustat usually reports the book value of carryforwards and not the tax value. Yet the tax value, which may differ significantly from the book amount, is the relevant consideration here.

The way the capital gains measure is calculated in definition (a) may also produce misleading results.[6] A more accurate measure of the percentage gain would use the lowest price over the preceding six-month period as the denominator. The third measure of the capital gains liability as specified by definition (c) may also be a poor proxy for the aggregate capital gains liability. This measure assumes that high variance stocks have a greater proportion of short-term holders (who will be taxed on any gains at ordinary income tax rates) than a lower variance stock. While this result may hold under some assumptions,[7] as yet there is no empirical support for this measure.

Crawford

Crawford (1986) uses a probit model to predict the tax status of an acquisition (taxable or nontaxable) and the form of payment (cash versus stock). He considers taxable cash acquisitions and nontaxable stock acquisitions.

The tax attributes considered in his model are the capital gains liability of the target firm's shareholders, the size of the potential step-up in the asset basis, and NOL carryforwards and unused tax credits of the target firm that become available to the acquiring firm. In addition, two non-tax variables are incorporated in the prediction model: one representing potential transactions costs associated with the acquisition and one proxying for the benefits of accelerating the acquisition process. Crawford suggests that transactions costs are greater in stock versus cash transactions both in terms of money (underwriting costs) and time (registration forms must be filled out, compliance with federal and state securities laws must be demonstrated, etc.). He thus reasons that small target firms are more likely to be acquired for cash. Since cash transactions can be affected more quickly, he further suggests that if there is competition to control the target firm (either from existing management or from another bidding firm), cash will be preferred over stock as the medium of exchange.

Incorporating the three tax and two non-tax variables as described in Table 2C into a probit model to predict the tax status and financing decision, Crawford hypothesizes that an acquisition is more likely to be structured as a taxable cash transaction as:

(1) the potential to step-up the target firm's asset basis increases,

(2) the capital gain realized by the median target firm's shareholder decreases,[8]

(3) the magnitude of the target firm's NOL carryforwards and unused investment and foreign tax credits decreases,

(4) the transactions cost savings from using cash increases, and

(5) the benefit of using cash to accelerate the acquisition process increases.

The results suggest that the step-up is significant in predicting the tax status; the greater the potential step-up, the more likely the acquisition is to be taxable. Although Crawford's measure appears to be more valid than that used by Niden, he still measures the step-up from the target firm's point of view rather than from that of the acquiring firm. Crawford finds weak evidence suggesting that the lower the capital gains liability of the target firm's shareholders, the more likely the acquiring firm is to enter into a taxable acquisition. Again, however, it must be questioned whether or not the measure used to represent this liability, which consists of the average price of the firm's stock over a two-year period multiplied by the average turnover, is valid. The

TABLE 2C

EMPIRICAL STUDIES OF TAX ATTRIBUTES IN ACQUISITIONS

Study: Crawford (1986)

Purpose: To predict tax status of acquisition and type of consideration offered by acquiring firm

Sample: Target firms in Compustat Research File delisted after October 31, 1970 (n=58; 41 firms involved in taxable acquisitions and 17 firms involved in tax-free acquisitions)

TAX VARIABLES	MEASURE USED	SIGNIFICANT
NOL Carryforward of Target Firm	Amount reported in firms' financial statements	No
Unused Credits of Target Firm	Amount reported in firms' statements	No
Step-Up in Asset Basis	Book value of assets minus target firm's deferred tax account divided by its marginal tax rate	Yes
Capital Gains Liability	Average month-end price of target firm's stock over two-year period ending 50 trading days prior to merger announcement times average monthly turnover over same period where turnover is the monthly trading volume divided by number of target shares outstanding	Yes
NON-TAX VARIABLES		
Transactions Costs	Market value of acquiring firm divided by market value of target firm where market value equals value of common stock 50 trading days prior to the acquisition announcement plus the book value of debt and preferred stock	Yes
Benefits of Accelerating Acquisition Process	Variable that equals 1 if another firm attempted to acquire target firm between time of acquisition announcement and effective date of merger or if target firm's managers resisted the takeover	Yes

presence of NOL carryforwards and unused tax credits appears to have no significant effect on the acquiring firm's decision. Both of the non-tax variables, use of cash to reduce transactions costs and to accelerate the acquisition process, were statistically significant in the prediction model.

Auerbach and Reishus

Auerbach and Reishus (1986) focus on the same three tax attributes as did Gilson et al.,: the presence of an NOL carryforward and/or unused tax credits, a step-up in the target firm's asset basis and an increase in the interest deductions occurring as a result of a debt-financed acquisition. As noted in Table 2D, their study is descriptive in nature and no attempt is made to relate the various tax attributes to the tax status of the acquisitions.[9]

To examine the importance of NOL carryforwards and unused tax credits, Auerbach and Reishus first identify target and acquiring firm pairs. They then group the individual firms into four groups:

(1) firms with positive federal taxes payable and no carryforwards or credits,

(2) firms with no federal taxes payable in the current period but that can carry back losses and credits against taxable income in prior years,

(3) firms with no tax losses in the current period but that have unused tax credits that can be carried forward for use in subsequent periods, and

TABLE 2D

EMPIRICAL STUDIES OF TAX ATTRIBUTES IN ACQUISITIONS

Study: Auerbach & Reishus (1986)

Purpose: To estimate prevalence of tax-motivated acquisitions

Sample: Target firms in the Compustat Research File that were acquired by a firm in the Compustat Annual Industrial File (1968-1983) (n=318)

TAX VARIABLES	MEASURE USED	SIGNIFICANT
NOL Carryforward of Target and/or Acquiring Firm	Amount reported in firms' financial statements	Yes
Unused Credits of Target and/or Acquiring Firm	Amount reported in firms' financial statements	Yes
Step-Up in Asset Basis	Present value of depreciating difference in estimated current market value and depreciated value of structural assets (see Appendix C)	No
Increased Interest Payments	Change in debt/equity ratios from two years prior to two years following merger	No

(4) firms with both carryforwards and unused credits that are available for use in the future.

To examine whether tax benefits are important in acquisitions, Auerbach and Reishus focus on the number of firms in group one (those that are most likely to benefit from tax shields) that merge with firms in groups three and four (those that are most likely to have tax shields available). Firms in the second group are ignored because they have no tax benefits to transfer nor is it likely that they have the capacity to absorb tax shields transferred from another firm.

They find that NOL carryforwards and unused tax credits are present in about 20% of the mergers they examine. The average value of these tax attributes appears to be slightly over one-tenth of the target firm's market value. Auerbach and Reishus thus conclude that for a small fraction of mergers, the transfer of these tax benefits could be significant. This conclusion is valid only if (1) the tax attributes are available to the acquiring firm which may not be the case if the acquisition is not structured as a tax-free acquisition as noted in Chapter I and (2) the value of the attributes has not been impounded in the target firm's stock price prior to acquisition as discussed in the next chapter.

To estimate the step-up in the asset basis available to the acquiring firm, a procedure based on the perpetual inventory method is used to calculate the "economic" depreciation of structural assets. Again this measure is

constructed from the target firm's viewpoint. However given the design used by Auerbach and Reishus, the step-up from both the target and acquiring firms' perspectives should be considered. The results regarding this variable indicate that because so few of the target firms examined have assets that appreciated in value (less than 5%), the step-up is not an important factor in acquisitions. This conclusion is valid only if the method used to calculate the step-up is sound. However, there appear to be several reasons why this calculation may severely understate the value of the step-up in acquisitions as discussed in detail in Appendix C.

To examine the tax shield due to increased interest payments resulting from debt-financed acquisitions, Auerbach and Reishus consider the change in the debt/equity ratios of the target and acquiring firm pairs from two years prior to two years following the acquisition. They find an average change of about 2%, indicating a relatively small increase in interest payments. They conclude that increased interest deductions, like the increased depreciation deductions provided by the step-up, are unimportant in acquisitions.

Two things should be noted about the way Auerbach and Reishus examine the role of increased interest payments resulting from acquisitions. First, it is doubtful that acquiring firms enter into acquisitions solely to generate interest deductions.[10] However, because of these

deductions, debt may be the preferred form of financing the acquisition. Second, if the intention is to measure the value of these increased deductions, the measure used by Auerbach and Reishus is weak. They consider all firm pairs regardless of whether debt financing was used or not. Also, no attempt is made to measure the tax reduction arising from increased interest payments. The procedure used focuses more on whether the combined firms increase their debt level than on the interest deductions arising from acquisitions per se.

Schipper and Smith

Schipper and Smith (1986), in a pilot study, examine the magnitude of and the extent to which tax savings are associated with management buyouts (MBOs) of public companies. An MBO is an acquisition of the firm by a management group which, by purchasing all of the publicly-held stock, takes the firm private. These differ from the acquisitions discussed in this study where another firm or an outside group of investors purchases the target firm. Several of the tax attributes that become available in traditional acquisitions are also available in MBOs. In particular, Schipper and Smith consider two variables examined in the studies described above: a step-up in the asset basis and interest deductions arising from debt financing. These variables are described in Table 2E.

The results indicate that firms announcing an intention to step-up the asset basis after the MBO realize

TABLE 2E

EMPIRICAL STUDIES OF TAX ATTRIBUTES IN ACQUISITIONS

Study: Schipper and Smith (1986)

Purpose: To examine tax variables in management buyouts

Sample: Firms contained in the Center for Research on Security Prices (CRSP) database involved in management buyouts (1980-1985) (n=32)

TAX VARIABLES	MEASURE USED	SIGNIFICANT
Step-Up in Asset Basis	Depreciable assets: Step-up assumed to equal the premium paid by the acquiring firm Inventory: Firms using LIFO assumed to have new tax basis equal to the FIFO cost; the difference in the bases is the step-up. No step-up is estimated for firms using FIFO.	Yes
Increased Interest Payments	Net increase in interest tax deductions is estimated from face value of debt, stated coupon rates and repayment schedule.	Yes

larger tax savings from doing so than do firms that do not plan to step-up the asset basis. The tax savings resulting from the step-up averages 6% of the sample firms' equity values and 15% of the total tax savings resulting from the buyouts. The remainder of the tax savings comes from the benefits of increased interest deductions arising from debt financing. The value of these increased deductions dominates the savings from the step-up and accounts for more than half of the dollar premium paid to shareholders of the firms examined.

Wealth Effect Studies

Indirect evidence about the importance of tax variables is provided by studies examining wealth changes during the acquisition announcement period. Specifically, the gains accruing to target and acquiring firms in tender offers are larger, on average, than those experienced by firms involved in merger negotiations as shown in Table 3. None of these studies consider tax variables. However, the tax variables available in the acquisitions affected by tender offers are likely to differ from those that result from merger bids because acquisitions made through tender offers are usually taxable while those transacted as mergers may be tax-free. Since the average premium arising from a tender offer exceeds that resulting from a merger announcement, the previous studies suggest indirectly that the tax variables present in taxable acquisitions result in higher premiums than those present

TABLE 3

WEALTH EFFECTS OF SUCCESSFUL ACQUISITIONS*

(1) Tender Offer Studies	(2) Sample	(3) Announcement Period	(4) Cumulative Abnormal Returns Target Firms	(5) Cumulative Abnormal Returns Acquiring Firms
Dodd & Ruback (1977)	1958-1978	announcement month	+20.58 (133,25.81)	+2.83 (124,2.16)
Kummer & Hoffmeister (1978)	1956-1974	announcement month	+16.85 (50,10.88)	+5.20 (17,1.96)
Bradley (1980)	1962-1977	-20 days to +20 days	+32.18 (161,26.68)	+4.36 (88,2.67)
Jarrell & Bradley (1980)	1962-1977	-40 days to +20 days	+34.06 (147,25.48)	+6.66 (88,3.35)
Bradley, Desai & Kim (1982)	1962-1980	-10 days to +10 days	+31.80 (162,36.52)	+2.35 (161,3.02)
Merger Studies				
Dodd (1980)	1970-1977	-20 days to day 0	+21.78 (71,11.93)	+0.80 (60,0.67)
Eckbo (1983)	1963-1978	-20 days to +10 days	+14.08 (57, 6.97)	+1.58 (102,1.48)
Asquith (1983) and Asquith, Bruner & Mullins (1983)	1962-1976	-19 days to day 0	+13.30 (211,15.65)	+0.20 (196,0.25)
Malatesta (1983)	1969-1974	announcement month	+16.80 (83,17.57)	+0.90 (256,1.53)

* Data for this table are from Jensen and Ruback (1983). In column (3) days are expressed in event time where day 0 is the announcement date. In columns (4) and (5), the number of firms in the sample and the t-statistic are given in parentheses.

in tax-free one.[11] These higher premiums may serve to compensate target firms' shareholders who are faced with an immediate capital gains tax liability in taxable acquisitions; the premiums may be smaller in tax-free acquisitions since the capital gains tax liability can be deferred.[12]

Extensions Made in this Study

This study differs from the previous empirical studies in several ways. First, reasons why the tax attributes of the target firm may or may not be related to the acquisition announcement period returns are discussed. Gilson, Scholes and Wolfson address this point, focusing primarily on a perfect markets setting. As yet, the extent to which real world imperfections limit alternative means of utilizing tax benefits is not clear.

Second, additional variables that may be related to the announcement returns are identified and incorporated into explanatory models. In particular, the type of acquisition offer would appear to be a significant variable which should be controlled for in developing models to explain the acquisition period returns. Third, the methods used to measure the magnitude of the tax attributes are thought to be considerably more accurate than those used in earlier studies. The primary improvement here is in the way the step-up is measured from the target and the acquiring firms' perspectives.

Finally, the analysis considers not only the relationship between the target firm's returns and the tax variables, but also the same relationship for the acquiring firm's returns.[13]

In addition to examining the relationship between announcement period returns and the tax attributes of interest, two other tests are performed to provide further information about tax attributes in acquisitions. In the first, the market's reaction to IRS rulings on the tax status of acquisition are examined. The second test assesses the impact of a proposed change in the tax law that would have retroactively affected the value of the step-up to acquiring firms. These tests are described in detail in Chapter IV.

In the next chapter, the conditions necessary for the tax variables to be a source of the acquisition period gains are explored and hypotheses are developed.

Notes to Chapter II

[1] The studies done by Niden and Crawford are (to the best of my knowledge) currently being completed for their doctoral dissertations. The methodologies described and results presented here are based on their proposals and thus may not reflect the final versions of their studies.

[2] It is not clear why tax attributes of the acquiring firm would be expected to influence the price paid to acquire the target firm.

[3] An examination of the amount of the NOL carryforward reported for financial reporting and tax purposes reveals that the former amount (which is usually the amount reported by Compustat) is significantly lower than the amount reported for tax purposes. For 52 firms acquired during the 1977-1984 period with NOL carryforwards when acquired, the mean values of the carryforwards for financial reporting and tax purposes were $12.524 million and $24.744 million, respectively. The difference is significant at the .01 level (t-statistic = 2.85).

[4] ACRS had not yet been introduced. Further, inflation did not become severe until the mid- to late-1970s.

[5] Other examples where the hypotheses are not well-specified are as follows. The acquiring firm is predicted to prefer a taxable acquisition if the potential step-up is large (hypothesis two). However, it is expected to have to pay a larger premium to the target firm's shareholders to obtain this step-up (hypothesis six). But if the market to acquire the step-up is competitive, the acquiring firm will be indifferent to the size of the step-up and the target firm's shareholders will extract the full value of the step-up in the purchase price. Similarly, if a target firm has a large NOL carryforward, the value of this tax attribute might also be associated with a higher price removing the reason for tax-free preference (hypothesis four).

[6] For example, if on average the stockholders of firm A purchased their shares for $4 per share and the offer price is $20 per share, the construction of the capital gains variable as shown in Table 2b definition (a) would result in a value of 0.8. If the stockholders of another firm B purchased their shares at an average price of $1 per share and the price five days before acquisition is $5 per share, the measure also equals 0.8. However, the capital gains liability for shareholders of firm A is four as large as it is for shareholders of firm B. This

measure is thus valid only if the shareholders of firm B hold four times as many shares (i.e., have an equal dollar investment) as the shareholders of firm A.

[7] Niden cites Constantinides (1983).

[8] Crawford (p. 15) defines the median shareholder as the last shareholder that agrees to sell his shares before a change of control occurs. He notes in footnote 12 that his use of the term "median" implies that the purchase of a simple majority of target shares is sufficient to accomplish a takeover. If a supermajority of, say, 75% is required to transfer control, the median shareholder is defined as the third quartile shareholder.

[9] Since the value of various tax attributes (i.e., a step-up in the asset basis, NOL carryforwards and unused tax credits) to the acquiring firm depends on the tax status of the acquisition, this may be a serious omission.

[10] Results of Schipper and Smith (1986) suggest that management buyouts may be undertaken to take advantage of increased interest deductions since in some cases these deductions appear to "pay" for the firm. Management buyouts however may viewed as a means of refinancing the firm, replacing equity with debt. In contrast, when an acquiring firm purchases a target firm with debt, it is increasing its debt level.

[11] This conclusion may be erroneous due to the assumption about the relationship between the type of proposal (tender offer or merger bid) and the tax status of the resulting acquisition. It is true that all successful cash tender offers result in taxable acquisitions. However, the tender offer samples may also include stock offers which often result in partially taxable or tax-free acquisitions. Further, merger bids may result in combinations that are taxable, partially taxable or tax-free. The tax status of the various acquisitions investigated in past studies cannot be determined due to limited information about the sample characteristics. Thus, the results of these studies only suggest that the tax variables associated with taxable and tax-free acquisitions produce gains of different magnitudes.

[12] On a more general level, it may be the case that the aggregate value of tax attributes available in taxable acquisitions (and not just the recognition of the capital gains tax) are worth more to the acquiring firm than those associated with tax-free acquisitions.

[13] In a perfectly competitive setting, only the target firm will benefit from the tax attributes. However even if some degree of competition is present, as long as perfect competition does not prevail both the target and acquiring firms can benefit as summarized by Ruback (1983, p. 145).

