Empirical tax research in accounting [☆]

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Abstract

This paper traces the development of archival, microeconomic-based, empirical income tax research in accounting over the last 15 years. The paper details three major areas of research: (i) the coordination of tax and non-tax factors, (ii) the effects of taxes on asset prices, and (iii) the taxation of multijurisdictional (international and interstate) commerce. Methodological concerns of particular interest to this field also are discussed. The paper concludes with a discussion of possible directions for future research. © 2001 Elsevier Science B.V. All rights reserved.

JEL classification: M41; H25; K34; G32; F23

Keywords: Taxes; Empirical tax research; Non-tax costs; Financial reporting costs; Tax capitalization

1. Introduction

Tax research has long attempted to address three questions of scholarly and policy interest: Do taxes matter? If not, why not? If so, how much? Current tax research in accounting addresses these questions using a framework developed

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by Scholes and Wolfson (SW, 1992).[1] This paper traces the genesis of the framework and its influence on the development of archival, microeconomic-based, empirical tax research in accounting over the last 15 years. It is intended to serve as a historical record, an introduction for doctoral students and other interested parties, and a guide for identifying important unresolved issues in the literature.

Although tax research has a long history in economics and finance and many accounting practitioners specialize in tax planning and compliance, accounting academe was slow to adopt taxes as an important area of inquiry. Besides empirical inventory costing studies (e.g., Ball, 1972; Dopuch and Ronen, 1973; Sunder, 1973, 1975), tax research by accountants before the mid-1980s could be dichotomized into two lines: (a) legal research, evaluating the effects of taxes on exogenous transactions, usually published in law journals, and (b) policy studies, evaluating the distributional or efficiency effects of taxes, usually published in public economics journals. Few tax papers were published in general interest accounting journals. Although seminal studies in corporate finance, many of which examined tax issues (e.g., Modigliani and Miller, 1963), influenced financial accounting research, they did not similarly affect tax research in accounting.

By the mid-1980s, finance was losing interest in tax research. Myers (1984, p. 588) expressed finance's frustration with empirical tax studies in his presidential address, "I know of no study clearly demonstrating that a firm's tax status has predictable, material effects on its debt policy. I think the wait for such a study will be protracted." Scholes, a finance professor, and Wolfson, an accounting professor, responded by adopting a microeconomic perspective to analyze settings where taxes were likely important.

The Scholes–Wolfson paradigm does not advance new theories or methodology. It focuses on neither detailed legal aspects nor policy recommendations. Rather it adopts a positive approach in an attempt to explain the role of taxes in organizations. Drawing extensively from corporate finance and public economics, it merges two distinct bodies of knowledge: microeconomics and tax law. The paradigm is central to current empirical tax research in accounting, important in public economics, and somewhat influential in corporate finance.

Its conceptual framework is developed around three central themes (known as all parties, all taxes, and all costs), none of which is particularly novel or counterintuitive:

- "Effective tax planning requires the [tax] planner to consider the tax implications of a proposed transaction for all of the parties to the transaction.

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[1] Scholes et al. (2001) is an updated, second edition of SW.

- Effective tax planning requires the planner, in making investment and financing decisions, to consider not only explicit taxes (tax dollars paid directly to taxing authorities) but also implicit taxes (taxes that are paid indirectly in the form of lower before-tax rates of return on tax-favored investments).
- Effective tax planning requires the planner to recognize that taxes represent only one among many business costs, and all costs must be considered in the planning process: to be implemented, some proposed tax plans may require exceedingly costly restructuring of the business.'' (SW, p. 2).

An example of all parties is considering both employer and employee taxes when structuring compensation. An example of all taxes is a municipal bond, which carries a lower interest rate because its interest is tax-exempt. An example of all costs is the tradeoff between corporate financial accounting and tax objectives.

The three themes—all parties, all taxes, and all costs—provide a structure for tax management that achieves organizational goals, such as profit or wealth maximization. The themes imply that tax minimization is not necessarily the objective of effective tax planning. Instead, effective tax planning must be evaluated in the efficient design of organizations and through adoption of a contractual perspective. The paradigm implicitly assumes that if all contractual parties, all taxes (explicit and implicit), and all non-tax costs can be identified and controlled, then the observed tax behavior will be rational and predictable.

Typically, the quality of research in this area is evaluated based on whether the research design identifies and controls for all parties, all taxes, and all costs. The paradigm is so widely accepted in accounting that differences between predicted and actual are attributed to unspecified exclusion of an important party, tax, or non-tax cost. Contrary evidence is presumed to reflect model misspecification or measurement error. No paper challenges the validity of the SW framework.

The three themes, while providing an excellent analytical structure, are less effective for constructing rigorous tests. Because the framework operates as maintained hypotheses (similar to utility or firm value maximization), any finding can be characterized as consistent with the theory because non-tax costs, such as financial reporting considerations, are difficult to quantify. To illustrate, suppose an accounting choice (e.g., accruals) is believed to be jointly determined by tax and financial reporting factors, neither of which is perfectly observable. If empirical tests reveal that taxes are an important consideration, then the finding will be interpreted as evidence that financial reporting considerations are insufficiently important to affect taxes. If empirical tests reveal that taxes are not an important consideration, then the finding will be interpreted as evidence that financial reporting considerations overwhelm tax considerations in this setting.

Despite its shortcomings, the framework accounts for the recent surge in tax research in accounting.[2] Tax now rivals managerial accounting and auditing for second billing in the research community after financial accounting. The most active researchers in this area are well-trained empiricists with an understanding of tax law. Newly minted accounting doctoral students who combine professional tax experience with an understanding of microeconomics and finance are ideally situated to adopt the new tax perspective. An appreciation of the nuances of the tax law stands as a substantial barrier to entry for many accounting researchers, particularly in the more technically challenging areas, such as international tax and mergers and acquisitions.

Most of the research is best described as documentation. In the early years of the framework, the demand for documentation was clear. For example, Scholes and Wolfson (1987) state, ''What is most lacking in the literature at the moment is a documentation of the facts.'' The literature is slowly shifting from documentation to explanation, understanding, and prediction, an evolution that is critical to the field's advancement.

Quasi-experimental opportunities (e.g., changes in the tax law) and data availability have directed tax research more than hypothesis testing of competing theories. In particular, the development of the framework coincided with passage of the Tax Reform Act of 1986 (TRA 86), which overhauled the US tax system. Many tax studies applied the framework to examine the economic effects of TRA 86 (e.g., Collins and Shackelford (1992), Matsunaga et al. (1992), and Scholes et al. (1992) among many others).

At first, the empirical tax papers built on SW alone. Instead of a trunk with major branches, the tax literature grew like a wild bush, springing in many directions from the SW root. In recent years, at least three major areas of inquiry (tax and non-tax tradeoffs, taxes and asset prices, and multijurisdictional) have emerged. This review evaluates these three areas of greatest development in the hope that understanding the progress in these areas may provide insights into the factors that promote the production of empirical tax research in accounting. For example, current working papers in international tax reflect a much higher quality than the studies that were published in the early 1990s. The advances are attributable to improvements in theory, data, and research design. Similar improvements are evident in research evaluating the coordination of taxes and financial reporting considerations and in recent studies of implicit taxes (also known as tax capitalization) that attempt to quantify the effect of taxes on asset prices.

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[2] To calibrate the framework's influence and recency, we reviewed the *Journal of Accounting and Economics*, *Journal of Accounting Research*, and *The Accounting Review* for papers that include the word ''tax'' or any variant in their titles. The percentage of archival, empirical papers so entitled increased from 2 percent of all publications in the 1970s and 1980s to 7 percent in the 1990s. Excluding papers addressing accounting for income taxes, recent papers invariably cite Scholes and Wolfson or research referencing their framework.

Our challenge in this paper is to delineate tax research in accounting from tax research in other fields and from other types of accounting research. The multidisciplinary nature of taxes means that tax accountants often conduct microeconomics-based empirical research with non-accounting tax researchers (e.g., Scholes and Wolfson's joint work) and with non-tax accounting researchers, particularly financial accountants. It is also not unusual for the work to be published in economics journals (e.g., *Journal of Public Economics* and *National Tax Journal*) and leading finance journals. Thus, defining tax research in accounting becomes imprecise at best.

To the extent possible, we have attempted to address this issue by concentrating on areas where accountants have made the greatest contribution to academe's understanding of taxes. For example, accountants have concentrated almost solely on income tax research. This focus likely reflects both the centrality of income measurement in the field of accounting and the historical emphasis on income tax consulting by tax accountants. However, the lines are blurring as tax accountants increasingly contribute to the broader academic field of taxes. By importing mainstream accounting research concerns (e.g., the role of earnings) into tax analyses, where accounting topics traditionally have been ignored, tax accountants are tilting tax inquiries toward longstanding accounting issues. In short, the body of knowledge produced in recent years by tax accountants has influenced both accounting research, infusing it with a tax perspective, and tax research, infusing it with an accounting perspective.

Finally, besides the usual scholarly demand for understanding, the demand for microeconomics-based tax research in accounting is fueled partly by the popularity of the research in the classroom. An indication of the research-teaching link is the fact that the seminal work in the field (SW) is an MBA textbook. In the SW preface, Scholes and Wolfson attribute the framework to a frustration with the existing tax teaching materials. Later through funding by the Ernst and Young Foundation, their course was taught to several hundred accounting (mostly tax) faculty in the late 1980s and early 1990s. Variants of the tax class are among the most popular MBA electives at many business schools. This unusually strong synergy between teaching and research in the tax area creates a demand for research that can be easily transformed into pedagogical materials (e.g., case studies).

The next three sections concentrate on three major areas of tax research in accounting. Section 2 discusses studies that address the coordination of tax and non-tax factors. Section 3 details research linking asset prices and taxes. Section 4 reviews investigations of the taxation of multijurisdictional (international and interstate) commerce.

Empirical tax research in accounting suffers from the research design limitations that are common to all empirical work (e.g., model specification, data limitations, measurement error, among others). Rather than provide

detailed criticisms of each individual paper in Sections 2–4, Section 5 discusses six general methodological concerns that are particularly applicable to tax research in accounting. Closing remarks follow.

2. Tax and non-tax tradeoffs

The largest body of tax research in accounting examines the coordination of taxes and other factors in business decisions. The tension surrounding these papers is that taxes cannot be minimized without affecting other organizational goals. Although these studies address each of the three questions of tax research (Do taxes matter? If not, why not? If so, how much?), they focus mostly on the second question, explaining why tax minimization might not be the optimal business strategy. Of the three themes of the framework (all parties, all taxes, and all costs), these papers rely heavily on "all costs", i.e., understanding taxes requires understanding non-tax factors. Some papers reflect "all parties", i.e., a multilateral contracting perspective, but the "all taxes" theme is generally ignored in these studies.

This review of the tradeoff literature is dichotomized into papers that address the interaction of financial reporting and tax factors and papers that examine the effects of agency costs on tax minimization. The papers cover a wide range of settings including inventory, compensation, and tax shelters. Although it is difficult to summarize a large literature, common themes in these papers are:

- taxes are not a cost that taxpayers inevitably avoid;
- tax management is complex and involves many dimensions of business;
- the effects of financial reporting considerations on taxes is better understood than the effects of agency costs;
- quantification of non-tax costs has progressed slowly.

2.1. Financial reporting considerations

This section focuses on one non-tax factor of particular interest to the readership, financial reporting incentives. At the risk of oversimplification, financial reporting costs are those costs, real or perceived, related to reporting lower income or shareholders' equity. These costs are well discussed in the earnings management literature covered elsewhere in this issue. They are important to effective tax planning because tax-minimizing strategies often result in lowering reported income. Many financial contracts with creditors, lenders, customers, suppliers, managers, and other stakeholders use accounting numbers to specify the terms of trade, influencing managers' willingness to report lower income. Thus, many choices in accounting, financing, marketing, production, and other business functions involve weighing the tax incentives to

lower taxable income against the financial reporting incentives to increase book income.

Although tax accounting and financial accounting often differ in revenue recognition and other important concerns, tax plans often result in reporting lower book income. Thus, it is not surprising that tax planning affects financial accounting choices and that financial accounting considerations affect tax plans. In fact, tax accountants have contributed to the multidisciplinary field of taxes by demonstrating the extent to which financial reporting considerations affect tax choices. Likewise, tax researchers have contributed to accounting research by demonstrating that tax considerations often affect accounting choices.

The remainder of this section reviews several research settings used to calibrate book and tax tradeoffs in an attempt to answer the question, "What is known about the relation between financial accounting considerations and tax considerations?" In short, the literature suggests that financial accounting management and tax management are not independent and neither consideration consistently dominates the other in decision-making. A key implication from these studies is that financial accounting considerations may be an important omitted correlated variable in tax studies, and tax considerations may be an important omitted correlated variable in financial accounting studies.

Finally, as detailed in Section 5, empirical tax researchers face a number of methodological issues. We briefly overview some of them here to set up our discussion of individual papers.

Empirical tax researchers examining corporate behavior generally require an estimate of a firm's marginal tax rate. Unless otherwise explicitly noted, the studies discussed below proxy firms' tax status with a dummy variable equal to 1 if the firm has a net operating loss carryforward (NOL) and 0 otherwise. We argue in Section 5 that this variable measures a firm's marginal tax rate with error and thus caution must be exercised in interpreting results based on the NOL dummy variable. We discuss an alternative approach based on repeated simulations of firms' future taxable income (Shevlin, 1990; Graham, 1996a, b).

A second problem facing some studies is that the outcomes of choices are examined with the choice being treated as exogenous—a self-selection problem. Even in studies that model the choice, often the researchers must make assumptions about what the firm's economic balance sheet, income statement and taxable income would be if the alternative choice were made. This is commonly known as as-if calculations. Such calculations often unavoidably bias the findings in favor of the alternative hypothesis. The papers discussed below mostly recognize this problem and conduct sensitivity analyses to determine the extent of the bias. We highlight such papers in our discussion.

2.1.1. Inventory accounting

Research addressing the tension between tax and book incentives can be traced to numerous studies evaluating the LIFO conformity requirement in the 1970s before SW. This literature grew out of interest in two questions. First, do stock prices change in an efficient or unsophisticated manner at releases of information about LIFO adoptions? If managers are sophisticated, then an LIFO adopter would experience declines in both reported earnings and the present value of corporate taxes (Ball, 1972; Sunder, 1973, 1975; Ricks, 1986). In such a setting, it was argued that a functional fixation view of investors would predict that LIFO adopters would experience negative stock price changes when the lower LIFO-based earnings were announced. In contrast, an efficient market view of investors predicts they would disregard the lower book earnings and value the LIFO tax benefits so that LIFO adopters would experience positive stock price changes at adoption announcements.

On balance, the empirical results of investigations into LIFO adoption announcements during the 1970s and 1980s were inconclusive and puzzling. Researchers found little evidence of a positive mean excess stock return at the initial disclosure of actual or potential LIFO adoptions. Lanen and Thompson (1988) model the stock price reaction to a voluntary accounting change, such as LIFO adoption. They show that if investors rationally anticipate voluntary accounting changes, then the sign of the association between the stock price reaction at the announcement date and firm-specific characteristics (measuring the expected cash flow effects of the change) are difficult to predict. Later Kang (1993) argued that LIFO adoptions should be accompanied by negative stock returns because the decision to adopt LIFO is rational if a firm on FIFO sees unexpectedly higher future inflation for its input prices. In other words, the adoption of LIFO signals optimizing in the face of unexpectedly bad news about long-term input price inflation. Hand (1993) tested Kang's theory using firms that announced they were considering adopting LIFO and then resolved that uncertainty by either adopting LIFO or remaining on FIFO. Hand's results, after including controls for Lanen and Thompson's arguments on prior probability of adoption, were broadly consistent with the major predictions of the Kang model. In particular, firms that resolved the LIFO adoption uncertainty by adopting LIFO (remaining on FIFO) experienced reliably negative (positive) mean excess returns at the resolution of uncertainty date. Thus, Kang and Hand appear to have provided a reasonable explanation for the earlier empirical findings of a negative stock price reaction to the announcement of LIFO adoption.

The second question in the LIFO studies concerns whether managers choose the inventory accounting method that minimizes the present value of the firm's current and expected future tax payments or avoid LIFO because its use lowers reported earnings in the short term. Many studies find that taxes are a primary consideration in inventory costing (e.g., Dopuch and Pincus, 1988; Cushing

and LeClere, 1992). After reviewing the literature, Jenkins and Pincus (1998) conclude that tax savings dominate earnings management concerns when firms adopt LIFO.

Several papers have examined the role of tax and non-tax factors in inventory management by LIFO firms. Firms can increase reported earnings by liquidating LIFO layers but at a tax cost because taxable income also increases. Firms can decrease reported earnings and taxes by additional year-end purchases at higher prices.[3] Dhaliwal, Frankel, and Trezevant (DFT, 1994) find that both tax and financial reporting factors affect LIFO liquidations. Liquidations are larger and more common for low-tax firms (measured as the existence of an NOL carryforward) and more likely to occur when earnings changes are negative and firms have greater leverage. Also measuring taxes by the existence of an NOL carryforward, Frankel and Trezevant (1994) find that taxes affect LIFO firms' year-end purchasing behavior, but financial reporting considerations do not.

Hunt, Moyer, and Shevlin (HMS, 1996) do not find that taxes affect inventory decisions of LIFO firms. Recognizing inventory management as one of many options LIFO firms can employ to manage taxes and earnings, they incorporate LIFO inventory management together with current and noncurrent accruals in a cost minimization model (based on a model developed by Beatty et al., 1995b). Although HMS's financial reporting results concur with DFT, their tax results do not. Sensitivity tests attribute the difference to HMS's using a system of equations and employing a more sophisticated measure of a firm's tax status.

Using a system of equations allows for simultaneity among the three choice variables HMS study but requires the researcher to make assumptions about which exogenous variables to include in each model. It is necessary to have at least one different exogenous variable in each regression model to identify (estimate) the system. These choices are sometimes somewhat arbitrary and results in simultaneous equations can be sensitive to which variables are included and excluded in each regression.

HMS use the simulation approach to estimate each firm's marginal tax rate. We believe that while the simulation approach is not without its own problems, it provides a superior measure of firms' marginal tax rates. Thus, when results differ between studies using an NOL dummy variable and the simulation estimate, we attach more credence to the simulation-based results.

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[3] Bowen and Pfieffer (1989) discuss the year-end decision facing LIFO firms and illustrate the issue with Farmer Brothers, a company that roasts and packages coffee for the restaurant industry, which faced large input price increases in 1976–1977 after a severe freeze in the coffee growing regions of Brazil.

The final LIFO choice facing a firm is LIFO abandonment. Johnson and Dhaliwal (1988) examine the tradeoff between taxes and financial statement effects in the LIFO abandonment decision. Consistent with abandonment increasing taxes and lowering financial reporting costs, they find abandonment firms are more leveraged, closer to violating working capital covenants, and have larger NOL carryforwards. Additional tests regress the disclosed tax costs of abandonment ($7.8 million on average) on financial statement variables. These tests are particularly intriguing because they use actual firm estimates of the tax costs to test the tradeoffs between tax and other factors. After analyzing 22 firms closely, Sweeney (1994) finds that despite financial reporting benefits, firms will not switch to FIFO if the change generates ''significant'' tax costs.[4]

Overall, we conclude that taxes are an important determinant (have a first-order effect) in firms' decisions to adopt LIFO, in LIFO liquidations, and in LIFO abandonment. However, we believe that the evidence in HMS Hunt et al. (1996) suggests that taxes are far less important than financial reporting considerations for firms wishing to manage earnings through LIFO inventory management.

