

Positive Accounting Theory: A Ten Year Perspective

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ABSTRACT: This paper reviews and critiques the positive accounting literature following publication of Watts and Zimmerman (1978, 1979). The 1978 paper helped generate the positive accounting literature which offers an explanation of accounting practice, suggests the importance of contracting costs, and has led to the discovery of some previously unknown empirical regularities. The 1979 paper produced a methodological debate that has not been very productive. This paper attempts to remove some common misconceptions about methodology that surfaced in the debate. It also suggests ways to improve positive research in accounting choice. The most important of these improvements is tighter links between the theory and the empirical tests. A second suggested improvement is the development of models that recognize the endogeneity among the variables in the regressions. A third improvement is reduction in measurement errors in both the dependent and independent variables in the regressions.

IT is more than a decade since our two papers, "Towards a Positive Theory of the Determination of Accounting Standards" and "The Demand for and Supply of Accounting Theories: The Market for Excuses" were published in *The Accounting Review*. The intervening time allows us to look back on these papers and the ensuing literature with some perspective.

The two papers were controversial ten years ago and remain so today. The papers (primarily Watts and Zimmerman 1978) contributed to a literature that has uncovered empirical regularities in accounting practice (Christie forthcoming; Holthausen and Leftwich 1983; Leftwich forthcoming; Watts and Zimmerman 1986). The empirical regularities have been replicated in different settings

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(Christie forthcoming) and it is clear there is a relation between firms' accounting choice and other firm variables, such as leverage and size and the signs of the relations are mostly consistent across studies. Positive accounting research guided the search for the empirical regularities and provided explanations for them. To date, there are no *systematic* alternative sets of *explanations* for those regularities articulated and tested in the literature. Further, the literature has moved beyond the first simple exposition of the theory in the 1978 paper. The explanation for accounting choice is now richer and more sophisticated.

Our first objective in this paper is to convey our perspective on the evolution and current state of positive accounting theory and to summarize the evidence on systematic empirical regularities in accounting (Section I). The second objective is to evaluate the research methods and the methodology used to document the empirical regularities. We discuss criticisms of the original papers and of the subsequent positive accounting literature in Section II. While the positive accounting literature has explained some accounting practice, much remains unexplained. Our third objective is to provide our views about future directions for positive accounting literature (Section III).

I. Evolution and State of Positive Accounting Theory

Evolution

Modern positive accounting research began flourishing in the 1960s when Ball and Brown (1968), Beaver (1968), and others introduced empirical finance methods to financial accounting. The subsequent literature adopted the assumption that accounting numbers supply information for security market investment decisions and used this "information perspective" to investigate the relation between accounting numbers and stock prices.¹ The "information perspective" has taught us much about the market's use of accounting numbers. But, except for the choice of inventory methods, the "information perspective" has not provided hypotheses to predict and explain accounting choices. The "information perspective" has not provided hypotheses to explain why entire industries switch from accelerated to straight-line depreciation without changing their tax depreciation methods.

An important reason that the information perspective failed to generate hypotheses explaining and predicting accounting choice is that in the finance theory underlying the empirical studies, accounting choice *per se* could not affect firm value. Information is costless and there are no transaction costs in the Modigliani and Miller (1958) and capital asset pricing model frameworks. Hence,

¹ The "information perspective" views accounting data (usually earnings, dividends, and cash flows) as providing information on inputs to valuation models (e.g., discounted cash flows) and tests for associations between accounting disclosures and stock prices or returns. In the contracting approach adopted in the literature and discussed in this paper, accounting methods are primarily determined by the use of accounting numbers in contracts between parties to the firm. Under this approach accounting disclosures directly affect parties' (including stockholders') contractual claims and, hence, the values of those claims (including stock prices). To the extent accounting disclosures are correlated with attributes investors use in valuing securities, these disclosures contain information and affect stock prices. Thus, under both an "information perspective" and a "contracting perspective," accounting disclosures have the potential to alter securities prices (Holthausen forthcoming).

if accounting methods do not affect taxes they do not affect firm value. In that

market prices; within the firm alternative mechanisms such as standard costs are used (Ball 1989). Which productive activities are carried out by markets and which by firms depends on which arrangement is cost effective.³ In competition among firms, those that organize themselves to minimize contracting costs are more likely to survive (Fama and Jensen 1983a, 1983b). It was a short step to suggest that accounting methods affect the firm's organizational costs and so the accounting methods that survive are the result of a similar economic equilibrium (Watts 1974, 1977).⁴ Accounting researchers have recently returned to using that notion of an efficient set of accounting methods to explain accounting choice (Zimmer 1986).

As noted above, the agency costs associated with debt and management compensation contracts and the agency, information, and other contracting costs associated with the political process provided the hypotheses tested in the early empirical accounting choice studies (bonus plan, debt/equity, and political cost hypotheses). However, the more general approach suggested agency and other costs associated with other contracts (e.g., sales contracts) could also affect accounting choice.⁵ This potential for many contracts to play a role in explaining organizational choice (including accounting choice) and the fact that agency costs used to explain the contracts often arise in contractual scenarios that differ from those of the standard agency problem led researchers to start to use the term "contracting costs" instead of agency costs (Klein 1983; Smith 1980). The concept of contracting costs and the notion of accounting methods as part of efficient organizational technology play key roles in contemporaneous positive accounting theory.

Contemporaneous Positive Accounting Theory

Contracting costs arise in (1) market transactions (e.g., selling new debt or equity requires legal fees and underwriting costs), (2) transactions internal to the firm (e.g., a cost-based transfer price scheme is costly to maintain and can produce dysfunctional decisions), and (3) transactions in the political process (e.g., securing government contracts or avoiding government regulation requires lobbying costs). Contracting costs consist of transaction costs (e.g., brokerage

³ Coase (1937) suggests that economies of scale in long-term contracting are what cause activity to be organized in firms. Alchian and Demsetz (1972) point out that those economies are not sufficient since market arrangements could achieve the same economies (e.g., contracting consultants). What is necessary is some unique advantage of firm organization over market arrangements. Alchian and Demsetz suggest it is the advantage firms have in metering inputs to team production that generates firms. Monitors meter individual inputs and the monitors' incentive problem is solved by giving them the residual claim to the firm (hence, the firm structure). Klein et al. (1978) suggest firms emerge to solve post contractual opportunism associated with specialized assets. Meckling and Jensen (1986) suggest that firms have an advantage in generating information by aggregating data and using that information. Difficulties in capturing the information's benefits in the market result in the firm being the optimal form of organization.