CHAPTER III

TAX ATTRIBUTES AS A SOURCE OF ANNOUNCEMENT PERIOD GAINS

In this chapter, the conditions necessary for tax attributes to be a source of the announcement period returns are explored. As noted in Chapter II, Gilson, Scholes and Wolfson (1986) raise several interesting points regarding tax benefits as a motivation for acquisition and also discuss conditions under which tax variables may be a source of acquisition period gains. Their arguments, where relevant, are included in the discussion below. However, the Gilson et al., analysis differs from this study in that they are concerned with whether the tax system favors acquisitions. That is, will an acquisition be undertaken solely to achieve a tax benefit? The focus of this study is different. The question of interest is, given that an acquiring firm has decided to affect an acquisition (perhaps for non-tax-related reasons), do tax variables explain the acquisition period returns?

Tax Attributes as a Source of Gains

In the following sections, each tax attribute examined in this study is discussed separately since the nature of these attributes differs. It is assumed that the tax attributes are being valued in a world of

imperfect markets where information and transactions costs exist, assets are not perfectly divisible and non-tax-related operating efficiencies are available to the combining firms.

Step-Up in the Asset Basis

As noted earlier, the so-called step-up in the asset basis is frequently viewed as a tax advantage accruing to the acquiring firm. The argument here is that the acquiring firm can take depreciation on an amount greater than that depreciated by the target firm thereby reducing its tax liability. For example, suppose that the target firm's depreciable asset basis is A_0 and the fair market value of these assets is A_1 where $A_1>A_0$. Assuming that the acquiring firm pays A_1 to purchase the assets, the increase A_1-A_0 is available to the acquiring firm as a depreciation deduction that was not available to the target firm. However, the acquiring firm can obtain the same depreciable basis, A_1, from purchasing the assets piecemeal rather than from the target firm or it could purchase the assets from a different target firm having an asset basis of say A_2 where $A_1>A_2$. The amount of the increase in the asset basis is thus not a concern to the acquiring firm. Acquiring an asset with a basis of A_1 where A_1 is greater than A_0 does not provide a tax benefit to the acquiring firm (other than the usual depreciation deduction) since it must pay A_1 to realize a tax savings with a present value that is less than A_1.

However, suppose that the acquiring firm can claim that some portion of the price paid for the target firm's nondepreciable assets, ND, was actually spent to purchase the target firm's depreciable assets. The acquiring firm's basis becomes A_1+ND and it does benefit from this "added step-up" by an amount equal to the present value of the depreciation deductions associated with ND.[1] (Hereafter, the amount allocated to the asset basis above the fair market value of the assets will be referred to as the added step-up.) Deliberate falsification is not necessary to obtain an added step-up. Under the so-called "second-tier" allocation method, all assets including nonamortizable intangibles are first individually valued. The excess of the total price over the aggregate of such values is then allocated among the assets in accordance with their relative values as an addition to their basis. In addition to this opportunity to increase the step-up, acquiring firms may be able to take advantage of the "noise" involved in acquisitions where multiple assets change hands. Since it is costly for the IRS to strictly monitor allocations of the purchase price to assets, acquiring firms may be able to overstate depreciable assets beyond the legal limits (fair market value) specified by the IRS.[2] Table 4 indicates that allocations above fair market value do occur.

From the target firm's point of view, selling depreciated assets at their current market price, if this

TABLE 4

AMOUNT ALLOCATED TO TARGET FIRMS' DEPRECIABLE ASSETS

Note No.	Item	Amount	Percent
(1)	Total No. of Firms Examined	27	(100.0%)
(2)	Firms with Allocated Amount > FMV	22	(81.5%)
(3)	Average Value of Depreciable Assets	$110.308	(100.0%)
(4)	Average FMV of Depreciable Assets	$127.516	(115.6%)
(5)	Average Amount Allocated to Depreciable Assets	$140.091	(127.0%)
(6)	Estimated Amount Allocated to Depreciable Assets	$141.746	(128.5%)

Notes to Table 4:
The numbers on the notes below correspond to the numbers in parentheses in column one above.

(1) The firms included in this table were involved in successful acquisitions during the 1977-1984 period. To be included in this table, current cost data for the target firm and information on the amount the acquiring firm allocated to the target firm's depreciable assets had to be available.

(2) This is the number of firms where the amount allocated to depreciable assets (determined from the acquiring firms' financial statements in the acquisition year and through conversations with financial personnel of the acquiring firms) exceeds the fair market value (FMV) of these assets (defined as the current cost of these assets reported in the target firms' financial statements in compliance with Financial Accounting Standard (FAS) 33 at the year-end prior to the year of the acquisition announcement).

(3) The value of depreciable assets is defined as the net book value of plant and equipment reported in the target firm's financial statements at the year-end prior to the year of the acquisition announcement. All dollar figures are in millions.

(4) FMV is defined in note (2).

(5) The amount allocated to depreciable assets is defined in note (3).

(6) This estimated amount was determined using the procedure discussed in Chapter IV and in the discussion of ASTEPUP in Appendix E.

price exceeds the depreciable basis, enables the firm's shareholders to realize the appreciation on their assets. The step-up may thus be viewed as being potentially advantageous to the target firm's shareholders. If the step-up is a source of the target firm's acquisition announcement period returns, its realization must have been unanticipated prior to the announcement. That is, the market must assess a low probability to the event that the step-up will be realized by the target firm. For this to occur, the market must (a) assign a low probability to the event that the step-up will be realized via acquisition and (b) assign a low probability to the event that the step-up will be realized through non-acquisition-related methods.

Addressing the latter point, as Gilson et al., note, there are alternative ways of realizing the appreciated value of depreciable assets such as through individual asset sales or through sale and leaseback arrangements. If these are viable options, the market will capitalize the value of the step-up whether or not an acquisition is likely, discounting the increased cash flows to reflect the timing of the realization and netting out any transactions costs. If there are no viable means of realizing the step-up other than through acquisition, the value of the step-up reflected in the target firm's stock price depends on the market's probability assessment that the firm will be acquired.

Barriers to alternative ways of realizing the step-up may exist. For example, from a practical standpoint, assets may be indivisible. It may be difficult to sell those assets that have appreciated in value given that they are needed to perform the operations of the firm and to replace them with comparable assets from the proceeds of the sale. In such cases, selling the entire firm may be the only means of realizing the step-up. Or, if over time the target firm fails to take advantage of these alternative means of securing the step-up, the market may continually reduce its assessment of the probability that the step-up will be utilized via a means other than through acquisition. Finally, as Gilson et al., note, transactions costs associated with selling assets piecemeal and transporting them to another location may be prohibitive making an acquisition the only viable means of obtaining a step-up. In such cases, the acquisition announcement could increase the market's probability assessment of realization of the step-up significantly and a relationship between the size of the announcement period returns and the magnitude of the tax variables would be expected.

Even if the likelihood of the step-up being realized by other methods is low, the value of the step-up will still be reflected in the target firm's stock price prior to the acquisition announcement if the market assesses a high probability to the firm being acquired and the step-

up being realized as a result of the acquisition. On average, however, the market does not appear to be adept at predicting target firms. Palepu (1986) provides strong evidence that target firms cannot be predicted from a model using publicly available information.[3] In the situation where an acquisition is the primary means of realizing the step-up, announcement of an acquisition also conveys news about the realization of the step-up. The announcement period returns to the target firm's shareholders would be correlated with the magnitude of the step-up.

As noted above, the step-up per se is not of value to the acquiring firm. However, if the acquiring firm can allocate an amount greater than the fair market price to depreciable assets, then the added step-up is of value to it. This is the critical issue regarding the added step-up: Can acquiring firms significantly add to the depreciable basis of the acquired assets? If they can, there is no reason to expect the associated benefits to be capitalized in the acquiring firm's stock price prior to the acquisition announcement since this added step-up is available to the acquiring firm only through acquisition and acquisitions do not appear to be predictable events. Further, the acquisition announcement conveys information about the price offered by the acquiring firm. Since the added step-up is likely to vary positively with this price, the announcement also conveys information about the

magnitude of the added step-up. (In the section entitled "Other Tax-Related Hypotheses" at the end of this chapter, the added step-up is examined in more detail.)

Depreciation Recapture Taxes

Realization of a step-up is of benefit to the target firm's shareholders. Yet there are costs associated with the realization of these benefits. In particular, depreciation may have to be recaptured and taxed as ordinary income and the target firm's shareholders will have to recognize any capital gains in the year of the acquisition. These two costs are different in that the capital gains tax varies with the price paid by the acquiring firm whereas the depreciation recapture tax varies only up to a certain point (i.e., the "excess depreciation" for Section 1250 property; for Section 1245 property and Section 1245 recovery property, the price paid for the assets if the price is lower than the post-1961 depreciation or the post-1961 depreciation if the price exceeds that amount). Depreciation recapture taxes are regarded here as a cost of affecting a taxable acquisition that reduces the value of the step-up to the target firm's shareholders. Whether or not the step-up is reflected in the target firm's announcement period returns as described in the section above is thus considered net of depreciation recapture taxes.

Capital Gains Tax Liability

The aggregate capital gains tax liability depends on the original price paid by the target firm's shareholders to acquire each share of stock and the price paid by the acquiring firm as follows:

$$\text{Aggregate Capital Gains Liability} = \sum_i \{[\sum_s (\text{Price}_s - \text{Basis}_{si})]\ (CG_i)\}$$

where Price_s is the price per share offered by the acquiring firm, Basis_{si} refers to the basis of each share of stock, s, held by individual i and CG_i is the individual's tax rate on the capital gain. The total capital gains liability resulting from the acquisition is the sum of these individual tax liabilities.

The capital gains tax, while levied directly on the individual shareholders of the target firm, may be passed through to the acquiring firm depending on the relative bargaining strength of the two firms.[4] At one extreme, in a perfectly competitive setting where the target firm is regarded as a homogenous bundle of assets by all potential acquiring firms, there is one market price for the target firm reflecting the maximum value of the tax variables, the non-tax-related assets and any synergies expected from combination. In this case, an acquiring firm desiring a taxable transaction will not be successful in acquiring the target firm because the after-tax proceeds to the target firm's shareholders will be less than the proceeds from a tax-free acquisition. Here the announcement period

returns will not be associated with the capital gains liability since the liability will be deferred due to the tax-free nature of the transaction. At the other extreme, where the target firm is valued differently across potential acquiring firms depending on the value of the combined firms after acquisition, the firm offering the highest after-tax price would, ceteris paribus, be successful in acquiring the target firm. Here, the successful acquiring firm in taxable acquisitions can be viewed as bearing the burden of the capital gains liability through a higher acquisition premium.[5]

If acquisitions, their tax status and the acquisition price are predictable, any premium associated with the capital gains tax will be reflected in the target firm's stock price prior to acquisition. However, to the extent that these are not anticipated by the market, if the successful acquiring firm in taxable acquisitions compensates the target firm's shareholders for the capital gains tax so that they prefer or are at least indifferent to a taxable acquisition and the highest tax-free offer received, the announcement period returns would be expected to be related to this tax liability.

Net Operating Loss Carryforwards and Unused Tax Credits

Although the tax benefits provided by NOL carryforwards and unused investment and foreign tax credits differ in that carryforwards are a deduction from income and credits are used to directly offset taxes, they

are similar in nature in that they both transfer to the acquiring firm in tax-free acquisitions and reduce the acquiring firm's tax liability. Thus the following discussion applies equally to carryforwards and credits although it is couched in terms of NOL carryforwards.

As was true with the step-up in the target firm's asset basis, the extent to which the tax benefits stemming from utilization of a target firm's NOL carryforwards are capitalized in its stock price prior to the acquisition announcement depends on (a) the probability that the firm itself will realize the benefit provided by the carryforward in the absence of an acquisition and (b) the probability that the firm will be acquired in a tax-free reorganization by an acquiring firm that will be able to utilize the carryforward. Both of these probabilities are adjusted to reflect when the utilization is expected to occur and the marginal tax rate of the firm utilizing the carryforward.

With respect to (a), Gilson et al., note that in a perfect market setting, alternatives to acquisition exist as a means of utilizing a firm's NOL carryforwards. For example, the firm can issue equity or sell depreciable assets that have appreciated in value and use the proceeds to buy taxable bonds. The NOL carryforward can then be used to reduce taxable income generated by the bonds. In a world of imperfect markets, these alternatives may or may not be available. If they are, then the value of the

NOL carryforward will be capitalized in the target firm's stock price prior to the acquisition announcement. The only revision upon announcement of an acquisition may be due to a reassessment of when the benefit provided by the NOL carryforward will be realized, not whether it will be realized. In this case, there will not be a relationship between the announcement period returns and the magnitude of the NOL carryforward.

On the other hand there may be barriers to these alternative methods of utilizing the carryforward. Firms may not have the wherewithal to secure funds to invest to generate taxable income. Or, if the NOL carryforward is particularly large, the firm may be able to generate only a small portion of the funds needed to offset the carryforward.[6] An acquisition may be the only viable means of realizing this tax benefit. If this were the case and if the market assigns a high probability of acquisition to firms with NOL carryforwards, then the announcement period returns are still unlikely to be related to the magnitude of the carryforward.

If Palepu's (1986) results apply equally to firms with NOL carryforwards,[7] the market's assessment of the probability of acquisition prior to the acquisition announcement is likely to be low. Also, information provided in Table 5 suggests that relatively few large firms with NOL carryforwards are acquired.[8,9]

TABLE 5

ACQUISITION OF FIRMS WITH NOL CARRYFORWARDS

Year	(1) Number of Firms with NOL Carryforwards	(2) Number (Percentage) of Firms with NOL Carryforwards Acquired
1965	66	0 (0.00%)
1966	79	0 (0.00%)
1967	113	2 (1.77%)
1968	177	14 (7.90%)
1969	195	10 (5.13%)
1970	210	7 (3.30%)
1971	277	7 (2.51%)
1972	279	11 (3.93%)
1973	274	8 (2.89%)
1974	335	9 (2.68%)
1975	368	8 (2.16%)
1976	339	12 (3.54%)
1977	335	13 (3.88%)
1978	302	16 (5.23%)
1979	293	11 (3.75%)
1980	280	6 (2.14%)
1981	293	10 (3.41%)
1982	380	9 (2.37%)
1983	385	9 (2.34%)
Total	4,980	162
Avg/Year	262.1 (100.0%)	8.5 (3.25%)

Notes to Table 5:

(1) This column was formed by adding the number of firms on the Compustat Industrial File that report positive NOL carryforwards in a given year to the number of firms on the Compustat Research File that report positive NOL carryforwards in that same year and that had not yet been delisted.

(2) This column includes all firms on the Compustat Research File that had an NOL carryforward within two years of the time of acquisition. The percentages given in parentheses are formed by dividing the numbers in column two by those in column one. (A total of 146 firms had an NOL carryforward at the time of acquisition. If only this group of firms is considered, the average percentage of firms acquired with NOL carryforwards drops from 3.25% to 2.93%.)

Even if the market's estimate of the likelihood of acquisition is not low, its assessment of the probability that an acquisition will qualify for tax-free status (and correspondingly, that the NOL carryforward will be available to the acquiring firm) may be low. Recall from Chapter I (and Appendix A) that there are numerous IRC rules and regulations that must be met to qualify for tax-free status. Not all acquisitions of firms with NOL carryforwards are made via tax-free acquisitions. For example, only 30% of the target firms with NOL carryforwards as reported in Table 5 were acquired in tax-free transactions.[10] Obtaining tax-free status may be particularly difficult if the target firm has an NOL carryforward. As Bittker and Eustice (1979, p. 16-4) note:

> It seems safe to say that the judicial climate is hostile to taxpayer efforts to secure corporate tax benefits by merger or other forms of (tax-free) acquisition; some judges and commentators apparently feel that traffic in corporate tax benefits, most notably net operating loss carryovers, is akin to original sin, but not all authorities are so disposed. In any event, the taxpayer must thread his way through a formidable array of statutory provisions and court decisions (to qualify for tax-free status). (Parentheses added.)[11]

If these obstacles to utilization exist, announcement of an intended tax-free acquisition will convey news about the value of the target firm's NOL carryforward.[12] In this case, the size of the announcement period returns to the target firm's shareholders would be expected to be related to the magnitude of the NOL carryforward.

Assuming that the NOL carryforward is not capitalized in the target firm's stock price prior to an acquisition announcement, whether or not the associated benefits will be reflected in the acquiring firm's announcement period returns again depends on the relative bargaining power of the target and acquiring firms. To the extent that the target firm is valued homogeneously by potential acquiring firms, the target firm will capture the benefit of the carryforward and the magnitude of this attribute will not be related to the acquiring firm's returns. However, if acquiring firms value the target firm differently, then the successful acquiring firm's returns could reflect the carryforward.

The length of time that an NOL carryforward has been in existence may be an important factor governing the relationship between announcement period returns and the carryforward. For example, if some portion of the carryforward is due to expire in the period shortly following the acquisition announcement, the market may assess the probability of its use before expiration as being fairly low (i.e., the probability of utilization decreases over time). In this case, news of a possible acquisition would change the probability assessment and the announcement period returns would be related to the magnitude of the amount of the carryforward due to expire. On the other hand, if the market assesses a relatively low probability to the event that carryforwards will be

allowed to expire (i.e., the probability of utilization increases over time), then the presence of expiring attributes indicates that the carryforward will have been capitalized in the target firm's stock price prior to the acquisition announcement. There will not be a significant relationship between the target or acquiring firms' announcement period returns and the magnitude of this tax attribute. Because the market may evaluate the expiring and nonexpiring portions of carryforwards and unused credits differently, they are considered separately in this study.

Hypotheses about Tax Attributes

Tax Variables

Hypotheses based on the preceding discussion about the relationship between announcement period returns and the tax attributes examined in this study are stated below. The assumption underlying these hypotheses is that the values of tax attributes are not reflected in the involved firms' stock prices prior to an acquisition announcement. The null hypothesis in each case is that the value of the attribute is capitalized prior to the announcement and thus it is not related to the announcement period returns.

In tax-free acquisitions, the hypotheses focus on NOL carryforwards and unused tax credits, and the portion of these attributes that might expire in the absence of an acquisition as follows:

H1: In tax-free acquisitions, the announcement period returns realized by the target and acquiring firms' shareholders increase as the magnitude of NOL carryforwards and unused investment and foreign tax credits available for tax purposes increases.

H2: In tax-free acquisitions, the announcement period returns realized by the target and acquiring firms' shareholders increase as the portion of the NOL carryforwards and unused credits due to expire within the near future increases.