2.1.2. Compensation

Compensation is another business cost affected by both tax and financial reporting incentives. Several papers have examined the role of taxes in the choice between firms issuing incentive (or qualified, ISOs) and non-qualified employee stock options (NQOs). On an aggregate usage level, the relative use of ISOs and NQOs has changed over time, consistent with changes in the tax laws favoring one or the other option type. For example, Hite and Long (1982) report that firms switched from ISOs to NQOs after the top individual tax rates were lowered in the Tax Act of 1969 (making ISOs less tax favored relative to NQOs). Similarly, the Tax Reform Act of 1986 reduced the attractiveness of ISOs considerably because not only was the top individual rate set below the top corporate rate but the capital gains rate was set equal to the tax rate on

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[4] Another line of research has examined the value relevance of the LIFO reserve. Initial research predicted a positive association between firm value and the LIFO reserve because the LIFO reserve is the difference between current cost and old costs of inventory (FIFO cost−LIFO cost) and is thus expected to represent an asset. Guenther and Trombley (1994) and Jennings et al. (1996) document a negative association between the LIFO reserve and firm market value of equity. These authors develop a price elasticity argument to explain the negative association: if the LIFO reserve provides information to investors about a firm's future input price increase, the negative association is then consistent with investors expecting firms cannot on average raise output prices by a similar amount. Both papers provide evidence consistent with this explanation. Dhaliwal et al. (2000) provide an alternative explanation. They add the LIFO reserve to FIFO inventory and tax-adjust the LIFO reserve arguing that the tax-adjusted LIFO reserve is an estimate of the deferred tax liability arising from future LIFO liquidations. Thus, they predict and observe (both before and after controlling for the firm's ability to pass on input price increases) a negative association between the tax-adjusted LIFO reserve and the market value of equity.

ordinary income.[5] Balsam et al. (1997) document that NQO usage increased relative to ISOs after 1986. However, papers that examine firm-specific usage of ISOs and NQOs as a function of corporate and individual tax rates fail to find results consistent with their tax predictions. For example, Madeo and Omer (1994) report that firms that switched from ISOs to NQOs following the 1969 Tax Act tended to be firms with low tax rates, when from a purely tax viewpoint, the high-tax firms should be the ones switching. Austin et al. (1998) report that the firm's marginal tax rate (estimated using the simulation approach) appears to have played little role in the choice of option type during the 1981–1984 period, with the choice appearing to be driven by minimizing the executives' tax burden. Thus the extant evidence is somewhat mixed on the role of taxes in the choice between ISOs and NQOs and, if we were forced to make a judgment on the current state of knowledge, we would interpret the evidence as consistent with taxes not being an important determinant of individual firm's choice between ISOs and NQOs.

Using the framework's ''all parties'' approach, Matsunaga, Shevlin, and Shores (MSS, 1992) examine a setting where employers tradeoff the tax benefits of a corporate deduction for compensation with the financial reporting costs of lower earnings arising from transaction costs. Specifically, they investigate the response to TRA 86's tax rate changes that reduced the tax advantages of ISOs relative to NQOs.

One possible response for employees holding ISOs is to exercise them and sell the stock within 12 months of exercise, resulting in a disqualifying disposition. A disqualifying disposition automatically converts ISOs into NQOs. Disqualification generates ordinary taxable income for the individual and transaction costs for both employee and employer, with the transaction costs to the employer reducing book earnings.[6] The negatives must be balanced against the tax savings of a compensation deduction for the firm.

MSS analyze the tradeoffs by holding employees indifferent and computing the net tax benefits for employers (using the simulation approach to estimate each firm's marginal tax rate). Consistent with firms coordinating taxes and financial reporting, MSS find that disqualification is more common among firms facing fewer financial reporting constraints. They estimate that firms without disqualifications avoided roughly a 2.3 percent reduction in reported earnings, on average, at a mean cost of net tax benefits of $0.6 million. Because of data limitations MSS are required to make assumptions (discussed explicitly

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[5] TRA 86 lowered the maximum statutory corporate tax rate from 46 to 34 percent and the maximum statutory personal tax rate from 50 to 28 percent while increasing the maximum statutory personal long-term capital gains tax rate from 20 to 28 percent.

[6] A firm's transaction costs arise from compensating employees for their transaction costs associated with disqualifying the ISO and for the employee's incremental taxes triggered by the disqualification.

in their paper) to estimate both the tax benefits and financial reporting consequences of a disqualifying disposition, which unavoidably bias them toward finding in favor of the alternative hypothesis. For firms that did not disqualify, as-if numbers are required. This creates a problem common to many studies, both tax and non-tax (for example, pre-managed earnings in earnings management studies), and the results. The inferences must be interpreted cautiously in the light of the assumptions underlying the as-if calculations.

Pensions are another form of compensation that has attracted book–tax analysis. Pension contributions reduce taxable income while pension expense reduces book income. Francis and Reiter (1987) test whether the level of pension funding varies with tax incentives to overfund and financial reporting incentives to underfund. They find funding levels are increasing in marginal tax rates and decreasing in financial reporting costs (measured by leverage). Examining similar issues, Thomas (1988) focuses on taxes while controlling for financial reporting effects via sample selection and inclusion of profitability and leverage variables. His results are generally consistent with Francis and Reiter (1987).

Thomas (1989) and Clinch and Shibano (1996) explore whether taxes motivate termination of overfunded defined benefit pension plans. Thomas concludes that firms seem more motivated by cash needs than by taxes (measured by an NOL carryforward variable) whereas Clinch and Shibano, using a more sophisticated approach to estimating expected tax benefits, report results consistent with taxes playing an important role in the decision and timing of pension plan terminations.[7] Both studies indicate that financial reporting considerations are a second-order motivation for plan terminations. Mittelstaedt (1989) also ignores financial reporting issues in examining pension asset reversions (either through reduced contributions or plan terminations). The results of the papers that omit financial reporting considerations must be interpreted with caution because of concerns with correlated omitted variables. Nevertheless, the evidence is consistent with taxes being an important determinant of firm's funding policy and also of pension termination decisions when more sophisticated techniques are used to estimate tax effects of the termination.

Finally, deferred compensation would appear to be a particularly useful setting for investigating both tradeoffs and agency costs. However, to date, no empirical evidence has applied the SW framework to document the tax and non-tax factors that determine deferred compensation. We look forward to such an analysis.

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[7] Researchers should seriously consider the approach taken by Clinch and Shibano when examining decisions with large dollar effects that might invalidate an approach based on a marginal tax rate estimate.

2.1.3. Intertemporal income shifting

Passed in 1986, TRA 86 phased-in tax rate reductions through 1988 (e.g., for calendar year companies the maximum regular tax rate fell from 46 percent in 1986 to 40 percent in 1987 and 34 percent in 1988). This precommitment to lower rates enabled tax managers to plan, knowing that rates were falling. This provided a powerful setting to assess firms' willingness to obtain tax savings by deferring earnings. Scholes et al. (1992) report that larger companies are more active income shifters. They acknowledge that financial reporting considerations likely impede shifting income into future periods, but their research design does not include any measures designed to capture these incentives.

Guenther (1994a) extends Scholes et al. (1992) to include proxies for financial reporting costs. He confirms that large firms shift more but adds that firms with higher leverage ratios (a proxy for financial reporting costs) are less willing to report lower income. Thus, shifting income to save taxes appears coordinated with managing debt covenant violation costs. Lopez et al. (1998) extend Guenther (1994a) to report that income shifting is concentrated among firms that exhibited prior tax aggressiveness (as measured using the tax subsidy measure from Wilkie and Limberg, 1993).

The rate reductions in TRA 86 also provided an incentive to maximize NOL carrybacks to years before rates fell (e.g., 1986). Maydew (1997) tests for NOL-induced income shifting using leverage to measure financial reporting costs. He estimates firms with NOL incentives to carryback losses shifted $2.6 billion less operating income because of costs associated with increasing leverage. This compares with total shifting of $27.2 billion of income, showing the restraints from financial reporting considerations were substantial.

While its rate reduction was providing incentives to shift income from 1986 to later years, TRA 86's alternative minimum tax provided incentives to shift book income back to 1986 or forward, beyond 1989. From 1987 to 1989, book income was a component of taxable income for firms subject to the AMT. This direct link between book and tax provided an unusually powerful setting for calibrating the exchange rate between book earnings and taxable income.

Several studies estimate the AMT impact on reported earnings. Gramlich (1991) finds the AMT exerted downward pressure on firm earnings. He adds that firms shifted book earnings from 1987 to 1986 to avoid taxes. Using actual tax returns to identify AMT firms, Boynton et al. (1992) confirm income shifting. However, their study omits controls for financial reporting incentives. Dhaliwal and Wang (1992), Manzon (1992), and Wang (1994) concur with Gramlich (1991) that firms shifted income from 1987 to 1986.

The AMT book income adjustment studies illustrate several common problems facing archival empiricists. The studies use a treatment/control group approach which, besides any possible self-selection problems discussed in Section 5.2 below, requires the researcher to identify firms likely/not likely to be affected. Some studies use ex-ante identification while others use ex-post

(firms report they paid the AMT). Both approaches are problematic, as discussed by Choi et al. (1998). Further, the treatment firms are compared with control firms that have alternative income shifting incentives because of the contemporaneous change in corporate statutory tax rates. Finally, as recognized by Manzon (1992) the treatment firms vary in their incentives because the effective AMT tax rate varies cross-sectionally. Thus, Choi et al. (1998) contend on methodological grounds that little evidence supports AMT-driven income shifting and we concur with their contention. Finally, to our knowledge, no study jointly evaluates the rate reduction incentives to realize income after 1986 and the AMT incentives to realize income in 1986.

2.1.4. Capital structure, divestitures, and asset sales

Engel, Erickson, and Maydew (EEM, 1999) analyze an unusual security, trust preferred stock (TRUPS), from the perspective of tax and financial reporting tradeoffs. GAAP does not treat TRUPS as debt even though their dividends are deductible. Thus, firms that retire outstanding debt with the proceeds from TRUPS strengthen the appearance of their balance sheet.[8] EEM find that for the 44 issuers that used TRUPS to retire debt, the debt/asset ratio declined on average by 12.8 percent. EEM estimate upper and lower bounds of the costs to the firm of reducing the debt/asset ratio. The lower bound is the average actual issuance costs of the TRUPS across issuers, estimated at $10 million. The upper bound is estimated using the 15 TRUPS issuers that retired debt, rather than their outstanding traditional preferred stock. By not retiring the traditional preferred stock, the issuers chose to forgo tax benefits of $43 million, on average. Thus, firms were willing to pay between $10 and $43 million to improve their balance sheet (i.e., reduce their debt/assets ratio by 12.8 percent).

We find EEM's quantification of non-tax costs useful and encourage other researchers to attempt such estimations. By estimating the lower and upper bounds of what firms are willing to pay for favorable balance sheet treatment, EEM provides a model for estimating elusive non-tax costs. They demonstrate how taxes can provide a metric for the less quantifiable components in the efficient design of organizations. However, EEM did not model either the issuance choice or the choice of how the proceeds were used (these choices were taken as exogenous), and so their results could suffer from self-selection bias (a correlated omitted variables bias), discussed in more detail in Section 5. Nevertheless, we look forward to more papers that adopt their quantitative approach.

Maydew, Schipper, and Vincent (MSV, 1999) investigate book–tax tradeoffs by examining tax-disadvantaged divestitures, i.e., taxable sales that could have

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[8] The income statement is largely unaffected because TRUPS dividends are included among operating expenses, similar to interest expense.

been avoided with a tax-free spin-off. They conclude that financial reporting incentives and cash constraints lead firms to forego a tax-free spin-off and opt for taxable asset sales. Similar to MSS (1992), in modeling the choice of divestiture, MSV must make assumptions about the effect on the firm if the alternative choice were made in order to calculate as-if calculations. MSV provide a good discussion of the issues (pp. 130–132) and recognize this problem leads to inference problems about what variables are driving the choice. In a related study, Alford and Berger (1998) find that spin-offs are more likely when the taxes associated with a sale are large; however, financial reporting considerations mitigate the importance of taxes in the divestiture decision.

Finally, Bartov (1993) finds both earnings (smoothing and debt covenants) and tax incentives influence the timing of asset sales. Klassen (1997) adds that manager-owned firms are more likely to realize losses. He concludes that management ownership reduces financial reporting costs, enabling the firm to place a higher priority on tax management.

2.1.5. Regulated industries

In recent years, the most active setting for evaluating book–tax tradeoffs has been banks and insurers. Regulated industries are particularly useful settings for book–tax comparisons because their mandated disclosures are more extensive than other firms are, and their production functions are relatively simple. Scholes, Wilson, and Wolfson (SWW, 1990) developed the model for research in this area when they analyzed bank investment portfolio management in regressions that pitted tax considerations against earnings considerations and another non-tax factor, regulatory capital. In the SWW setting, a bank can reduce taxable income by selling a security at a loss.[9] Unfortunately, a realized loss for tax purposes also reduces net income and regulatory capital. Conversely, selling an appreciated security relaxes book and regulatory pressures, but increases taxes.

Collins, Shackelford, and Wahlen (CSW, 1995b) and Beatty, Chamberlain, and Magliolo (BCM, 1995b) extend SWW to recognize that portfolio management is only one means of managing taxes, earnings, and regulatory capital. CSW note that a fully specified model would capture heterogeneity across banks, non-stationarity in tax, earnings and regulatory pressures, endogeneity among bank choices, and autocorrelation within a choice (i.e., exercising a response option now affects its future usefulness). Unfortunately,

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[9] GAAP has changed since SWW. Financial Accounting Standard 115 now requires mark-to-market accounting for these types of securities. If they are classified as trading (available for sale) securities, then any unrealized gains and losses are included in income (equity). An interesting research question is whether this change in accounting method affects banks' willingness to realize losses to save taxes.

capturing all these dimensions in a single estimation is impossible. Thus, the researcher must choose among the dimensions.

CSW relax SWW's assumption that banks are homogeneous. They estimate bank-specific regressions, capturing bank-specific targets for each objective, rather than cross-sectional pooled means. They examine seven choice variables: security gains and losses, loan loss provisions, loan charges, and the issuance of capital notes, common stock, preferred stock, and dividends.

BCM relax SWW's assumption of independence among bank decisions. They develop and solve a cost minimization model that leads to a system of equations that they subsequently estimate, subjecting themselves to the same critique of the simultaneous equations approach as HMS (1996). BCM examine loan loss provisions, loan charge-offs, pension settlement transactions, issuances of new securities, and gains and losses from sales of both securities and physical assets.

The different approaches employed by SWW, CSW, and BCM provide triangulation. All three studies find evidence that financial reporting and regulatory considerations affect bank decisions. SWW alone find taxes are an important consideration.[10]

CSW and BCM's failures to detect substantial tax effects motivated at least one additional study. Collins, Geisler, and Shackelford (CGS, 1997a) speculate that because all banks face the same US tax rates, banking studies suffer from insufficient power to detect tax effects and so repeat the banking analysis in a setting with more cross-firm tax variation, the life insurance industry. As in banking, conditional on taxable income, all stock life insurers face constant marginal tax rates. However, conditional on taxable income, mutual life insurers face varying marginal tax rates because of an unusual equity tax imposed on mutuals. In this more powerful setting, CGS report that taxes (as well as financial reporting costs and regulatory considerations) affect investment portfolio management.

Beatty and Harris (1999) examining banks, and Mikhail (1999) examining life insurers, extend this literature to investigate whether the relative importance of taxes, earnings, and regulation differs for public and private companies. Both studies report that taxes influence the decisions of private firms more than the decisions of public firms. Since private and public firms face the same tax system, these findings imply that private firms find financial accounting considerations are less important, and consequently, find optimal tax strategies are less costly.

Mikhail (1999) notes that public and private firms differ for at least two reasons: (i) public firms' compensation schemes are designed to mitigate agency

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[10] SWW and BCM use the simple proxy of the existence of an NOL carryforward (and/or a tax credit carryforward) to signal low-tax status. CSW use the bank's level of municipal bond holdings to assess its appetite for tax minimization, a proxy based on a SWW finding.

costs and (ii) public firms are concerned about the stock market interpretations of reduced earnings associated with tax planning. To differentiate between these two explanations, Mikhail examines mutual life insurers. Mutuals have diffuse ownership and concurrent agency costs similar to public firms. However, unlike public firms, mutuals do not face stock market pressure. Mikhail finds that mutual insurers do not manage taxes. Because mutuals' failure to manage taxes resembles public firms' actions, Mikhail concludes that public firms' incentive compensation contracts account for their difference from private companies, rather than stock market pressures.

The veracity of Mikhail's conclusion depends critically on the assumption that mutual firms face the same set of agency problems as public firms. Furthermore, while Mikhail uses a simultaneous equations approach to examine the multiple choices available to insurers to manage earnings and taxes, he does not model the initial choice of organizational choice and thus faces self-selection bias of unknown severity. Nevertheless, this paper is a good first attempt at probing deeper into the differences between private and public firms' tax aggressiveness. We look forward to more research that attempts to differentiate between these competing explanations for observed differences between private and public firms.

Finally, the SWW structure has been used to compare taxes and regulatory capital when there are no earnings implications. Adiel (1996) reports that regulatory capital considerations dominate tax concerns in the decision by property-casualty insurers to reinsure. Petroni and Shackelford (1995) find that both tax and regulatory concerns affect the organizational structure through which property-casualty insurers expand operations across states.

Overall, except for the early study of banks by SWW (1990), the evidence from studies of public firms in regulated industries suggests that regulatory capital and financial reporting concerns dominate taxes (although assessment of cross-sectional variation in tax status has been generally limited to the existence of an NOL carryforward). Further, private firms appear to be more aggressive tax planners (either because they do not face capital market pressures or because they face fewer agency problems).

2.1.6. Other settings

Keating and Zimmerman (2000) examine accounting for depreciable assets. In this setting book–tax tradeoffs are not expected because book depreciation is established based on the accountant's judgment of the useful life of the assets, and since 1981 tax depreciation has been set by statute. They report that the book life of depreciable assets varies with statutory lives for tax depreciation purposes. They interpret these results as evidence that the optimal holding period for depreciable assets varies with tax deductibility. In other words, taxes affect the book depreciation, even though financial reporting does not affect tax depreciation.

This result compliments Keating and Zimmerman (1999). Examining years before tax depreciation was determined by statute, the evidence is consistent with the determination of depreciation for financial accounting being an important factor in justifying tax depreciation deductions to Internal Revenue Service (IRS) auditors. In other words, financial accounting used to affect tax depreciation, but no longer does.

Cloyd et al. (1996) also examine the influence of tax reporting on financial reporting choices. They hypothesize and report evidence (collected by survey) consistent with the idea that management's choice to conform the tax and financial accounting choice (even though the financial accounting choice reduces reported book income) is positively associated with the expected tax savings. They also find that public firms are less likely to conform than private firms, consistent with other studies discussed in this review that public firms exhibit less aggressive tax behavior because they face higher non-tax costs arising from capital market pressure or agency costs.

Guenther et al. (1997) provide another example of tax policy affecting financial reports. TRA 86 mandates that firms use the accrual basis. Before TRA 86, firms could use either cash basis (except for inventory) or accrual basis to calculate taxable income. Examining 66 cash method firms, Guenther et al. (1997) find that before the mandated change, cash-basis corporate taxpayers exhibited little tradeoff in their tax planning and financial reporting. However, after the mandated change, the former cash-basis firms deferred income for financial statement purposes. That is, book–tax conformity led the firms to change their accrual behavior. By deferring income, they reduced their taxable income and saved taxes, albeit at the cost of lower reported earnings.

Finally, Mills (1998) tests whether the level of book income affects IRS audits. Using confidential tax return data from the Coordinated Examination Program from 1982 to 1992, she finds that proposed IRS tax adjustments are increasing in the amount that book income exceeds taxable income and that public firms are less aggressive in tax planning, which she attributes to their facing higher financial reporting costs. In our opinion, the most important implication from her results is that firms cannot costlessly reduce taxable income even if book income is not affected.

Together the above studies suggest that tax rules influence firms' financial reporting choices and that firms are concerned with book–tax differences and thus conform book numbers to tax numbers when necessary to save taxes. This might seem to conflict with prior evidence that firms leave tax benefits on the table if the action to save taxes will reduce reported profits (or have other financial reporting consequences). The results, however, are not inconsistent. The studies in this section generally do not explicitly examine cross-sectional variation in firms' financial reporting costs.

2.2. Agency costs

Evaluations of tax and non-tax factors extend beyond the financial reporting and regulatory considerations discussed in the previous section. SW (1992, Chapter 7) asserts that agency costs are another non-tax cost responsible for tax minimization not equating to effective tax planning. This section reviews papers that evaluate the effects of adverse selection and moral hazard on tax planning.

Research addressing taxes and agency costs is much less well developed than the book–tax coordination literature. Because incentive problems pervade business, agency problems likely impact tax decisions. Unfortunately, the literature has largely been unable to progress beyond identifying possible areas where incentives affect tax management. We attribute the paucity of papers in this area to difficulties in quantifying incentive costs. We look forward to both theoretical and empirical advances in this area.