⁴ Watts adopted such a view in "Accounting Objectives" which he presented to the Annual Congress of the N.S.W. branch of the Institute of Chartered Accountants in Australia in 1974. The paper was later substantially revised given Jensen and Meckling (1976) and joint work with Zimmerman and published in Watts (1977).

⁵ The influence of sales contracts on accounting choice is considered by Watts and Zimmerman (1986, 207) and by Zimmer (1986) and joint venture contracts by Zimmer (1986). Further, Ball (1989) suggests intrafirm transactions affect internal accounting choice (e.g., the basis for transfer prices).

fees), agency costs (e.g., monitoring costs, bonding costs, and the residual loss from dysfunctional decisions), information costs (e.g., the costs of becoming informed), renegotiation costs (e.g., the costs of rewriting existing contracts because the extant contract is made obsolete by some unforeseen event), and bankruptcy costs (e.g., the legal costs of bankruptcy and the costs of dysfunctional decisions). Throughout this paper, we use the term “contracting costs” to incorporate this wide variety of costs. The term “contracting parties” is meant to include all parties to the firm including “internal” employees and managers and “external” parties, such as suppliers, claim holders, and customers.⁶

The existence of contracting costs is crucial to models of both the organization of the firm and accounting choice. Meckling and Jensen (1986) suggest that within the firm the lack of a market price is replaced by systems for allocating decisions among managers, and measuring, rewarding, and punishing managerial performance. Accounting plays a role in these systems and so appears to be part of the firm’s efficient contracting technology. Trying to predict and explain the organization of the firm with zero contracting costs is pointless (Coase 1937; Ball 1989). How the firm is organized, its financial policy, and its accounting methods, are as much a part of the technology used to produce the firm’s product as are its production methods. Hence, modelling accounting choice while assuming zero contracting costs is not productive.

The extent to which accounting choice affects the contracting parties’ wealth depends on the relative magnitudes of the contracting costs. For example, *assume* accounting-based debt agreements have higher renegotiation costs than accounting-based bonus plans. Then, mandatory changes in accounting procedures by the FASB impose greater relative costs on firms with debt agreements than on firms with bonus plans, *ceteris paribus*. And, firms with debt agreements will conduct more lobbying and undertake more (costly) accounting, financing, and production changes to undo the effects of the mandatory change than firms with only bonus plans. Thus, developing a positive theory of accounting choice requires an understanding of the relative magnitudes of the various types of contracting costs.

Contracts that use accounting numbers are not effective in aligning managers’ and contracting parties’ interests if managers have complete discretion over the reported accounting numbers. If managers know (or can determine) which accounting methods best motivate subordinates, then the contracting parties want managers to have some discretion over the accounting numbers. Hence, we expect some restrictions on managers’ discretion over accounting numbers, but some discretion will remain. When managers exercise this discretion it can be because (1) the exercised discretion increases the wealth of all contracting parties, or (2) the exercised discretion makes the manager better off at the expense of some other contracting party or parties. If managers elect to exercise discretion to their advantage *ex post*, and the discretion has wealth redistributive effects among the contracting parties, then we say the managers acted “opportunistically.”

⁶ See Watts (1974) for an earlier and Ball (1989) for a later discussion of contracting parties other than capital suppliers and managers.

Ex ante, the set of accounting choices restricted by the contracting parties is determined by "efficiency" reasons (to maximize firm value). One cost of allowing managers more rather than less discretion is the increased likelihood of some *ex post* managerial "opportunism" (i.e., wealth transfers to managers) via accounting procedures. However, *ex ante* the contracting parties expect some redistributive effects and reduce the price they pay for their claims. *Ex post*, wealth is redistributed by managerial opportunism, but *ex ante* some redistribution was expected and the parties price protected themselves. Price protection does not eliminate the incentive to act opportunistically nor does price protection eliminate the dead weight costs of managers taking opportunistic actions. The extent to which contracts can be written *ex ante* to preclude such *ex post* behavior that causes dead weight costs increases the chance the firm will survive in a competitive environment (Klein 1983, fn. 2).

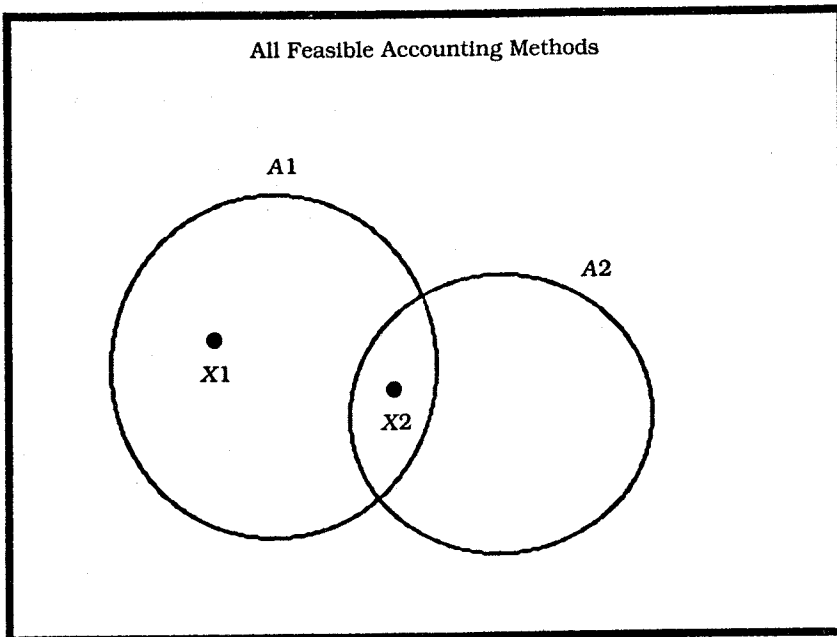
The set of accounting procedures within which managers have discretion is called the "accepted set." It is voluntarily determined by the contracting parties. Managerial discretion over accounting method choice (i.e., the "accepted set") is predicted to vary across firms with the variation in the costs and benefits of restrictions. These restrictions produce the "best" or "accepted" accounting principles even without mandated accounting standards by government. The restrictions are enforced by external auditors. Reacting to the incentive of managers to exercise accounting discretion opportunistically, the accepted set includes "conservative" (e.g., lower of cost or market) and "objective" (e.g., verifiable) accounting procedures (Watts and Zimmerman 1986, 205-206).