In taxable acquisitions, the hypotheses focus on the step-up net of depreciation recapture taxes for the target firm, the added step-up for the acquiring firm, and the effect of capital gains taxes as seen below.

H3: In taxable acquisitions, the announcement period returns realized by the target and acquiring firms' shareholders increase as the step-up in the asset basis and the added step-up increase, respectively.

H4: As the aggregate capital gains liability arising in taxable acquisitions increases, the announcement period returns realized by the target firm's shareholders increase and those realized by the respective acquiring firm's shareholders decrease.

These hypotheses apply only to acquisitions with the appropriate tax status. For instance, if firms involved in taxable acquisitions have NOL carryforwards, then the announcement period returns are not expected to be related to the carryforwards for these firms.

Non-Tax Variables

The results of past studies suggest that several non-tax variables may also influence the magnitude of the announcement period returns. The ones included in this

study are those that have proven to be significant in other studies as described below.

Relative Size. Asquith, Bruner and Mullins (1983) find that the returns realized by the acquiring firm's shareholders are positively related to the relative size of the target and acquiring firms; there is a positive but statistically insignificant relationship between the magnitude of the returns realized by the target firm's shareholders and relative size.[13] Accordingly, relative size is considered in this study.

Type of Offer. As discussed in the literature review, there is also evidence that the type of acquisition offer is related to the announcement period returns of the involved firms. On average, both target and acquiring firms involved in tender offers experience higher announcement period returns than do firms involved in mergers. Since most tender offers tend to be cash transactions and therefore taxable and a number of the large mergers that have occurred are tax-free, it is important to try to separate differences in returns arising from the tax status of the transaction from those related to the type of offer. Accordingly, both taxable and tax-free tender offers and mergers are examined.

Number of Bidders. Bradley, Desai and Kim (1982) find that the target firm's announcement period returns are positively related to the number of acquiring firms bidding for the firm. Successful acquiring firms' returns

are negatively related to the number of active bidders for a given target firm. Number of bidders thus provides a measure of the level of competition present in the bidding process.[14]

Resistance. The evidence suggests that managerial resistance to an acquisition attempt is significantly related to the announcement period returns, although the evidence about the direction of the impact is contradictory. Kummer and Hoffmeister (1978) find that the target firm's returns are higher if its managers contest the acquisition. In contrast, Dodd's (1980) results indicate that managerial opposition harms the target firm's stockholders. Whether or not the target firm's managers resist the offer is thus controlled for in this study.

Past Performance. Several studies find that target firms experience negative abnormal returns over a period ending before the acquisition announcement. While there are no studies to date that directly link these abnormal returns with performance measures,[15] Jensen and Ruback (1983) note that such performance is consistent with inefficient management of the target firm. Controlling for the performance of the target firm's managers would appear to be particularly important when examining NOL carryforwards and unused credits. Poor management may result in the presence of these tax attributes. In such

cases, these variables may capture that effect rather than the value of the tax attributes per se.

Other Tax-Related Hypotheses

In addition to examining the above hypotheses, two additional hypotheses are examined to determine the extent to which tax considerations are important in acquisitions. The first concerns how important the tax status of acquisition is to the involved firms. The second hypothesis further explores the value of the added step-up in the asset basis to acquiring firms. These hypotheses are discussed below.

IRS Rulings on Tax Status

Frequently an acquiring firm, after making public its intention to acquire a particular target firm in a tax-free acquisition, will ask the IRS to rule on the likely tax status of the transaction if there is uncertainty as to whether the tax-free status will be approved. The IRS considers the type of consideration to be offered to acquire the target firm and the form of the subsequent combination and makes a tentative ruling as to the probable tax status; there is no guarantee that the tax courts will uphold these rulings. These rulings are private, yet the IRS opinion is often made public by the involved firms. Analysis of the market's reaction to these rulings may provide further information about the tax attributes available in tax-free acquisitions.

The hypothesis examined regarding these rulings is:

H5: Target and acquiring firms that seek IRS rulings experience significant stock price increases if the IRS rules in favor of tax-free status. If an unfavorable ruling is received, stock prices of these firms will significantly decline.

IRS Regulation on Step-Up

The second hypothesis concerns the added step-up in the asset basis available to the acquiring firm in taxable acquisitions. This analysis involves examining the market's reaction to an IRS regulation that could have had the effect of severely reducing the value of the added step-up to acquiring firms that had already taken advantage of this tax benefit. Details of the regulation are as follows.

In late January, 1986, the IRS issued temporary regulations prohibiting acquiring firms from assigning any of the excess between the purchase price and fair market value of target firms' assets to depreciable assets. (Recall from the earlier discussion that the ability to allocate this excess to depreciable assets is what makes the change in the asset basis of value to the acquiring firm.) Instead, it was mandated that the excess be assigned to goodwill or going concern value, both nondepreciable assets. The regulation was retroactive to August 31, 1982 and would effect all firms that had increased the asset basis of an acquired firm's assets. The first notice of this regulation to the financial community appeared in The Wall Street Journal in early

February. Over the next three-week period, various articles continued to appear about the proposed regulation. In April, after much discussion of the possible impact of this regulation, the IRS revised its position by exempting acquisitions that were consummated before January 30, 1986 and subsequent acquisitions if a binding contract was in effect on that date.

The market's reaction to this regulation provides insight on the value of the added step-up to the acquiring firm. Specifically, if acquiring firms have benefited from this tax attribute, those involved in taxable acquisitions between September 1, 1982 and December 31, 1985 where the potential to assign the excess purchase price to depreciable assets is high would be expected to have experienced negative abnormal returns when the regulation was made public as stated in the following hypothesis:

> H6: Acquiring firms in taxable acquisitions that would have been effected by the retroactive reallocation of the excess purchase price experienced negative abnormal returns during the regulation announcement period.

If abnormal returns were experienced, they are expected to be negatively related to the magnitude of the excess purchase price assigned to depreciable assets. This hypothesis is based on the assumption that the market either had no knowledge of the regulation at the time of its announcement and/or assigned a relatively low probability to its acceptance.

Similarly, this same set of acquiring firms is expected to have experienced positive abnormal returns when the IRS revision was made removing the retroactive clause. Again, this assumes that the market either was unaware of the possibility of revision or assigned a low probability to its passage. While the regulation received little if any coverage prior to January 1986, after the proposal was made public numerous articles were written speculating on its impact. It thus appears likely that there was little in the way of new information when the formal announcement was made that the retroactive portion of the regulation had been removed. Therefore, the market's reaction to the revision is likely to be far less significant than its reaction during the regulation announcement period.

In the next chapter, data sources to examine the hypotheses are identified, the models used are presented and the methodology is discussed.

Notes to Chapter III

[1] Gilson et al., consider the advantage of a piecemeal asset sale over an acquisition as a means of achieving the step-up from the target firm's point of view. They do not consider the advantage to the acquiring firm of depreciating the added step-up. However, if an acquisition makes this opportunity available to the acquiring firm, the acquiring firm may share this benefit with the target firm through payment of a higher price. The relative attractiveness of an acquisition from the target firm's point of view would then increase.

[2] In keeping with the prevailing notion that the tax benefits available through acquisition should be reduced, the Tax Reform Act of 1986 seeks to eliminate the possibility of an added step-up by disallowing the second-tier allocation method. Instead it requires that the "residual method" be used by both the buyer and seller of a group of assets. (Heretofore, in some instances the buyer and seller could allocate different amounts to the same assets.) In the typical acquisition involving a purchase for a premium, the residual method maximizes basis allocations to goodwill, going concern value and other nonamortizable intangible assets at the expense of basis allocations to other assets such as depreciable property. The amounts allocated to tangible assets and amortizable intangibles are generally fixed at their fair market values.

[3] Among the variables examined, Palepu includes a "market-to-book value" defined as the market value of common equity divided by the book value of equity. This variable is used to see if firms with low market-to-book ratios are more likely to be target firms. This variable is not statistically significant in his model.

[4] Even if it is assumed that investors ordinarily adopt portfolio strategies that serve to mitigate their capital gains liability (which does not appear to be the case as discussed in Poterba (1985)), avoiding the capital gains liability arising from taxable acquisitions may be difficult. Investors may have a relatively short planning horizon following the acquisition announcement in which to generate the losses needed to offset long-term capital gains (see Appendix B). Further, it may be costly for them to realign their portfolios to offset these gains.

[5] It is a matter of interpretation as to whether or not the price paid by the acquiring firm compensates for the capital gains tax or whether a higher or lower value is being assigned to the target firm's assets. For example, consider a target firm with tangible assets worth

$75 and potential synergies homogeneously valued by the market at $25. No acquiring firm would be willing to pay $110 to secure assets worth only $100. An acquiring firm that offers to pay $110 could be said to bear the burden of the capital gains tax, assuming that the tax is $10. Now assume that all acquiring firms still value the assets at $75 but value the potential synergies differently. If one acquiring firm offers $100 and a second acquiring firm offers $110, it must the case (assuming the managers are maximizing shareholder value) that the second firm places a value of at least $35 on the potential synergies. Similarly in the case of taxable acquisitions, the successful acquiring firm is usually the one offering the highest after-tax price. (The exception arises in situations where white knights are the favored contenders in spite of a lower offer price.) From the target firm's shareholders' perspective, they are being compensated for the capital gains tax. From the acquiring firm's perspective, it is willing to pay a higher price than competing firms because it places a higher value on the target firm.

[6] Chrysler Corporation had a substantial NOL carryforward in the early 1980s. Given its financial problems, it is doubtful that it could have borrowed the funds needed to generate taxable income from investments against which to use the carryforward.

[7] Palepu's model does not include NOL carryforwards. The only variable that may provide information about the firm's profitability (and indirectly about the presence of carryforwards or unused credits) is his use of the Price/Earnings ratio.

[8] These firms are deemed relatively large because in order to be included in the Compustat database, it is required that they meet various size requirements.

[9] Over the same period from 1965 to 1983, an average of 2.79% of the Compustat firms in any given year were acquired. Thus a slightly greater percentage of firms with NOL carryforwards was acquired as compared with the percentage of firms (including those with NOL carryforwards) acquired in general.

[10] Information on acquisition tax status could be clearly determined for 133 of the 162 acquisitions. Of these 133, 40 (30.1%) were structured as tax-free reorganizations.

[11] The difficulty in meeting the tax-free requirements is complicated not only by the stringency of the conditions that must be met but also by the complexity

of the restrictions themselves as highlighted by the following quote from Tax Notes (1984, p. 1249):

> The current restrictions on operating losses are a technical maze, understandable only by those high priests of the tax profession--Philadelphia tax lawyers, Cleveland tax accountants, and their kindred.

[12] The information contained in the acquisition announcement about an NOL carryforward may differ from that about the step-up or capital gains liability. In general, if an acquiring firm purchases a target firm in a tax-free reorganization, the full NOL carryforward becomes available to the acquiring firm. The maximum amount of the carryforward available does not increase with the price paid by the acquiring firm and thus the offer price would not provide useful information to the market about the magnitude of the carryforward. In contrast, to the extent that the step-up and, more likely, the added step-up vary with price, and because the capital gains liability depends on the price, information about the offer price is likely to be relevant in determining the magnitude of these tax attributes.

[13] Asquith, Bruner and Mullins (1983) measure relative size as the natural logarithm of the market value of equity of the target firm divided by the market value of equity of the acquiring firm. Since size is used in this study as a control variable rather than as a variable of interest per se, relative asset size was deemed a "cleaner" measure. It avoids econometric problems that may arise from having the ratio of the market value of equity of the target and acquiring firms as an independent variable in a model where some of the other independent variables are standardized by the equity value of either the target or acquiring firm, depending on the sample examined.

[14] Number of bidders is a weak measure of competition because although there may only be one known firm seeking to acquire a target firm, there may be other firms that are also interested in acquiring the target firm whose identities are not known. (Of course, the identity of one such competing firm, as represented by the current firm's managers, is known.) These firms do not bid for the target firm because the price offered by the known firm precludes the offer they would have made. Competition is implicit in such cases and cannot be ascertained from the number of bidding firms.

[15] This issue is currently being addressed in Adams and Hayn (1987).

CHAPTER IV

DATA, MODELS AND METHODOLOGY

This chapter begins with a discussion of how the target and acquiring firms were identified and the sources and criteria used to gather the data on the tax and non-tax variables. Next, the models examined are presented and the hypotheses are restated in terms of the models. The methodology used to compute announcement period returns and to measure the variables in the models is then explained. The chapter concludes with a discussion of the methodology used to examine the other tax-related hypotheses.

Data

In this study, successful acquisitions announced in the period from 1977 to 1984 are examined. Acquisitions were determined by first identifying target firms. Target firms were selected from firms delisted due to acquisition from the Center for Research in Security Prices (CRSP) database, Standard and Poor's Compustat Research File and the FAS 33 database. The respective acquiring firms were then identified using The Wall Street Journal Index, The Wall Street Journal, issues of Mergers and Acquisitions, the SEC's News Digest and Prentice-Hall's Capital Adjustments. The acquisition was deemed successful if the

target firm's shareholders voted to accept the acquiring firm's offer in the case of mergers and if the acquiring firm obtained the number of shares sought in a tender offer.

The Wall Street Journal and Moody's Industrial Manuals were used to determine if the acquiring firm had significant previous ownership in the target firm (defined as 10% or more of the outstanding stock) prior to the acquisition announcement. If it did, this acquisition was eliminated because the acquisition (and the effect of any tax variables) may have been anticipated at the time of this earlier stock purchase. (This filter also eliminated "clean-up" offers where the acquiring firm owned at least a simple majority (51%) of the target firm's stock prior to the acquisition announcement.) Several acquisitions that were accomplished in "steps" were also eliminated from the sample since a precise acquisition date could not be ascertained.[1]

Announcement and outcome date information was collected from The Wall Street Journal Index and The Wall Street Journal. The announcement date was defined as the first day on which the acquiring firm's name was mentioned as a potential acquirer. For instance, if it was reported that Firm A was interested in acquiring Firm B, or that Firm A was discussing the possibility of merging with or making a tender offer for Firm B, this was regarded as the announcement date. The outcome date was the day the

shareholders approved the acquisition in the case of mergers or on the date that the offer expired for tender offers. If no information on these events was available, the outcome date was defined as the day the acquisition became effective.

The tax status of the acquisition was ascertained primarily from Capital Adjustments and from information in the firms' proxy statements. In addition, if there was any uncertainty as to the tax status (such as when stock was exchanged or if stock and some other form of consideration such as debt or preferred stock was offered by the acquiring firm), the acquiring firm was asked to confirm the tax status.[2] If the tax status could not be determined, the acquisition was not included in the sample.

The market data needed to compute the stock returns and the market value of equity were obtained using the CRSP Daily Stock Return File and the CRSP Daily Master File.

The magnitudes of the step-up, the added step-up, NOL carryforwards and unused tax credits were estimated based on information provided in the firms' financial statements and by the firms themselves.[3] In addition, some current cost information used in computing the step-up measures was obtained from the FAS 33 database. The capital gains tax liability was estimated using price data obtained from the CRSP Master File.

Data for the non-tax variables were determined as follows. Information on the type of offer, tender offer or merger, was obtained from The Wall Street Journal, The Wall Street Journal Index or Capital Adjustments. If a tender offer was made and the firms subsequently merged, the transaction was regarded as a tender offer. The number of bidders was ascertained by examining The Wall Street Journal Index over the year preceding the acquisition announcement and the time period after the announcement up to the time when the acquisition became effective. Information on opposition was obtained from The Wall Street Journal Index and The Wall Street Journal. Data used to compute the performance measure were obtained from the CRSP Daily Return File.

Models

The models used to test the hypotheses in this study are presented in Table 6. Each model is examined for four groups of firms: target firms involved in taxable and tax-free acquisitions and acquiring firms involved in taxable and tax-free acquisitions. The hypotheses are restated in terms of the models as shown in quadrants I and III of Table 7. As noted earlier, the tax attributes of interest are hypothesized to be significant in explaining the announcement period returns only in the groups with the appropriate tax status. If NOL carryforwards are important, they should only be significant in explaining returns in the tax-free groups. Similarly, if the step-up

TABLE 6

MODELS TO EXAMINE TAX ATTRIBUTES*

Model 1: Tax Attributes in Tax-free Acquisitions

$$CAR_{in} = \alpha_1 + \beta_{11}NOL_i + \beta_{12}EXPIRE_i + \beta_{13}SIZE_i + \beta_{14}TYPE_i + \beta_{15}NUMB_i + \beta_{16}OPPOSE_i + \beta_{17}PERF_i + e_1$$

Model 2: Tax Attributes in Taxable Acquisitions

$$CAR_{in} = \alpha_2 + \beta_{21}STEPUP_i + \beta_{22}CGAINi + \beta_{23}SIZEi + \beta_{24}TYPE_i + \beta_{25}NUMB_i + \beta_{26}OPPOSE_i + \beta_{27}PERF_i + e_2$$

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Variable Definitions

Dependent Variable

CAR_{in} = the cumulative abnormal return of firm i for the n-day period around the acquisition announcement date

Tax Variables

NOL_i = the value of any NOL carryforward and unused investment and foreign tax credits

$EXPIRE_i$ = the value of any NOL carryforward and unused investment and foreign tax credits that will expire within two years subsequent to the year-end preceding the acquisition announcement

$STEPUP_i$ = the amount of the increase in the target firm's asset basis upon acquisition (net of any depreciation recapture taxes) when target firms are examined and the added step-up when acquiring firms are examined

$CGAIN_i$ = the total amount of taxes owed by the target firm's shareholders due to the immediate recognition of any gain occurring as a result of the acquisition

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TABLE 6
(continued)

Non-Tax Variables:

$SIZE_i$ = the relative size of the target and acquiring firms

$TYPE_i$ = the type of bid with 1 representing a tender offer and 0 representing a merger proposal

$NUMB_i$ = the number of bidders attempting to acquire the target firm with 1 representing the presence of two or more bidding firms and 0 representing the presence of only one bidding firm

$OPPOSE_i$ = whether actions were taken to prevent the acquisition with 1 representing actions taken by the target firm's managers or shareholders to prevent the acquisition and 0 otherwise

$PERF_i$ = the performance of the target firm's managers over the one-year period prior to the acquisition announcement period

e = the residual term

* A more detailed description of the variables in the models is presented in the methodology section which follows.