2.2.1. Compensation

Johnson, Nabar, and Porter (JNP, 1999) investigate firm responses to 1993 legislation that disallows a deduction for non-performance-related compensation in excess of $1 million. Affected firms can preserve full deductibility for their five most heavily compensated employees by either qualifying the compensation as performance-based or deferring the compensation until a deduction can be taken. Analyzing 297 publicly held US firms with non-qualified compensation in excess of $1 million in 1992, they find that 54 percent preserve deductibility, most (78 percent) through plan qualification. JNP find that preservation increases in tax benefits (i.e., the product of the excess compensation and the firm's marginal tax rate) and stakeholder concern about the firm's compensation plan and decreases in contracting costs. Examining the same legislation, Balsam and Ryan (1996) confirm that agency costs affected the preservation decision. While we commend these researchers for attempting to develop proxies for agency problems, we also note that the proxies are open to arguments and interpretation and thus the conclusions based on these proxies are subject to alternative interpretations.

Harris and Livingstone (1999) examine a different aspect of this legislation. They develop the hypothesis that the $1 million limit reduced the implicit contracting costs faced by firms paying less than this limit. They find that firms below the limit actually increased cash compensation above what they predicted and those further from the limit increased their compensation the most, although this inference relies critically on the model used to predict expected compensation.

2.2.2. Tax shelters

Another setting where agency costs have been identified is tax shelters. Although shelters encompass various tax plans, historically they were distinguished by the deductibility of an investment at a rate that exceeds its economic depreciation (SW, 1992, p. 393). Shelters create tax savings by repackaging ownership rights among investors. Unfortunately, repackaging can lead to inefficient organizations fraught with incentive problems.

For instance, before TRA 86 severely restricted their usefulness for tax avoidance, limited partnerships (LPs) enabled tax shelters to transfer deductions to limited partners facing high tax rates. Despite their tax effectiveness, these partnerships faced large transaction costs (e.g., sales commissions and investment banking fees commonly absorbed 10 percent of investments) and numerous incentive problems. For example, Wolfson (1985) details several agency costs, including resource allocation among related parties, proving up (i.e., general partner extracting private information using limited partners' investments), payout allocation and measurement difficulties, overcompletion, and undercompletion.

Space constraints prevent a detailed discussion of each incentive problem. We choose to illustrate one problem, undercompletion. Analyzing the oil and gas tax shelter industry in the 1970s, Wolfson shows that the tax-minimizing drilling structure encouraged undercompletion. From a tax perspective, the value of an LP interest is maximized if the limited partners fund the initial drilling operations, which can be immediately deducted. If the drilling succeeds, the general partner completes the extraction process, which cannot be immediately deducted. If not, the well is abandoned. The undercompletion problem arises because the general partner alone knows the status of the drilled hole. Because the general partner is responsible for all completion costs, but only receives part of the revenues, he will abandon the well unless it is profitable from his perspective, not the partnership's perspective. For example, if the general partner finds $2 of oil after drilling and knows that it will cost $1 to complete the well, he will only complete the well if he receives more than half the revenues.

Undercompletion occurs because the tax system encourages the limited partner to invest before the general partner. Wolfson provides empirical evidence that undercompletion is mitigated by drilling wells that have a low probability of being marginal (i.e., an exploratory well, where either no oil or excessive oil is expected) and by the general partner's reputational effects. Wolfson's empirical evidence is consistent with both tax shelter organizers and the investing public impounding these incentive problems in market prices.

Similarly, Shevlin (1987) examines the decision to conduct research and development (R&D) in-house versus through a limited partnership. R&D LPs enable firms with low marginal tax rates (e.g., start-ups) to transfer (or sell) tax benefits to high marginal tax rate individuals (limited partners). LP investors

can utilize the immediate deductions from R&D to reduce taxes more than lower marginal tax rate entities and subsequently realize appreciation at tax-favored long-term capital gains tax rates. In addition, in-house R&D uses traditional debt and equity funding while an R&D LP provides an opportunity for ''off-balance-sheet'' financing. Thus, unlike most studies, where taxes are competing with financial reporting, Shevlin examines a setting where tax and book incentives are aligned. Relying on the empirical agency literature to identify measures of financial reporting costs, Shevlin concludes that both taxes and off-balance sheet financing motivate R&D LPs. One limitation of this study is that in conducting his tests, Shevlin must compute as-if numbers, which bias him toward finding results consistent with the off-balance sheet motivation. Shevlin also acknowledges information costs between the firm and the LP investors, similar to those identified in Wolfson (1985); however, he does not incorporate them in his tests due to lack of data. Beatty et al. (1995a) extend Shevlin to evaluate jointly tax, financial reporting considerations, and information costs. They report that firms facing high information and transaction costs will sacrifice both tax and financial reporting benefits.

The extant tax shelter studies examine syndicated individual structures that were severely limited by TRA 86. Recently a new form of corporate tax shelter has arisen. More complex than the earlier shelters, these corporate tax shelters typically involve flow-through entities, financial instruments, non-US entities, and aggressive interpretation of the tax law (Gergen and Schmitz, 1997; Bankman, 1998). Understanding corporate tax shelters and the extent to which they contribute to the recent decline in corporate tax receipts as a percentage of corporate profits are questions of policy and scholarly interest. Accountants are ideally positioned to unravel these complex transactions. Unfortunately, to our knowledge, data limitations have thwarted empirical attempts to analyze corporate tax shelters. We encourage accountants to think creatively about the data restrictions and initiate research in this area.

Although not examining tax shelters, Guenther (1992) presents further evidence on the costs of the partnership form. Guenther compares the tax and non-tax costs associated with C corporations and master limited partnerships (MLPs). While corporations face ''double'' taxation (once at the firm level and again at the shareholder level via either dividends or capital gains), partnerships are flow-through entities facing taxation only at the partner level.

On non-tax dimensions, shareholders and limited partners (who do not materially participate in operations) enjoy limited liability; general partners do not. Before 1981 and after 1986, corporate taxation was levied on any publicly traded entity. During the interim, MLP limited partners enjoyed entity tax exemption, limited liability, and access to public capital markets.

In 1981, changes in statutory tax rates favored MLPs relative to corporations and led many to predict a surge in MLP activity. Guenther identifies non-tax costs that may have mitigated the shift from corporate form

to MLPs. Besides higher record keeping costs, partnerships face higher costs arising from indemnification insurance for managers and potentially sub-optimal investment and operating decisions. These increased costs are predicted to result in lower rates of return for businesses organized as partnerships rather than corporations. Guenther finds that MLPs report lower accounting-based measures of performance than corporations, particularly earnings before interest and taxes.

Shelley et al. (1998) discuss the tax and non-tax costs and benefits of restructuring a business as a publicly traded partnership (PTP) and examine the association between the capital market reaction to the announcement of the restructuring and proxies for the tax and non-tax factors. Among the purported benefits of a PTP formation are improved management (similar to that hypothesized with spin-offs and equity carve-outs), reduced information asymmetries about growth opportunities, and flow-through taxation. Off-setting these advantages are the problems mentioned in Wolfson (1985) and Guenther (1992). Shelley et al. (1998) find that announcement period returns are associated with proxies for these factors in the predicted direction. Finally, Omer et al. (2000) examine conversions from C corporations to S corporations in the natural resource industry following TRA 86. They discuss both the tax and non-tax costs and benefits similar to above.

This completes our review of the literature investigating the factors that impact tax management. The papers in this area consistently document that firms do not minimize taxes, rather their decisions reflect integration of multiple factors, including taxes. The interaction of financial reporting costs and taxes is well documented, however, further documentation is needed concerning the coordination of taxes and agency costs. Less is known in both areas about the relative importance of taxes. In particular, we look forward to more studies that estimate and quantify exchange rates between taxes and other considerations.

3. Taxes and asset prices

Price formation is a fundamental issue in accounting, finance, and economics. One possible price determinant is taxes. Investigations of this possibility are the second major area of current tax research in accounting.

The research asks the same questions as in the tradeoff literature (Do taxes matter? If not, why not? If so, how much?). Unlike the tradeoff literature, which focuses on the factors that offset tax minimization, the pricing literature concentrates on the first and third questions, which can be reexpressed as: To what extent do prices impound taxes? In addition, unlike the tradeoff literature, where "all taxes", i.e., the importance of considering tax-motivated price adjustments, is largely ignored, here it is the dominant theme. The multilateral

contracting approach ("all parties") is also important, but consideration of non-tax factors ("all costs") is of secondary importance.

Unlike the prior section, where accountants dominate the research (particularly the coordination of taxes and financial reporting), the impact of taxes on asset prices has long been an active area of research in finance and economics. Thus, it is particularly difficult to distinguish the contributions of accounting tax researchers from those of other tax researchers. Although we continue to focus primarily on the work conducted by accounting faculty and/ or published in accounting journals (as stated in the introduction), we recognize the substantial contributions of our colleagues in finance and economics that go largely unmentioned in this review.

Our review begins with tax research in accounting that investigates the extent to which taxes affect the structure and prices of mergers and acquisitions. Next, we review early seminal papers in finance that attempted to determine the impact of taxes on the optimal capital structure followed by recent accounting research in that area. The section concludes with a discussion of the early implicit tax studies that were motivated by SW and the current interest in whether shareholder taxes affect stock prices. The common theme in these studies is the extent to which prices impound taxes.

3.1. Mergers and acquisitions

Mergers and acquisitions have been studied extensively in finance. This section reviews several tax studies by accountants that examine whether merger and acquisition structure and prices reflect corporate and investor taxes. First, however, we briefly review the relevant tax code in this complex area.

Acquisitions can be tax-free (no tax to the target firm shareholders) or taxable (gains taxable and losses deductible to the target firm shareholders). In either case, the acquirer can purchase the assets or the stock of the target. In a tax-free acquisition (asset or stock), the tax basis of the target's assets, its tax attributes (NOL and tax credit carryforwards), and its earnings and profits (E&P), the source of dividends, are unaffected.

A taxable asset acquisition adjusts tax bases to fair market values ("step-up") and potentially creates goodwill.[11] If the target is liquidated following sale of its assets, E&P are eliminated. In a taxable stock acquisition, the tax basis of the target's assets carries over to the acquiring firm and thus no goodwill is

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[11] As an aside, goodwill reported on the balance sheet (prepared in accordance with GAAP) is often not deductible. In financial accounting, amortizable goodwill arises if the purchase method of accounting is used regardless of whether the acquirer buys the assets or the stock of the target. Deductible goodwill for tax purposes is more restrictive. Goodwill is only deductible if the acquirer buys assets, buys stock in a free-standing company and elects to step-up the tax basis of the assets (IRC Section 338), or buys a subsidiary and the acquirer and target jointly elect asset step-up (IRC Section 338(h)(10)).

booked for tax purposes. However, elections permit a taxable stock acquisition to be treated for tax purposes as if it were a taxable asset acquisition. The elections are IRC Section 338 if the target is a freestanding corporation and IRC Section 338(h)(10) if the target is a subsidiary. Unlike 338(h)(10) elections, a 338 election extinguishes target E&P.

Several merger and acquisition papers address whether and to what extent the tax law governing mergers and acquisitions affects transactions. These studies address issues such as whether the benefits associated with the step-up of tax basis and deductible goodwill offset the costs of depreciation recapture and capital gains taxation of target shareholders.[12] Although tax issues in an acquisition vary by the type of target (freestanding C corporation, subsidiary of a C corporation, S corporation or partnership), most extant research examines only acquisitions of freestanding C corporations.

Examining pre-TRA 86 acquisitions, Hayn (1989) finds that target and bidder announcement period abnormal returns are associated with the tax attributes of the target firm. Specifically, in tax-free acquisitions, potential tax benefits arising from net operating loss carryforwards and available tax credits positively affect the returns of bidder and target firms. In taxable acquisitions, target shareholder capital gains taxes and potential tax benefits of a step-up in basis affect the returns of both bidder and target firms involved.

Examining the structure of acquisitions over the period 1985–1988, Erickson (1998) applies an ''all parties'' approach, analyzing the role of tax and non-tax factors of the acquiring firm, the target firm and target firm shareholders. He finds that the acquirers with high marginal tax rates and an ability to issue debt are more likely to undertake a debt-financed taxable transaction. He finds little support that potential target shareholder capital gains tax liabilities or target firm tax and non-tax characteristics influence the acquisition structure. In further analysis, he finds that the magnitude of the potential target shareholder capital gains is small and that the corporate taxes immediately triggered by the step-up often exceed the present value of the tax benefits of stepped-up target assets.

Further illustrating ''all parties'', Henning et al. (2000) find that the acquirer bears target firm or shareholder taxes through higher purchase prices. This paper is not without controversy. Among other concerns, Erickson (2000) questions the validity of the sample partitions, detailing the difficulty of partitioning acquisitions as either stock or asset acquisitions and using publicly available disclosures to assess tax basis step-up. Henning et al. (2000) also

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[12] A common misunderstanding is that there are always net tax benefits associated with a transaction that results in basis step-up. In fact, the immediate taxes associated with depreciation recapture and shareholder capital gains often exceed the present value of future tax benefits from increased depreciation and recapture, eliminating any tax incentive for structuring a transaction to garner step-up.

report that contingent payments to the seller (which allow deferral of taxes on some of the gain) are more likely when the seller faces a high marginal tax rate.

Three papers investigate 1993 legislation that permits a deduction for goodwill amortization. Henning and Shaw (2000) find that tax deductibility resulted in an increase in purchase price of goodwill generating acquisitions, consistent with acquirers sharing the tax benefits with the selling firm, and an increase in the percentage of purchase price allocated to tax deductible goodwill.

Weaver (2000) addresses whether the frequency of taxable transactions giving rise to goodwill (e.g., tax basis step-up transactions) increased after the tax law change. She finds that the tax law change increased the probability of the taxable transaction being structured to obtain a step-up in basis and thus a deduction for goodwill. She adds that a step-up is more likely the higher the acquiring firm's marginal tax rate.

In contrast, Ayers et al. (2000b) report that transactions with tax basis step-up remain a constant 17 percent of the taxable transactions despite the tax change. However, a significant increase in the purchase price premium following passage of the tax law change is detected for acquisitions qualifying for goodwill amortization deductions. They estimate that higher acquisition prices enable targets to obtain 75 percent of the tax benefits arising from goodwill deductibility.

To determine the role of taxes in the 338(h)(10) election, Erickson and Wang (2000) examine 200 subsidiaries that were divested in a taxable sale of stock from 1994 to 1998. As expected, they find that the election is more likely if an asset sale does not trigger too much additional tax relative to a stock sale. Consistent with the acquirer reimbursing the seller for the additional taxes, the acquisition price also is higher when the election is made. In other words, the structure of the transaction affects its price. They also report that the abnormal returns of the divesting parent are positively associated with the election's tax benefits.

Although it is improbable that acquisitions and divestitures are initiated for tax reasons, these studies indicate the transaction structure and price are influenced by acquiring firms' tax status, target firms' tax status (although the evidence is somewhat mixed), and the tax attributes of the target firm. The evidence in these papers is consistent with merger and acquisition prices incorporating complex tax conditions, which are typically ignored in valuation techniques, such as revenue, earnings and/or book multiples.

In addition, though it is unclear whether goodwill tax deductibility increased the incidence of goodwill generating transactions, the law change appears to have increased acquisition prices in these transactions. Illustrating the ''all taxes'' and ''all parties'' themes in the framework approach, these studies document that the tax treatment affects asset (transaction) prices and influences transaction structure (asset versus stock acquisition). However, less

is known about the extent to which non-tax costs (e.g., concerns over target liabilities, transaction costs such as transferring asset titles) interact with tax considerations.

Finally, contrary to popular belief, it is unusual for firms to trade-off tax and accounting (book) considerations when structuring mergers and acquisitions. The tax treatment and the book treatment of acquisitions differ. In particular, tax factors rarely preclude the popular pooling of accounting interests, which enables firms to avoid goodwill amortization for book purposes. Most acquisitions of freestanding C corporations involve stock purchases (and consequently carryover of inside tax basis) and can be structured to qualify for pooling treatment. The accounting treatment for asset acquisitions and acquisition of a subsidiary's stock is independent of the tax treatment. Both result in purchase accounting. The tax and financial accounting issues in this area are complex and often misunderstood. We look forward to research that brings these two areas together.

3.2. Capital structure

3.2.1. Early finance studies

Perhaps the most developed area of tax research in finance involves capital structure choices. Capital structure has not been as dominant in tax research in accounting, but several studies have been conducted. This section reviews the development of some influential capital structure studies in finance and recent capital structure work in accounting.

Among the most influential papers in business research are Modigliani and Miller (MM, 1958, 1963), two finance papers addressing capital structure. MM (1958) show that with no taxes (and perfect and complete capital markets), the value of the firm is independent of its capital structure (and its dividend policy). MM (1963) add that if interest is deductible and dividends are not deductible, then the optimal capital structure is the corner solution of all debt.

Since MM (1963) is not clearly descriptive, finance researchers searched for non-tax costs of debt that prevented the corner solution. Some conclude that firms balance taxes against the possible bankruptcy costs associated with risky debt. Others assert that agency costs between debt and equity holders are increasing in debt (the static tradeoff theory involving taxes and agency costs). Myers and Majluf (1984) and Scott (1977), among others, report that leverage varies with the type of assets held by the firm. Ceteris paribus, firms with tangible assets can borrow more than firms with intangible assets because the property rights associated with tangible assets enable greater securitization (the debt securability hypothesis). Myers' (1977) conclusion is the same, but he claims that growth prospects pose greater agency costs to lenders.

Miller (1977) adds personal taxes to the leverage controversy (an ''all parties'' approach). Like MM, Miller assumes no market frictions or

restrictions. In perhaps the most influential tax study of all, he predicts that investors with low marginal tax rates (e.g., tax-exempt investors) will hold tax-disadvantaged bonds, earning taxable interest that is currently taxed. Investors with high marginal tax rates will hold stocks that do not pay dividends and derive their equity returns through favorably taxed capital gains that are deferred until sale of the stock. Miller's insight underlies the ''all taxes'' theme in the SW framework and is fundamental to the current tax research in accounting linking equity prices and taxes.

Miller (1977) implies dividend clienteles, i.e., high-dividend stocks will be held by low marginal tax rate investors and vice versa. Many finance studies test for the existence of dividend clienteles (e.g., Miller and Scholes, 1978). One example in accounting is Dhaliwal et al. (1999). Consistent with Miller (1977), they document an increase in institutional ownership (a coarse measure for tax-exempt status) of firms that initiate dividend payments.

DeAngelo and Masulis (1980) relax Miller's assumption that all corporations face the top corporate tax rate. Recognizing interest expense is only one type of tax shield, DeAngelo and Masulis (1980) predict that leverage is less in firms with alternative tax shields, such as depreciation (debt substitution hypothesis). One test of their theory by accountants is Dhaliwal, Trezevant, and Wang (DTW, 1992) who test MacKie-Mason's (1990) claim that the substitution effect increases as firms near the loss of tax shields (tax exhaustion hypothesis). After controlling for debt securability (which predicts a positive relation between leverage and fixed assets), DTW document a negative association between non-debt and debt tax shields, consistent with tax exhaustion. Examining 1981 legislation that caused changes in tax shields, Trezevant (1992) also finds support for debt substitution and tax exhaustion hypotheses. Together these studies document a link between taxes and capital structure that had been somewhat elusive.

3.2.2. Recent studies

Several recent studies suggest that taxes affect capital structure. Scholes et al. (1990) report that among banks, those with net operating loss carryforwards are more likely to raise capital through equity with non-deductible dividends than through capital notes with deductible interest. Collins and Shackelford (1992) link the choice between debt and preferred stock to foreign tax credit limitations. Graham (1996a), among others, adds that a firm's marginal tax rate is positively associated with its issuance of new debt.

Engel et al. (1999) conclude that the tax benefits of leverage are large (approximately 80 percent of the estimated upper bound) in their TRUPS study. Their setting is particularly powerful because they compare securities that are nearly identical, except taxes, enabling them to exclude potentially confounding effects, such as risk, signaling, and agency costs. Their weakness is that their results may not generalize to other securities.

Myers (2000) provides further evidence that taxes matter. Introducing pension plans as a capital structure option, she reports that corporate tax benefits are increasing in the percentage of pension assets allocated to bonds, potentially resolving a longstanding puzzle in finance. Her findings confirm Black (1980) and Tepper (1981) who predict firms integrate their defined benefit plans to reduce overall taxes through arbitrage (e.g., a company issues debt, invests in stock, and deducts interest while its pension invests in bonds with tax-exempt returns).