Figure 1 represents the concept of the "accepted set" of accounting methods as a Venn diagram. A1 denotes the accepted set of methods for firm 1. *Ex ante*, the accepted set is determined jointly by the contracting parties to maximize the value of the firm (e.g., set A1 vs. A2 in Fig. 1). Managers have discretion to choose any method within the accepted set (e.g., X1). Also, managers in firm 2 are constrained *ex ante* to the set A2 and choose X2 *ex post*. For example, within the accepted set of procedures used for bonus plans managers might select the method that maximizes their utility, even if it comes at another contracting party's expense. Managers' *ex post* choice can either increase the wealth of all contracting parties or redistribute wealth among the parties. Empirically, it is difficult to separate *ex ante* from *ex post*. Contracts are continually being written, rewritten, and revised.

Variations across sets of accepted accounting procedures (e.g., A1 and A2 in Fig. 1) explain some cross-sectional variation in accounting choice (e.g., managers in firm 2 cannot choose method X1). For example, Zimmer (1986) argues Australian real estate development firms are restricted by accepted practice from capitalizing interest except for cost plus contracts that allow interest as a cost. His evidence is consistent with that hypothesis.

Most accounting choice studies assume managers choose accounting methods to transfer wealth to themselves at the expense of another party to the firm because they can take the firm's observed contracts as given and then determine managers' incentives for accounting choice. Some research studies assume accounting methods are chosen for efficiency reasons (i.e., they increase the pie available being shared among all parties to the firm (Watts 1974, 1977; Leftwich

Figure 1
Relation Between the Accepted Set of Accounting Methods
and the Choice of Method from within the Accepted Set



A1 denotes the set of accepted methods for firm 1
 A2 denotes the set of accepted methods for firm 2
 X1 denotes the choice of method from within the accepted set by firm 1
 X2 denotes the choice of method from within the accepted set by firm 2

et al. 1981; Zimmer 1986; Whittred 1987; Ball 1989; Malmquist forthcoming; Mian and Smith forthcoming). However, no study to date has explained both the *ex ante* choice of the accepted set and the *ex post* choice of accounting method from within the accepted set. Most studies that assume opportunistic choice of accounting methods do not control for the fact that managers in different firms likely are choosing accounting methods from different constrained accepted sets.

The accepted set of accounting methods is one part of the firm's implicit and explicit contracts including the firm's capital structure, compensation plans, and ownership structure. All the contracting provisions (including the accounting policies) are endogenous. Capital structure choice is related to compensation policy and to accounting policy. But, the relation is not necessarily causal. Capital structure changes do not *cause* changes in the accepted set of accounting methods. Rather, some exogenous event, such as a new invention or government deregulation occurs and this causes changes in the contracting variables including accounting methods (Ball 1972; Smith and Watts 1986).

Evidence on the Theory

Two types of tests of the theory have been conducted: stock price tests and accounting choice tests. The stock price tests have been reviewed extensively elsewhere (Foster 1980; Ricks 1982; Holthausen and Leftwich 1983; Lev and Ohlson 1982; Watts and Zimmerman 1986; Bernard 1989). Stock price tests of the theory reveal some price reactions to mandatory accounting changes, especially involving oil and gas accounting (Lys 1984).⁷ Stock price studies are probably relatively weak tests of the theory (Watts and Zimmerman 1986). The more promising ones are accounting choice studies.

Most accounting choice studies attempt to explain the choice of a single accounting method (e.g., the choice of depreciation) instead of the choice of combinations of accounting methods. Focusing on a single accounting method reduces the power of the tests since managers are concerned with how the combination of methods affects earnings instead of the effect on just one particular accounting method (Zmijewski and Hagerman 1981). Some studies seek to explain accounting accruals (the difference between operating cash flows and earnings). Accounting accruals aggregate into a single measure the net effect of all accounting choices (Healy 1985; DeAngelo 1986, 1988a; Liberty and Zimmerman 1986). But use of accruals as a summary measure of accounting choice suffers from a lack of control of what accruals would be without managerial accounting discretion.

Most accounting choice studies use combinations of three sets of variables: variables representing the manager's incentives to choose accounting methods under bonus plans, debt contracts, and the political process. Bonus plan and debt contract variables are used because they're observable. The three particular hypotheses most frequently tested are the bonus plan hypothesis, the debt/equity hypothesis, and the political cost hypothesis. The literature has tended to state each of these hypotheses as managers behaving opportunistically. The bonus plan hypothesis is that managers of firms with bonus plans are more likely to use accounting methods that increase current period reported income. Such selection will presumably increase the present value of bonuses if the compensation committee of the board of directors does not adjust for the method chosen.

The choice studies to date find results generally consistent with the bonus plan hypothesis (Watts and Zimmerman 1986, chap. 11; Christie forthcoming).

⁷ Using Lys' own calculations, Frost and Bernard (1989, 20) and Bernard (1989, 14) conclude Lys' evidence is inconsistent with a link between stock price reactions to mandated oil and gas accounting and the violation of debt covenants. However, that conclusion is unwarranted. Lys estimates the average cost of violations as 2.5 percent of the stock value, the same order of magnitude as the stock price reactions observed. Frost and Bernard argue that given an average cost of violation of 2.5 percent, the average stock price reaction should be much less since according to Foster (1980) very few firms have a debt covenant violation as a result of the mandated accounting change. There are at least three problems with the Frost and Bernard argument. First, the Lys point estimates are likely to have large standard errors. Second, to obtain an estimate of the stock price reaction, the estimated cost of a violation has to be weighted not by the relative frequency of violation but by the change in the likelihood of violation. While few firms violated covenants, many firms' probability of violation likely increased substantially. Third, Malmquist (forthcoming) suggests Foster's description of oil and gas firms' covenants is incorrect. Frost and Bernard (1989) also use their own empirical study's results to argue that there is no link between the stock price reaction and debt covenants. Because of selection biases, however, their study provides little evidence on the issue (Begley forthcoming).