TABLE 7

HYPOTHESES IN TERMS OF MODELS*

		Hypothesized Direction of Sign of Coefficient			
	Hypothesis:	H1	H2	H3	H4
	Model:	1		2	
	Tax Attribute:	NOL	EXPIRE	STEPUP	CGAIN
Model	Sample	$\beta 11$	$\beta 12$	$\beta 21$	$\beta 22$
1	Tax-free Acquisitions	I		II	
	- Target Firms	>0	>0	=0	=0
	- Acquiring Firms	>0	>0	=0	=0
2	Taxable Acquisitions	IV		III	
	- Target Firms	=0	=0	>0	>0
	- Acquiring Firms	=0	=0	>0	<0

* The quadrants discussed in the text are designated by Roman numerals in the table.

(or added step-up) is related to the announcement period returns, it should only be significant for firms involved in taxable transactions. Examining the models on groups of firms involved in acquisitions where the tax status precludes the tax attributes from being of value to the involved firms as shown in quadrants II and IV of Table 7 serves as a check on the reliability of the measures used.

Methodology to Examine Hypotheses about Tax Attributes Announcement Period Returns

Abnormal returns for the target and acquiring firms were found using an "event study" approach as described in more detail in Appendix D. This methodology uses return data prior to the announcement date (the event date) to estimate regression parameters of the market model. These regression parameters are used to estimate the return of the firm's stock for each day in the announcement or event period. Abnormal returns are then calculated by subtracting the estimated return from the actual return on a given day t as follows:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$$

where AR_{it} is the abnormal return for firm i on day t, R_{it} is the actual return for firm i on day t and the expression in parentheses is the predicted return from the market model where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the regression parameters and R_{mt} is the return on the market on day t.

The cumulative abnormal returns, CAR_{in}, used in the cross-sectional regressions are formed by adding the

abnormal returns for a firm from day -9 through day 0, the announcement date. This 10-day period was used because preliminary analysis indicated that for approximately 97% of the firms in the sample, the announcement period effects as measured by statistically significant daily abnormal returns occurred within this period.

Tax Variables

The measures used to estimate the tax attributes are explained below. In this study, these measures are divided by the market value of equity of the firm being examined. This is done to standardize the amount of the tax attribute per dollar of equity outstanding. The market value is determined 40 trading days prior to the acquisition announcement by multiplying the firm's stock price at that time by the number of shares of the firm's stock outstanding. For example, the NOL variable is standardized by the market value of equity of the target firm that incurred the carryforward when target firms' returns are examined and by the market value of equity of the respective acquiring firm when acquiring firms' returns are examined.

Tax-free Acquisitions. The two tax variables of interest in tax-free acquisitions are NOL carryforwards and unused tax credits, represented by the NOL variable, and the portion of these due to expire within the two-year period following the acquisition announcement, represented by EXPIRE. The tax value of these attributes rather than

the book value reported for financial reporting purposes was used in the computations described below.

NOL was determined as follows. The amounts of an NOL carryforward and any unused investment or foreign tax credits reported by the target firm at the year-end prior to the year of the acquisition announcement were determined.[4] Any amounts due to expire within a two-year period subsequent to the year-end preceding the year of the acquisition announcement were subtracted from these amounts. (The amount subtracted was used to compute the EXPIRE variable described below.) Because carryforwards are deductions in computing taxable income, the amount of the non-expiring portion of the NOL carryforward was multiplied by the maximum corporate tax rate prevailing in the year of the acquisition announcement. This product equals the reduction in the taxes owed as a result of using the carryforward. Investment and foreign tax credits are applied against the tax liability reducing the amount of taxes owed on a dollar-for-dollar basis. Thus the amount representing the tax savings arising from use of the NOL carryforward was added to the amount of any unused tax credits reported.

EXPIRE was defined as the amount of an NOL carryforward (multiplied by the maximum corporate tax rate) plus any unused credits due to expire within a two-year period subsequent to the year-end preceding the year of the acquisition announcement.

Taxable Acquisitions. In taxable acquisitions, STEPUP is used to capture the value of the step-up and CGAIN represents total taxes on capital gains. Four definitions of STEPUP are used, two measures based on the value of the step-up from the target firm's perspective, a third measure constructed in an attempt to estimate the added step-up taken by the acquiring firm and the fourth measure combining measures one and three. All measures were multiplied by the tax rate prevailing in the year of the acquisition announcement since depreciation is a deduction in computing taxable income. The STEPUP measures are described briefly below and in more detail in Appendix E. This is followed by a discussion of the computation of CGAIN.

For target firms, STEPUP is first defined as the difference in the book value and the current cost of depreciable assets (plant and equipment) without adjusting for estimated depreciation recapture taxes; this variable is designated TSTEPUP. Here the book value proxies for the tax basis of the assets and the current cost represents their fair market value (i.e., the price paid by the acquiring firm for those assets). The tax basis of assets is likely to be lower than the reported book value because the tax basis probably reflects use of accelerated depreciation methods whereas book value is likely to be based on straight-line depreciation. This measure would thus tend to understate the step-up in the asset basis

from the target firm's point of view. Depreciation recapture taxes are not included in this measure because prior to the passage of the Tax Reform Act of 1986, firms were allowed to defer recapture taxes if the acquisition transaction met certain requirements as specified in Section 338, IRC. The requirements appear to have been fairly lenient and most firms reportedly took advantage of this provision. Thus the assumption is initially made that all firms in the sample were able to defer the recapture tax.

The second measure of STEPUP from the target firm's point of view consists of the first measure adjusted for an estimate of the depreciation recapture taxes owed upon acquisition; this variable is designated RSTEPUP. As noted in Chapters I and III, both depreciation recapture and the immediate recognition of capital gains may be regarded as costs associated with taxable acquisitions. The reason that the step-up is reduced only by depreciation recapture is that it occurs at the firm level; the capital gains tax is levied at the individual level and is thus handled as a separate variable as described below.

The third measure of STEPUP, ASTEPUP, is an estimate of the added step-up taken by the acquiring firm. Essentially, this measure is an attempt to capture the excess amount allocated to the target firm's depreciable

assets. The last line of Table 4 indicates that this estimate of the added step-up is fairly accurate.

The fourth measure of STEPUP, TOTALUP, is the sum of TSTEPUP and ASTEPUP. It attempts to measure the total change in the target firm's asset basis upon acquisition.

CGAIN is measured as the difference in the target firm's stock price 10 days prior to the acquisition announcement and the lowest price over the preceding one-year period.[5] This difference is multiplied by the number of target firm shares outstanding 40 days prior to the acquisition announcement, and then multiplied by 20% if the acquisition outcome occurred in 1982 or later and by 28% if the acquisition outcome occurred prior to 1982.[6]

It is important to note that the way that two of the variables in taxable acquisitions are operationalized may make them spuriously correlated with the dependent variable, cumulative abnormal returns. First, to the extent that the procedure used to estimate the added step-up, ASTEPUP, is correlated with the offer price, there would be a relationship between the dependent and independent variables. Abnormal returns reflect the offer price and the added step-up reflects the difference between the portion of this price allocated to depreciable assets and the fair market value of these assets. This would bias the tests for STEPUP toward finding results for acquiring firms in taxable acquisitions. Note that the step-up computed from the target firm's point of view,

calculated as the difference between the book amount and current cost amount, would not have this problem. Second, the estimate of the capital gains liability might be correlated with the offer price for target firms, biasing the results in favor of accepting the null hypothesis; this thus seems to be a less serious concern.[7]

Non-Tax Variables

The five non-tax variables used as controls in the models are: relative size of the target and acquiring firm designated by SIZE, type of offer represented by TYPE, number of bidders denoted by NUMB, whether or not the offer was opposed as indicated by OPPOSE, and the performance of the target firm over the period prior to acquisition represented by PERF. These variables are operationalized as follows.

To control for the effects of relative size, SIZE is included in the models. SIZE is defined as the total asset amount reported by the target firm at the year-end prior to the year of the acquisition announcement divided by the total asset amount of the acquiring firm reported at this time. Following Asquith, et al., (1983), the natural logarithm of this ratio was then determined.

TYPE is included in the models to control for whether a tender offer or merger proposal was the means of approaching the target firm. If a tender offer was made, TYPE is assigned a value of 1. If the target firm was involved in a merger, TYPE is assigned a value of 0. If

target firms received tender offers and were eventually merged with the acquiring firm, they are regarded as having received tender offers.

If only one firm sought to acquire the target firm, the variable to control for number of bidders, NUMB, is assigned a value of 0. If two or more firms attempted to acquire the target firm (as evidenced by offers or negotiations with the target firm) within a specific time period, NUMB is assigned a value of 1. The time period of concern is the period one-year prior to the offer made by the successful acquiring firm through the time when the offer is deemed successful.

OPPOSE, the variable indicating whether or not the offer was resisted is given a value of 1 if the managers of the target firm took actions in an attempt to thwart the acquisition or if shareholders sought an injunction or brought suit against the acquiring firm. If no such actions were taken, OPPOSE equals 0.

The performance of the target firm over a one-year period prior to the acquisition announcement, PERF, was ascertained using market data and an "event study" methodology (see Appendix D). (Palepu (1986) and Smiley (1976) also use this procedure to assess firm performance.) Parameters of the market model were determined for the 150-day period ending 290 days prior to the acquisition announcement. Abnormal returns were then determined for the 250 days ending 40 days prior to the

acquisition announcement. The average abnormal return over this 250-day period was then determined.[8]

The way this variable is constructed may cause it to be spuriously correlated with the dependent variable for target firm groups.[9] Accordingly, a follow-up study will incorporate other measures of performance to circumvent this potential confounding effect.[10]

Methodology to Examine Other Hypotheses

IRS Rulings on Tax Status

Firms involved in tax-free acquisitions are divided into two groups: the rulings group consisting of firms that submit to the IRS for a ruling on the tax status of acquisition (i.e., the tax status is initially uncertain) and the no rulings group made up of firms that do not submit to the IRS for rulings (i.e., the tax status is more certain). Both of these groups are divided further into target and acquiring firms. Announcement period returns of these groups are then computed using the event study methodology. If the tax variables associated with a tax-free acquisition are important, the initial announcement period returns for target and acquiring firms in the rulings group will be lower as compared with the returns for target and acquiring firms in the no rulings group.

Next, target and acquiring firms in the rulings group are broken down further into those that receive a favorable ruling and those that receive an unfavorable

ruling. If receiving a favorable ruling is important to the involved firms, those receiving a favorable ruling should experience positive returns around the ruling date and those receiving unfavorable rulings are expected to experience price decreases. Further, for the group with favorable rulings, on average the sum of the returns around the initial announcement date and the ruling date should approximate the announcement period returns of firms involved in tax-free acquisitions that do not submit to the IRS for a ruling.[11]

IRS Regulation on Step-Up

The effect of the retroactive reduction of the step-up in the asset basis is examined as follows. First, acquiring firms involved in acquisitions over the relevant period with return data were determined. To increase the number of firms in the analysis, additional acquiring firms that made acquisitions in the period from September 1982 through December 1985 were identified. Return data and the financial information on the respective target firms needed to calculate ASTEPUP had to be available for these firms for them to be included.[12] The acquiring firms were then divided into taxable and tax-free groups. This process resulted in a total of 126 acquiring firms in taxable acquisitions and 42 acquiring firms in tax-free acquisitions.

The next step consisted of dividing the taxable firms into two subgroups: those most likely to be hurt by the

recapture of depreciation deductions (designated "More Likely") and those affected by the regulation but that were less likely to be have to pay a significant amount of recapture taxes (designated "Less Likely"). These subgroups were formed as follows. ASTEPUP was determined using the methodology described in Appendix E. Firms were ranked from high to low on the basis of the magnitude of ASTEPUP. Those in the 60 percentile or higher are included in the More Likely Group. Those in the bottom 40 percentile are in the Less Likely Group. The firms in the middle were eliminated from the analysis. Acquiring firms involved in tax-free acquisitions over this period were deemed the "No Effect" group since they would not have been effected by the regulation.

Since several announcements about this proposed legislation were made, the average CARNn for each group for the 15-consecutive-day period over which these announcements were made are computed. It is expected that the More Likely Group will experience significant negative abnormal returns around the announcement of this regulation. Further, these returns are hypothesized to be more negative than those experienced by the other two groups. In turn, the returns experienced by the Less Likely Group are expected to be more negative than those experienced by the No Effect Group.

Two-day CARNn are also calculated around the first announcement of the regulation in The Wall Street Journal.

Again the returns for the three groups are compared and it is expected that the More Likely group will have the most negative returns.

Notes to Chapter IV

[1] "Step transactions" are defined as those where the acquiring firm acquires the target firm's stock in several relatively small purchases (in terms of percentage of stock bought). Usually the acquiring firm makes several of these small purchases before making known its intention to acquire the target firm.

[2] This was done only for firms that appeared to be involved in taxable mergers or tax-free tender offers. Approximately 35 firms were contacted directly via letters or phone conversations.

[3] In particular, if information was not provided about the size of an NOL carryforward or unused credits available for tax purposes and a carryover or credit was available for financial reporting purposes or vice versa, the firm was contacted.

[4] Section 382, IRC, limits the amount of an NOL carryforward that can be used by the acquiring firm. This limitation was exceeded for five percent of the firms with NOL carryforwards examined. In those instances, the amount of the NOL carryforward was reduced to the statutory limit.

[5] Since a calendar year has approximately 250 trading days, the one-year period ranges from day -260 to day -11 in event time.

[6] The maximum individual tax rate prior to 1982 was 70%; beginning in 1982 the rate was lowered to 50%. If investment property is held for at least a year as discussed in Appendix B, it qualifies for long-term capital gain treatment. Since 60% of long-term capital gains are not included in taxable income, the maximum amount of taxes owed on investment property is:

$$\text{Maximum Capital Gains Rate} = [\text{Individual Tax Rate}] \times [40\% \text{ of Gain}]$$

This calculation gives rise to the two percentages mentioned in the text. Application of these two percentages assumes that either the capital gain is long-term or, if it is short-term for some investors, that they can offset the gain with losses for tax purposes.

[7] The reason why this doesn't appear to be a serious concern is as follows. The dependent variable, cumulative abnormal returns, consists of the sum of abnormal returns over days -9 through day 0 in event time. The independent variable representing the capital gains liability consists of the stock price on day -10 minus the lowest stock price

over the preceding one-year period (from day -260 to day -11 in event time), P_{low}. If P_{low} is in the interval from day -190 to day -41 it directly effects two of the daily returns of the 150-day estimation period over which the regression parameters are estimated.

[8] Since a calendar year has approximately 250 trading days, the one-year period ranges from day -290 to day -41.

[9] The reason this is true is because there is an overlap of 150 days in the calculation of the performance measure (the independent variable) and the period used to estimate the parameters from which cumulative abnormal returns (the dependent variable) are calculated. Specifically, the average excess return is found for the period from day -290 to day -41 in event time. The estimation period used to estimate the parameters needed to find expected returns is from day -190 to day -41 in event time.

[10] Measures based on the deviation of the firm's performance from the industry average appear to provide information about the target firm's performance as demonstrated by Adams and Hayn (1987).

[11] The announcement period returns for the no rulings group occur at the time of the initial announcement. Those for firms in the rulings group occur over a longer period from the initial announcement date through the ruling date. Since both groups of firms are involved in tax-free transactions, the average total announcement period returns should be approximately equal for the two groups. This reasoning is incorrect if the value of the tax attributes and/or other synergies upon combination systematically differ between firms that submit for rulings and those that do not. However, there is no reason to believe that such a difference exists.

[12] The reason why some acquiring firms that made acquisitions in the 1982-1984 period were not included in the previous analyses is because the sample was formed by first identifying target firms. If the target firms did not have return data, neither they nor the respective acquiring firms were included in the analyses. Acquiring firms that made acquisitions in 1985 were identified primarily through Mergers and Acquisitions.

CHAPTER V

RESULTS

In this chapter, the results of the various analyses are presented; they are discussed further in the next chapter and related back to the hypotheses. This chapter is organized as follows. First, descriptive data about the sample characteristics are discussed. Announcement period returns are then presented for the 51-day period beginning 40 days prior to the announcement date for target and acquiring firms. Firms are grouped according to whether the type of offer was a tender offer or merger proposal and by the tax status of the acquisition. The results of the cross-sectional analyses examining the tax attributes available in tax-free and taxable acquisitions are then shown. Finally, the findings from the tests examining IRS rulings on tax status and the proposed retroactive regulation limiting the step-up taken by the acquiring firm are provided.

Descriptive Data

Data on the announcement date and the tax status of acquisitions were available for 560 firms that were acquired in the period from 1977 to 1984. The tax status of these acquisitions by year is shown in Table 8. The majority of

TABLE 8

TAX STATUS OF ACQUISITIONS BY YEAR

Year	Tax Status			Total Acqns
	Taxable	Tax-free	Partially Taxable	
1977	38 (49.4%)	23 (29.9%)	16 (20.8%)	77
1978	47 (52.8%)	27 (30.3%)	15 (16.9%)	89
1979	41 (55.4%)	19 (25.7%)	14 (18.9%)	74
1980	38 (58.5%)	16 (24.6%)	11 (16.9%)	65
1981	45 (67.2%)	12 (17.9%)	10 (14.9%)	67
1982	33 (55.9%)	14 (23.7%)	12 (20.3%)	59
1983	52 (65.8%)	14 (17.7%)	13 (16.5%)	79
1984	34 (68.0%)	8 (16.0%)	8 (16.0%)	50
TOTAL	328	133	99	560
%AGE	(58.6%)	(23.7%)	(17.7%)	(100.0%)

acquisitions are taxable. The number of tax-free acquisitions has decreased from slightly under one-third of the acquisitions examined in 1977-78 to less than one-fifth of the acquisitions in 1983-84.

The tax status of acquisition by type of consideration offered is reported in Table 9. Cash is the most prevalent type of consideration. Stock-for-stock exchanges are the second most common type of transaction. Note that an all cash offer is always taxable whereas stock exchanges may be taxable, partially taxable or tax-free.