3.3. Implicit taxes

3.3.1. Early studies

Besides motivating the recent capital structure studies in accounting, the seminal finance papers and SW are the foundation for the current tax research in accounting known as implicit tax or tax capitalization studies. This section reviews that literature, first looking at early studies, then transitioning to ongoing research in the area that investigates whether stock prices reflect potential dividend and capital gains taxes.

Miller (1977) implies that after-tax rates of return are identical across all assets, conditional on risk and assuming no market frictions or government restrictions. SW (1992, Chapter 5) define implicit taxes as the reduced rates of returns for tax-favored investments required for this equality to hold. The classic example of implicit taxes is the lower pretax returns on municipal bonds. Because the interest earned on municipal bonds is tax-exempt, taxable investors are willing to pay more for municipal bonds than equally risky alternative investments, such as corporate bonds. Investors in the highest tax brackets will value the exclusion on municipal bond interest the most and thus a clientele of high-tax investors will hold municipal bonds.

An initial implicit tax study in accounting is Shackelford's (1991) examination of the interest rates of leveraged employee stock ownership plans (ESOP). The Tax Reform Act of 1984 excludes half the interest income on ESOP loans from income taxation. Because the benefits of interest exclusion are uncertain, most ESOP loans provide a form of tax indemnification. Specifically, two interest rates are provided in an ESOP loan agreement. The first assumes that the exclusion is available to the lender. The second assumes that the loan's interest income is fully taxable.

Because ESOP loans provide two interest rates for the same loan from the same lender to the same borrower over the same period, differing only in their tax treatment, they provide an ideal setting to test whether prices fully impound taxes. The implicit tax concept would predict that the loan's two interest rates would provide the same after-tax return to the lender. Shackelford finds after-tax rates are similar, but not equal. Approximately 75 percent of the tax benefits from the exclusion are passed through to the

borrower as lower interest rates. This finding is analogous to findings in Ayers et al. (2000b) and Henning and Shaw (2000) that target shareholders extract part of the benefits of goodwill deductibility from acquirers through higher acquisition prices.

Differentially taxed investments attract different clienteles. Consistent with this prediction, Shackelford finds that high tax rate lenders dominate the ESOP loan market. He concludes that ESOP interest rates reflect the tax treatment accorded their lenders and that the lenders are the financial capital suppliers who can most benefit from the favorable tax treatment.

Other early implicit tax studies include Stickney et al. (1983), Berger (1993), and Guenther (1994b). Stickney et al. (1983) estimate that in 1981 General Electric Credit Corporation paid roughly 70 cents on the dollar for tax benefits related to safe harbor leasing. Berger adds that the tax benefits accorded research and development affect its asset price. Guenther detects a small response in the interest rates of Treasury securities to changes in the taxation of individuals.

More recently, Erickson and Wang (1999) document that by redeeming Seagram's shares at a below-market rate in 1995, DuPont retained 40 percent of Seagram's tax savings. On the other hand, Engel et al. (1999) show that taxes had little effect on asset prices in their TRUPS study.

3.3.2. Marginal investor

Shackelford's (1991) results imply that the marginal provider of ESOP capital has a marginal tax rate that approaches the statutory tax rate. As a result, ESOP interest rates clear at a level that reflects the relatively high tax rate of the marginal investor. In other words, the research question could be restated as, "Who is the marginal investor?"

If Shackelford had found no difference between ESOP interest rates, he could not have rejected the implicit tax concept. Instead the evidence would have been consistent with (a) the marginal provider of ESOP capital being a tax-exempt organization, facing a zero marginal tax, or (b) market frictions or government restrictions impeding price adjustments. Because neither frictions nor restrictions seem likely in Shackelford's (1991) setting, his paper can be recast as an estimation of the marginal tax rate of the marginal investor. In this light, the differences in ESOP interest rates can be interpreted as providing evidence that the marginal lender is in a high-tax bracket.

Erickson and Maydew (EM, 1998) elaborate on the role of the marginal investor. They show that the existence and magnitude of implicit taxes are largely empirical questions. Building on SW, they stress that the theoretical prediction that prices adjust to reflect taxes is of limited predictive value because of diverse differentially taxed assets and investors, market imperfections, and government restrictions on tax arbitrage (SW, 1992, Chapter 6). With two differentially taxed assets (taxable corporate bonds and tax-free

municipal bonds) and two differentially taxed investors (taxable individuals and tax-exempts), it is impossible to predict the implicit tax rate that equates the two asset values. If the marginal investor is an individual, the yield on a tax-free municipal bond should be reduced by the individual's tax rate. If the marginal investor is a tax-exempt, the pretax yield on a corporate bond should equal the pretax yield on a tax-free municipal bond.

EM report that a 1995 proposed decrease in the dividends-received deduction (thus increasing the dividend taxes paid by corporate investors) resulted in a price decline for preferred stock, but not common stock. They conclude that the marginal investor for preferred stock is a corporation that enjoys the dividends-received deduction while the marginal investor for common stock is not a corporation affected by the dividends-received deduction. Alternatively stated, the implicit taxes associated with the corporate dividends-received deduction are greater for preferred stock than for common stock.

3.4. Equity prices and investor taxes

3.4.1. Motivation

One of the most active areas in tax research currently is whether investor taxes (dividends and capital gains taxes) affect share prices, or, alternatively stated, whether the marginal equity investor pays taxes. Tax research in accounting contributes to this literature with Dhaliwal and Trezevant (1993), Landsman and Shackelford (1995), Erickson (1998), Erickson and Maydew (1998), Guenther and Willenborg (1999), Harris and Kemsley (1999), Ayers et al. (2000a), Blouin et al. (2000a–c), Collins et al. (2000), Collins and Kemsley (2000), Gentry et al. (2000), Guenther (2000), Harris et al. (2001), Lang and Shackelford (2000), Seida and Wempe (2000), and Lang et al. (2001), among others.

The implicit null hypothesis throughout this literature is that the marginal investor does not pay taxes.[13] This null is no straw man. Miller and Scholes (1978), among others, conclude that investor taxes do not affect stock prices. Unlike the presumption that municipal bonds impound investor's tax exemption, theoretical and empirical studies in accounting, finance, and economics implicitly assume that prices are set by pensions, not-for-profit organizations, or other shareholders that do not pay investor taxes. For example, in accounting, leading theoretical work (e.g., Ohlson, 1995) implicitly assumes that the marginal equity investor is a tax-exempt organization. Similarly, by generally ignoring investor-level taxes in their valuations, popular

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[13] Few papers in this field explicitly state the null hypothesis of tax irrelevance. We believe that this reliance on an implicit null hypothesis has contributed to some misunderstanding about the purpose of these studies.

MBA courses, such as financial statement analysis, and current valuation texts (e.g., Palepu et al., 1996) implicitly assume that the marginal equity investor is a tax-exempt organization.

Tax capitalization studies challenge the widely held assumption that investor taxes are value-irrelevant. If the marginal investor pays taxes (e.g., individuals, mutual funds held in personal account, corporations, trusts, estates, etc.), then an important determinant of stock prices may be missing from many analytical and empirical models. Moreover, any measurement error associated with ignoring investor-level taxes, particularly capital gains taxes, may have increased dramatically in recent years because of the long-running US bull market.

The implications of overturning investor-tax irrelevance are non-trivial, including:

- share prices impound the expected after-tax returns to investors;
- share prices vary with changes in the expected tax treatment of dividends and capital gains;
- share prices vary with changes in the tax status of its investors;
- information affects share prices differently depending on investors' tax attributes (e.g., whether investors are taxable or tax-exempt and whether they have appreciated or depreciated positions in the stock).

In the following sections, we review several recent studies and ongoing research that estimate relations between equity values and investor-level taxes, attempting to assess the importance of shareholder taxes. Readers should approach these studies skeptically. Many are unpublished, and few have undergone close scrutiny and numerous replications. However, we believe that these studies potentially have important implications for accounting, finance, and economics.

3.4.2. Dividend tax capitalization

Early tax studies in economics and finance focus on whether dividend taxes affect share prices. The evidence is mixed and remains controversial. These studies come under various names, including Tobin q studies, new view vs. traditional view of dividends, and ex-dividend date studies.

The dividend tax capitalization studies produced at least three schools of thought (see Harris and Kemsley (1999), for additional discussion). The traditional view of dividends assumes the non-tax benefits of dividends (e.g., reduced agency costs) offset the tax cost of dividends. As noted above, the irrelevance view (e.g., Miller and Scholes, 1978) assumes the marginal equity investor is a tax-exempt entity.

The ''new view'' of dividends is less intuitive. It claims that share prices fully capitalize the future taxes associated with dividends. This implies that growth is funded first with internal resources. Thus, firms are not expected to pay

dividends and issue new shares simultaneously. Furthermore, the cost of capital does not depend on the "permanent" component of the dividend tax rate. Mature firms can pay dividends anytime at no incremental tax cost because shareholders have already bid down share prices to reflect the inevitable dividend taxes, assuming constant tax rates and inevitable distribution of all earnings and profits as dividends.[14]

A series of recent accounting studies (Harris and Kemsley, 1999; Harris et al., 2001; Collins and Kemsley, 2000) investigate dividend tax capitalization using Ohlson's (1995) residual-income valuation model. They concur that the marginal equity investor is an individual. All three papers infer that equity is discounted for dividend taxes because the coefficient on retained earnings (their proxy for future dividends) in their valuation model is less than the coefficient on other book value.

Collins and Kemsley (CK, 2000) extend the original model to incorporate the capital gains taxes arising from secondary trading. Examining 68,283 observations from 1975 to 1997, they regress firm-level stock prices on stockholders' equity, earnings, and dividends and interactions with dividend and capital gains tax rates. Consistent with investors treating dividends as an inevitable distribution of E&P, the magnitudes of CK's estimated coefficients imply that share prices fully capitalize dividend taxes at the top individual statutory federal tax rate. They also estimate that prices further capitalize approximately 60 percent of capital gains taxes at the top individual long-term capital gains tax rate. Both dividend and capital gains results imply that individuals are the marginal equity investors.

CK conclude that capital gains tax capitalization in stock prices is in addition to, rather than in lieu of, dividend tax capitalization. This produces the counterintuitive conclusion that paying dividends provides an incremental

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[14] In practice, dividends are not inevitable. That is, E&P, the source of dividend taxation, do not have to be distributed to shareholders in a form that triggers dividends. Besides dividends, E&P are reduced by share repurchases, liquidations following taxable asset acquisitions, and 338 elections following stock acquisitions (Lang and Shackelford, 2000). The evidence is conflicting about the extent to which acquisitions eliminate E&P through non-dividend means. In their analysis of 83 going-private management buyouts from 1982 to 1986, Schipper and Smith (1991) report that 11 buyouts were share redemptions and 28 other acquirers announced that they would step-up the tax basis of the acquired company. Conversely, Erickson finds little evidence of E&P elimination at acquisition among publicly traded companies. Analyzing 340 acquisitions from 1985 to 1988 involving publicly traded acquirers and targets, Erickson reports only seven acquirers disclosed their intention to step-up the tax basis of the target's assets. On the other hand, Bagwell and Shoven (1989) report that 1987 redemptions totaled $53 billion, up 824 percent from 1977. They show that from 1985 to 1987 total repurchases were 60 percent of total dividends. Auerbach and Hassett (2000) counter that redemptions have become less important. They report that by the mid-1990s, only 5–10 percent of companies repurchased shares. Regarding taxable asset acquisitions followed by corporate liquidations, Henning et al. (2000) identify 49 acquisitions of the assets of an entire company from 1990 to 1994. Presumably targets were subsequently liquidated, eliminating E&P. They also report that 338 elections followed 154 stock acquisitions during the same period.

tax benefit for shareholders, rather than the commonly assumed incremental tax penalty associated with dividends. Dividend payments benefit shareholders because they reduce the value of the firm and thus avoid "redundant" capital gains taxes when investors sell their stock.

CK's findings are controversial for at least three reasons. First, most companies do not pay dividends, and among those that do pay, dividend yields are low.[15] Thus, for CK's findings to hold, investors must price companies, such as Microsoft, which has never paid any dividends, as if they will eventually distribute all of their earnings and profits as taxable dividends to investors facing the current top personal rate. Given the changes in dividend tax rates over the last few decades, if dividends are not anticipated until far in the future, it seems unlikely that market prices would be sensitive to current dividend tax rates.

Second, CK's results conflict with dividend tax clienteles. Dhaliwal et al. (1999) findings imply that if non-dividend-paying companies (e.g., Microsoft) begin paying dividends, individuals will sell their shares to investors who can receive dividends at a lower cost, such as tax-exempt entities. The new shareholders would be taxed on the dividends at less than the highest personal income tax rate. The selling shareholders would pay tax on the appreciation in the company at the capital gains tax rates. In other words, dividend tax clienteles imply that Microsoft's stock might impound capital gains taxes at the highest individual rate, but not dividend taxes. We look forward to a study that reconciles dividend tax capitalization and dividend tax clienteles.

Third, there is little variation in the maximum statutory capital gains tax rates. While the highest dividend tax rates ranged from 31 to 70 percent from 1975 to 1997, capital gains tax rates were 28 percent in all years, except 1975–1978, when they were 35 percent, and 1982–1986, when they were 20 percent. Thus, the capital gains tax results are driven solely by differences between the study's first four years and the five years following the 1981 rate reduction and rely critically on controls for other sources of variation between these two periods. Furthermore, in years of legislative change in the rates (i.e., 1978, 1981, 1986, and 1997), investors presumably impounded the capital gains tax rate before it became effective. Finally, to the extent prices are set by the expected capital gains tax rate, rather than the current statutory rate, it becomes difficult to identify the relevant rate in several non-change years that were filled with speculation about possible changes in the capital gains tax rate.

For these reasons, we find these results implausible and will need additional tests employing various methodologies to accept the implications of these

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[15] Fama and French (1999) report only 20.7 percent of US firms paid cash dividends in 1998. Lang and Shackelford (2000) report that the dividend-paying firms among the nation's largest 2000 companies had a mean dividend yield of 2.8 percent in 1997.

studies. Nevertheless, we readily acknowledge that this current set of dividend tax capitalization papers in accounting have renewed interest in dividend tax capitalization, and, at a minimum, caused scholars to revisit the longstanding dividend puzzle. If the results hold under further scrutiny, it will be no overstatement to term these studies revolutionary.

3.4.3. Capital gains tax capitalization studies of equilibrium prices

Compared with dividend tax capitalization, capital gains tax capitalization is a relatively unexplored area. Capital gains taxation differs from dividend taxation in at least three critical areas. First, shareholders, not firms, generally determine when capital gains taxes are generated. In fact, capital gains taxes can be avoided completely by holding shares until death. Second, unlike dividends, which are paid quarterly by some firms, every stock price movement creates capital gains and losses for all taxable shareholders. Third, the applicable capital gains tax rate has historically been less than the dividend tax rate for property held for an extended period. For example, under current law, individuals who hold investments for more than one year face a maximum 20 percent capital gains tax rate on gains. Gains on investments held for shorter periods (and dividends) are taxed at the ordinary tax rate, which caps at 39.6 percent.

Empirical papers in this area generally exploit changes in tax policy or economic conditions to increase the power of the tests to detect a relation between stock prices and capital gains taxes. In brief, these studies generally find equity values impound the capital gains taxes that shareholders anticipate paying when they sell, a finding that conflicts with prior conclusions that shareholder taxes are irrelevant for share prices (e.g., Miller and Scholes, 1978, 1982).

Our discussion of the extant capital gains tax capitalization literature is split into two sections. This section reviews equilibrium pricing studies, which test whether stock prices impound the tax-favored long-term capital gains tax rate (currently at 20 percent). The next section discusses price pressure studies, which test whether trading volume and share prices respond temporarily to shifts in the capital gains tax.

Equilibrium pricing studies address issues similar to the dividend tax capitalization papers reviewed above. The intuition is as follows: When an individual considers incorporation, he values the business venture after all taxes, including any investor-level taxes. If he is the sole shareholder, he ignores dividend taxes because he will not pay himself tax-disfavored dividends. Instead, he anticipates capital gains taxes at liquidation or sale of the business. If shareholders of widely held, public companies value the returns on their stock investments similarly, i.e., after investor-level capital gains taxes, then equity prices should reflect capital gains tax capitalization, rather than dividend tax capitalization.

For those companies that pay dividends, the calculus is slightly altered, but current dividend payout ratios are so small, as discussed above, that investors likely anticipate the bulk of their returns will be subject to investor-level capital gains taxes, not dividend taxes. Because most firms pay no dividends and few firms pay large dividends, capital gains tax capitalization arguably dominates dividend tax capitalization if the marginal equity investor pays taxes. Example of "equilibrium pricing" studies include Erickson (1998), Guenther and Willenborg (1999), and Lang and Shackelford (2000), among others. CK jointly evaluate dividend and long-term capital gains tax capitalization.

Despite its intuitive appeal, researchers have been slow to consider the possibility of long-term capital gains tax capitalization for at least two reasons. First, as discussed above, the evidence from the dividend studies is mixed. Since dividends are more predictable than sales, it seems reasonable that documenting capital gains tax capitalization may be a difficult task.

Second, researchers have generally assumed (perhaps erroneously) that the necessary conditions do not hold for long-term capital gains to affect stock prices. The conditions include the marginal investor being a compliant taxable individual who intends to sell in a taxable transaction after holding the stock more than one year, the current long-term holding period (Shackelford, 2000). If his investment horizon is shorter, all gains and losses will be subject to short-term rates and thus the long-term rate will not be capitalized. Because all conditions must hold simultaneously for share prices to vary with the long-term capital gains tax rate, tax scholars historically assumed that long-term capital gains taxes had little effect on equilibrium pricing. Current studies challenge this assumption by designing tests of hypotheses that follow from the conditions holding.

Lang and Shackelford (LS, 2000) model an initial structure for considering how capital gains taxes might affect equilibrium pricing. They show that secondary trading and share repurchases accelerate the recognition of taxable income or losses that otherwise would be deferred until firm liquidation. They predict that if the necessary conditions hold, then capitalization of the capital gains tax in a firm's share price will be greater to the extent a firm's stock is traded in the secondary market and/or repurchased by the company, two events that trigger capital gains taxes. Thus, it becomes an empirical issue whether market behaviors are consistent with these predictions.

Employing a conventional event study methodology, LS report that the raw returns of non-dividend-paying firms were 6.8 percentage points greater than the raw returns of other firms during the May 1997 week when Congress and the White House agreed to reduce the long-term capital gains tax rate.[16] They

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[16] There is some controversy over the permanence of the price shift. LS find no evidence that the price change is temporary. As detailed below, Guenther (2000), however, attributes part of the price shift to temporary price pressure, the subject of discussion in the next section.

interpret these findings as evidence that investors discriminated among companies based on the probability that shareholder returns would be affected by the new capital gains tax rates.

Guenther and Willenborg (1999) find that IPO prices increased following implementation of a special 50 percent capital gains tax exclusion for small offerings. Initial public offerings are popular for both equilibrium pricing and price pressure tests (e.g., Reese, 1998; Blouin et al., 2000a) in the capital gains tax capitalization literature because individuals hold disproportionate shares of these companies and the IPO provides a start date for computing long-term capital gains holding periods.

Lang et al. (2001) find some evidence of capitalization of the capital gains taxes levied on corporate shareholders. They analyze stock price responses to the 2000 elimination of the German capital gains tax on crossholdings, i.e., German stock held by other German companies. They find that investee stock prices increase upon elimination of the crossholdings tax. However, the price increase is limited to non-strategic holdings (less than 20 percent) by the largest German banks and insurers in manufacturing firms. Moreover, the investing banks and insurers enjoyed even larger price surges than the investee corporations.

These studies provide preliminary evidence consistent with capital gains tax capitalization. At worst, these findings conflict sufficiently with prior assumptions (that share prices do not impound potential capital gains taxes) that they demand further attention. At best, they may be seminal studies, documenting that the many necessary conditions simultaneously hold (at least in certain situations) and providing evidence that the marginal investor is an individual discounting equity values for an anticipated long-term capital gains tax.

3.4.4. Price pressure arising from capital gains taxes

The price pressure studies in the capital gains tax capitalization literature build on the findings in the equilibrium pricing papers, using a structure developed in finance for non-tax price pressure (e.g., Harris and Gurel (1986), Shleifer (1986), and Lynch and Mendenhall (1997), among many others). These studies generally investigate short windows and test whether capital gains tax incentives affect trading volume and, if so, whether the volume surge is large enough to move prices.