The early tests of the bonus hypothesis are not very powerful tests of the theory because they rely on simplifications of the theory that are not appropriate in many cases. For example, a bonus plan does not always give managers incentives to increase earnings. If, in the absence of accounting changes, earnings are below the minimum level required for payment of a bonus, managers have incentive to reduce earnings this year because no bonuses are likely paid. Taking such an “earnings bath” increases expected profits and bonuses in future years. By using bonus plan details to identify situations where managers are expected to reduce earnings, Healy’s (1985) tests encompass more kinds of manipulation. His results are consistent with managers manipulating net accruals to affect their bonuses.

The debt/equity hypothesis predicts the higher the firm’s debt/equity ratio, the more likely managers use accounting methods that increase income. The higher the debt/equity ratio, the closer (i.e., “tighter”) the firm is to the constraints in the debt covenants (Kalay 1982). The tighter the covenant constraint, the greater the probability of a covenant violation and of incurring costs from technical default. Managers exercising discretion by choosing income increasing accounting methods relax debt constraints and reduce the costs of technical default.

The evidence is generally consistent with the debt/equity hypothesis.⁸ The higher firms’ debt/equity ratios, the more likely managers choose income increasing methods. Press and Weintrop (forthcoming) and Duke and Hunt (forthcoming) find that debt/equity ratios are correlated with closeness to bond covenants as assumed in the debt/equity hypothesis.⁹ Some studies, however, have avoided using the debt/equity ratio as a proxy variable for closeness to the covenant constraint by using more direct tests. For example, Bowen et al. (1981) examine whether accounting choice varies with tightness of the dividend constraint as specified in the debt covenant and measured by “unrestricted retained earnings.” The association between leverage and accounting method choice is an empirical regularity unknown prior to the positive accounting studies.

The political cost hypothesis predicts that large firms rather than small firms are more likely to use accounting choices that reduce reported profits. Size is a proxy variable for political attention. Underlying this hypothesis is the assumption that it is costly for individuals to become informed about whether accounting profits really represent monopoly profits and to “contract” with others in the political process to enact laws and regulations that enhance their welfare. Thus, rational individuals are less than fully informed. The political process is no different from the market process in that respect. Given the cost of information and monitoring, managers have incentive to exercise discretion over accounting profits and the parties in the political process settle for a rational amount of *ex post* opportunism.

⁸ Holthausen (1981) and Healy (1985) fail to reject the null hypothesis of no association between leverage and accounting method choice (see Christie forthcoming, table 1).

⁹ Researchers are beginning to distinguish between how close the firm is to a given covenant constraint versus the existence of the covenant. For example, Press and Weintrop (forthcoming) find the existence of a covenant has additional explanatory power in a model predicting accounting choice after including a leverage variable.

The evidence is consistent with the political cost hypothesis. However, the result only appears to hold for the largest firms (Zmijewski and Hagerman 1981) and is driven by the oil and gas industry (Zimmerman 1983). Difficulties with using firm size to proxy for political costs, including the likelihood that it can proxy for many other effects, such as industry membership, are discussed in Ball and Foster (1982). The interesting finding is the consistency of the sign of the relation between size and accounting choice across a variety of studies. The largest firms tend to use income decreasing accounting methods. Presently, there is no alternative theory for the empirical regularity between firm size and accounting choice other than the political cost hypothesis.

Bonus plan, debt contract, and political process variables other than bonus plan existence, leverage, and size have also been found to be associated with accounting choice. Christie (forthcoming) aggregates test statistics across the various studies and concludes "... six variables common to more than one study have explanatory power. These variables are managerial compensation, leverage, size, risk, and interest coverage and dividend constraints. Another conclusion is that the posterior probability that the theory taken as a whole has explanatory power is close to one."

While bonus, debt, and political process variables tend to be statistically significant (p -values smaller than .10), in many studies the explanatory power (R^2) of the models is low. In Zmijewski and Hagerman (1981), the model of cross-sectional choice of accounting methods is not significantly better than picking the most common combination, although Press and Weintrop (forthcoming) achieve slightly improved explanatory power. The alternative predictive model is that each firm uses the most common combination of accounting methods, a model with little explanatory appeal. The alternative model begs the question of what determines the majority accounting choice. Many accounting teachers would be uncomfortable with the explanation that managers choose their accounting procedures based on what most other firms are doing. The real issue is the lack of an alternative model with greater explanatory power, not the low explanatory power of the extant theory. Several problems with the existing research methods contribute to the low explanatory power. These are discussed next.

II. Criticisms of Positive Accounting Research

Table 1 lists most of the published papers with critical comments on our 1978 and 1979 papers. The second and third columns list the number of explicit references made by the authors to our 1978 and 1979 papers. These columns indicate which of the two papers is the primary focus of the article. The fourth column lists the general topic of the paper and the fifth column lists the major criticisms raised in the paper.

The criticisms in Table 1 can be dichotomized into two mutually exclusive sets: those concerning research methods (including the inferences drawn) and those concerning methodology (including the philosophy of science). For example, Ball and Foster (1982), Holthausen and Leftwich (1983), and McKee et

Table 1
Summary of Papers Reviewing Watts and Zimmerman (1978 and 1979)

Authors	Number of References		Topic	Major Criticisms
	WZ (1978)	WZ (1979)		
Ball and Foster (1982)	13	1	Review of Empirical Accounting Research	<ul style="list-style-type: none"> • Firm size and bonus plans can proxy for omitted variables • Weak theoretical underpinning for size-political cost construct • Holdout sample not used
Tinker et al. (1982)	1	4	Positive versus normative theories	<ul style="list-style-type: none"> • Positive theories are value-laden and mask a conservative bias • Ignores underlying class struggles
Christenson (1983)	6	9	Methodology of Positive Accounting	<ul style="list-style-type: none"> • Logical Positivism is an obsolete methodological approach • Approach is a "sociology of accounting" instead of accounting theory • Tests introduce <i>ad hoc</i> arguments to excuse the exceptions to the theory • Inappropriate methods are used for constructing explanatory theories
Holthausen and Leftwich (1983)	7	0	Review of "Economic Consequences Literature"	<p>Interpretation of results limited because:</p> <ul style="list-style-type: none"> • Incomplete political and contracting theories • Specification problems in left-hand-side and right-hand-side variables
Lowe et al. (1983)	0	12	WZ (1979)	<ul style="list-style-type: none"> • Economic framework is unjustified • Positive approach open to dispute • Nature of proof is unscientific • Contrary evidence presented