In Table 10, the tax status of the acquisition is related to the form of the acquisition offer. The second line of this table shows the number of successful tender offers that culminated in a merger. The tax status of the tender offer and merger in these "two-tier" offers is generally taxable. That is, in most cases, the tender offer is taxable and the subsequent merger is also taxable. However, there are instances where the tender offer is taxable and the following merger is deemed a reorganization and thus tax-free.[1] For purposes of this study, firms reported on line two are regarding as receiving a tender offer; the announcement date is defined as the date of the tender offer announcement and the tax status of the acquisition is assumed to be that of the tender offer. The amounts on lines (1) and (2) are combined as shown on line (3).

TABLE 9

TAX STATUS OF ACQUISITION BY TYPE OF CONSIDERATION

Type of Consideration	Tax Status of Acquisition: Taxable	Tax-free	Partially Taxable	Total	%age of Total
Cash	230	0	0	230	41.1%
Common Stock	48	106	25	179	32.0%
Preferred Stock	2	8	3	13	2.3%
Debt	8	0	7	15	2.7%
Mixed:					
Cash and Common Stock	18	6	30	54	9.6%
Cash and Other Consideration Excluding Common Stock	17	5	30	52	9.3%
Other Mixed Consideration	5	8	4	17	3.0%
TOTAL	328	133	99	560	100.0%
	(58.6%)	(23.7%)	(17.7%)	(100.0%)	

TABLE 10

TAX STATUS OF ACQUISITION BY FORM OF OFFER

Type of Consideration	Tax Status of Acquisition: Taxable	Tax-free	Partially Taxable	Total	%age of Total
(1) Tender Offers	105 (68.2%)	28 (18.2%)	21 (13.6%)	154 (100.0%)	27.5%
(2) Tender Offers Followed by Mergers	62 (63.9%)	10 (10.3%)	25 (25.8%)	97 (100.0%)	17.3%
(3) Total Tender Offers	167 (66.5%)	38 (15.2%)	46 (18.3%)	251 (100.0%)	44.8%
(4) Mergers	161 (52.1%)	95 (30.8%)	53 (17.1%)	309 (100.0%)	55.2%
(5) Total Acqns	328 (58.6%)	133 (23.7%)	99 (17.7%)	560 (100.0%)	100.0%

The majority of tender offers (66.5%) are taxable. Given that the bulk of the proceeds received by target firms' shareholders in partially taxable acquisitions is also likely to be taxable, if the number of partially taxable acquisitions is combined with the taxable ones, 84.9% of tender offers are taxable.[2] Mergers may be taxable, partially taxable or tax-free. In this sample, 52.1% of the mergers are taxable whereas 30.8% are tax-free. The bulk of the proceeds in partially taxable mergers is likely to be tax-free.[3] If the number of partially taxable mergers is combined with the number that are tax-free, about 47.9% of the mergers are tax-free.

Announcement Period Returns

Announcement period returns were calculated for 491 of the 560 target firms.[4] The returns for target firms by tax status of acquisition are shown in Table 11. The methodology used to compute return measures and test statistics for Tables 11-18 is presented in Appendix D. The notation used in these tables is as follows:

ARNt = the average abnormal daily return on day t for the N firms being examined,

TNt = the test statistic used to examine whether ARNt is significantly different from zero,

Ct = the test statistic used to determine whether the daily abnormal returns vary across the N firms on day t, and

CARNn = the cumulative abnormal returns for the N firms being examined over the n days from day -40 through day t where t ranges from day -40 to day +10

TABLE 11

ANNOUNCEMENT PERIOD RETURNS OF TARGET FIRMS

	Tax Status of Acquisition								
	Taxable (n=274)			Tax-free (n=124)			Partially Taxable (n=93)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.002	1.436	.002	-.003	-1.730	-.001	.001	0.539	.001
		(1.197)			(-0.797)			(0.225)	
.									
-30	.003	1.558	.017	.004	1.473	.024	.002	0.223	.006
		(1.565)			(1.363)			(0.572)	
.									
-20	.006	4.130	*.040	-.001	-0.229	.034	.000	0.094	-.003
		(2.448)			(-0.419)			(0.059)	
.									
-10	.005	2.870	*.073	.003	0.923	.042	.003	1.079	.037
		(2.029)			(1.444)			(1.088)	
.									
-5	.009	6.120	*.105	.003	2.850	*.071	.004	2.910	*.043
		(3.025)*			(1.147)			(1.450)	
-4	.016	11.396	*.120	.016	8.598	*.080	.030	10.184	*.074
		(4.315)*			(3.191)*			(3.809)*	
-3	.013	9.619	*.134	.015	8.751	*.096	.023	8.926	*.097
		(4.947)*			(3.919)*			(5.356)*	
-2	.026	18.142	*.160	.023	11.109	*.116	.032	13.422	*.129
		(7.182)*			(5.176)*			(5.309)*	
-1	.118	84.094	*.277	.064	35.051	*.181	.108	50.755	*.237
		(11.557)*			(7.109)*			(6.601)*	
0	.054	39.918	*.332	.025	14.506	*.205	.026	14.634	*.263
		(7.238)*			(3.233)*			(3.275)*	
1	.000	.208	.332	.003	1.849	.208	.004	1.243	.267
		(0.182)			(1.286)			(0.801)	
.									
10	.000	0.101	.334	-.004	-1.344	.200	.002	1.393	.268
		(0.181)			(-1.607)			(1.266)	
Avg. Alpha		0.0002			0.0006			0.0006	
Beta		1.0335			1.0259			1.0136	

* Significant at the .01 level

As expected, there are significant abnormal returns around the acquisition announcement date.[5] The weighted average cumulative abnormal return (CARNn) on day 10 for all target firms shown is 28.6%. The CARNn on day 10 is 13.4 percentage points higher for target firms involved in taxable acquisitions as compared with those involved in tax-free ones.

In Table 12, the announcement period returns for target firms involved in tender offers are shown by tax status of acquisition. The weighted average CARNn for all target firms involved in tender offers is 32.4% on day 10. The difference in CARNn on day 10 for firms involved in taxable versus tax-free tender offers is 16.1 percentage points. If partially taxable tender offers are considered taxable, the weighted average CARNn for firms involved in taxable tender offers is 34.9% on day 10, a 14.0 percentage point difference as compared with that for firms involved in tax-free tender offers.

Target firms involved in mergers are shown in Table 13. The weighted average CARNn on day 10 for all of these firms is 26.0%. The difference in the CARNn on day 10 for firms involved in taxable versus tax-free mergers is 12.5 percentage points. If partially tax-free mergers are considered tax-free, the weighted average CARNn for target firms involved in tax-free mergers is 21.1%, 9.5 percentage points less than the CARNn of target firms involved in taxable mergers.

TABLE 12

ANNOUNCEMENT PERIOD RETURNS OF TARGET FIRMS IN TENDER OFFERS

	Tax Status of Acquisition								
	Taxable (n=124)			Tax-free (n=36)			Partially Taxable (n=43)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.001	0.517	.001	-.007	-1.995	-.007	.000	-0.822	.000
		(0.466)			(-2.011)			(-0.019)	
.									
-30	.002	0.852	.021	.004	0.284	.007	.006	0.231	.008
		(1.042)			(0.982)			(1.072)	
.									
-20	.009	4.315	*.060	-.004	-0.815	.024	-.001	-0.520	-.001
		(2.260)			(-1.262)			(-0.565)	
.									
-10	.004	1.473	.068	-.002	-0.326	.043	.006	1.642	.037
		(0.995)			(-0.396)			(1.270)	
.									
-5	.008	3.430	*.127	.000	-0.008	.077	.007	2.651	*.072
		(2.534)			(-0.111)			(1.469)	
-4	.015	9.709	*.142	.005	1.925	.082	.046	10.436	*.118
		(2.571)*			(0.860)			(3.012)*	
-3	.015	7.185	*.157	.020	5.351	*.102	.022	5.559	*.139
		(3.660)*			(2.369)			(3.269)*	
-2	.029	14.680	*.186	.039	10.662	*.141	.031	8.985	*.170
		(5.137)*			(3.952)*			(3.368)*	
-1	.121	59.865	*.307	.064	16.830	*.204	.083	23.846	*.252
		(7.603)*			(5.094)*			(3.641)*	
0	.049	27.095	*.356	.020	5.156	*.224	.003	0.555	.255
		(4.468)*			(2.146)			(0.511)	
1	-.001	-1.011	.355	.006	1.514	.231	.019	4.811	*.274
		(-0.587)			(1.655)			(2.191)	
.									
10	.000	0.056	.370	-.004	-1.294	.209	.001	0.693	.287
		(0.166)			(-1.835)			(0.299)	
Avg. Alpha		0.0001			0.0008			0.0007	
Beta		1.0191			0.9764			1.0022	

* Significant at the .01 level

TABLE 13

ANNOUNCEMENT PERIOD RETURNS OF TARGET FIRMS IN MERGERS

	Tax Status of Acquisition								
	Taxable (n=150)			Tax-free (n=88)			Partially Taxable (n=50)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.003	1.463	.003	-.001	-0.778	-.000	.001	0.025	.001
		(1.180)			(-0.150)			(0.301)	
.									
-30	.003	1.328	.013	.003	1.567	.024	-.002	-0.079	.004
		(1.183)			(1.025)			(-1.244)	
.									
-20	.003	1.687	.024	.000	0.250	.029	.001	0.641	-.005
		(1.202)			(0.168)			(0.349)	
.									
-10	.006	2.532	.076	.005	1.304	.037	.000	-0.098	.038
		(1.832)			(1.926)			(-0.090)	
.									
-5	.010	5.138	*.087	.005	3.388	*.058	.001	1.477	.016
		(2.114)			(1.283)			(0.395)	
-4	.016	6.613	*.103	.021	8.975	*.069	.016	4.032	*.031
		(3.551)*			(3.099)*			(3.019)*	
-3	.012	6.481	*.115	.013	6.966	*.082	.024	7.050	*.056
		(3.351)*			(3.127)*			(4.353)*	
-2	.024	11.219	*.139	.017	6.367	*.099	.033	9.987	*.089
		(5.018)*			(3.540)*			(4.141)*	
-1	.115	59.293	*.254	.064	30.842	*.163	.133	47.694	*.222
		(8.694)*			(5.504)*			(5.694)*	
0	.058	29.323	*.312	.027	13.921	*.190	.048	19.944	*.271
		(5.691)*			(2.646)*			(3.431)*	
1	.002	1.179	.313	.002	1.227	.192	-.011	-2.974	*.260
		(0.633)			(0.611)			(-3.294)*	
.									
10	.000	0.085	.306	-.004	-0.768	.181	.003	1.272	.250
		(0.094)			(-1.138)			(1.594)	
Avg. Alpha		0.0004			0.0005			0.0005	
Beta		1.0454			1.0462			1.0064	

* Significant at the .01 level

For all of the target firm groups shown in Tables 12-13, cross-sectional test statistics, Ct, are reported. Note that around the announcement date, Ct is significantly different from zero at the .01 level for all groups of target firms examined. This indicates that the majority of firms in each group experienced abnormal returns close to the mean abnormal return reported on a given day; ARNt is thus not inflated due to large abnormal returns for just a few firms in each group.

In Table 14, the CARNn for the ten days ending on the announcement date are compared across target firm groups. There are significant differences in announcement period returns experienced by firms in taxable versus tax-free groups (comparison 1), regardless of whether the firms are involved in tender offers (comparison 5) or mergers (comparison 8). Overall, returns for the partially taxable group are more like those for the taxable group (comparisons 2 and 3). The difference of 4.2 percentage points in the mean CARNn for firms involved in tender offers versus mergers is significant (comparison 4). The last three comparisons show that the difference between the mean CARNn for firms in tender offers is usually higher than that for those in mergers. However, only the difference of 5.2 percentage points for the taxable group is significant (at the .074 level).

TABLE 14

COMPARISON OF ANNOUNCEMENT PERIOD RETURNS FOR TARGET FIRM GROUPS

		Sample	N	(1) Mean	(2) T-Value
Tax Status:	(1)	Taxable	274	.2594	4.55*
		Tax-free	124	.1676	
	(2)	Taxable	274	.2594	1.34
		Part. Tax.	93	.2261	
	(3)	Tax-free	124	.1676	2.39**
		Part. Tax.	93	.2261	
Type of Offer:	(4)	Tender Offers	203	.2542	1.93**
		Mergers	288	.2127	
Tender Offers by Tax Status:	(5)	Taxable	124	.2880	3.68*
		Tax-free	36	.1814	
	(6)	Taxable	124	.2880	1.54
		Part. Tax	43	.2177	
	(7)	Tax-free	36	.1814	0.98
		Part. Tax	43	.2177	
Mergers by Tax Status:	(8)	Taxable	150	.2357	2.87*
		Tax-free	88	.1619	
	(9)	Taxable	150	.2357	0.08
		Part. Tax	50	.2333	
	(10)	Tax-free	88	.1619	2.31**
		Part. Tax	50	.2333	
Tax Status by Type of Offer:					
(11) Taxable:		Tender Offers	124	.2880	1.79
		Mergers	150	.2357	
(12) Tax-free:		Tender Offers	36	.1814	0.79
		Mergers	88	.1619	
(13) Part. Tax:		Tender Offers	43	.2177	0.38
		Mergers	50	.2333	

Notes to Table 14:

(1) The mean CARNn for the sample over the 10-day period ending with the announcement date is reported.

(2) T is based on the separate or pooled sample variance estimates, depending on the probability of F.[6]

* Significant at .01 level; ** Significant at .05 level

Announcement period returns were calculated for 369 of the acquiring firms. Acquiring firms experience far smaller wealth gains (if any) than do the respective target firms. Overall, based on a weighted average of the CAR_{Nn} for the three tax groups, Table 15 indicates that acquiring firms experience cumulative abnormal returns of 1.9% over the announcement period regardless of the tax status of the acquisition. Firms involved in taxable transactions fared better than those involved in tax-free acquisitions, as was true for target firms. The difference in the CARNn on day 10 for the taxable and tax-free groups is 4.6 percentage points.

Table 16 reports the returns to acquiring firms involved in tender offers by tax status of the acquisition. The weighted average return is 3.6%. Returns to acquiring firms in mergers are shown in Table 17. The weighted average return is 0.01%. In both tender offers and mergers, acquiring firms in taxable acquisitions realized larger returns than those in tax-free ones.

Table 18 compares the ten-day CARNn for acquiring firm groups. Those involved in taxable acquisitions realized a gain of about 2.3%, 3.4 percentage points above that experienced by acquiring firms in tax-free acquisitions (comparison 1). Regardless of the tax status, the CARNn for firms in tender offers was higher than for firms in mergers (comparisons 4, 11, 12 and 13). Controlling for type of offer, the difference between the CARNn for taxable and

TABLE 15

ANNOUNCEMENT PERIOD RETURNS OF ACQUIRING FIRMS

	Tax Status of Acquisition								
	Taxable (n=164)			Tax-free (n=109)			Partially Taxable (n=82)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.001	0.639	.001	.000	0.524	.000	.004	1.829	.004
		(0.486)			(0.230)			(1.241)	
.									
-30	-.001	-0.909	.000	-.002	-0.293	.002	.004	2.026	-.004
		(-0.902)			(-0.562)			(2.186)	
.									
-20	.000	-0.191	.003	-.005	-2.880*	-.001	.001	0.280	.015
		(-0.195)			(-2.395)			(0.631)	
.									
-10	.001	0.596	.007	.000	-0.015	.007	.000	0.111	.015
		(0.505)			(-0.076)			(0.602)	
.									
-5	-.001	-0.648	.005	.004	2.207	.010	.003	1.015	.008
		(-0.605)			(1.196)			(1.324)	
-4	.000	0.168	.005	-.002	-1.653	.008	.002	0.896	.010
		(0.002)			(-0.927)			(0.934)	
-3	.002	1.363	.007	-.003	-1.541	.005	.001	0.211	.011
		(1.161)			(-1.680)			(0.509)	
-2	.004	3.228*	.011	.004	0.448	.009	.001	1.209	.012
		(2.506)			(1.042)			(0.089)	
-1	.013	9.465*	.024	-.004	-1.298	.005	-.002	-5.016*	.010
		(2.015)			(-0.516)			(-2.259)	
0	.006	2.928*	.030	-.009	-5.438*	-.004	.004	1.684	.014
		(2.003)			(-3.559)*			(1.516)	
1	.003	1.645	.033	-.004	-3.031*	-.002	.001	0.971	.015
		(1.495)			(-2.021)			(0.772)	
.									
10	.003	1.970	.038	-.002	-1.324	-.008	.000	0.216	.016
		(0.083)			(-1.731)			(0.760)	
Avg. Alpha		0.0001			0.0002			0.0002	
Beta		1.0133			1.0135			1.0302	

* Significant at the .01 level

TABLE 16

ANNOUNCEMENT PERIOD RETURNS OF ACQUIRING FIRMS
IN TENDER OFFERS

	Tax Status of Acquisition								
	Taxable (n=78)			Tax-free (n=34)			Partially Taxable (n=38)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.001	0.472	.001	-.001	-0.042	-.001	.004	1.829	.004
		(0.369)			(-0.352)			(1.241)	
.									
-30	-.002	-0.824	-.005	-.003	-0.852	.006	.005	2.026	-.015
		(-1.088)			(-1.526)			(2.186)	
.									
-20	-.001	-0.149	-.009	-.008	-3.147*	.013	.004	1.820	.001
		(-0.454)			(-2.311)			(2.071)	
.									
-10	-.002	-1.273	.002	-.002	-0.357	.025	.001	0.280	.001
		(-0.972)			(-0.715)			(0.631)	
.									
-5	.000	-0.488	.003	.005	1.052	.021	.002	0.111	-.007
		(-0.189)			(0.584)			(0.602)	
-4	.001	0.284	.004	-.004	-1.450	.018	.006	2.015	-.001
		(0.380)			(-0.937)			(2.324)	
-3	.000	0.008	.004	.001	0.467	.019	.002	0.896	.001
		(-0.530)			(0.278)			(0.934)	
-2	.006	3.497*	.010	.007	2.358	.026	.002	0.211	.003
		(2.330)			(1.733)			(0.509)	
-1	.022	11.743*	.032	.017	7.580*	.043	.001	1.029	.004
		(1.812)			(0.912)			(0.089)	
0	.003	0.591	.035	-.004	-1.589	.039	.015	5.016*	.019
		(0.888)			(-0.886)			(2.259)	
1	.003	1.078	.038	-.001	-0.953	.038	.004	1.684	.023
		(1.142)			(-0.242)			(1.516)	
.									
10	.003	1.957	.042	-.001	-0.419	.034	.002	0.216	.027
		(1.678)			(-0.695)			(0.760)	
Avg. Alpha		-0.0004			-0.0002			0.0001	
Beta		1.0308			0.9979			1.0430	