For example, as noted above, Guenther (2000) examines the same legislative change as LS. He fails to detect the normal price movements for ex-dividend date firms (price decline before ex-dividend, price rebound the following day) during the 1997 long-term capital gains tax rate reduction. He attributes this departure to an unwillingness by individual investors (who had held shares for more than one year) to sell until the lower long-term capital gains tax rate took effect. This seller's strike temporarily boosted prices, implying that some of the

LS price response may be temporary. Unfortunately, the generalizability of Guenther's findings is hampered by the study's focus on a small set of ex-dividend date firms.

Landsman and Shackelford (1995) examine a setting where shareholders demand compensation to accelerate long-term capital gains taxes. Examining the confidential records of individual shareholders, they report that when RJR Nabisco shareholders were forced to liquidate their shares in the firm's leveraged buyout, stock prices rose to compensate shareholders for long-term capital gains taxes, which they had intended to defer or avoid fully by holding shares till death. Shareholders facing smaller capital gains taxes generally sold for less than shareholders facing larger capital gains taxes did.

A particularly active area in the price pressure literature tests whether buyers compensate sellers to sell earlier and pay tax-disfavored short-term capital gains taxes (or conversely, whether sellers forgo compensation on sales of depreciated securities to ensure tax-favored short-term capital losses.) Shackelford and Verrecchia (1999) model the potential price pressure showing that, if individuals purchase stock assuming the long-term capital gains tax rate will apply to their gains, then they will demand compensation through higher prices to sell before long-term qualification (and pay the higher short-term capital gains tax). In other words, a seller's strike will force prices to increase temporarily. Conversely, holders of depreciated property prefer short-term capital loss treatment to long-term capital loss treatment. Therefore, they will flood the market with shares immediately preceding long-term qualification, increasing volume and driving prices down.

Empirical papers in this area analyze trading volume around the long-term qualification date and test whether the volume reactions are sufficient to move prices. In other words, the empirical tests assess whether the market is liquid enough to absorb a seller's strike with appreciated property or sell-offs with depreciated property.

Several studies provide empirical support for capital gains tax-motivated price pressure around the qualification date. For example, analyzing several years of data, Reese (1998) reports that trading volume increases and prices fall for appreciated firms when their initial public shareholders qualify for long-term capital gains tax treatment, consistent with a sell-off when lower long-term capital gains tax rates first apply.

Also analyzing initial public shareholders first qualifying for long-term capital gains tax rates, Blouin et al. (2000a) examine volume and price responses to the 1998 Congressional committee report that shortened the long-term capital gains holding period. They find that trading volume increased for appreciated shares. Moreover, on the announcement date, volume surged enough that share prices fell and then rebounded the next day, consistent with price pressure created by differences in long- and short-term rates.

Similarly, Poterba and Weisbrenner (2001) revisit the January effect and show that from 1970 to 1978, the prices of equities that had declined during the capital gains holding period (six months at that time) rebounded following year-end. This is consistent with temporary price reversal following a tax-induced, year-end sell-off intended to ensure short-term capital loss treatment.

Blouin, Raedy, and Shackelford (BRS, 2000b, c) attempt to determine whether these price pressures can be detected under more general conditions (i.e., when tax considerations are less prominent). They note that most prior capital gains tax studies are conducted under conditions that bias in favor of finding that taxes matter, e.g., changes in tax policy, transactions where taxes are important considerations (e.g., mergers and acquisitions), companies held disproportionately by individuals (e.g., IPOs), and periods when tax planning is prevalent (e.g., year-end). They attempt to determine whether the findings in support of price pressure reflect exceptions to the rule (i.e., only occur under special tax conditions) or whether they illustrate a more general pricing role for capital gains taxes.

Another distinction of these papers is that they explicitly state the trading strategy that they presume individual investors use. Specifically, their empirical tests presume investors trade in the fashion described by Constantinides (1984), i.e., investors sell losses before the qualification date and sell gains immediately subsequent to the qualification date, reestablishing the option to realize future capital losses at the short-term rate.

BRS (2000c) examine the change in stock returns when the Standard & Poor's Corporation announces the addition of a firm to its 500 stock index. They link price increases to capital gains taxes, concluding that index funds compensate individual investors holding appreciated stock to entice them to sell before long-term capital gains qualification. This compensation provides temporary price pressure around the index announcement.

BRS (2000b) examine an even more improbable setting for capital gains tax effects, price responses to quarterly earnings announcements (probably the most investigated setting in accounting research). They find trading volume temporarily increased when individual investors faced incremental taxes (tax savings) created by selling appreciated (depreciated) shares before they qualify for long-term treatment. Furthermore, they find that the surge in volume is sufficient to cause shares to trade temporarily at higher (lower) prices, consistent with shareholders receiving (forgoing) compensation for unantici-pated capital gains (losses). In other words, it appears that around earnings releases, the equity markets are insufficiently liquid to counter the tax-driven trading without moving prices. We find this result particularly surprising and anticipate extensions that will test the robustness of this finding.

To summarize, unlike prior studies that focus on price reactions in settings where shareholder taxes are unusually salient, the BRS papers find the imprint

of capital gains taxes in more general settings, devoid of any obvious biases toward finding taxes matter. To find that personal capital gains affect security trading in these settings is surprising and suggests that capital gains tax effects are pervasive and matter more than previously thought.

A weakness of many capitalization studies (Landsman and Shackelford (1995), notwithstanding) is their inability to test directly the impact of shareholder taxes on stock prices. Better data are needed to construct direct tests. For example, BRS (2000c) could be nicely extended with detailed records of selling and buying shareholders (and their tax status) around the announcement that a firm is joining the S&P 500. Instead of inferring from capital markets tests (as they do) that mutual funds are compensating taxable individuals for their capital gains taxes, such data could enable direct tests of questions, such as: Are the shareholders selling to mutual funds, when firms join the S&P 500 index, taxable individuals holding appreciated stock for less than one year? Unfortunately, these ideal data tend to be confidential and difficult to obtain; however, we look forward to creative research that employs these richer data.

3.4.5. Summary

In summary, an active area in tax research in accounting addresses whether prices impound taxes. These studies trace their lineage to seminal finance papers in capital structure. Besides capital structure, accountants have explored debt securities and mergers and acquisitions. In general, these studies have combined extensive institutional knowledge with sound econometric analysis to contribute to our understanding of the importance of taxes in corporate finance.

More recently, a flurry of papers question whether equity prices reflect investor-level taxes, both dividend taxes and capital gains taxes. Exploiting accountants' comparative advantage of understanding the nuances of the tax law, these papers challenge the assumption of shareholder tax irrelevance. Conducted in a variety of settings, most provide empirical evidence that dividends and/or capital gains taxes affect share prices. Although many studies are unpublished and important questions remain, we infer from this increasingly large body of empirical evidence that at least in some settings, prices are set by taxable individual investors and that investor tax irrelevance (while providing analytical simplification) is less descriptive than previously thought.

In short, the contributions and caveats of dividend tax and capital gains tax capitalization studies are similar. Both produce surprising results and have the potential to overturn some longstanding positions (e.g., shareholder tax irrelevance). However, additional research is warranted to assess the robustness of these studies and their implications for share prices.

4. Multijurisdictional research

Another area in which complex tax provisions serve as barriers to entry for many researchers is the taxation of multijurisdictional commerce. Multinational and multistate research has been among the most active areas of tax research in accounting in recent years. However, the motivation for the work in this area differs somewhat from the tradeoff and the capitalization literatures.

Tax researchers have repeatedly applied the SW framework to multinational settings for at least four reasons.[17] First, from a pragmatic empirical perspective, transjurisdictional settings enhance a tax researcher's power because multiple jurisdictions introduce additional tax rate and base variation. The fundamental questions (Do taxes matter? If not, why not? If so, how much?), which are difficult to test in a single jurisdiction with constant tax rates and bases, can become tractable in transjurisdictional settings with variable rates and bases.

Second, from a theoretical perspective, the impact of jurisdictional variation in tax burdens on commerce is an inherently interesting scholarly question that relates closely to cost accounting. Markets ignore political borders; taxes vary with them. For example, telecommunications link consumers from different governments. Which government has jurisdiction over which part of a communication? If a New Yorker calls a Texan and the call is routed through satellites and other telecommunications equipment across the country, where are profits earned, i.e., which state has tax jurisdiction over the taxable income arising from the call? How are revenues and expenses allocated across multiple states? Accountants have a comparative advantage in addressing these questions of profit and cost allocation. An example of one particularly important current issue is Internet taxes (Goolsbee, 2000).

Third, from a policy perspective, as business has expanded in recent years, policymakers and tax practitioners have demanded documentation and understanding in the previously arcane multinational and multistate areas. Finally, recent construction of international databases that provide computer readable data from publicly available financial disclosures (e.g., Global Vantage) has significantly lowered the costs of some types of international tax research.

4.1. Multinational

As an initial multinational study, Collins and Shackelford (CS, 1992) exploit another contributing factor to the growing interest in multinational studies, the

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[17] Economists, particularly those with access to confidential US tax returns, also have been active in the international tax research area (see Hines (1997) for a review). Accountants, however, dominate the international income shifting field.

shift by US multinationals from domestic tax planning to global tax planning following the 1986 reduction in US corporate tax rates and concurrent limitation of foreign tax credits. Applying both "all parties" and "all taxes", CS show that the tax considerations of a US multinational, its lenders, and its shareholders must be jointly evaluated to determine the least costly source of financial capital.

TRA 86 strengthened the provisions that require firms to allocate domestic interest expense against foreign source income. Because foreign source income is the base on which foreign tax credits are computed, interest allocation reduces foreign tax credits. More specifically, foreign tax credits shrink when an American company opts for domestic debt financing. Moreover, because the interest is allocated according to the percentage of the firm's operations outside the US, the shrinkage increases with the firm's foreign operations. Thus, the benefits of interest deductions for a US company are diminishing in the firm's foreign operations. Consequently, after TRA 86, equity financing became less costly, relative to debt financing, for profitable US multinationals with extensive foreign activities.

To operationalize the multilateral perspective, CS hold the suppliers of debt and equity capital indifferent after-tax, recognizing that corporations are taxed advantageously on dividend income. They then compute the level of foreign operations that would leave firms indifferent between debt and equity. They show that if a firm has 22 percent of its operations abroad, it is indifferent between debt and equity. If their foreign operations are greater, then equity is a less costly form of capital.

Consistent with this prediction, CS find evidence consistent with taxpaying companies with large international operations (e.g., Coca-Cola and Exxon) substituting adjustable-rate preferred stock for commercial paper. CS argue that both products are short-term sources of capital, differing largely on their tax treatment; however, they do not incorporate any other differences (e.g., agency costs) in their tests. The preference for equity by companies facing high marginal tax rates illustrates the counterintuitive conclusions that are common when the multilateral perspective is employed.

Newberry (1998) extends Collins and Shackelford to examine incremental financing choices (see Section 5.4 for discussion of the advantage of studying incremental or new issues). She finds that the FTC limitations influenced firms to decrease their domestic debt by substituting both common and preferred stock (the latter predominantly by large firms, consistent with CS, who mostly evaluated large firms).

Besides substituting equity for debt, US multinational firms could respond by locating more of their debt in foreign subsidiaries. Smith (1997) and Newberry and Dhaliwal (2000) document such a response. Newberry and Dhaliwal examine international bond issuances and find that the bond issuance is more likely to be placed in a foreign subsidiary than in the US parent if the

US firm has a US NOL carryforward and if the FTC limit is binding. They add that bonds are more likely to be placed in foreign subsidiaries located in high-tax countries than in moderate tax rate countries.

Newberry and Dhaliwal illustrate the income shifting studies—the largest area of international tax research in accounting. Two initial income shifting studies in accounting were Harris (1993) and Klassen et al. (1993). Both examine publicly available data of a cross section of US multinationals. They attempt to determine whether patterns in reported income and taxes are consistent with incentives to shift taxable income to the US following TRA 86. Their findings are mixed. In his discussion of these papers, Shackelford (1993) recognizes their originality but concludes that more powerful tests are needed to determine whether multinationals shift income to minimize their global tax burdens.

More recent income shifting studies reflect at least three advancements in the research technology. First, at least some of the empirical analyses adopt a theoretical structure that enables them to move beyond the descriptive nature of the earlier studies and develop more powerful tests. For example, Harris (1993) and Jacob (1996) recognize that multinationals vary in their ability to shift income. Olhoft (1999) formally incorporates economies of scale to predict that international tax avoidance is increasing in the size of the multinational. Second, several studies access confidential tax return and other proprietary information to construct more powerful tests. For example, Collins et al. (1995a, 1997b), and Collins and Shackelford (1997) examine transactions within global enterprises that would be unobservable without their access to actual US corporate tax returns. Third, alternative tests are being conducted. For example, Collins et al. (1998) use capital markets methodology to test whether reported earnings reflect income shifting.

These technological improvements have raised the bar for quality tax research in the international area. For example, Mills and Newberry (2000) combine confidential IRS data on a select group of the largest foreign-controlled US companies with publicly available financial information on foreign corporations to conduct detailed firm-level tests of income shifting and the country location of debt. They find that the amount of tax paid to the US by a foreign corporation varies with numerous factors, including how the US tax rate compares with other countries' rates, the financial performance and reliance on intangible assets by the global enterprise, and the financial performance and leverage of its US operations. Despite these advances, Mills and Newberry (2000) remains largely documentation, not unlike the prior studies. We look forward to studies that use the technological advances to move beyond documentation.

Besides income shifting, several papers examine the role of taxes in the location of production facilities. Kemsley (1998) reports results consistent with firms locating production in response to foreign tax credit incentives and US

and foreign country tax rates. Wilson (1993) conducts a field-based study while Single (1999) uses the responses of tax executives to a case study to analyze the relative importance of taxes in the location decision. Both approaches offer ways for researchers to supplement the use of archival data and provide insights not available from analysis of archival data. Wilson suggests that the tax costs of locating in a country are negatively associated with the costs arising from non-tax factors such as the quality of the workforce, infrastructure, and political stability, i.e., tax incentives offset the other costs arising from locating in that country. Single's results indicate that tax holidays (no foreign taxes are due for the first *n* years of the firm's operations) are positive incentives, but rank relatively low in a list of 29 factors.

Finally, consistent with firms coordinating their inter-affiliate transfers to mitigate worldwide taxes, Collins and Shackelford (1997) find that dividend, royalties, and sometimes interest payments, but not management fees, between foreign affiliates of US multinationals are negatively associated with the net tax levied on cross-border transfers. Although data limitations prevent explicit testing, they acknowledge that agency costs likely mitigate more extensive worldwide tax minimization. These costs include impaired performance evaluation, resulting from profit reallocation within the organization, and erosion of the firm's non-tax relations with both home and host governments.

4.2. Multistate

Although heterogeneity across tax systems is a major attraction of international settings, other forms of cross-country variation (e.g., currency, legal system, financial markets, and economic development) potentially introduce correlated omitted variables and measurement error that affect inferences. In an attempt to retain the variation in tax systems while controlling for many sources of heterogeneity, researchers have recently turned to multistate tax research, another area of increased tax planning.

Besides reducing measurement error, multistate research is also attractive because states have unique provisions that permit alternative tests of whether taxes affect business activity. For example, unlike countries that rely on separate accounting to determine the tax base, states and provinces allocate total firm income (from all states) across states according to a predetermined formula that varies across states but relies on the percentage of total sales, property, and payroll in a particular state.

Several recent studies address these unique features of state tax provisions. Paralleling many international tax shifting papers, Klassen and Shackelford (1998) find an inverse relation between the income reported in US states and Canadian provinces and their corporate income tax rates. They also link shipping locations to state provisions concerning the taxation of goods shipped out-of-state (so-called ''throwback'' rules). Goolsbee and Maydew (2000)

estimate that double-weighting the sales apportionment factor increases manufacturing employment in the state by 1.1 percent, albeit by imposing negative externalities on other states. Lightner (1999) finds that low corporate tax rates spur employment development more than favorable apportionment formulae or throwback rules. Gupta and Mills (1999) report high returns to firms that invest in state tax avoidance.

A series of papers address issues unique to property-casualty insurers, an industry where state taxes are unusually burdensome. These papers conclude that state premium taxes affect insurers' cross-state expansion (Petroni and Shackelford, 1995) and their statutory filings with regulators (Petroni and Shackelford, 1999). Ke et al. (2000) add that less insurance is purchased in states that tax insurers more heavily, consistent with insurance prices capitalizing the effects of state taxes.

In conclusion, multijurisdictional research likely will continue as a major focus of tax research in accounting, if for no other reason than its variation in tax rates and bases provides a powerful setting for testing tax effects. However, documenting that taxes matter likely will be insufficient for publication in the leading journals. The proliferation of multinational (and increasingly multi-state) studies has significantly raised the hurdle for incremental contribution in this area. As a mature specialization in tax research in accounting, international tax may not have the growth potential of some areas, but the quality of its published research likely will be high.

5. Methodological issues

The remainder of the paper addresses six methodological issues: estimating marginal tax rates, self-selection bias, specifying tradeoff models, changes vs. levels specifications, implicit taxes in tax burden studies, and using confidential data. Although these issues are not unique to tax research, each is prominent in the extant literature. To date, tax research has not been noted for many methodological advancements. Perhaps the issues raised in this section will initiate evaluation of the appropriate tools for undertaking empirical tax research in accounting.

5.1. Estimating marginal tax rates

Most tax research in accounting requires a marginal tax rate estimate or proxy. In addition, many studies outside the tax area need marginal tax rate measures to control for possible tax effects. A major contribution of tax research in accounting to non-tax research has been the development and assessment of various marginal tax rate estimates.

SW define the marginal tax rate as the change in the present value of the cash flow paid to (or recovered from) the tax authorities as a result of earning one extra dollar of taxable income in the current tax period. This definition incorporates both the asymmetry and multiperiod nature of US corporate tax law. Taxable income is taxed in the current period. Taxable losses are carried back (currently two years) and forward (currently 20 years) to offset taxable income arising in other years. Thus, managers make decisions using tax rates that reflect the firm's past tax status and anticipated future tax status.

To illustrate, suppose a corporate taxpayer has generated more tax deductions than taxable income in the past. The result is $20 of NOL carryforwards, which can shelter future taxable income. Suppose investment and financing plans are fixed and the firm anticipates annual taxable income of $8 beginning one year from today. The current and expected statutory corporate tax rate is 40 percent.

Without NOLs, an extra dollar of taxable income would trigger an immediate tax of 40 cents, leaving a marginal tax rate of 40 percent. With $20 of NOLs, the firm faces no immediate tax liability on an extra dollar of income. However, its marginal tax rate is not zero. Instead, $8 per year of taxable income means the firm will pay taxes in three years. Therefore, an extra dollar of taxable income today triggers a tax payment of 40 cents in three years. Discounting after-tax cash flow at 8 percent per year leaves a present value of the incremental tax of 31.75 cents ($40/1.08^3$) or a corporate marginal tax rate of 31.75 percent. More formally stated for this scenario

$$\text{mtr} = \frac{(\$1 \times \text{str}_s)}{(1 + r)^s},$$

where mtr denotes the marginal tax rate, str_s denotes the expected statutory tax rate in period s, the period in which the firm is eventually taxed on the extra dollar of income earned in the current period, and r is the firm's after-tax discount rate.

Therefore, if the current statutory rate is scheduled to fall in one year to 25 percent, then the current marginal tax rate for the NOL firm would be 19.84 percent (or $0.25/1.08^3$), even though the rate for a firm without NOLs would remain 40 percent. Analogously, if the statutory rate is expected to increase to 55 percent in one year, then the current marginal tax rate for the NOL firm would be 43.66 percent (or $0.55/1.08^3$). In other words, if tax rates are rising, the current marginal tax rate of NOL firms could exceed that of non-NOL firms current paying taxes at the full statutory rate!