TABLE 1—Continued

Authors	Number of References		Topic	Major Criticisms
	WZ (1978)	WZ (1979)		
McKee et al. (1984)	4	0	Replication of WZ (1978)	<ul style="list-style-type: none"> • Results do not hold in a new sample • Holdout sample not used • Foreknowledge of sample proportions biases parameter estimates
Whittington (1987)	0	7	Review of WZ (1986)	<ul style="list-style-type: none"> • Presentation of arguments and evidence is unbalanced • Extreme methodological stance • Positive theories are value-laden • Approach is a "sociology of accounting" instead of accounting theory
Hines (1988)	4	0	Christenson (1983) and Methodology	<ul style="list-style-type: none"> • Popper is not a practical evaluative guideline for empirical accounting research

al. (1984)¹⁰ discuss research methods problems and not philosophy of science issues. The remaining authors concentrate on philosophy of science issues to the near exclusion of problems with research methods. Except for Holthausen and Leftwich (1983), all the reviews of positive accounting ignore the accumulating body of evidence consistent with the theory. For example, Hines (1988) cites McKee et al. (1984) as contradictory evidence to Watts and Zimmerman (1978). Yet, she ignores 21 studies reviewed in Watts and Zimmerman (1986, chaps. 11, 12) and Christie (forthcoming) that present evidence generally consistent with the theory.

The research method issues are important and future research must attempt to address them. However, it is unlikely that the positive accounting literature or any other empirical literature will ever totally eliminate such issues. We do not agree with many of the philosophy of science issues raised and seek to eliminate the common misconceptions they reflect. Research method issues, some raised by others and some by us, are discussed first in this section and philosophy of science issues are discussed second.

Research Method Issues

The first research method issue involves the tests' lack of power. The second issue involves the possibility that the results obtained in the positive accounting literature are due to unrecognized alternative hypotheses, not the stated hypotheses.

Reductions in the tests' power. Tests of the theory lack power for several reasons: problems with model specification, problems specifying the left-hand-side and right-hand-side variables, and omitted variables. Each of these are discussed next.

Model specification. All the studies to date have assumed accounting choice results either from efficiency reasons or managerial opportunism. This produces two model specification errors. First, in probit type regressions where the choice of accounting method depends on the effect of the choice on the manager's wealth, the right-hand-side or explanatory variables reflect the wealth effects of the choice via compensation plans, debt agreements, and the political process. Implicitly researchers are holding constant the firm's investment opportunity set and contracts and interpret the compensation plan variable as managerial opportunism. But, the debt and political variables can represent both efficiency and opportunism. Thus, the model is misspecified. The second specification error results from ignoring the interaction effects among the right-hand-side variables. Higher earnings impose political costs and so reduce the size of the pie for the contracting parties and at the same time increase the manager's bonus compensation. The manager's increased share of the smaller pie might be larger than a smaller share of the larger pie. The bonus plan and political process effects inter-

¹⁰ McKee et al. (1984) discuss problems of the tests in Watts and Zimmerman (1978), extend the tests to another sample of firms, and offer some statistical refinements. The only statistically significant explanatory variable in our 1978 paper was firm size. McKee et al. find that their refined measure of firm size, (SALES/MAXSALES)DTREND, is statistically significant in both our sample and their sample and remains statistically significant after various refinements are made. They do not discuss the importance of this finding.

act. However, in the empirical models the right-hand-side variables are treated as additive and interaction effects are ignored. Solving these two specification problems requires researchers to specify the intertemporal interaction between opportunism (including managerial reputation incentives) and efficiency effects (see Christie 1987).

Left-hand-side variable. Problems specifying the accounting choice variable reduce the power of the tests. One such problem mentioned earlier is the use of single method choices as the left-hand-side variable. Zmijewski and Hagerman (1981) and Press and Weintrop (forthcoming) use sets of accounting methods and still achieve relatively low explanatory power. However, ranking the effects of various portfolios of accounting methods on earnings requires assumptions about the relative effects on earnings of the various accounting choices (e.g., the effect of depreciation choice vs. inventory choice). These assumptions induce error in the left-hand-side variable. Healy (1985) tries to overcome this problem by using net accruals as his left-hand-side variable. But, the variable "net accruals" is a noisy measure of the net accruals manipulated by managers. Some accounting decisions that affect accruals have been made earlier and are probably beyond the manager's discretion at the time of the measurement. Ideally, net accruals should be measured relative to what they would be without manipulation, so these variations are excluded from the left-hand-side variable. This requires a model of accruals that currently does not exist (Moyer 1988; McNichols and Wilson 1988; DeAngelo 1988b).

Right-hand-side variables. Some variables in accounting choice studies are mismeasured. For example, both the closeness to the covenant (i.e., the difference between the number specified in the covenant and the actual number) and the existence of the covenant are likely important determinants of accounting choice. But the debt/equity ratio by itself is an imprecise measure of both closeness to the constraint and the existence of a constraint. Also, the use of a zero-one variable to measure a bonus plan effect is simplistic. Ball and Foster (1982, 184) point out that other components of pay, such as salary, can depend on accounting earnings without a formal compensation plan and that even with a formal accounting-based plan the outside directors can adjust the incentive pay for accounting changes. However, finding an association between an indicator variable representing a bonus plan and choice of accounting methods is informative and suggests that further research with more refined measures based on the bonus plans' details will yield stronger results than the zero-one variable. Also, more direct measures of political sensitivity than firm size (Wong 1988; Jones 1988; Sutton 1988) provide more powerful tests of the political cost hypothesis.

Omitted variables. There are three different omitted variable problems in the current literature: omitting standard accounting-based contracts, omitting less standard contracts, and omitting variables representing the accepted set. First, contracting cost variables for standard contracts, such as bonus plans occasionally are omitted because such variables are costly to collect. For example, Daley and Vigeland (1983) omit a variable representing accounting-based management compensation plans from their regression. Because leverage, compensation contracts, and accounting policy are part of the firm's efficient contracting technology, these variables covary and also vary with firm size. Omitting

a right-hand-side variable correlated with included variables causes the existing right-hand-side variables to become surrogates for the omitted variables. This produces biased coefficients of the estimated right-hand-side variables and hampers their interpretation.