* Significant at the .01 level

TABLE 17

ANNOUNCEMENT PERIOD RETURNS OF ACQUIRING FIRMS IN MERGERS

	Tax Status of Acquisition								
	Taxable (n=86)			Tax-free (n=75)			Partially Taxable (n=44)		
Day	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn	ARNt	TNt(Ct)	CARNn
-40	.001	0.433	.001	.000	0.439	.000	.004	1.340	.004
		(0.321)			(0.179)			(2.336)	
-30	-.001	-0.471	.005	-.001	-0.186	.000	.004	1.818	.005
		(-0.244)			(-0.221)			(1.898)	
-20	.000	-0.122	.013	-.003	-1.026	-.007	-.001	-0.214	.020
		(-0.152)			(-1.015)			(-0.451)	
-10	.003	2.035	.011	.002	0.519	.000	.000	1.034	.018
		(1.841)			(0.947)			(0.180)	
-5	-.002	-0.430	.007	.004	2.138	.005	.004	1.204	.021
		(-1.070)			(1.726)			(1.881)	
-4	-.001	-0.039	.006	-.001	-1.027	.004	-.001	0.069	.020
		(-0.399)			(-0.368)			(-0.216)	
-3	.004	1.875	.010	-.005	-1.881	.000	.000	-0.615	.020
		(1.685)			(-1.747)			(-0.168)	
-2	.003	1.209	.013	.002	-0.690	.001	.000	-0.028	.020
		(1.270)			(0.568)			(-0.012)	
-1	.004	1.886	.017	-.013	-6.123*	-.012	-.006	-2.117	.014
		(0.897)			(-2.705)*			(-1.276)	
0	.008	3.481*	.025	-.011	-5.229*	-.023	-.005	-2.080	.009
		(1.824)			(-3.235)*			(-1.243)	
1	.003	1.245	.028	-.005	-2.820*	-.028	-.002	-0.186	.007
		(1.178)			(-1.896)			(-0.878)	
10	.003	0.856	.035	-.003	-1.324	-.027	-.001	-0.334	.007
		(0.760)			(-1.537)			(-0.476)	
Avg. Alpha		0.0005			0.0004			0.0003	
Beta		0.9975			1.0206			1.0187	

* Significant at the .01 level

TABLE 18

COMPARISON OF ANNOUNCEMENT PERIOD RETURNS FOR ACQUIRING FIRM GROUPS

		Sample	N	(1) Mean	(2) T-Value
Tax Status:	(1)	Taxable	164	0.0234	2.50*
		Tax-free	109	-0.0111	
	(2)	Taxable	164	0.0234	2.04*
		Part. Tax.	82	-0.0010	
	(3)	Tax-free	109	-0.0111	0.77
		Part. Tax.	82	-0.0010	
Type of Offer:	(4)	Tender Offers	150	0.0221	2.09*
		Mergers	205	-0.0040	
Tender Offers by Tax Status:	(5)	Taxable	78	0.0326	0.59
		Tax-free	34	0.0138	
	(6)	Taxable	78	0.0326	1.12
		Part. Tax	38	0.0079	
	(7)	Tax-free	34	0.0138	0.21
		Part. Tax	38	0.0079	
Mergers by Tax Status:	(8)	Taxable	86	0.0150	3.20*
		Tax-free	75	-0.0232	
	(9)	Taxable	86	0.0150	2.06*
		Part. Tax	44	-0.0086	
	(10)	Tax-free	75	-0.0232	1.51
		Part. Tax	44	-0.0086	
Tax Status by Type of Offer:					
(11) Taxable:		Tender Offers	78	0.0326	0.96
		Mergers	86	0.0150	
(12) Tax-free:		Tender Offers	34	0.0138	1.27
		Mergers	75	-0.0232	
(13) Part. Tax:		Tender Offers	38	0.0079	0.97
		Mergers	44	-0.0086	

Notes to Table 18:

(1) The mean CARNn for the sample over the 10-day period ending with the announcement date is reported.

(2) T is based on the separate or pooled sample variance estimates, depending on the probability of F. (See endnote 6.)

* Significant at .01 level; ** Significant at .05 level

tax-free acquisitions ranges from 1.9 percentage points (comparison 5) to 3.8 percentage points (comparison 8). If the tax status of the acquisition is held constant (comparisons 11, 12 and 13), the CARNn are not significantly different for the two forms of offer.

Cross-Sectional Analyses

Tax-free Acquisitions

To examine whether the announcement period returns were related to the tax attributes in tax-free acquisitions, firms with NOL carryforwards and/or unused investment and foreign tax credits were identified. Of the 491 target firms for which return data were available, 88 (17.9%) had NOL carryforwards and/or unused investment and foreign tax credits at the year-end prior to the year of the acquisition announcement. These firms were included in the analyses if return data were available for the respective acquiring firms. A total of 85 of the firms met this requirement. Breaking these 85 acquisitions down by tax status, 37 were taxable, 38 were tax-free and the remaining ten were partially taxable acquisitions. In two of the partially taxable acquisitions, the tax attributes of the target firm transferred to the acquiring firm and so they are included in the group of tax-free acquisitions. In five of the acquisitions, the tax attributes of the target firm did not transfer to the acquiring firm and so they are included in the taxable group. The remaining three were dropped from the sample since it was not clear whether the tax attributes

of interest would transfer to the acquiring firm. An additional 80 target firms were randomly drawn from the remainder of the sample (ten each year for eight years; five involved in taxable acquisitions and five involved in tax-free acquisitions) for inclusion in the cross-sectional analyses. To be included in this random draw, return data on the respective acquiring firm and data on the non-tax variables included in the models had to be available.[7] The final group of firms used for the cross-sectional analyses to examine the tax attributes available in tax-free acquisitions thus consists of 82 target and acquiring firms involved in taxable acquisitions and 80 target and acquiring firms involved in tax-free acquisitions.

Returns were calculated for this sample of firms as shown in Table 19. The CARNn over the ten-day period ending on the announcement date are compared for all firms in the two tax groups and then for the subgroups consisting only of target firms (or the respective acquiring firms) with NOL carryforwards and/or unused credits. The CARNn is 7.22 percentage point higher for target firms involved in taxable acquisitions as compared with those in tax-free transactions (comparison 2A). The CARNn is comparable with the return to the taxable group reported in Table 14 (.2674 and .2594, respectively). For the tax-free group, the CARNn for target firms used in the cross-sectional analysis (.1952) is higher than that for the overall sample of tax-free target firms examined in Table 14 (.1676).

TABLE 19

TAX ATTRIBUTES AVAILABLE IN TAX-FREE ACQUISITIONS (1)

Variable		Mean Values Taxable	Tax-free	z-Stat
1.A. Total Number of Firms	- Target	82	80	
	- Acquiring	82	80	
B. Target Firms with NOL Carryforwards and/or Unused Credits	-	42	40	
2.A. CARNn for All Firms	- Target	.2674	.1952	2.28*
	- Acquiring	.0336	.0167	1.72*
B. CARNn for Firms with NOL Carryforwards and/or Unused Credits	- Target	.2632	.2168	1.54**
	- Acquiring	.0358	.0297	0.38
C. CARNn for Firms with Expire	- Target	.2214	.2598	2.31*
	- Acquiring	.0283	.0265	0.39
3. Magnitude of Tax Variables for Firms with NOL Carryforwards and/or Unused Credits	- Target			
	NOL	.2118	.3336	1.53**
	EXPIRE	.0598	.0904	2.21*
	- Acquiring			
	NOL	.0512	.0663	1.32**
	EXPIRE	.0097	.0201	1.56**
4. Magnitude of Non-Tax Variables for All Firms				
	SIZE	-1.468	-1.202	1.07
	TYPE	.622	.425	2.86*
	NUMB	.292	.150	1.56**
	OPPOSE	.195	.088	1.94*
	PERF	-0.0001	-0.0003	1.07

Notes to Table 19:
(1) The z-statistic is based on the Mann-Whitney test. The CARNn are over the ten-day period ending on the announcement date.

* Significant at .05 level; ** Significant at .10 level

Both the taxable and tax-free groups of acquiring firms have higher returns than those reported for the overall sample in Table 18. Acquiring firms examined in the cross-sectional analyses had a CARNn of .0336 in taxable acquisitions compared with the CARNn of .0234 for all taxable acquiring firms. Those in tax-free acquisitions had a CARNn of .0167 compared with the CARNn of -.0111 for all tax-free acquiring firms.

Target firms with NOL carryforwards had a higher CARNn if they were in the tax-free group (comparison 2B) than the CARNn for all tax-free target firms. Similarly the respective acquiring firms had higher CARNn. Target firms involved in tax-free acquisitions where tax attributes will expire in the near future (comparison 2C) had much higher CARNn than those with tax attributes that were not due to expire within the two-year period around the acquisition announcement.

As noted in Chapter IV, the tax attributes were standardized by the market value of equity of the target or acquiring firm. On average, the tax attributes available equal between 21.2% and 33.4% of the target firms' equity values, and 5.1% to 6.6% of the acquiring firms' equity values (comparison 3). The amount of the tax attributes due to expire in the near future is significantly higher for target firms in tax-free acquisitions, equalling about 9.0% of their equity values on average. Similarly, the amount of the tax attributes due to expire is larger in proportion to

the acquiring firms' equity values for those involved in tax-free acquisitions as compared with those involved in taxable ones.

Regarding the non-tax variables (comparison 4), taxable acquisitions tend to be accomplished through tender offers, to have more bidders, and to be opposed more as compared with tax-free acquisitions.

Results of the cross-sectional analyses are presented in Table 20 and discussed below.

Tax Variables. The coefficient on the NOL variable is consistently positive for target and acquiring firms involved in tax-free acquisitions as hypothesized. For target firms in tax-free acquisitions, it is significantly positive at the 15 percent level of significance. For the other groups of firms, it is not significant.

EXPIRE, the portion of the NOL carryforward and unused credits due to expire in the near future, is significantly related to the announcement period returns of target and acquiring firms involved in tax-free acquisitions as hypothesized. The coefficient is negative and significant for target firms in taxable acquisitions. This variable is not significant for acquiring firms in taxable transactions.

Non-Tax Variables. SIZE does not appear to have much of an impact on the returns to target firms. Similarly, while the coefficient is consistently positive for the acquiring firm groups, it is not significant. TYPE is significant for target and acquiring firms involved in

TABLE 20

CROSS-SECTIONAL ANALYSES OF TAX ATTRIBUTES AVAILABLE IN TAX-FREE ACQUISITIONS (1)

Sample: Tax-free Acquisitions - Target Firms (n=80)

	β_{11}	β_{12}	β_{13}	β_{14}	β_{15}	β_{16}	β_{17}
	Const.	NOL	EXPIRE	SIZE	TYPE	NUMB	OPPOSE	PERF
	.080	.051	.578	-.028	.049	.123	-.195	-11.105
	(1.48)@	(1.05)	(1.77)*	(-1.21)	(0.84)	(1.71)*	(-1.57)@	(-1.82)*

Adjusted R^2 = .48 F = 5.38*

Sample: Taxable Acquisitions - Target Firms (n=82)

	β_{11}	β_{12}	β_{13}	β_{14}	β_{15}	β_{16}	β_{17}
	Const.	NOL	EXPIRE	SIZE	TYPE	NUMB	OPPOSE	PERF
	.143	.093	-1.106	-.011	.089	.067	-.214	17.567
	(1.72)*	(0.89)	(-1.29)@	(-0.35)	(1.55)@	(1.14)	(-1.85)*	(1.38)@

Adjusted R^2 = .27 F = 2.72*

Sample: Tax-free Acquisitions - Acquiring Firms (n=80)

	β_{11}	β_{12}	β_{13}	β_{14}	β_{15}	β_{16}	β_{17}
	Const.	NOL	EXPIRE	SIZE	TYPE	NUMB	OPPOSE	PERF
	.021	.167	.947	.010	.042	-0.062	-0.114	5.121
	(0.35)	(0.95)	(1.75)*	(1.08)	(1.01)	(-1.18)	(-1.63)*	(1.04)

Adjusted R^2 = .22 F = 2.13*

Sample: Taxable Acquisitions - Acquiring Firms (n=82)

	β_{11}	β_{12}	β_{13}	β_{14}	β_{15}	β_{16}	β_{17}
	Const.	NOL	EXPIRE	SIZE	TYPE	NUMB	OPPOSE	PERF
	.025	.162	.051	.008	.030	-0.018	-0.052	-1.474
	(1.03)	(0.98)	(0.68)	(1.14)	(2.01)*	(-.93)	(-1.53)@	(-0.61)

Adjusted R^2 = .19 F = 1.85

Notes to Table 20:
(1) T-statistics are given in parenthesis; significance is determined using a one-tailed t-test.

* Significant at .05 level; @ Significant at .10 level

taxable acquisitions. While the coefficient is positive for target and acquiring firms in tax-free acquisitions, it is not statistically significant. Number of bidders appears to result in higher returns to target firms involved in tax-free acquisitions; it is relatively insignificant in explaining the returns to target firms involved in taxable acquisitions. The coefficient on this variable is negative for both groups of acquiring firms although it is not significant. As indicated by the coefficient on OPPOSE, a contested acquisition results in lower returns to target and acquiring firms' shareholders, regardless of whether the proposed acquisition is taxable or tax-free. Results regarding the performance measure are not consistent across groups. PERF is significant and negatively related to the returns for target firms in tax-free acquisitions. For acquiring firms in tax-free acquisitions, the coefficient is positive. The reverse is true for taxable acquisitions. The coefficient on PERF is positive and significant for target firms and negative although insignificant for acquiring firms.

Taxable Acquisitions

The data used in the cross-sectional analyses to examine the tax attributes available in taxable acquisitions are described in Table 21. To be included in the sample used to examine these tax attributes, current cost information had to be available in order to construct measures of the step-up, and return data had to be available

TABLE 21

TAX ATTRIBUTES AVAILABLE IN TAXABLE ACQUISITIONS (1)

Variable			Mean Values Taxable	Tax-free	z-Stat
1. Total Number of Firms		- Target	105	66	
		- Acquiring	105	66	
2. CARNn for All Firms		- Target	.2716	.1785	2.42*
		- Acquiring	.0401	.0192	2.01*
3. Magnitude of Tax Variables					
		- Target			
	STEPUP:	TSTEPUP	.2641	.1646	1.93*
		RSTEPUP	.2382	.1472	1.45**
		TOTALUP	.2863	.1932	2.49*
	CGAIN:		.2341	.1493	3.01*
		- Acquiring			
	STEPUP:	ASTEPUP	.0163	.0065	2.67*
		TOTALUP	.1251	.0634	2.22*
	CGAIN:		.0631	.0405	1.45**
4. Magnitude of Non-Tax Variables for All Firms					
		SIZE	-1.376	-1.228	1.22
		TYPE	.622	.103	6.63*
		NUMB	.315	.199	2.08
		OPPOSE	.222	.079	2.16*
		PERF	.002	.001	1.12

Notes to Table 21:
(1) The z-statistic is based on the Mann-Whitney test. The CARNn are over the ten-day period ending on the announcement date.

* Significant at .05 level; ** Significant at .10 level

for both the target and acquiring firms. Information was found for 105 firms involved in taxable acquisitions and 66 firms involved in tax-free acquisitions.

Significant differences in the CARNn occur in the taxable and tax-free groups (comparison 2). The CARNn of both taxable and tax-free target groups are higher than those for the comparable groups reported in Table 14. Acquiring firms in taxable acquisitions also experience higher returns than those in tax-free ones and higher returns than those for the comparable acquiring firm groups reported in Table 18.

All measures of STEPUP comprise a higher percentage of the target and acquiring firms' equity values for the taxable groups as compared with the tax-free ones. TSTEP varies from 26.1% of the target firms' equity values for the taxable group down to 14.5% for the tax-free group. ASTEPUP equals approximately 0.6% to 1.6% of the equity values of acquiring firms. The CGAIN variable is significantly higher for taxable target and acquiring firm groups as compared with the respective tax-free groups.

Regarding the non-tax variables, again more acquisitions in the taxable group were accomplished through tender offers, had more than one bidding firm present, and were opposed as compared with the tax-free group. The performance measures are larger than those in Table 19, and are higher for target firms in the taxable group relative to those for the tax-free group.