Marginal tax rate proxies in the extant literature include a categorical variable for the existence of an NOL carryforward, a categorical variable for the sign of (estimated) taxable income, the effective or average tax rate, and the top statutory tax rate. Each measure has weaknesses. Shevlin (1990) summarizes the limitations of the NOL dummy variable and the dummy

variable for the sign of taxable income.[18] Because it is an average tax rate, the effective tax rate is a flawed measure for assessing the role of taxes in incremental decisions. The top statutory tax rate ignores cross-sectional variation in firms' marginal tax rates.[19]

If the study includes NOL carryforward firms, precision is added to the marginal tax rate estimate by incorporating the recovery of future taxes through utilization of the NOL. Forecasts of future taxable income are needed to estimate the number of years before the NOL is exhausted. Manzon (1994) forecasts future taxable income with a simple valuation model:

$$V = E/r,$$

where V is the market value of the firm's common equity, E is the expected future earnings or taxable income, and r is the after-tax discount rate. Rearranging

$$E = Vr.$$

Now solving for s, the number of periods before the NOL carryforward ends, finds

$$s = \text{NOL}/E.$$

To illustrate, suppose a firm has an NOL carryforward of $6, a market value of equity of $15.625, and r equals 8 percent. These data imply an expected annual future taxable income of $1.25, implying s equals five years. If the statutory tax rate is expected to remain at 35 percent over the foreseeable future and taxes are paid at the end of the year, the marginal tax rate equals 25.7 percent.

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[18] Two studies examine the accuracy of the NOL data reported by Compustat. Kinney and Swanson (1993) compare the Compustat data with the firms' financial statement footnote disclosures. They report that when a categorical variable is created from Compustat data item #52 indicating the existence of an NOL carryforward, 10 percent are coded as zero when a carryforward exists, and 2 percent are coded as one when a carryforward is not mentioned in the footnotes. Mills et al. (2000) construct tax NOLs from confidential tax return data and find 9 percent of their sample report a Compustat NOL when the tax return reports no NOL (often when the firm reports a foreign NOL in their footnotes). They also find that 3 percent of their sample report no Compustat NOL when there is a US NOL (often relatively small NOLs). Mills et al. (2000) provide some classification rules to reduce measurement error in Compustat reported NOLs.

[19] See Graham (1996a, b) for evidence of cross-sectional variation in estimated marginal tax rates. His findings are consistent with several financial accounting papers that document an increase in the frequency and number of firms reporting losses. Moreover, marginal tax rates can vary among firms currently paying tax at the top statutory rate if taxable losses are anticipated in the next two years (under current law). The loss can be carried back and taxes paid in the current year recovered. In that case, the marginal tax rate is the current period statutory tax rate minus the present value of the tax rate in the loss period. If a currently profitable firm does not expect to incur taxable losses within the next two years, the statutory tax rate likely is a reasonable approximation for its marginal tax rate.

Shevlin (1987, 1990) and Graham (1996b) develop more complex simulations that forecast future taxable income based on the firm's historical taxable income series. Shevlin incorporates the NOL carryback and carryforward rules, and Graham extends the approach to include tax credits and the corporate alternative minimum tax.

The interested reader should refer to the original papers because the simulations are too complex to review fully in this paper. They require several assumptions to implement, and estimates vary with the assumptions. Nevertheless, simulated rates have become increasingly popular (e.g., Keating and Zimmerman, 2000; Myers, 2000). Graham's (1996b) evaluation of marginal tax rate proxies makes a compelling case in their support and simulated rates for a large sample of publicly listed firms can be easily accessed at Graham's website, http://www.duke.edu/~jgraham/ under the "tax rates" option.

Do these proxies actually capture the marginal tax rates that managers use to make decisions? Unfortunately, as with discretionary accruals, this question is difficult to answer because "true" marginal tax rates are unobservable. Using confidential tax return data, Plesko (1999) attempts an evaluation of the marginal tax rate proxies. Unfortunately, Plesko's data are limited to one period, preventing him from incorporating multiperiod effects of the asymmetric treatment of gains and losses. He calculates each firm's taxable income from tax return data and then uses the statutory tax rate for that level of taxable income as the firm's "true" marginal tax rate. He assigns a marginal tax rate of zero if the firm reports taxable losses even though the loss may be utilized in a future year or carried back to a prior year. Plesko concludes that two binary variables capture most of the variation in the marginal tax rates. However, this conclusion, due to the single period nature of Plesko's calculation, is too premature to guide estimations of corporate marginal tax rates.[20]

Access to a time series of firm tax data would strengthen Plesko's analysis by enabling incorporation of NOL carrybacks and carryforwards. However, such data enhancements are of limited value if future taxable income realizations are a function of current and past actions taken by the firm in response to its tax status (Shevlin, 1990, note 8). If the endogeneity of future period taxable income realizations to current marginal tax rates is of second order magnitude, then future taxable income realizations could be used to calculate a present value measure of marginal tax rates.

Regardless, the relevant marginal tax rate is the one used by managers and a worthwhile endeavor would be to document (possibly by field study) how firms incorporate their tax status into their decisions. Determining whether managers use a simple binary measure based on the sign of taxable income

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[20] See Shevlin (1999) for further (critical) discussion of Plesko's paper.

or more complex measures as assumed by the simulation measures would be an important finding.

5.2. Self-selection bias

Tax studies commonly estimate models taking the following form:

$$y_i = \beta' X_i + \delta I_i + \varepsilon_i, \tag{1}$$

where I is a categorical variable indicating group membership. For example, in their tests of tax, earnings, and regulatory management, Beatty and Harris (1999), and Mikhail (1999) compare two groups, publicly- and privately-held firms. In another setting, Henning and Shaw (2000) investigate the extent to which 1993 legislation, which provided deductibility for goodwill amortization, affected the allocation of acquisition purchase prices across assets. Among various tests, they compare allocations between two groups, targets that stepped-up tax basis and targets that did not. Examining the same event, Ayers et al. (2000b) compare acquisition premiums between two groups, firms likely qualifying for deductible goodwill amortization and those not likely qualifying.

Each of these papers uses ordinary least squares to estimate regression models that are similar in structure to Eq. (1). Consequently, each faces a self-selection problem that may result in biased estimates of δ. Interested readers are referred to Maddala (1991) and Greene (1990). Intuitively, two conditions must hold for ordinary least squares to produce biased estimates of δ. One, non-random selection determines group membership (i.e., firms self-select into groups). Two, group determinants are correlated with the X variables. If both conditions hold, one solution is to include the inverse Mills ratio as an additional regressor to correct this omitted correlated variables problem.[21] Practically, if results are unaltered by inclusion of the Mills ratio, erroneous inferences from self-selection bias can be ruled out. For example, Guenther et al. (1997) recognize the potential self-selection bias in their study, report that their OLS results are similar to their two-stage results, and dismiss self-selection as a material problem in their setting.

Including the Mills ratio effectively transforms the estimation into two regressions. The first stage estimates a model explaining the group member-ship. The second stage estimates the original relation between group member-ship and the dependent variable with the inclusion of the inverse Mills ratio. Thus, studies examining the choice of group membership (e.g., ISO disqualification, organization form, domestic vs. foreign location, LIFO inventory choice, and acquisition or divestiture structure) are unaffected by self-selection problems because these studies are modeling the choice itself.

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[21] It is not clear that this solution is implementable if the group membership variable is to be interacted with other explanatory variables.

Self-selection becomes a problem when the researcher is interested in the effects of the selection on some other decision variable, i.e., when group membership is an explanatory variable rather than a dependent variable or only one group is examined. For example, in the latter case, Hunt et al. (1996), by examining the earnings management behavior of LIFO firms as a function of taxes and financial reporting factors ignore the self-selection issue: firms that select LIFO likely do so because of the opportunities it offers to reduce taxes and manage reported earnings.[22]

A second alternative to the self-selection problem is offered by Himmelberg et al. (1999) and implemented in an accounting tax paper by Ke (2000). Modeling the group choice in a first-stage regression assumes that observable variables are available (some of which are not already in the second-stage regression).[23] To the extent variables are not observable or available (e.g., the group choice and dependent variable in the second stage are jointly determined by firm-specific unobservable characteristics of the firm), a firm fixed effects model can control for (or mitigate) the effects of any self-selection biases.

Finally, self-selection can be a problem even if firms find themselves grouped by a seemingly exogenous change, e.g., a change in tax policy. For example, as discussed above, several studies attempt to assess whether firms managed book accruals to reduce taxes triggered by the TRA 86's book–tax adjustment (BIA) to the alternative minimum tax (e.g., Gramlich, 1991; Boynton et al., 1992; Dhaliwal and Wang, 1992; Manzon, 1992). Suppose a sample is drawn including both treatment firms (those likely affected by the provision) and control firms (those not likely affected by the provision). A measure of accrual management is then regressed on a variable that segregates treatment and control firms. Does this structure constitute a potential self-selection bias?

On the surface, it appears that the firms did not self-select. However, the BIA was targeted at firms reporting high book income to shareholders and low taxable income to the tax authorities. To the extent determinants of these reporting choices correlate with other determinants of accrual management

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[22] Note that the argument is that LIFO choice is likely correlated with some of the explanatory variables examined by Hunt et al. (1996) and thus a check for self-selection biases would require inclusion of the Mills ratio from a first-stage selection model. The argument is not that the LIFO choice is correlated with the other dependent variables examined in Hunt et al. (1996). If that were the case, the LIFO choice would be endogenous (that is, dependent on the other dependent variables) and LIFO choice would need to be modeled as part of a simultaneous equations system, which differs from the self-selection issue, discussed here.

[23] This comment also suggests that the validity (or strength of the control offered) of the inverse Mills approach depends upon how well the researcher models the group choice in the first-stage regression. To the extent the researcher does a poor job, the more likely it is that including the inverse Mills ratio in the second stage will not change results leading the researcher to falsely conclude that self-selection does not appear to be an important issue in their setting. This comment applies to all instrumental variable approaches.

(the dependent variable), the AMT studies suffer from self-selection. The implication of this example is that researchers should carefully consider the process through which groups are produced.

In summary, the seriousness of self-selection is unresolved. At a minimum, researchers should consider a robustness check that compares single-stage OLS results to two-stage tests including the Mills ratio as an additional regressor.

5.3. Specifying tradeoff models

Many studies reviewed in the tax and non-tax tradeoff section can be characterized as using the following design (e.g., Scholes et al., 1990; Matsunaga et al., 1992):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon, \tag{2}$$

where Y denotes the choice under study, for discussion purposes here assumed to be a categorical variable, 0, 1, with firms undertaking the choice coded 1, X_1 is a variable measuring a firm's tax benefits/costs, again assumed to be 0, 1 with 0 (1) being low (high) tax firms, and X_2 is a variable measuring non-tax costs/ benefits, again coded 0, 1 with 0 (1) being firms with low (high) non-tax costs.

Suppose the non-tax costs are financial reporting considerations. A significant coefficient on β_1 (β_2) provides evidence that taxes (financial reporting) affect the choice. However, significant coefficients on both variables also have been interpreted as evidence that firms tradeoff taxes and financial reporting in the choice.

We question this stronger interpretation. In a regression model such as Eq. (2), the correct interpretation of a significant positive coefficient on X_1 is that after controlling for the effects of the other variables in the model, the firm's tax status has a positive effect on the choice. A similar interpretation attaches to the other coefficient(s). In other words, the regression coefficient captures the incremental effect of the firm's tax status on the firm's choice. If the researcher wishes to make the stronger interpretation that firms tradeoff taxes with other non-tax costs and benefits, then a different model specification is necessary. Tradeoffs should mean that the effect of taxes on the firm's choice depends on the level of the non-tax costs, or conversely, the effect of non-tax costs on the firm's choice depends on the firm's marginal tax rate. To capture this effect, we suggest a model specification, which includes an interaction between tax and non-tax effects. For example

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 (X_1 \times X_2) + \varepsilon. \tag{3}$$

A significant coefficient on the interaction term is consistent with firms considering the level of the other variable and hence trading off tax and non-tax costs.

For purposes of developing the discussion, we present the following 2×2. Assume the choice reduces taxable income, saving taxes, but also reduces reported accounting earnings.[24]

		X_1	
		0 (low tax)	1 (high tax)
X_2	0 (low FRC)	a	b
	1 (high FRC)	c	d

We discuss each cell in turn. In cell a, the firm faces both a low tax rate and low financial reporting costs. Thus, there is no tax incentive to undertake the transaction (and no real incentive to do the transaction for financial reporting), and Y is predicted to equal zero. In cell b, the firm is high-tax and faces a low financial reporting cost. The firm is expected to undertake the income reducing action so $Y = 1$. In cell c, the firm is low-tax and faces high financial reporting costs. There is little incentive to undertake the action; thus $Y = 0$. Finally, in cell d, the firm is high-tax but faces high financial reporting costs. Here the firm must weigh both taxes and financial reporting costs. The probability of the firm taking the action lies between 0 and 1.

This analysis shows that the extent to which taxes matter depends on the financial reporting costs faced by the firm. In this simple example, all high-tax firms have an incentive to reduce income and save taxes. However, only those firms in cell d tradeoff taxes and financial reporting costs. They likely engage in less tax reducing behavior than high-tax firms in cell b that are less encumbered by financial reporting costs.

Finally, studies that include an interactive term on taxes for ownership structure (e.g., Klassen's (1997) insider ownership measure) essentially are estimating the interaction model described above. For example, the categorical variable for ownership structure may denote firms less concerned with financial reporting costs because they are manager-controlled or closely held and thus face lower reporting costs. Other papers, e.g., Beatty and Harris (1999) and Mikhail (1999), include an indicator variable for ownership interacted on each of the tax and non-tax costs to examine whether their effects vary with firm ownership (public versus private). In summary, the appropriate model specification in a tax and non-tax tradeoff study depends on the research question and any resulting inferences should be based on the model estimated.

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[24] The reasoning is unaltered if the choice (i) increases reported income, but also increases tax costs for high-tax firms, or (ii) more generally, potentially increases or reduces taxable and accounting income, e.g., sale of securities to realize gains and losses, disposal of assets, and LIFO inventory management.

5.4. Changes vs. levels

In their investigation of the relation between a firm's marginal tax rate and the issuance of new debt, both Mackie-Mason (1990) and Graham (1996a) illustrate how a "changes" (rather than "levels") approach allows a more powerful test of debt and taxes. Examining the issuance of new debt rather than total outstanding debt avoids two problems that plague many "levels" studies. First, a firm's capital structure (as well as other accounts) reflects past decisions that were based on expectations that may not have been fulfilled because of unexpected outcomes (e.g., a change in product markets, competition, the economy, or tax policy). Thus, even if decisions are tax-motivated when undertaken, later they may appear contrary to predicted tax responses. Because it is costly to restructure capital (e.g., debt–equity swaps), cross-section "levels" studies may erroneously conclude that taxes do not affect capital structure decisions. In other words, recontracting costs inhibit firms from immediately restructuring their economic balance sheets when their tax status unexpectedly changes. Thus, cross-sectional tests of debt levels can fail to find a tax effect when it actually exists.

The second "levels" problem that the changes approach avoids is the downward bias on the regression coefficient that occurs when researchers compare ex-post choices and ex-post marginal tax rates when the choice affects the rate. For example, theory predicts that high-tax firms will use debt to lower their tax bills. By increasing debt, however, firms increase the interest deduction and lower their marginal tax rate. Thus, in equilibrium, all firms may appear to face similar marginal tax rates. If so, tests can fail to detect a relation between ex-post debt levels and ex-post marginal tax rates when, in fact, high-tax firms increased their debt levels to garner the tax shield offered by debt. An alternative to the changes specification is to use marginal tax rates (and, where necessary, other variables) estimated on a but-for approach (also referred to as pre or as-if measures). An example of this approach is Graham et al. (1998) in which they show that debt levels and the usual after-financing tax rates are negatively correlated but that debt levels and before-financing tax rates (but-for marginal tax rates) are positively associated as predicted by theory.[25]

5.5. Tax burdens and implicit taxes

The theoretical and empirical evidence suggests that implicit taxes are pervasive. Besides the discussions above, a few sources of implicit taxes include

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[25] As noted in Section 2, in calculating but-for or as-if variables, the researcher has to be careful not to induce biases towards the alternative hypothesis. See discussions of this issue in Shevlin (1987) and Maydew et al. (1999).

rapid depreciation, tax credits, expensing of certain investments (e.g., advertising and research and development), and special tax treatment for industries, such as oil and gas, timber, and real estate.

If implicit taxes are as pervasive as they appear, it is important that they be incorporated in measures of the total tax burden levied on the economy. Unfortunately, to our knowledge, studies that assess corporate tax burdens (e.g., Zimmerman, 1983; Porcano, 1986; Wilkie and Limberg, 1990, 1993; Wang, 1991; Kern and Morris, 1992; Shevlin and Porter, 1992; Collins and Shackelford, 1995, 2000; Gupta and Newberry, 1997) and individual tax burdens (e.g., Seetharaman and Iyer, 1995; Dunbar, 1996; Iyer and Seetharaman, 2000) ignore implicit taxes. These important tax policy studies typically compute effective (or average) tax rates as a measure of taxes payable (current tax expense or total tax expense) divided by a measure of firm earnings.[26]

Tax burden studies usually acknowledge that implicit taxes are ignored because they are difficult to measure. Unfortunately, if implicit taxes are material (or alternatively stated, prices are set by taxpaying investors), omitting them from distribution analyses potentially leads to erroneous inferences and flawed policy recommendations. Advances in the technology for estimating implicit taxes would be an important advancement for the tax burden literature.

To illustrate the shortcoming in the current studies, suppose A invests $10 of capital in fully taxable investments, earning a pretax rate of return of 10 percent per annum. B invests $10 of capital in a tax-exempt activity (e.g., municipal bonds), earning a pretax rate of return of 7 percent per annum. If the statutory tax rate is a flat 30 percent on all taxable income, both firms earn $7 after-tax, but A has an effective tax rate of 30 percent and B has an effective tax rate of 0 percent using current tax burden methodology. If instead implicit taxes could be incorporated in the analysis, the average tax rate for both firms would be 30 percent. A's 30 percent would be all explicit. B's 30 percent would be all implicit.

Unfortunately, measuring implicit taxes is rarely as simple as in the above example. Callihan and White (1999) attempt to derive an estimate of implicit taxes, using publicly available financial statement data. Briefly, they estimate the implicit taxes as

$$(\text{PTI} - \text{CTE})/(1 - \text{str}) - \text{PTI},$$

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[26] See Omer et al. (1991) and Callihan (1994) for reviews of the effective tax rate literature and methodology. Plesko (1999) attempts an evaluation of ETR studies using actual tax return data. He argues and attempts to document that financial statement based ETRS are measured with error. We agree that financial statement based ETRs contain measurement error when compared to a benchmark of tax return tax burdens. However, depending on the research question, financial statement based ETRs are the appropriate measure to study and tax-based ETRs then contain measurement error. See Shevlin (1999) for further discussion of this issue.

where PTI is the firm's pretax income, CTE is the current tax expense, and str is the top statutory tax rate. The first term represents an estimate of the pretax return the firm would have earned had it invested in fully taxable assets while the second term represents the pretax return on actual investments. We can define CTE = (PTI − X)str where X is the difference between taxable and accounting income arising from temporary and permanent differences and tax credits. Substituting, implicit taxes equal X str/(1 − str). Thus, implicit taxes are estimated as the amount of tax preferences times the top statutory tax rate grossed up to a pretax value or equivalently stated, the pretax value of the tax savings arising from the use of tax preferences. When deflated by shareholders equity, this measure is equivalent to the tax subsidy measure derived by Wilkie and Limberg (1993). This measure can also be restated as (str − etr)/(1 − etr) where etr is the firm's effective tax rate (total tax expense/pretax book income) indicating that the measure is really only capturing variations in firms' effective tax rates and thus is not directly estimating firms' implicit taxes. Callihan and White's approach may be a start toward developing useful estimates of implicit taxes at the firm level but obviously more work is needed. Similarly, Mazur et al. (1986) may aid researchers in assessing individuals' tax burdens.

5.6. Confidential data

A distinguishing feature of several international tax papers (e.g., Collins et al., 1997b; Collins and Shackelford, 1997; Mills and Newberry, 2000) and some papers outside the international area (e.g., Boynton et al., 1992; Plesko, 1999; Landsman et al., 2001) is the use of data that are not publicly available, such as confidential tax returns. Access to confidential tax returns typically arises from employment (e.g., Plesko, 1999), consulting (e.g., Mills and Newberry, 2000), or special arrangements with the IRS (e.g., Collins et al., 1995a). Access to confidential firm data typically is gained through personal contacts with firm officials (e.g., Landsman and Shackelford, 1995) or financial consultants (e.g., Myers, 2000) or by solicitation through mailings (e.g., Shackelford, 1991; Phillips, 1999; Yetman, 2000).