A second omitted variables problem is that to a large degree, the literature to date focuses only on debt and compensation contracts. Other contracts influence management's choice of accounting methods, but these are omitted in most tests. For example, the existence of a bonus plan is likely correlated with other organizational devices such as stock option plans. These other organizational structures might be driving the accounting choice rather than bonus plans (Ball and Foster 1982, 185). And, it is incorrect to ascribe all the explanatory effect of the bonus plan indicator variable results to the bonus plan. Corporate control issues also are often omitted as explanatory variables in seeking to explain accounting choices. DeAngelo (1988a) finds that net accruals are more positive (i.e., higher reported earnings) during proxy fights. Zimmerman (1979) and Ball (1989) argue that accounting numbers are part of the internal control process and, thus, affect manager's choice of accounting methods (e.g., cost allocations). Ignoring these, other less frequently researched informal contracts can produce biased coefficients.

Third, as discussed under specification problems above, the left-hand-side variable in most studies is the manager's choice of accounting methods. Even without a government regulatory defined set of accounting methods, this choice is made from within the "accepted set of methods" (see Fig. 1).¹¹ Yet, most studies do not control for differences across firms' accepted sets. Such control requires a theory of how the sets of accepted accounting methods vary and such a theory does not exist. Failure to control for differences in accepted sets induces another correlated omitted variables problem in the tests. The severity of this correlated omitted variables (and model specification) problem is likely to be larger in studies in which the sampled firms are drawn from several industries than in studies where the sampled firms are drawn from the same industry.

Alternative hypotheses. Alternative hypotheses can explain the bonus, debt/equity, and size results found in the positive accounting literature. Several scenarios illustrate how this problem might arise:

1. If the accounting system is part of the firm's efficient set of implicit and explicit contracts, accounting choice is endogenous. Contracting, investment, and production decisions are determined jointly. The type of contracts used (including the accounting methods) depends on the firm's investment opportunity set. Hence, the firm's investment opportunity set (e.g., whether it includes growth options or not) is correlated with the firm's financial, dividend, compensation, and accounting policies. Smith and Watts (1986) find significant cross-sectional correlations among

¹¹ Mian and Smith (forthcoming) find that accounting policy decisions regarding consolidations vary by type of organization structure. Consumer finance subsidiaries are more prevalent where the parent is in the financial services industry and choice of consolidation is more homogeneous within like organization structures than in dissimilar structures. Also, operating interdependencies between the parent and subsidiary drive some accounting choices.

firms' investment opportunity sets, financial policies, dividend policies, and compensation policies. The documented correlations between debt/equity and accounting choice and between bonus plans and accounting choice could be due to the correlation between financial and compensation policies and the optimal set of accounting procedures for contracting. Most researchers, however, interpret these associations as resulting from opportunistic actions by managers and have not considered efficiency-based hypotheses.

2. Accounting choice also is endogenous in the political process. The potential costs of a proposed accounting standard affect the standard before it is released. The correlation between financial and compensation policies and accounting policy is likely affected by the firm's tax accounting policies. While some financial accounting method choices do not affect taxes, reducing bookkeeping costs by keeping one set of books and the possibility that tax audits or future taxes might be levied using reported income induce a relation between financial accounting and tax accounting methods.¹²

One cannot test claims that variables like debt/equity and size are surrogates for alternative explanations until those alternatives are identified and the relation specified. Given the investment opportunity set and taxes are identified as possible explanatory variables, future research can investigate their implications as alternative hypotheses to those currently advanced. For example, changing accounting methods can result from a change in the firm's investment opportunity set causing the efficient contracts and accounting methods to change. Or, some exogenous event occurs (such as reduced demand for the firm's products) and managers take opportunistic actions to undo the adverse compensation and debt contract effects of the exogenous event. Accounting changes likely are due to both efficiency reasons and managerial opportunism. Probing the relative importance of efficiency and opportunism for accounting method changes requires more refined theories and more linkage between the theory and the tests.

Philosophy of Science Issues

Positive theories are value-laden. Tinker et al. (1982, 167) argue that all research is value-laden and not socially neutral. Specifically, "Realism, operating in the clothes of positive theory, claims theoretical supremacy because it is born of fact, not values" (p. 172). We concede the importance of values in determining research; both the researcher's and user's preferences affect the process.

Competition among theories to meet users' demands constrains the extent to which researcher values influence research design. Positive theories are "If . . . , then . . ." propositions that are both predictive and explanatory. Researchers choose the topics to investigate, the methods to use, and the assumptions to make. Researchers' preferences and expected payoffs (publications and citations) affect their choice of topics, methods, and assumptions. In this sense, all re-

¹² The Corporate Alternative Minimum Tax under the Tax Reform Act of 1986 requires a portion of reported income be in the tax base. This act increases the tax incentives on financial reporting. Research to date has not documented the effect of 1986 tax reform on financial reporting incentives.

search, including positive research is “value-laden.” The usefulness of positive theories depends on their predictive and explanatory power and on the user’s preferences or objective function. To the extent that the researcher’s values interfere with the theory’s ability to predict and explain, the theory’s usefulness is reduced.

Approach is a “sociology of accounting” instead of accounting theory. Christenson (1983, 5) writes, “The program of the Rochester School is concerned with describing, predicting, and explaining the behavior of accountants and managers, not that of accounting entities.” His definition of an “accounting entity” is “A business enterprise or other economic unit, or any subdivision thereof for which a system of accounts is maintained” (Kohler 1975, 14). Christenson (1983, 6) supports his criticism with an analogy from the physical sciences, “Chemical theory consists of propositions about the behavior of chemical entities (molecules and atoms) not about the behavior of chemists.” In chemistry, chemical reactions exist without chemists and one can study reactions without studying chemists. But, there would be no accounting without accountants, managers, or preparers of the numbers; there would be no numbers or systems to investigate because people “maintain” the system (Lavoie 1989). Analogously, there would be no study of political science if politicians and voters were ignored.