TABLE 22

CROSS-SECTIONAL ANALYSES OF TAX ATTRIBUTES
AVAILABLE IN TAXABLE ACQUISITIONS TO TARGET FIRMS (1)

Sample: Taxable Acquisitions - Target Firms (n=105)

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TSTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.04	0.35	0.51	0.03	0.09	0.02	0.04	6.38
	(0.91)	(1.62)*	(1.96)*	(1.15)	(1.31)@	(0.65)	(0.32)	(1.47)@

Adjusted R^2 = .27 F = 2.86*

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	RSTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.04	0.39	0.46	0.07	0.11	0.02	0.06	4.39
	(0.85)	(1.78)*	(2.02)*	(1.26)@	(1.22)@	(0.48)	(0.27)	(1.71)*

Adjusted R^2 = .29 F = 3.01*

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TOTALUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.05	0.22	0.44	0.06	0.12	0.04	0.05	4.06
	0.65)	(1.51)@	(1.81)*	(1.02)	(1.28)@	(0.81)	(0.67)	(1.91)*

Adjusted R^2 = .24 F = 2.67*

Sample: Tax-free Acquisitions - Target Firms (n=66)

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TSTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.18	0.23	-0.12	0.01	0.21	0.16	-0.09	-4.17
	(1.57)@	(0.61)	(-1.05)	(0.91)	(1.61)@	(1.24)@	(-1.35)@	(-.95)

Adjusted R^2 = .33 F = 3.51*

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	RSTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.16	0.34	-0.22	0.03	0.14	0.12	-0.05	-3.26
	(1.18)	(0.86)	(-.98)	(1.37)@	(1.24)@	(1.07)	(-1.03)	(-1.51)@

Adjusted R^2 = .36 F = 3.82*

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TOTALUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.15	0.28	-0.26	-0.02	0.04	0.09	-0.11	-5.02
	(1.11)	(1.03)	(-0.85)	(-.95)	(1.39)@	(1.31)@	(-1.24)@	(-1.12)

Adjusted R^2 = .29 F = 3.01*

Notes to Table 22:
(1) T-statistics are given in parenthesis; significance is determined using a one-tailed t-test.
* Significant at .05 level; @ Significant at .10 level

TABLE 23

CROSS-SECTIONAL ANALYSES OF TAX ATTRIBUTES
AVAILABLE IN TAXABLE ACQUISITIONS TO ACQUIRING FIRMS (1)

Sample: Taxable Acquisitions - Acquiring Firms (n=105)

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	ASTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.09	6.21	0.22	0.02	0.05	-.045	-0.19	-15.66
	(1.84)@	(2.87)*	(0.66)	(0.41)	(1.42)@	(-0.63)	(-2.23)*	(-3.57)@

Adjusted R^2 = .26 F = 4.24*

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TOTALUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	0.03	0.31	0.12	0.08	0.03	-0.06	-0.11	-9.37
	(0.54)	(2.32)*	(0.73)	(1.37)@	(1.51)@	(-0.81)	(-2.47)*	(-2.31)*

Adjusted R^2 = .31 F = 4.72*

Sample: Tax-free Acquisitions - Acquiring Firms (n=66)

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	ASTEPUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	-0.02	21.29	0.14	0.05	0.03	0.05	-0.12	10.16
	(-.42)	(1.08)	(0.56)	(1.14)	(1.22)@	(0.42)	(-0.81)	(1.02)

Adjusted R^2 = .09 F = 1.31

	β_{21}	β_{22}	β_{23}	β_{24}	β_{25}	β_{26}	β_{27}
	Const.	TOTALUP	CGAIN	SIZE	TYPE	NUMB	OPPOSE	PERF
	-0.05	0.21	0.45	0.02	0.06	-0.10	-0.04	12.83
	(-.71)	(0.83)	(0.75)	(0.84)	(1.18)	(-1.27)@	(-0.53)	(1.91)*

Adjusted R^2 = .07 F = 1.02

Notes to Table 23:
(1) T-statistics are given in parenthesis; significance is determined using a one-tailed t-test.
* Significant at .05 level; @ Significant at .10 level

The results of the cross-sectional analyses are presented in Tables 22 and 23 and discussed below.

Tax Variables. The evidence consistently supports the hypothesis about the step-up. The opportunity to step-up the asset basis of the target firms' assets appears to be related to the announcement period returns of the target firms in taxable acquisitions regardless of the measure used. For target firms in tax-free acquisitions, the coefficients for the step-up measures are positive although not significant. Similarly for acquiring firms in taxable acquisitions, the coefficients for the step-up measures are significant while for the tax-free group they are not significant.

The coefficient on CGAIN is positive for all groups except target firms involved in tax-free acquisitions. As hypothesized, it is significant for target firms in taxable acquisitions. For taxable acquiring firms, the coefficient was hypothesized to be negative; however, it is positive and insignificant. As hypothesized, for tax-free acquiring firms the coefficient is not significantly different from zero.

Non-Tax Variables. The sign on the coefficient on the SIZE variable is generally positive across all groups although it is significant only for the tax-free target and the taxable acquiring groups. TYPE has a positive and statistically significant coefficient for all groups. The number of bidders has a positive coefficient for target firm

groups but it is significant only for the tax-free group. The coefficient on this variable is negative (but generally insignificant) for acquiring firm groups. Consistent with the previous series of cross-sectional analyses, opposition appears to sometimes harm both target and acquiring firms' shareholders as evidenced by the results of the tax-free target group and the taxable acquiring group. The variable representing prior performance of the target firm exhibits the same pattern as in the previous cross-sectional analyses. The coefficient is positive and significant for target firms in taxable acquisitions and negative and significant for the respective acquiring firms. For target firms in tax-free acquisitions, it is negative and significant and for acquiring firms in tax-free acquisitions, the coefficient is positive and sometimes significant.

Other Tests

IRS Rulings on Tax Status

Cumulative abnormal returns for firms that request an IRS ruling on the tax status of the acquisition were computed at the time of the initial acquisition announcement (when the tax status was uncertain) and around the ruling date (when the tax status ruling was made known) as shown in Table 24. The CARNn for the ten days ending on the initial announcement date are lower than those for target firms involved in tax-free acquisitions at the time of the initial acquisition announcement where the tax status of the

TABLE 24

MARKET REACTION TO TAX STATUS RULINGS(1)

Group	n	(2) CARNn Initial Announcement	(3) CARNn IRS Ruling	(4) CARNn Subsequent Announcement
TARGET FIRMS				
Successful Acquisitions				
Favorable Ruling	41	.1006 (19.13)*	.0731 (17.27)*	Not Applicable
Unfavorable Ruling	24	.0957 (21.43)*	-.0427 (-9.51)*	.1013 (22.52)*
Unsuccessful Acquisitions				
Unfavorable Ruling	26	.1031 (19.72)*	-.0491 (-12.42)*	Not Applicable
ACQUIRING FIRMS				
Successful Acquisitions				
Favorable Ruling	31	.0152 (3.48)*	.0042 (1.44)	Not Applicable
Unfavorable Ruling	16	.0093 (1.22)	-.0128 (-2.94)*	.0135 (2.93)*
Unsuccessful Acquisitions				
Unfavorable Ruling	21	.0131 (2.012)*	-.0161 (-3.943)*	Not Applicable

Notes to Table 24:

(1) T-statistics are given in parentheses to determine if the CAR_{Nn} examined is significantly different from zero. Computation of t-statistics, $T(CAR_{Nn})$ is described in Appendix D.

(2) The CARNn consists of the ten trading days ending on the announcement date.

(3) The CARNn consists of the two trading days ending on the ruling date.

(4) The CARNn consists of the ten trading days ending on the subsequent announcement date.

* Significant at the .05 level

acquisition is known. The three groups of target firms examined had CARNn of about 10% during this period while the returns to the respective acquiring firms were slightly over 1% across the three groups.

The returns on the ruling date indicate that it is important that a favorable ruling be received. On average, the two-day CARNn (days -1 and 0) for target firms receiving a favorable ruling is 7.31%. This contrasts with the -4.27% two-day CARNn for target firms receiving unfavorable rulings where the acquisition was successful within a one-year period subsequent to the ruling date with a revised form of consideration or with the same consideration and a taxable tax status. Target firms receiving an unfavorable ruling that were not subsequently acquired experienced a CARNn of -4.91%.

Upon a subsequent offer, the CARNn over the ten-day announcement period for target firms was 10.13%. The sum of the abnormal returns around the first announcement and those around the ruling date is comparable with the announcement period CAR of firms that do not submit for a ruling (i.e., the tax status of acquisition is known). For acquiring firms, the CARNn at the time of the subsequent announcement is 1.36%. The overall abnormal return to acquiring firms receiving unfavorable rulings that are later able to successfully acquire the target firms is only slightly above 0.0%, comparable with the returns observed in some studies to acquiring firms involved in mergers.

Note that no firms were found with favorable rulings where the acquisition was unsuccessful. Apparently by the time firms seek a ruling, the terms of the acquisition have been agreed upon and the only unresolved issue is the tax status.

IRS Regulation on Step-Up

As shown in Table 25, firms involved in taxable acquisitions over the 1982-1985 period that would have been more likely to be affected by the retroactive clause of IRS Regulation on Section 338, IRC, (More Likely Group) experienced significant negative returns when compared with firms that were not as likely to be hurt be this law (Less Likely Group) or that would have been totally unaffected by the regulation (No Effect Group). The two-day CAR_{Nn} (day -1 to day 0) around the date of the initial press release in The Wall Street Journal for the More Likely Group is -2.38% which is significant at the .10 level. The two-day CAR_{Nn} for the other two groups of firms are not statistically significant. This evidence is consistent with the hypothesis that the ability to step-up the target firm's assets is a positive and significant factor to acquiring firms in acquisitions.

The CARNn over the regulation announcement period (column 2) are lowest for the More Likely Group although not statistically significant. The third column, however, indicates that the CARNn for the More Likely Group are significantly lower than for the other two groups.

TABLE 25

MARKET REACTION TO IRS REGULATION ON STEP-UP

Group	n	(1) CARNn Initial Announcement	(2) CARNn Regulation Announcements	(3) T-Statistic Comparing Groups
More Likely	50	-.0238 (-1.44)**	-.0185 (-1.28)	Not Applicable
Less Likely	50	-.0109 (-0.81)	-.0073 (-0.55)	-1.87*
No Effect	42	.0006 (0.34)	.0012 (0.51)	-4.83*

Notes to Table 25:

(1) T-statistics, given in parentheses in columns 1 and 2, are used to determine if the CARNn are statistically different from zero using a one-tailed t-test.

The initial announcement period consists of the 2-day interval from February 6 to February 7, 1986.

(2) Various regulation announcements were made over the 15-day interval ending on February 9, 1986.

(3) T-statistics are formed by comparing the CARNn of the More Likely Group with those of the Less Likely Group and the No Effect Group. A two-tailed t-test is used to determine if the CARNn of the groups are significantly different.

* Significant at .05 level; ** Significant at .10 level

In the next chapter, the results presented in this chapter are discussed and areas for further research are suggested.

Notes to Chapter V

[1] A possible explanation of this is that acquiring firms are appealing to different tax clienteles. However, that in itself, is no reason to structure the acquisition as a two-tiered deal since mixed consideration may be offered in a one-tier acquisition.

[2] A partially taxable tender offer usually consists primarily of a cash payment which is taxable plus an additional payment in the form of equity or debt instruments which, under certain circumstances, is considered tax-free.

[3] In partially taxable mergers, the acquiring firm usually makes a stock offer accompanied by a small amount of cash or some other form of consideration. If cash is involved, it is considered "boot" and is always taxable. If debt or preferred stock is involved, it is usually considered "boot" and is also taxable.

[4] A number of firms were eliminated because they were missing returns for two or more successive days. In the event study methodology used in this study, if only one daily return was missing, it was estimated by finding the geometric average of the two daily returns on either side of the missing day.

[5] The date on which the acquisition is reported is usually one day subsequent to the date of the actual acquisition announcement. Returns on day -1 are thus generally larger than those on day 0.

[6] If the probability of F is less than or equal to .10, the t-statistic is based on the separate sample variance estimates; otherwise, it is based on the pooled variance estimate. (See Overall and Kleet, 1972; Statistical Package for the Social Sciences, 2nd Edition, 1975.)

[7] For five of the target firms with NOL carryforwards and/or unused credits, return data were not available for the acquiring firm. Upon examination, these firms had been eliminated from the previous analyses because they were missing more than one successive day of returns during the estimation period. Because of the small number of firms with carryforwards and/or credits, it was important to include these in the analysis. Accordingly, the abnormal returns were calculated for these five acquiring firms by interpolating the missing returns over the missing period. At most four days of returns had to be interpolated.

CHAPTER VI

DISCUSSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

Taxable Versus Tax-free Acquisitions

This study provides strong evidence that there is a difference between the returns realized by target and acquiring firms' shareholders in taxable and tax-free acquisitions. The results presented in Tables 14 and 18 (comparisons 11, 12 and 13) consistently indicate that for both target and acquiring firms, the tax status of the offer rather than the form of the offer explains the differences in the wealth effect studies done on firms involved in tender offers versus mergers.

Target firms in taxable acquisitions experience abnormal returns that are approximately nine percentage points higher than those experienced by target firms in tax-free acquisitions. Breaking this down by type of offer, the returns in taxable tender offers are about ten percentage points higher than those in tax-free tender offers and eight percentage points for taxable versus tax-free mergers.

For acquiring firms, the overall returns in taxable acquisitions are about three percentage points higher than for tax-free acquisitions. Acquiring firms in taxable tender offers experience about a two percentage point

premium and those in mergers have almost a four percentage point premium compared with the returns for the respective tax-free group.

Tax Attributes in Tax-free Acquisitions

Comparing the magnitude of the tax attributes in taxable and tax-free acquisitions, the size of the NOL carryforwards and unused credits as well as the portion of these due to expire in the near future is significantly higher for target and acquiring firms in tax-free versus taxable acquisitions. The magnitude of the carryforwards and unused credits for target firms in tax-free acquisitions is over 30% of the target firms' equity values on average and averages over 6% of the acquiring firms' equity values. This compares with 21% and 5% for target and acquiring firms in taxable acquisitions, respectively. The portion of these attributes due to expire is 9% of target firms' equity values in tax-free acquisitions and 6% in taxable acquisitions. Comparable figures for acquiring firms are 2% and 1% of their equity values, for those involved in tax-free and taxable acquisitions, respectively.

Considering only tax-free acquisitions, target firms with NOL carryforwards and unused credits and their respective acquiring firms experience significantly higher announcement period returns than do target and acquiring firms in tax-free acquisitions where the target firm does not have these tax attributes. These results suggest that

acquiring firms enter into tax-free acquisitions to take advantage of the target firms' tax attributes if they are particularly large and/or if a significant portion of these attributes is due to expire in the near future. The difference in announcement period returns is consistent with the notion that these attributes contribute value to both the target and acquiring firms involved in the acquisition.

However, the results of the cross-sectional analyses provide mixed evidence regarding the hypothesis that these tax attributes contribute to the involved firms' announcement period returns. The coefficient on the NOL variable examined is consistently positive for the tax-free target and acquiring firm groups as hypothesized, although it is not statistically significant. The hypothesis about the portion of the attributes due to expire in the near future is strongly supported for both target and acquiring firms in tax-free acquisitions. This is consistent with the notion that the longer a tax attribute goes unutilized by the target firm, the more the market discounts the probability that it will be used. Interestingly, the coefficient on the EXPIRE variable for target firms in taxable acquisitions, hypothesized to equal zero, is negative. This suggests that in the event of an acquisition, the market anticipates a tax-free transaction in light of the expiring attributes.

Announcement of a taxable acquisition lowers the market's assessment that the attributes will be utilized.

Tax Attributes in Taxable Acquisitions

The results regarding the tax attributes in taxable acquisitions were much stronger than for those in tax-free acquisitions. The magnitude of the step-up measures for both target and acquiring firms are significantly higher in taxable versus tax-free acquisitions. On average, the step-up equals roughly 25% of the equity values of target firms in taxable acquisitions and about 15% of the equity value of target firms in tax-free acquisitions. The size of the estimated added step-up is also greater for acquiring firms in taxable acquisitions (about 1.6% of equity values) than for those involved in tax-free acquisitions (about 0.6% of equity values).

The capital gains liability was very similar in size to the step-up measures for target firms, equalling about 23% for target firms in taxable acquisitions and 15% for target firms in tax-free acquisitions. The capital gains measured 6% and 4% of the acquiring firms' equity on average in taxable and tax-free acquisitions, respectively.

Both the potential to step-up the asset basis and the capital gains liability is significantly related to the target firms' announcement period returns in taxable acquisitions. As hypothesized, the coefficients on these variables were not significant for target firms in tax-

free acquisitions, evidence that the measures are reliable. The added step-up was significantly related to the announcement period returns of acquiring firms in taxable acquisitions but not in tax-free acquisitions, again as hypothesized. Contrary to the hypothesis that acquiring firms bear the burden of the capital gains tax in taxable acquisitions, the capital gains variable was not related the acquiring firms' returns for the taxable group.

Other Tests

The market's reaction to both favorable and unfavorable IRS rulings on the tax status of acquisition confirms the finding that tax status is important. Firms that submit for rulings experience lower abnormal returns at the time of the initial acquisition announcement than do firms that do not submit for rulings. If the ruling is favorable, target firms experience significantly positive abnormal returns, equalling roughly 70% of the abnormal returns occurring at the initial acquisition announcement and 40% of the aggregate abnormal returns over the announcement and ruling period. Acquiring firms experience positive, statistically insignificant abnormal returns when favorable rulings are announced. Combining the returns at the initial announcement and the ruling date, the aggregate abnormal returns of the target and acquiring firms are comparable with the announcement period returns of firms that do not submit for rulings.

Firms that receive unfavorable rulings experience significantly negative abnormal returns. The difference in abnormal returns for target firms receiving favorable and unfavorable rulings is over 12 percentage points around the ruling date and for acquiring firms the difference is about 1.5 percentage points. The negative returns are large for target firms, equalling roughly half of the initial announcement period returns. For acquiring firms receiving unfavorable rulings, the negative abnormal returns around the ruling date completely wipe out the positive abnormal returns experienced at the time of the initial acquisition announcement. These negative returns are consistent with the notion that the market revises the probability of acquisition downward as a result of the ruling.

The results of the test examining the regulation calling for retroactive recapture of the added step-up are consistent with the hypothesis. Firms that would have been most hurt by this regulation experienced significantly negative abnormal returns around the announcement date; firms that would not have been effected by the regulation did not have abnormal returns during this time. This confirms the results discussed above on the added step-up. The value of stepping-up the asset basis of target firms' assets does not appear to be reflected in the involved firms' stock prices prior to an acquisition announcement. Acquiring firms do apparently

benefit from the increased asset basis, availing themselves of the opportunity to write-up the purchased assets above their fair market value. These results suggest that the added step-up equals about 2.0% of the acquiring firms' equity values.

Further Research

The results of this study suggest several avenues for further research. Acquiring firms appear to consider the tax attributes of target firms in deciding whether to undertake a taxable or tax-free acquisition, yet there may be other factors governing this decision. In particular, since the tax status of the acquisition is related to the consideration offered, a feasible question is what prompts an acquiring firm to make a cash offer, a stock exchange or to compensate the target firm's shareholders with some other form of consideration. DeAngelo, DeAngelo and Rice (1984) suggest that the acquiring firm's managers consider characteristics about the acquiring firm in making this decision. Yet it appears that target firm characteristics also play a role in the decision. Examining the way these concerns interact would provide insight into understanding the type of consideration offered. Similarly, if an acquiring firm involved in an active acquisition program usually makes cash offers and, for a particular target firm makes a stock offer, a viable question is whether the switch is due to internal changes and/or particular characteristics of the target firm.