Because the scientific method relies on the ability of researchers to replicate studies, should the research community rely on knowledge gained from using confidential data?[27] Our opinion (note one co-author has used confidential

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[27] Although replications per se are not commonly published in leading accounting journals, we would argue that replication occurs nonetheless. First, it is not unusual for doctoral students as part of their coursework to replicate prior research. Inability to complete such replications attracts the attention of students and their advisors and can lead to publications. Second, many publications are extensions that began by replicating the prior findings. Third, it is not unusual for lower tier journals to publish replications of papers in leading journals.

data extensively) is that such research should not only be published, but also encouraged. There are at least four reasons for this view.

First, even studies using confidential data can be replicated. Researchers within the Treasury can replicate studies using confidential tax return data at relatively low cost. Other researchers can follow the lead of the initial researchers and obtain access to confidential data. (To do so for replication alone, however, likely is a poor use of a valuable resource.) In many ways research based on confidential data is similar to much accounting research that relies on costly, privately (researcher) collected data (field research, experimental economics, judgment and decision-making research).

Second, many research questions that are investigated with confidential data could be addressed using publicly available data albeit imperfectly. Access to confidential data often is motivated by an attempt to reduce measurement error in a key variable. For example, several papers use publicly available financial statement data to examine the effects of the book income adjustment for the alternative minimum tax. Boynton et al. (1992) triangulate those studies using tax return data.

Third, occasionally confidential data enable researchers to address questions that could not be addressed with publicly available data. For example, Collins and Shackelford (1997) examine cash transfers between commonly owned foreign subsidiaries of US companies. This study could not be undertaken with publicly available data, such as financial statements. Fourth, in the same way that Fama (1980) argues for ex-post settling up in the managerial labor market as a disciplining device, reputation effects in academe dampen abuse with confidential data.

Despite many reasons for using confidential data, the experience of one co-author is that confidential data can be "fools' gold". Access can be slow, e.g., gaining permission through the IRS can take months or even years. Confidential data may not be computer readable. Sample sizes may be small and sampling non-random. Even if accessible, no data (even tax returns and private firm information) are complete and capable of transforming uninteresting research questions. Thus, before investing in costly confidential data, we would encourage researchers to ensure that the confidential data will significantly enhance the quality of the research.

6. Closing remarks

This paper provides a historical record of the scholarly journey that has led to the current state of empirical accounting research on taxation. This review reflects the struggles of empirical tax research in accounting to apply an initial

structure. We are encouraged by the rapid progress of the field in the last few years and look forward to further research enhancing our understanding of the role of taxes in organizations.

As the area enters its adolescence, we envision five developments. First, the better research in the future will move beyond simply documenting that taxes matter. It will more precisely quantify the extent to which taxes matter and the impediments to tax minimization.

Second, additional theoretical guidance is needed to move the literature beyond SW and longstanding finance papers. Notwithstanding some theoretical work in transfer pricing (e.g., Halperin and Srinidhi (1987, 1996), Harris and Sansing (1998), and Sansing (1999, 2000), among others), the theoretical tax work in accounting generally addresses issues of secondary interest to tax accounting empiricists, e.g., tax compliance. Without more structure, the literature covered in this paper will stagnate at the documentation stage. By developing theory or importing theories from related fields, hypothesis testing of competing theories will enable the field to mature.

Guenther and Sansing (2000) illustrate how modeling provides insights and guides the development of hypotheses and empirical research. They examine the firm valuation effects of the accounting for deferred taxes. Their model, in contrast to conventional wisdom, shows that the timing of expected deferred tax reversals should not affect the value of the firm. This result has both implications for empirical research examining how the market values deferred tax assets and liabilities and for standard setters who propose requiring firms to report a present value estimate of the deferred tax assets and liabilities (i.e., a function of the timing of reversals). Theoretical structure also is improving the capitalization literature (e.g., Shackelford and Verrecchia, 1999; Collins and Kemsley, 2000; Lang and Shackelford, 2000). Similarly, Olhoft (1999) formally introduces economics of scale to international tax avoidance. Research is needed that incorporates taxes and other organizational choices, such as vertical integration, out-sourcing, and decentralization.

Third, the methodological concerns raised in this paper imply that more rigorous econometrics may be needed. To date, this area has imported its methodology from other areas, particularly financial accounting. Researchers should consider whether econometric procedures that have not been needed in financial accounting would advance the tax field.

Fourth, we anticipate tax research in accounting to better incorporate knowledge from other areas, particularly finance and public economics. Because SW caused a paradigm shift among tax accountants, we have a tendency to ignore the long history of tax analysis in finance and economics. For example, the relation between stock prices and investor-level taxes has

been investigated extensively in both economics and finance. Accountants should be careful to avoid redundancy.

Fifth and closely related to the last development, tax research in accounting should increasingly impact the tax research being undertaken in finance and economics as the common interest across disciplines is better recognized. Recent contributions by accountants into the capitalization of capital gains taxes in equity prices may be a harbinger of future cross-pollination that benefits accounting and related fields. We encourage accountants to engage in joint research with tax researchers in economics and finance (e.g., Shackelford and Slemrod (1998), Goolsbee and Maydew (2000), and Harris et al. (2001) among others).

We close with a few thoughts about potentially new areas of research. Because advances in knowledge are inherently unpredictable and we do not pretend to have perfect foresight, these might be viewed as questions that we would like answered. First, strong links have been developed between financial accounting and taxes. Many studies reviewed here involve research jointly conducted by tax and financial accounting scholars. Some accounting scholars (including one co-author of this paper) are members of both camps. Surprisingly, similar bridges have not developed between tax and managerial accounting. The empirical focus of most current tax research may partially account for its affinity with empirical financial accounting. However, arguably tax, as an internal function of the organization, fits more naturally with the questions that interest managerial accounting than with the questions from financial accounting. Income shifting among commonly owned firms, such as observed in international tax, compensation, and the effects of incentive costs are a few topics closely related to managerial accounting. For example, transfer prices for taxes are derived from cost allocations. A recent example of potential links between managerial and tax is Phillips (1999) who examines the link between management compensation schemes and aggressive tax planning. One likely outcome of a managerial accounting emphasis would be enhanced interest by accountants in non-income taxes, such as sales, use, Internet, property, and compensation taxes. We look forward to more papers that span tax and managerial accounting research.

Second, a potentially understudied topic is accounting for income taxes, which neither tax research nor financial accounting research has closely evaluated. In recent years, a few papers have begun to analyze accounting for income taxes (e.g., Givoly and Hayn, 1992; Gupta, 1995; Amir et al., 1997; Ayers, 1998; Miller and Skinner, 1998; Sansing, 1998; Collins et al., 2000). However, none, to our knowledge, directly addresses the extent to which accounting for income taxes affects income tax planning. Anecdotal evidence suggests publicly traded firms manage book effective rates. Collaboration between tax and financial accounting researchers could

address how firms coordinate reducing tax payments and managing book effective tax rates.[28]

Finally, little is known about the potential cross-sectional differences in the willingness of firms to avoid taxes. Extant studies show that financial reporting costs and agency considerations constrain tax aggressiveness. Anecdotal evidence, however, suggests that firms (like individuals) vary in their tax aggressiveness. Questions that we find interesting include: What are the determinants of tax aggressiveness? Are growth firms, decentralized firms, and firms led by non-financial CEOs less tax aggressive? Why do some firms compensate on pretax measures and others use after-tax measures?

One determinant that has attracted attention is the extent to which managers or other insiders control the firm. Scholes et al. (1992) suggest that closely held firms face lower financial reporting costs. Klassen (1997), among others, conjectures that higher managerial ownership lowers market pressures to report higher income thus lowering the financial reporting costs and enhancing tax aggressiveness. The evidence, however, is mixed. Matsunaga et al. (1992) find no evidence that manager ownership influenced disqualifying dispositions of incentive stock options. Neither Gramlich (1991) nor Guenther (1994a) finds manager-owned firms more willing to shift income around TRA 86. On the other hand, Klassen (1997) finds that managerial ownership matters and concludes that high-tax manager-owned firms were more willing to save taxes than other firms were. An extension of this research is the comparison of private versus public firms in the banking and insurance industries that we discussed earlier. We find these types of analysis interesting and useful in better understanding the organizational factors that affect tax aggressiveness. We look forward to future studies that will further explain the determinants of tax planning.

References

Adiel, R., 1996. Reinsurance and the management of regulatory ratios and taxes in the property-casualty insurance industry. Journal of Accounting and Economics 22 (1–3), 207–240.

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[28] Recall that effective tax planning is not the equivalent of minimizing taxes, which is often the implied objective when the researcher studies the financial statement effective tax rate. Effective tax planning has the objective of maximizing the after-tax rate of return while tax minimization has the objective of lowering taxes. Further, by studying the effective tax rate (defined as total tax expense as a percent of pretax book income), the researcher is only capturing the extent to which the firm avails itself of permanent differences and tax credits in its tax planning activities. Accelerating deductions and delaying income recognition to the extent they give rise to temporary differences has no effect on the effective tax rate, yet these income shifting actions can increase the after-tax rate of return by saving taxes. However, if the researcher is interested in determining how aggressive the firm pursues tax minimization, then current tax expense (as a proxy for taxes paid) as a percent of pretax book income may be a reasonable measure.

Alford, A., Berger, P., 1998. The role of taxes, financial reporting, and other market imperfections in structuring divisive reorganizations. Working paper, Wharton School, University of Pennsylvania, Philadelphia, PA.

Amir, E., Kirschenheiter, M., Willard, K., 1997. The valuation of deferred taxes. Contemporary Accounting Research 14 (4), 597–622.

Auerbach, A., Hassett, K., 2000. On the marginal source of investment funds. National Bureau of Economic Research working paper 7821.

Austin, J., Gaver, J., Gaver, K., 1998. The choice of incentive stock options vs. nonqualified options: a marginal tax rate perspective. Journal of the American Taxation Association 20, 1–21.

Ayers, B., 1998. Deferred tax accounting under SFAS No. 109: an empirical investigation of its incremental value-relevance relative to APB No. 11. The Accounting Review 73 (2), 195–212.

Ayers, B., Cloyd, B., Robinson, J., 2000a. Capitalization of shareholder taxes in stock prices: evidence from the Revenue Reconciliation Act of 1993. Working paper, University of Georgia, Athens, GA.

Ayers, B., Lefanowicz, C., Robinson, J., 2000b. The effects of goodwill tax deductions on the market for corporate acquisitions. Journal of the American Taxation Association 22 (Suppl.), 34–50.

Ball, R., 1972. Changes in accounting techniques and stock prices. Journal of Accounting Research 10, Supplement 1–38.

Bagwell, L., Shoven, J., 1989. Cash distribution to shareholders. Journal of Economic Perspectives 3, 129–140.

Balsam, S., Ryan, D., 1996. Response to tax law changes involving the deductibility of executive compensation: a model explaining corporate behavior. Journal of the American Taxation Association 18 (Suppl.), 1–12.

Balsam, S., Halperin, R., Mozes, H., 1997. Tax costs and nontax benefits: the case of incentive stock options. Journal of the American Taxation Association 19, 19–37.

Bankman, J., 1998. The new market in corporate tax shelters. Working paper, Stanford University, Stanford, CA.

Bartov, E., 1993. The timing of asset sales and earnings manipulation. Accounting Review 68 (4), 840–855.

Beatty, A., Harris, D., 1999. The effects of taxes, agency costs and information asymmetry on earnings management: a comparison of public and private firms. Review of Accounting Studies 4, 299–326.

Beatty, A., Berger, P., Magliolo, J., 1995a. Motives for forming research & development financing organizations. Journal of Accounting and Economics 19 (2&3), 411–442.

Beatty, A., Chamberlain, S., Magliolo, J., 1995b. Managing financial reports of commercial banks: the influence of taxes. Journal of Accounting Research 33 (2), 231–261.

Berger, P., 1993. Explicit and implicit tax effects of the R&D tax credit. Journal of Accounting Research 31 (2), 131–171.

Black, F., 1980. The tax consequences of long-run pension policy. Financial Analysts Journal 36, 1–28.

Blouin, J., Raedy, J., Shackelford, D., 2000a. Capital gains holding periods and equity trading: evidence from the 1998 tax act. NBER working paper 7827.

Blouin, J., Raedy, J., Shackelford, D., 2000b. Capital gains taxes and price and volume responses to quarterly earnings announcements. Working paper, University of North Carolina, Chapel Hill, NC.

Blouin, J., Raedy, J., Shackelford, D., 2000c. The impact of capital gains taxes on stock price reactions to S&P 500 inclusion. NBER working paper W8011.

Bowen, R., Pfieffer, G., 1989. The year-end LIFO purchase decision: the case of Farmer Brothers Company. The Accounting Review 64, 152–171.

Boynton, C., Dobbins, P., Plesko, G., 1992. Earnings management and the corporate alternative minimum tax. Journal of Accounting Research 30 (Suppl.), 131–153.

Callihan, D., 1994. Corporate effective tax rates: a synthesis of the literature. Journal of Accounting Literature 13, 1–43.

Callihan, D., White, R., 1999. An application of the Scholes and Wolfson model to examine the relation between implicit and explicit taxes and firm market structure. Journal of the American Taxation Association 21 (1), 1–19.

Choi, W., Gramlich, J., Thomas, J., 1998. Potential errors in detection of earnings management: reexamining the studies of the AMT of 1986. Working paper, Columbia University, New York, NY.

Clinch, G., Shibano, T., 1996. Differential tax benefits and the pension reversion decision. Journal of Accounting and Economics 21 (1), 69–106.

Cloyd, B., Pratt, J., Stock, T., 1996. The use of financial accounting choice to support aggressive tax positions: public and private firms. Journal of Accounting Research 34 (1), 23–43.

Collins, J., Kemsley, D., 2000. Capital gains and dividend capitalization in firm valuation: evidence of triple taxation. Accounting Review 75, 405–427.

Collins, J., Shackelford, D., 1992. Foreign tax credit limitations and preferred stock issuances. Journal of Accounting Research 30 (Suppl.), 103–124.

Collins, J., Shackelford, D., 1995. Corporate domicile and average effective tax rates: the cases of Canada, Japan, the United Kingdom, and the United States. International Tax and Public Finance 2 (1), 55–83.

Collins, J., Shackelford, D., 1997. Global organizations and taxes: an analysis of the dividend, interest, royalty, and management fee payments between U.S. multinationals' foreign affiliates. Journal of Accounting and Economics 24 (2), 151–173.

Collins, J., Shackelford, D., 2000. Did the tax cost of corporate domicile change in the 1990s? A multinational analysis. Working paper, University of North Carolina, Chapel Hill, NC.

Collins, J., Kemsley, D., Shackelford, D., 1995a. Tax reform and foreign acquisitions: a microanalysis. National Tax Journal 48 (1), 1–21.

Collins, J., Shackelford, D., Wahlen, J., 1995b. Bank differences in the coordination of regulatory capital, earnings and taxes. Journal of Accounting Research 33 (2), 263–291.

Collins, J., Geisler, G., Shackelford, D., 1997a. The effect of taxes, regulation, earnings, and organizational form on life insurers' investment portfolio realizations. Journal of Accounting and Economics 24 (3), 337–361.

Collins, J., Kemsley, D., Shackelford, D., 1997b. Transfer pricing and the persistent zero taxable income of foreign-controlled U.S. corporations. Journal of the American Taxation Association 19 (Suppl.), 68–83.

Collins, J., Kemsley, D., Lang, M., 1998. Cross-jurisdictional income shifting and earnings valuation. Journal of Accounting Research 36 (2), 209–229.

Collins, J., Hand, J., Shackelford, D., 2000. Valuing deferral: the effect of permanently reinvested foreign earnings on stock prices. In: Hines, J. (Ed.), International Taxation and Multinational Activity. University of Chicago Press, Chicago.

Cushing, B., LeClere, M., 1992. Evidence on the determinants of inventory accounting policy choice. Accounting Review 67 (2), 355–366.

DeAngelo, H., Masulis, R., 1980. Optimal capital structure under corporate and personal taxation. Journal of Financial Economics 7, 3–29.

Dhaliwal, D., Trezevant, R., 1993. Capital gains and turn-of-the-year stock price pressures. Advances in Quantitative Analysis of Finance and Accounting 2, 139–154.

Dhaliwal, D., Wang, S., 1992. The effect of book income adjustment in the 1986 alternative minimum tax on corporate financial reporting. Journal of Accounting and Economics 15 (1), 7–26.

Dhaliwal, D., Trezevant, R., Wang, S., 1992. Taxes, investment related tax shields and capital structure. Journal of the American Taxation Association 14 (1), 1–21.

Dhaliwal, D., Frankel, M., Trezevant, R., 1994. The taxable and book income motivations for a LIFO layer liquidation. Journal of Accounting Research 32 (2), 278–289.

Dhaliwal, D., Erickson, M., Trezevant, R., 1999. A test of the theory of tax clienteles for dividend policies. National Tax Journal 52 (2), 179–194.

Dhaliwal, D., Trezevant, R., Wilkins, M., 2000. Tests of a deferred tax explanation of the negative association between the LIFO reserve and firm value. Contemporary Accounting Research 17, 41–59.

Dopuch, N., Pincus, M., 1988. Evidence on the choice of inventory accounting methods: LIFO versus FIFO. Journal of Accounting Research 26 (1), 28–59.

Dopuch, N., Ronen, J., 1973. The effects of alternative inventory accounting methods: LIFO versus FIFO. Journal of Accounting Research 11, 191–211.

Dunbar, A., 1996. The impact of personal credits on the progressivity of the individual income tax. Journal of the American Taxation Association 18 (1), 1–30.

Engel, E., Erickson, M., Maydew, E., 1999. Debt–equity hybrid securities. Journal of Accounting Research 37 (2), 249–274.

Erickson, M., 1998. The effect of taxes on the structure of corporate acquisitions. Journal of Accounting Research 36 (2), 279–298.

Erickson, M., 2000. Discussion of "The effect of taxes on acquisition price and transaction structure." Journal of the American Taxation Association 22 (Suppl.), 18–33.

Erickson, M., Maydew, E., 1998. Implicit taxes in high dividend yield stocks. Accounting Review 73 (4), 435–458.

Erickson, M., Wang, S., 1999. Exploiting and sharing tax benefits: Seagram and DuPont. Journal of the American Taxation Association 21, 35–54.

Erickson, M., Wang, S., 2000. The effect of transaction structure on price: evidence from subsidiary sales. Journal of Accounting and Economics 30, 59–97.

Fama, E., 1980. Agency problems and the theory of the firm. Journal of Public Economy 88 (2), 288–307.

Fama, E., French, K., 1999. Disappearing dividends: changing firm characteristics or lower propensity to pay. Working paper, University of Chicago, Chicago, IL.

Francis, J., Reiter, S., 1987. Determinants of corporate pension funding strategy. Journal of Accounting and Research 9 (1), 35–59.

Frankel, M., Trezevant, R., 1994. The year-end LIFO inventory purchasing decision: an empirical test. Accounting Review 69 (2), 382–398.

Gentry, W., Kemsley, D., Mayer, C., 2000. Are dividend taxes capitalized into share prices? Evidence from real estate investment trusts. Working paper, Columbia University, New York, NY.

Gergen, M., Schmitz, P., 1997. The influence of tax law on securities innovation in the United States, 1981–1997. Tax Law Review 52 (2), 119–197.

Givoly, D., Hayn, C., 1992. The valuation of the deferred tax liability: evidence from the stock market. Accounting Review 67, 394–410.

Goolsbee, A., 2000. In a world without borders: the impact of taxes on Internet commerce. Quarterly Journal of Economics 115 (2), 561–576.

Goolsbee, A., Maydew, E., 2000. Coveting thy neighbor's manufacturing: the dilemma of state income apportionment. Journal of Public Economics 75, 125–143.

Graham, J., 1996a. Debt and the marginal tax rate. Journal of Financial Economics 41, 41–74.

Graham, J., 1996b. Proxies for the marginal tax rate. Journal of Financial Economics 42, 187–221.

Graham, J., Lemmon, M., Schallheim, J., 1998. Debt, leases, taxes, and the endogeneity of corporate tax status. Journal of Finance 53 (1), 131–162.

Gramlich, J., 1991. The effect of the alternative minimum tax book income adjustment on accrual decisions. Journal of the American Taxation Association 13 (1), 36–56.

Greene, W., 1990. Econometric Analysis. MacMillan Publishing Company, New York, NY.

Guenther, D., 1992. Taxes and organizational form: a comparison of corporations and master limited partnerships. Accounting Review 67 (1), 17–45.

Guenther, D., 1994a. Earnings management in response to corporate tax rate changes: evidence from the 1986 Tax Reform Act. Accounting Review 69 (1), 230–243.