The study of accounting (or political science) is a social science (Christenson 1983, fn. 5). An accounting theory that seeks to explain and predict accounting cannot divorce accounting research from the study of people. The contracting approach to studying accounting requires researchers to understand the incentives of the contracting parties.

Inappropriate methods are used for constructing explanatory theories. We apply traditional, generally accepted research methods and methodology from accounting, finance, and economics. Christenson (1983, 6) states, “The Rochester School has drawn its concept of ‘positive theory’ from that guru of the Chicago School of Economics, Milton Friedman.”¹³ Whittington (1987, 331) states, “. . . Watts and Zimmerman are not unique in owing intellectual allegiance to the Chicago view. . . . The majority of North American empirical accounting researchers would fall into this category, and their collective achievements are formidable.”

The economic approach we and many others use applies a simple proposition: To predict and explain individual behavior, people (including accountants, regulators, and researchers) consider the private costs and benefits (broadly defined) of an action and choose the action if the benefits exceed the costs. This economics-based research methodology may be fundamentally flawed in ways we do not now understand. But, accounting research using this methodology has produced useful predictions of how the world works (e.g., association between earnings and stock prices, random walk model of earnings, contracting and size variables associated with accounting choice). A methodology that yields useful results should not be abandoned purely because it *may* not predict *all* human

¹³ Christenson is referring to Milton Friedman’s views on scientific methodology as expounded in Friedman (1953). In our opinion, Friedman places too much emphasis on prediction vis-à-vis explanation.

behavior. Do we discard something that works in some situations because it *may* not work in every circumstance? Despite what the critics think methodology *should be*, the methodologies that survive are the ones that produce useful theories. Competition in the marketplace of ideas will produce future research that uncover the errors of our present ways. Time will tell whether our approach is inappropriate.

Choice of the term "Positive Accounting Theory." Positive accounting research existed long before the publication of our 1978 and 1979 papers. Early examples include Gordon (1964), Gordon et al. (1966), and Gagnon (1967). We applied the label "positive" to a set of existing research studies. The prime reason we attached this adjective in "Towards a Positive Theory of the Determination of Accounting Standards" was to emphasize that accounting theory's role is to provide explanations and predictions for accounting practice.

In Watts and Zimmerman (1986, 2) we state the objective of an accounting theory is to explain and predict accounting practice. Neither prediction nor explanation is preeminent. We adopted the label "positive" from economics where it was used to distinguish research aimed at explanation and prediction from research whose objective was prescription. Given the connotation already attached to the term in economics we thought it would be useful in distinguishing accounting research aimed at understanding accounting from research directed at generating prescriptions. In the 1960s researchers were still debating various normative theories of accounting (Chambers 1966; Sprouse and Moonitz 1962).

Our use of the term "positive" differentiated our and other people's (positive) research from traditional normative theories by emphasizing the importance of prediction and explanation. It helped place normative theories and their role in a clearer perspective. Our work was not directly related to the debate over alternative normative theories and we wanted to differentiate our work from that debate. The phrase "positive" created a trademark and like all trademarks it conveys information. "Coke," "Kodak," "Levis" convey information. A positive theory differs from a normative theory, though a positive theory can have normative implications once an objective function is specified (Jensen 1983).

In retrospect, the term "positive" generated more confusion than we anticipated. For example, some thought we meant logical positivism (Christenson 1983). We merely intended to distinguish positive propositions from the extant normative propositions in the literature. While the term "positive" avoided debates over normative uses of the work, the term "positive" generated considerable debate over philosophical issues.

Despite its problems, we prefer "positive accounting literature" to alternative terms that have arisen, particularly the term "economic consequences literature." This latter term suggests accounting standards are decided on some higher basis and that economic consequences are a secondary factor only considered after the initial decision is made on the higher basis.¹⁴

¹⁴ Some have suggested the term "contracting theory." While descriptive of most of the elements in the existing theory, it seems to preclude noncontractual variables that might be discovered later (e.g., taxes or information for the capital markets, Holthausen forthcoming).

Debate over methodology. Several papers listed in Table 1 involve a debate over what constitutes “proper” methodology (Tinker et al. 1982; Christenson 1983; Lowe et al. 1983; Whittington 1987; Hines 1988). For example, Christenson (1983, 1) concludes, “. . . [T]he standards advocated by the Rochester School for appraisal of their own theories are so weak that those theories fail to satisfy Popper’s (1959) proposal for demarking science from metaphysics.” Hines (1988) then criticizes Christenson for relying on Popper (1959) which later philosophers of science have questioned. Hines (1988, 658) argues these methodology issues are important and if ignored will “harmfully limit the nature and domain of accounting research.”

The methodology criticisms have failed the market test because they have had little influence on accounting research. Researchers have not changed their approach. Referees and editors of journals have not asked researchers to alter their methodology based on these published critiques. There are at least three reasons these criticisms have had little effect on published research. First, the criticisms are written in an abstract fashion. Instead of just criticizing extant papers, if the critics would repeat studies without making the alleged errors, then users of the corrected research would demand such procedures be followed in the future. If the alleged errors are important to users, then other researchers, editors, and referees would adopt the suggestions. Second, critics who place unreasonable demands on studies cause other researchers to disregard their complaints. For example, Hines (1988, 661) argues that Watts and Zimmerman (1978) should have: (1) avoided crude proxies, (2) avoided unrealistic assumptions, (3) investigated the anomalies, (4) clarified their theories, and (5) rigorously tested their theories against competing hypotheses. All these standards are relevant, but if all were applied rigorously to individual papers (especially early papers in an area of thought), no research would be published. Third, to most researchers, debating methodology is a “no win” situation because each side argues from a different paradigm with different rules and no common ground. Our reason for replying here is that some have mistaken our lack of response as tacit acceptance of the criticisms.

III. Summary and Conclusions

Our prime objective in this paper is to provide a perspective on our 1978 and 1979 *Accounting Review* papers. The 1978 paper has proven more important than the “Excuses” paper. Based on citations, the 1978 paper has received over three times as many citations as the 1979 paper (Brown and Gardner 1985, 97). The 1978 paper was a catalyst for research into the choice of accounting methods. Except for generating debates over methodology, the 1979 “Excuses” paper has remained outside the mainstream of accounting research probably because of the more subjective type of evidence necessary to test theories of the effect of accounting research on policy.