The changes brought about by the Tax Reform Act of 1986 regarding tax attributes in acquisitions also deserve examination. The amount of a carryforward that can be used in any year to offset taxes of the acquiring firm is limited, the value of the step-up to acquiring firms is reduced and depreciation recapture taxes can no longer be avoided in taxable acquisitions. Do these changes serve to slow down merger activity as intended and/or reduce the acquisition purchase price, or do they seem to have little or no impact? Do the target firms purchased since the passage of this act differ in terms of the tax attributes they possess as compared with target firms prior to 1986?

Finally, future research could provide insights on the areas related to the control variables used in this study. As observed, there is a relationship between the tax status of the acquisition and the form of the acquisition proposal, tender offer or merger. It is commonly accepted that tender offers are used in hostile situations and mergers are used in friendly negotiations. Yet little has been done to examine this hypothesis. Data used in this study indicate that while more tender offers are contested, mergers are also contested. To attribute the proposal form solely to the friendly/hostile climate of the two firms would seem to be an oversimplification.

Results of previous studies are mixed as regards the effect of opposition on target and acquiring firms' returns. The results of this study indicate that in

general opposition by the target firm's managers or shareholders is related to lower announcement period returns to the target and acquiring firms. Further work on the source of opposition, the form it takes and the timing would shed light on its effect.

The performance of the target firm prior to acquisition deserves further attention. As noted in Chapter I, the results of some studies suggest that target firms are inefficiently managed and that acquiring firms take control and rectify this situation. However, this study suggests that not all target firms are inefficiently managed. Further, whether acquiring firms do in fact improve the efficiency of the target firms operations' deserves attention. Better measures for efficiency need to be developed and the relative efficiency of target and acquiring firms, and of target firms before and after acquisition, can then be explored.

APPENDICES

APPENDIX A

TAX-FREE ACQUISITIONS

The first condition that an acquisition must satisfy to qualify for tax-free status is that it must be equivalent to one of the three acquisition-related reorganizations defined in Section 368(a)(1), IRC. These reorganizations are commonly known by the letter of the subparagraph containing the definition as follows:

(1) Type A reorganizations include statutory mergers and consolidations. These are affected primarily by stock exchanges. Various state laws must be satisfied and a majority of the shareholders of both the target and acquiring firms must approve the acquisition.

(2) Type B reorganizations are stock-for-stock exchanges that meet strict requirements. Only voting stock of the acquiring firm or of its parent may be used to obtain the target firm's shareholders' voting stock.

(3) Type C reorganizations are stock-for-asset exchanges. At least 80% of the fair market value of all of the target firm's property must be acquired for voting stock of the acquiring firm.

Section 368(a)(1) limits the kind of consideration that may be offered and specifies the amount of control the acquiring firm must obtain in the target firm. It defines the terms "reorganization" but does not, by itself, have an operative effect.

The reorganization definitions become effective only insofar as other IRC provisions are met. Thus, the second condition for tax-free status is that the acquisition

satisfy the restrictions set forth in either Section 354 or 361, IRC. Section 354 holds that gain or loss shall not be recognized in stock-for-stock (Type A or B) exchanges. Section 361 defers recognition of gain or loss if assets are exchanged for stock (Type C) exchanges.

The third condition that an acquisition must meet to be considered tax-free is that it cannot be undertaken for the primary purpose of avoiding taxes. The Internal Revenue Service has incorporated numerous provisions in the IRC, most notably Section 269, in an attempt to ensure that the tax-free form is not being elected for the sole purpose of tax avoidance. Other restrictive conditions include Section 61, 334, 382, 383, 446, 482 and 1551, IRC.

The fourth condition for tax-free status stems from judicially-conceived constraints that have arisen over time when firms and/or their shareholders were charged with tax avoidance by the Internal Revenue Service. The primary constraints are (i) the business purpose doctrine which holds that there must be a legitimate purpose for the acquisition, (ii) the continuity-of-interest issue which provides that a substantial majority of the target firm's shareholders must continue to maintain an equity interest in the combined firm after acquisition (usually for from two to five years), (iii) continuity-of-business concerns which seek to ensure that the assets of the target firm are operated for essentially the same purpose as they were prior to the acquisition and (iv) the step

transaction doctrine which holds that several stock or asset purchases of a target firm by an acquiring firm that occur close together in time must essentially be regarded as one transaction for tax purposes.

APPENDIX B

CAPITAL GAINS TAX

Capital gains and losses are classified as short-term if the assets giving rise to the gain or loss have been held for one year or less; otherwise, the gain or loss is long-term. The amount eligible for the capital gains tax is determined as follows:

(1) Compute the net long-term capital gains position.

(2) Compute the net short-term capital gains position.

(3) Compute the overall net position by adding long-term capital gains (or losses) to short-term capital gains (or losses).

Only an overall net gain is eligible for capital gains treatment. The IRC allows noncorporate taxpayers to deduct 60% of an overall net gain; the remaining 40% is taxed at the ordinary rate. An overall net loss is deducted to the extent of capital gains (which occurs in steps (1) and (2) above) plus the lower of:

(a) the excess of a net short-term capital loss over a net long-term capital gain, plus one-half of the excess of a net long-term capital loss over a net short-term capital gain,

(b) $3,000 ($1,500 for married taxpayers filing separately), or

(c) taxable income computed without regard to capital gains and capital losses, increased by the zero bracket amount and the deduction for exemptions.

Noncorporate taxpayers can indefinitely carry forward

capital losses not deducted currently, preserving the long-term and short-term components.

When a taxpayer dies, the tax basis of the assets in the hands of the heirs is their fair market value at the time of the taxpayer's death. There is thus no tax on any gain that occurred while the taxpayer held the assets.

APPENDIX C

CRITIQUE OF METHOD USED BY AUERBACH AND REISHUS TO ESTIMATE STEP-UP

Auerbach and Reishus (1986) find that the opportunity to step-up the target firm's asset basis occurs in only about 5% of the acquisitions examined. However, this finding appears to be biased downward because of the method used to estimate the step-up. This method is discussed below.

As noted in Chapter I, the step-up is the difference between the target firm's tax basis in its depreciable assets and the acquiring firm's tax basis (which should reflect the amount paid to purchase those assets) in these assets. Auerbach and Reishus assume that the book value of structural assets at the end of the last year before the merger (the terminal value) is the tax basis. While this is unlikely to be the case since firms often use different methods of depreciation for financial reporting and tax purposes, the book value is used since information on the tax basis of firms' assets is not publicly available. Note that Auerbach and Reishus focus only on structural assets (plant) in estimating the tax basis. They calculate structural assets by multiplying the amount of a firm's fixed assets by a fraction representing the ratio of structural assets to fixed assets for the industry. The omission of equipment, which may also give rise to a step-up, biases the results downward, making it less likely that the step-up will be significant; use of

an industry fraction introduces "noise" in the calculation although this may not bias the results in a particular direction.

In measuring the purchase price, the assumption is made that the assets are purchased by the acquiring firm at their fair market value. This is a reasonable assumption. However the calculation used to find fair market value may lead to a serious understatement of the actual fair market value if (1) the depreciation method used for financial reporting purposes has changed over the period, (2) there is a significant difference between the book values and the tax values at the initial and terminal points in time and (3) the rate of inflation affecting the firm's assets is different from that affecting the economy as a whole (as measured by the GNP).

To see this, consider the method used by Auerbach and Reishus to find the fair market value. They first find the rate of economic depreciation by comparing the terminal value of structural assets with their initial value and finding the rate of declining balance depreciation that is consistent with these values. Rather than using a firm-specific rate, they use a declining balance rate of .033 based on an aggregate value derived from earlier work. Applying this rate, they find the balance of undepreciated structural assets at the end of each year during this period. Assuming that the assets increase in value at the general rate of price inflation,

they multiply the amount of undepreciated structural assets by the ratio of the price in the current year to that for the year in which the assets were assumed to be purchased. The sum of these yearly calculations is the estimated fair market value of structural assets.

No mention is made of adjusting for changes in depreciation methods. However if the firm changed from reporting depreciation on a straight-line basis to an accelerated basis, the estimated fair market value would be biased downward. Second, evidence suggests that inflation has been higher in capital intensive industries than for the economy as a whole. Thus use of the change in GNP to find the fair market value of assets again biases the results downward. Finally, because the difference between the book and tax value of assets at the two points in time may not be the same and further, because this difference is likely increase since the tax rules on depreciation have become increasingly lenient over the time period examined (1963-1983), bias is introduced. The result is that the fair market value of assets and, in turn, the value of the step-up is likely to be greater than estimated.

APPENDIX D

CALCULATION OF ANNOUNCEMENT PERIOD RETURNS

Basic Methodology

To calculate each firm's abnormal returns during the acquisition announcement period, the market model was used as described below. Cumulative abnormal returns were formed by aggregating the abnormal returns for each firm over the ten-day period ending on the announcement day. Abnormal returns were aggregated across firms following the methodology suggested by Patell (1976).

In the sections below, calculations of the abnormal returns and cumulative abnormal returns for each firm and the test statistics for these return measures are presented. Then the steps involved in computing average abnormal returns and cumulative abnormal returns across firms and the respective test statistics are explained.

Abnormal Returns for Each Firm

Abnormal stock returns for each firm during the acquisition announcement period were calculated using the market model. Parameters of the model were estimated using daily stock return data over the 150 trading days beginning 190 days prior to the announcement date (day 0) and ending 41 days prior to the announcement date. The estimation period thus ranges from day -190 to day -41. The announcement (or forecast) period begins 40 days prior to the acquisition announcement and ends 10 days following the announcement date (day -40 to day +10).

Abnormal returns for firm i on day t were determined as follows:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$$

where R_{it} is the actual return for firm i on day t and $(\hat{\alpha}_i + \hat{\beta}_i R_{mt})$ is the predicted return from the market model. A value-weighted market index was used for R_{mt}. (The market model was run with and without making the Scholes-Williams (1977) adjustment and the results were not significantly different. The results reported in Chapter V have not been subject to this adjustment.)

T_{it} is the test statistic used to examine the significance of the abnormal return for firm i on day t. It equals:

$$T_{it} = AR_{it} / s_{fi}$$

where s_{fi} is the standard error of the forecast as explained below. T_{it} is t-distributed with n-2 degrees of freedom, where n equals the number of days in the estimation period.

Cumulative Abnormal Returns for Each Firm

The cumulative abnormal return for firm i for a series of n days (from t_1 to t_2) during the announcement period is given by the sum:

$$CAR_{in} = \sum_{t=t_1}^{t_2} AR_{it}$$

In the cross-sectional models, $t_1 = -9$ and $t_2 = 0$. CAR_{in} thus consists of the sum of the abnormal returns for 10 days prior to and including the announcement date (day 0).

The standardized cumulative abnormal return for firm i for n days, $SCAR_{in}$, is distributed unit normal and can be used to examine the significance of CAR_{in}. This is calculated as follows:

$$SCAR_{in} = \sum_{t=t_1}^{t_2} T_{it}/(n^{1/2})$$

Average Abnormal Returns Across Firms

The average abnormal return for N firms on day t, AR_{Nt}, is presented in Tables 11-13 and 15-17. It is calculated by summing AR_{it} across the N firms and dividing this sum by N. The test statistic used to examine the significance of AR_{Nt} is:

$$T_{Nt} = \sum_{i=1}^{N} T_{it}/(N^{1/2})$$

which is approximately N(0,1) for large N.

These tables also report a cross-sectional test statistic, C_t, computed to examine the significance of firms' abnormal returns on a given day t. To form C_t, which is t-distributed with N-2 degrees of freedom, the standard deviation of abnormal returns for day t, $s(AR_t)$, is calculated and used to standardize AR_{Nt} as shown below:

$$C_t = AR_{Nt}/s(AR_t)$$

where $s(AR_t) = [(N-1)^{-1} (\sum_{i=1}^{N} AR_{it}^2) - NAR_{Nt}^2]^{1/2} (N)^{-1/2}$.

Average Cumulative Abnormal Return Across Firms

The average cumulative abnormal return for N firms for a series of n days, CAR_{Nn}, is reported in Tables 11-18. It is calculated by summing AR_{Nt} across n days. The test statistic used to examine the hypothesis that CARNn = 0 is determined as follows:

$$T(CAR_{Nn}) = CAR_{Nn}/S(CAR_{Nn})$$

where $S(CAR_{Nn}) = [(N-1)^{-1} \sum_{i=1}^{N} (CAR_{in} - CAR_{Nn})^2]^{1/2} (N)^{-1/2}$.

Standard Error of the Forecast

AR_{it} is distributed with mean 0 and variance σ_{fi} (the variance of the forecast or, in this case, the announcement period), where:

$$\sigma_{fi} = \sigma_i[1 + 1/n + (R_{mt} - \bar{R}_{me})^2 / \sum_{e=t_1}^{t_2} (R_{me} - \bar{R}_{me})^2].$$

In this expression, n=150, e is the estimation period ranging from day -190 to day -41, $\bar{R}_{me}$ is the mean of the market return over the estimation period, and σ_i is the variance of e_{it} in the following equation:

$$AR_{it} = R_{it} - \hat{R}_{it} = (\alpha_i - \hat{\alpha}_i) + (\beta_i - \hat{\beta}_i)R_{mt} - e_{it}.$$

The standard error of the regression, s_i, defined as follows, is an unbiased and consistent estimate of σ_i:

$$s_i = [(1/(n-2)) \sum_{e=t_1}^{t_2} (R_{ie} - \bar{R}_{ie})^2]^{1/2}$$

where n=150 and e ranges from day -190 to day -41.

Substituting s_i for σ_i yields:

$$s_{fi} = s_i[1 + 1/n + (R_{mt} - \bar{R}_{me})^2 / \sum_{e=t_1}^{t_2} (R_{me} - \bar{R}_{me})^2].$$

where s_{fi} is the estimated standard error of the forecast.

APPENDIX E

METHODOLOGY USED TO ESTIMATE STEP-UP MEASURES

Four measures of the STEPUP variable were calculated to estimate the value of the step-up available in taxable acquisitions. These measures are described below.

TSTEPUP

Based on the discussion in Chapter III, from the target firm's point of view the step-up is the difference between the purchase price and the tax basis prior to acquisition, times the target firm's prevailing tax rate. Assuming that the acquiring firm pays the fair market value to purchase the target firm's depreciable assets, designated by FMVDA, TSTEPUP is defined as follows where t_T is the effective tax rate of the target firm (as defined below) for the year prior to the year of the acquisition announcement:

$$TSTEPUP = (FMVDA - BVDA)t_T.$$

Here the assumption is made that the book value of depreciable assets, BVDA, equals the tax basis. Since a number of firms use straight-line depreciation for financial reporting purposes and accelerated depreciation methods for tax purposes, this difference is likely to understate the actual step-up from the target firm's point of view. The fair market value of depreciable assets, FMVDA, was estimated using replacement cost data provided by the FAS 33 footnote in the target firm's financial statements at the year-end prior to the year of the

acquisition announcement. The effective tax rate used in this calculation and those discussed below is defined as the federal taxes payable divided by pretax income from continuing operations.

RSTEPUP

RSTEPUP equals TSTEPUP minus estimated depreciation recapture taxes:

$$\text{RSTEPUP} = \text{TSTEPUP} - [\text{DEFTAX}\ (F)]$$
$$\text{where } F = \text{BVDA} / \text{TTA}.$$

Recapture taxes are estimated by multiplying the balance of the target firm's deferred tax account at the year-end prior to the year of the acquisition announcement, DEFTAX, by F, the ratio of the firm's net depreciable assets to total tangible assets. To find F, the value of the firm's net book value of depreciable assets, BVDA, at the year-end prior to the year of the acquisition announcement is divided by the total tangible assets of the firm, TTA, at this time. The assumption here is that the ratio of depreciable assets to total tangible assets is comparable with the percentage of the balance in the deferred tax account arising from use of accelerated depreciation for tax purposes and straight-line depreciation for book purposes. Accordingly, the depreciation recapture amount is still assumed to be zero for firms using accelerated methods for book purposes.

ASTEPUP

As noted in Chapter I, the acquiring firm accounts for the target firm's assets in taxable acquisitions at the purchase price which, according to IRS regulations, should approximate the fair market value of the assets. However, if the acquiring firm can allocate an amount to the assets exceeding the actual purchase price as discussed in Chapter III, then the firm benefits as a result of depreciation deductions taken on this excess. ASTEPUP attempts to measure this excess and is calculated as follows:

$$\text{ASTEPUP} = (\text{NB} - \text{FMVDA})t_A$$
$$\text{where NB} = (\text{PRICE} - \text{CGGOOD})\text{F}.$$

As seen in these equations, ASTEPUP is defined as the difference between the estimated new basis of the target firm's assets on the acquiring firm's books, NB, and the fair market value of depreciable assets, FMVDA, times the effective tax rate of the acquiring firm, t_A.

NB was found by first determining the aggregate purchase price paid by the acquiring firm, PRICE, to acquire the target firm. This was found by multiplying the offer price by the number of target firm shares outstanding 40 days prior to the acquisition announcement in the case of cash offers and, in the case of stock-for-stock acquisitions, by multiplying the price of the acquiring firm's stock ten days prior to the acquisition announcement by the number of acquiring firm's share offered in the exchange (based on the exchange rate).

Then, the increase in goodwill, CGGOOD, on the acquiring firm's books in the year of the completed acquisition as compared with the balance the previous year was ascertained. CGGOOD was subtracted from PRICE to determine the amount of the purchase price available for allocation to tangible assets. The result was multiplied by F (described in RSTEPUP), the fraction of depreciable assets held by the target firm, to determine the estimated amount allocated to depreciable assets and correspondingly, the new basis, NB.

TOTALUP

TOTALUP attempts to measure the total change in the asset basis upon acquisition. It consists of the sum of TSTEPUP and ASTEPUP as follows:

$$\text{TOTALUP} = (\text{FMVDA} - \text{BVDA})t_T + (\text{NB} - \text{FMVDA})t_A.$$

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(b) The IRS issued a regulation late in Jan. that could curb takeovers by increasing the tax bill for acquirers. February 7, 1986, p. 3.

(c) Tax revision vs. takeover: Editorial page article by Dale Collinson and John Fitzsimmons on proposed tax-law changes which could have a cooling effect on corporate takeovers. April 16, 1986, p. 32.

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