Guenther, D., 1994b. The relation between tax rates and pretax returns: direct evidence from the 1981 and 1986 tax rate reductions. Journal of Accounting and Economics 18 (3), 379–393.

Guenther, D., 2000. Investor reaction to anticipated 1997 capital gains tax rate reduction. Working paper, University of Colorado, Boulder, CO.

Guenther, D., Sansing, R., 2000. Valuation of the firm in the presence of temporary book–tax differences: the role of deferred tax assets and liabilities. Accounting Review 75 (1), 1–12.

Guenther, .D., Trombley, M., 1994. The "LIFO Reserve" and the value of the firm: theory and evidence. Contemporary Accounting Research 10, 433–452.

Guenther, D., Willenborg, M., 1999. Capital gains tax rates and the cost of capital for small business: evidence from the IPO market. Journal of Financial Economics 53, 385–408.

Guenther, D., Maydew, E., Nutter, S., 1997. Financial reporting, tax costs, and book–tax conformity. Journal of Accounting and Economics 23 (3), 225–248.

Gupta, S., 1995. Determinants of the choice between partial and comprehensive income tax allocation: the case of the domestic international sales corporation. Accounting Review 70 (3), 489–511.

Gupta, S., Mills, L., 1999. Multistate tax planning: benefits of multiple jurisdictions and tax planning assistance. Working paper, University of Arizona, Tempe, AZ.

Gupta, S., Newberry, K., 1997. Determinants of the variability in corporate effective tax rates: evidence from longitudinal data. Journal of Accounting and Public Policy 16 (1), 1–34.

Halperin, R., Srinidhi, B., 1987. The effects of the U.S. income tax regulations' transfer pricing rules on allocative efficiency. Accounting Review 62, 686–706.

Halperin, R., Srinidhi, B., 1996. U.S. income tax transfer pricing rules for intangibles as approximations of arm's length pricing. Accounting Review 71, 61–80.

Hand, J., 1993. Resolving LIFO uncertainty: a theoretical and empirical reexamination of 1974–75 LIFO adoptions and nonadoptions. Journal of Accounting Research 31 (1), 21–49.

Harris, D., 1993. The impact of U.S. Tax law revisions on multi-national corporations' capital location and income-shifting decisions. Journal of Accounting Research 31 (Suppl.), 111–140.

Harris, D., Livingstone, J., 1999. Federal tax legislation as an implicit contracting cost benchmark: the definition of excessive executive compensation. Working paper, Syracuse University, Syracuse, NY.

Harris, D., Sansing, R., 1998. Distortions caused by the use of arm's length transfer prices. Journal of the American Taxation Association 20 (Suppl.), 40–50.

Harris, L., Gurel, E., 1986. Price and volume effects associated with changes in the S&P 500 list: new evidence for the existence of price pressures. Journal of Finance 41, 815–829.

Harris, T., Kemsley, D., 1999. Dividend taxation in firm valuation: new evidence. Journal of Accounting Research 37 (2), 275–291.

Harris, T., Hubbard, R., Kemsley, D., 2001. The share price effects of dividend taxes and tax imputation credits. Journal of Public Economics 79, 569–596.

Hayn, C., 1989. Tax attributes as determinants of shareholder gains in corporate acquisitions. Journal of Financial Economics 23, 121–153.

Henning, S., Shaw, W., 2000. The effect of the tax deductibility of goodwill on purchase price allocations. Journal of the American Taxation Association 22 (1), 18–37.

Henning, S., Shaw, W., Stock, T., 2000. The effect of taxes on acquisition prices and transaction structure. Journal of the American Taxation Association 22 (Suppl.), 1–17.

Himmelberg, C., Hubbard, G., Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of Financial Economics 53, 353–384.

Hines, J., 1997. Tax policy and the activities of multinational corporations. In: Auerbach, A. (Ed.), Fiscal Policy: Lessons from Economic Research. MIT Press, Cambridge, MA, pp. 401–445.

Hite, G., Long, M., 1982. Taxes and executive stock options. Journal of Accounting and Economics 4, 3–14.

Hunt, A., Moyer, S., Shevlin, T., 1996. Managing interacting accounting measures to meet multiple objectives: a study of LIFO firms. Journal of Accounting and Economics 21 (3), 339–374.

Iyer, G., Seetharaman, A., 2000. An evaluation of alternative procedures for measuring horizontal equity. Journal of the American Taxation Association 22 (1), 89–110.

Jacob, J., 1996. Taxes and transfer pricing: income shifting and the volume of intrafirm transfers. Journal of Accounting Research 34 (2), 301–312.

Jenkins, N., Pincus, M., 1998. LIFO versus FIFO: updating what we have learned. Working paper, University of Iowa, Iowa City, IA.

Jennings, R., Simko, P., Thompson, R., 1996. Does LIFO inventory accounting improve the income statement at the expense of the balance sheet? Journal of Accounting Research 34, 573–608.

Johnson, M., Nabar, S., Porter, S., 1999. Determinants of corporate response to Section 162(m). Working paper, University of Michigan, Ann Arbor, MI.

Johnson, W., Dhaliwal, D., 1988. LIFO abandonment. Journal of Accounting Research 26 (2), 236–272.

Kang, S., 1993. A conceptual framework for the stock price effects of LIFO tax benefits. Journal of Accounting Research 31 (1), 50–61.

Ke, B., 2000. Using deductible compensation to shift income between corporate and shareholder tax bases: evidence from privately-held property-liability insurance companies. Working paper, Pennsylvania State University, University Park, PA.

Ke, B., Petroni, K., Shackelford, D., 2000. The impact of state taxes on self-insurance. Journal of Accounting and Economics 30 (1), 99–122.

Keating, S., Zimmerman, J., 1999. Depreciation policy changes: tax, earnings management, and investment opportunity incentives. Journal of Accounting and Economics 28, 359–389.

Keating, S., Zimmerman, J., 2000. Asset lives for financial reporting purposes: capital budgeting, tax and discretionary factors. Working paper, University of Rochester, Rochester, NY.

Kemsley, D., 1998. The effect of taxes on production location. Journal of Accounting Research 36 (2), 921–941.

Kern, B., Morris, M., 1992. Taxes and firm size: the effect of tax legislation during the 1980s. Journal of the American Taxation Association 14 (1), 80–96.

Kinney, M., Swanson, E., 1993. The accuracy and adequacy of tax data in Compustat. Journal of the American Taxation Association 15 (2), 121–135.

Klassen, K., 1997. The impact of inside ownership concentration on the tradeoff between financial and tax reporting. Accounting Review 72 (3), 455–474.

Klassen, K., Shackelford, D., 1998. State and provincial corporate tax planning: income shifting and sales apportionment factor management. Journal of Accounting and Economics 25 (3), 385–406.

Klassen, K., Lang, M., Wolfson, M., 1993. Geographic income shifting by multinational corporations in response to tax rate changes. Journal of Accounting Research 31 (Suppl.), 141–173.

Landsman, W., Shackelford, D., 1995. The lock-in effect of capital gains taxes: evidence from the RJR Nabisco leveraged buyout. National Tax Journal 48, 245–259.

Landsman, W., Shackelford, D., Yetman, R., 2001. The determinants of capital gains tax compliance: evidence from the RJR Nabisco leveraged buyout. Journal of Public Economics, forthcoming.

Lanen, W., Thompson, R., 1988. Stock price reactions as surrogates for the net cash flow effects of corporate policy decisions. Journal of Accounting and Economics 10, 311–334.

Lang, M., Shackelford, D., 2000. Capitalization of capital gains taxes: evidence from stock price reactions to the 1997 rate reductions. Journal of Public Economics 76, 69–85.

Lang, M., Maydew, E., Shackelford, D., 2001. Bringing down the other Berlin wall: Germany's repeal of the corporate capital gains tax. Working paper, University of North Carolina, Chapel Hill, NC.

Lightner, T., 1999. The effect of the formulatory apportionment system on state-level economic development and multijurisdictional tax planning. Journal of the American Taxation Association 21 (Suppl.), 42–57.

Lopez, T., Regier, P., Lee, T., 1998. Identifying tax-induced earnings management around TRA 86 as a function of prior tax-aggressive behavior. Journal of the American Taxation Association 20 (2), 37–56.

Lynch, A., Mendenhall, R., 1997. New evidence on stock price effects associated with changes in the S&P 500 index. Journal of Business 70, 351–383.

Mackie-Mason, J., 1990. Do taxes affect corporate financing decisions. Journal of Finance 45, 1471–1493.

Maddala, G.S., 1991. A perspective on the use of limited-dependent variables models in accounting research. Accounting Review 66 (4), 788–807.

Madeo, S., Omer, T., 1994. The effect of taxes on switching stock option plans: evidence from the Tax Reform Act of 1969. Journal of the American Taxation Association 16, 24–42.

Manzon, G., 1992. Earnings management of firms subject to the alternative minimum tax. Journal of the American Taxation Association 14 (2), 88–111.

Manzon, G., 1994. The role of taxes in early debt retirement. Journal of the American Taxation Association 16 (1), 87–100.

Matsunaga, S., Shevlin, T., Shores, D., 1992. Disqualifying dispositions of incentive stock options: tax benefits versus financial reporting costs. Journal of Accounting Research 30 (Suppl.), 37–76.

Maydew, E., 1997. Tax-induced earnings management by firms with net operating losses. Journal of Accounting Research 35 (1), 83–96.

Maydew, E., Schipper, K., Vincent, L., 1999. The impact of taxes on the choice of divestiture method. Journal of Accounting and Economics 28, 117–150.

Mazur, M., Scholes, M., Wolfson, M., 1986. Implicit taxes and effective tax burdens. Working paper, Stanford University, Stanford, CA.

Mikhail, M., 1999. Coordination of earnings, regulatory capital and taxes in private and public companies. Working paper, MIT, Cambridge, MA.

Miller, G., Skinner, D., 1998. Determinants of the valuation allowance for deferred tax assets under SFAS No. 109. Accounting Review 73 (2), 213–233.

Miller, M., 1977. Debt and taxes. Journal of Finance 32, 261–276.

Miller, M., Scholes, M., 1978. Dividends and taxes. Journal of Financial Economics 6, 333–364.

Mills, L., 1998. Book–tax differences and Internal Revenue Service adjustments. Journal of Accounting Research 36 (2), 343–356.

Mills, L., Newberry, K., 2000. Cross-jurisdictional income shifting by foreign-controlled U.S. corporations. Working paper, University of Arizona, Tucson, AZ.

Mills, L., Newberry, K., Novack, G., 2000. Reducing classification errors in Compustat net operating loss data: insights from U.S. tax return data. Working paper, University of Arizona, Tucson, AZ.

Mittelstaedt, F., 1989. An empirical analysis of factors underlying the decision to remove excess assets from overfunded pension plans. Journal of Accounting and Economics 11 (4), 369–418.

Modigliani, F., Miller, M., 1958. The cost of capital, corporation finance, and the theory of investment. American Economic Review 53, 261–297.

Modigliani, F., Miller, M., 1963. Corporate income taxes and the cost of capital: a correction. American Economic Review 53, 433–443.

Myers, M., 2000. The impact of taxes on corporate defined benefit plan asset allocation. Working paper, University of Chicago, Chicago, IL.

Myers, S., 1977. Determinants of corporate borrowing. Journal of Financial Economics 3, 147–175.

Myers, S., 1984. The capital structure puzzle. Journal of Finance 39 (3), 575–592.

Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13, 187–221.

Newberry, K., 1998. Foreign tax credit limitations and capital structure decisions. Journal of Accounting Research 36 (1), 157–166.

Newberry, K., Dhaliwal, D., 2000. Cross-jurisdictional income shifting by U.S. multinationals: evidence from international bond offerings. Working paper, University of Arizona, Tucson, AZ.

Ohlson, J., 1995. Earnings, book values and dividends in security valuation. Contemporary Accounting Research 11, 661–687.

Olhoft, S., 1999. The tax avoidance activities of U.S. multinational corporations. Working paper, University of Iowa, Iowa City, IA.

Omer, T., Molloy, K., Ziebart, D., 1991. Using financial statement information in the measurement of effective corporate tax rates. Journal of the American Taxation Association 13 (1), 57–72.

Omer, T., Plesko, G., Shelley, M., 2000. The influence of tax costs on organizational choice in the natural resource industry. Journal of the American Taxation Association 22, 38–55.

Palepu, K., Bernard, V., Healy, P., 1996. Business analysis and valuation. Southwestern Publishing, Cincinnati, OH.

Petroni, K., Shackelford, D., 1995. Taxation, regulation, and the organizational structure of property-casualty insurers. Journal of Accounting and Economics 20 (3), 229–253.

Petroni, K., Shackelford, D., 1999. Managing annual accounting reports to avoid state taxes: an analysis of property-casualty insurers. Accounting Review 74 (3), 371–393.

Phillips, J., 1999. Corporate tax planning effectiveness: the role of incentives. Working paper, University of Connecticut, Storrs, CT.

Plesko, G., 1999. An evaluation of alternative measures of corporate tax rates. Working paper, MIT, Boston, MA.

Porcano, T., 1986. Corporate tax rates: progressive, proportional, or regressive. Journal of the American Taxation Association 8 (1), 17–31.

Poterba, J., Weisbrenner S., 2001. Capital gains tax rules, tax loss trading, and turn-of-the-year returns. Journal of Finance 56, 353–368.

Reese, W., 1998. Capital gains taxation and stock market activity: evidence from IPOs. Journal of Finance 53, 1799–1820.

Ricks, W., 1986. Firm size effects and the association between excess returns and LIFO tax savings. Journal of Accounting Research 24 (1), 206–216.

Sansing, R., 1998. Valuing the deferred tax liability. Journal of Accounting Research 36 (2), 1998.

Sansing, R., 1999. Relationship-specific investments and the transfer pricing paradox. Review of Accounting Studies 4, 119–134.

Sansing, R., 2000. Joint ventures between non-profit and for-profit organizations. Journal of the American Taxation Association 22 (Suppl.), 76–88.

Scholes, M., Wolfson, M., 1987. Taxes and organization theory. Working paper, Stanford University, Stanford, CA.

Scholes, M., Wolfson, M., 1992. Taxes and Business Strategy: a Planning Approach. Prentice-Hall, Inc., Engelwood Cliffs, NJ.

Scholes, M., Wilson, P., Wolfson, M., 1990. Tax planning, regulatory capital planning, and financial reporting strategy for commercial banks. Review of Financial Studies 3, 625–650.

Scholes, M., Wilson, P., Wolfson, M., 1992. Firms' responses to anticipated reductions in tax rates: the Tax Reform Act of 1986. Journal of Accounting Research 30 (Suppl.), 161–191.

Scholes, M., Wolfson, M., Erickson, M., Maydew, E., Shevlin, T., 2001. Taxes and Business Strategy: a Planning Approach, 2nd Edition. Prentice-Hall, Inc., Upper Saddle River, NJ.

Schipper, K., Smith, A., 1991. Effects of management buyouts on corporate interest and depreciation tax deductions. Journal of Law and Economics 34, 295–341.

Scott, J., 1977. Bankruptcy, secured debt, and optimal capital structure. Journal of Finance 32, 1–19.

Seetharaman, A., Iyer, G., 1995. A comparison of alternative measures of tax progressivity: the case of the child and dependent care credit. Journal of the American Taxation Association 17 (1), 42–70.

Seida, J., Wempe, W., 2000. Do capital gain tax rate increases affect individual investors' trading decisions? Journal of Accounting and Economics 30, 33–57.

Shackelford, D., 1991. The market for tax benefits: evidence from leveraged ESOPs. Journal of Accounting and Economics 14 (2), 117–145.

Shackelford, D., 1993. Discussion of 'The impact of US tax law revision on multinational corporations' capital location and income shifting decisions' and 'Geographic income shifting by multinational corporations in response to tax rate changes.'. Journal of Accounting Research 31 (Suppl.), 174–182.

Shackelford, D., 2000. Stock market reaction to capital gains tax changes: empirical evidence from the 1997 and 1998 tax acts. In: Poterba, J. (Ed.), Tax Policy and the Economy, Vol. 14. National Bureau of Economic Research, MIT Press, Cambridge, MA, pp. 67–92.

Shackelford, D., Slemrod, J., 1998. The revenue consequences of using formula apportionment to calculate U.S. and foreign-source income: a firm-level analysis. International Tax and Public Finance 5 (1), 41–59.

Shackelford, D., Verrecchia, R., 1999. Intertemporal tax discontinuities. NBER working paper 7451, Cambridge, MA.

Shelley, M., Omer, T., Atwood, T., 1998. Capital restructuring and accounting compliance costs: the case of publicly traded partnerships. Journal of Accounting Research 36 (2), 365–378.

Shevlin, T., 1987. Taxes and off-balance-sheet financing: research and development limited partnerships. Accounting Review 52 (3), 480–509.

Shevlin, T., 1990. Estimating corporate marginal tax rates with asymmetric tax treatment of gains and losses. Journal of the American Taxation Association 11 (1), 51–67.

Shevlin, T., 1999. A critique of Plesko's "An evaluation of alternative measures of corporate tax rates." Working paper, University of Washington, Seattle, WA.

Shevlin, T., Porter, S., 1992. The corporate tax comeback in 1987: some further evidence. Journal of the American Taxation Association 14 (1), 58–79.

Shleifer, A., 1986. Do demand curves for stocks slope down? Journal of Finance 61, 579–590.

Single, L., 1999. Tax holidays and firms' subsidiary location decisions. Journal of the American Taxation Association 21 (2), 21–34.

Smith, J., 1997. The effect of the Tax Reform Act of 1986 on the capital structure of foreign subsidiaries. Journal of the American Taxation Association 19 (2), 1–18.

Stickney, C., Weil, R., Wolfson, M., 1983. Income taxes and tax-transfer leases: General Electric's accounting for a Molotov cocktail. Accounting Review 58, 439–459.

Sunder, S., 1973. Relationship between accounting changes and stock prices: problems of measurement and some empirical evidence. Journal of Accounting Research 11 (Suppl.), 1–45.

Sunder, S., 1975. Stock price and risk related to accounting changes in inventory valuation. Accounting Review 305–316.

Sweeney, A., 1994. Debt-covenant violations and managers' accounting responses. Journal of Accounting and Economics 17 (3), 281–308.

Tepper, I., 1981. Taxation and corporate pension policy. Journal of Finance 36, 1–14.

Thomas, J., 1988. Corporate taxes and defined benefit pension plans. Journal of Accounting and Economics 10 (3), 199–237.

Thomas, J., 1989. Why do firms terminate their overfunded pension plans? Journal of Accounting and Economics 11 (4), 361–398.

Trezevant, R., 1992. Debt financing and tax status: tests of the substitution effect and the tax exhaustion hypothesis using firms' responses to the Economic Recovery Tax Act of 1981. Journal of Finance 47, 1557–1568.

Wang, S., 1991. The relation between firm size and effective tax rates: a test of firm's political success. Accounting Review 66 (1), 158–169.

Wang, S., 1994. The relationship between financial reporting practices and the 1986 alternative minimum tax. Accounting Review 69 (3), 495–506.

Weaver, C., 2000. Divestiture structure and tax attributes: evidence from the Omnibus Budget Reconciliation Act of 1993. Journal of the American Taxation Association 22 (Suppl.), 54–71.

Wilkie, P., Limberg, S., 1990. The relationship between firm size and effective tax rate: a reconciliation of Zimmerman (1983) and Porcano (1986). Journal of the American Taxation Association 11 (1), 76–91.

Wilkie, P., Limberg, S., 1993. Measuring explicit tax (dis)advantage for corporate taxpayers: an alternative to average effective tax rates. Journal of the American Taxation Association 15 (1), 46–71.

Wilson, P., 1993. The role of taxes in location and sourcing decisions. In: Giovannini, A., Hubbard, G., Slemrod, J. (Eds.), Studies in International Taxation. University of Chicago Press, Chicago, pp. 195–231.

Wolfson, M., 1985. Empirical evidence of incentive problems and their mitigation in oil and gas tax shelter programs. In: Pratt, J., Zeckhauser, R. (Eds.), Principals and Agents: the Structure of Business. HBS Press, Boston, pp. 101–125.

Yetman, R., 2000. Tax planning by not-for-profit organizations. Working paper, University of Iowa, Iowa City, IA.

Zimmerman, J., 1983. Taxes and firm size. Journal of Accounting and Economics 5, 119–149.