The debate over methodology has been less useful than the discovery and explanation of empirical regularities. The positive accounting literature has discovered several empirical regularities in accounting choice and provided an explanation for them. Critics of the 1978 and 1979 papers raise issues involving

research methods and philosophy of science. The methodology we and the subsequent literature use is the methodology of economics, finance, and science generally. This methodology has been successful in accounting and we feel no necessity to apologize for it. Under this methodology, a theory is not discarded merely because of some inconsistent observations. The best theory is determined in a competition to meet the demand from students and practitioners for theories that explain and predict accounting choice. It is unlikely an accounting or a social science theory with perfect predictions will ever exist. Researchers are influenced by their values. But, to the extent those researchers are competing to meet student and practitioners' demand for theories, they have incentives to reduce that influence. Further, the careful dichotomy between theory and prescription helps reduce that influence. Lastly, accounting is an activity carried out by people and one cannot generate a theory that predicts and explains accounting phenomena by ignoring the incentives of the individuals who account. In this final section we summarize the contributions made by this literature, our views on promising research directions, and some conclusions.

Positive Accounting Literature Contributions

Discovering systematic patterns in accounting choice outlined in the preceding sections and providing specific explanations for the patterns are the literature's major contributions. However, we believe the literature has made other contributions: it provides an intuitively plausible framework for understanding accounting. A plausible framework is a useful pedagogy for teaching accounting. The literature also encourages researchers to address accounting issues and emphasizes the central role of contracting costs in accounting theory.

The literature explains why accounting is used and provides a framework for predicting accounting choices. Choices are not made in terms of "better measurement" of some accounting construct, such as earnings. Choices are made in terms of individual objectives and the effects of accounting methods on the achievement of those objectives. For example, some accounting instructors teach that certain accounting methods (e.g., current cost) are better than others (e.g., historical cost). But, no explanation is offered why these "better" measures are not adopted. The positive accounting literature takes as given the proposition that the accepted set maximizes the wealth of the contracting parties and then seeks to understand how wealth is affected by specific accounting methods.

The literature's emphasis on predicting and explaining accounting phenomena encourages research that is relevant to accounting. One of the first questions one pursuing this approach asks of a new model is whether it has any relevance to predicting and explaining accounting practice.

Another contribution of the literature is to highlight the importance of contracting costs (including information, agency, bankruptcy, and lobbying costs). Contracting costs have long been important in economics and date to Coase (1937). Positive accounting research has more recently recognized the importance of contracting costs to explain accounting. In the late 1960s and 1970s, financial economists derived pricing models (capital asset pricing models, option pricing models, arbitrage pricing models). These models were developed under assumptions of costless information and such models explain why different

securities sell for different relative prices. Such models do not explain institutional differences, such as open- and closed-end mutual funds. To explain such institutional differences requires assumptions of costly information and contracting. Likewise, accounting would not exist without contracting costs and so it is difficult to produce a theory that predicts and explains accounting without making assumptions about the relative magnitudes of these costs. The central role of contracting costs highlighted by positive accounting research makes it difficult to ignore these costs in accounting theories. It directs researchers' attention to the appropriate issues.

Future Research Directions

Section II discussed two major research methods issues: the lack of power of the tests and alternative economic explanations for the empirical regularities. The following research suggestions focus on these two issues. We believe these suggestions will be more fruitful in advancing the understanding of accounting choice than "merely conducting more studies using existing formulations of the theory and existing ways of measuring variables" (Christie forthcoming) (also see Holthausen and Leftwich 1983, 109–114).

First, the single most important task facing positive accounting researchers is improving the linkage between the theory and empirical tests. The theory predicts that the magnitude of debt renegotiation costs will affect managers' choice of accounting methods and will set an upper bound on the magnitude of the default costs. To date, researchers have been unable to document the magnitude of the costs imposed by a technical violation of a debt covenant or the magnitude of renegotiation costs (Holthausen 1981; Leftwich 1981; Lys 1984; Leftwich forthcoming). Greater attention has to be placed on developing a unified theory that incorporates both the *ex ante* efficient restrictions on the managers' accepted set of accounting methods and the *ex post* exercise by managers of their discretion to choose accounting methods from within the accepted set. The empirical tests can no longer assume accounting choice is made for either efficiency or opportunistic reasons. Both must be incorporated into the tests. Also, estimates of the relative magnitudes of the various components of contracting costs can help to further refine the linkage between the theory and tests by identifying those costs most influential in driving accounting choice.

Developing and testing alternative hypotheses for the existing empirical regularities also will enhance the linkage between the theory and the tests. Hypotheses can be developed to predict new empirical regularities. Under the contracting approach, debt and compensation contracts are only some of the contracts that affect firms' cash flows. Other (explicit and implicit) contracts can be used to develop new predictions (DeAngelo 1988a). Particularly promising is the effect of accounting procedures for internal control on external reporting (Ball 1989). For example, Mian and Smith (forthcoming) find that the prevalence of consolidated reporting of financing subsidiaries depends on the extent to which the subsidiary is interdependent with the parent's main business. How the firm is organized internally (e.g., functionally or by product line), the type of internal compensation systems, and the investment opportunity set are likely associated with the type of internal accounting performance measurement systems. Inter-

nal contracting parties may well turn out to be as important a determinant of external financial reporting as the external contracting parties.

Finally, the political process can affect firms' cash flows other than via the simple political cost hypotheses. More detailed specification of government regulatory processes that rely on accounting numbers can be used to develop new hypotheses and a tighter linkage between the theory and tests by suggesting more precise proxy variables other than firm size (Sutton 1988; Wong 1988; Jones 1988).

Second, when accounting choice is cast as part of the efficient contracting technology, variables often used to explain and predict accounting choice are endogenous. For example, changes in accounting procedures occur simultaneously with changes in the firm's investment opportunity set, its financial and compensation contracts, its organizational structure, and even in its political environment. Managers choose packages of accounting policy, financial policy, and organizational structure (including performance evaluation and reward systems). Theoretical and empirical models have to be developed to sort out the endogeneity problems among the variables and, thereby, increase the power of the tests. While this is no easy task, it seems essential to significant advances in both the theories of the firm and of accounting.

Accounting numbers are used in different ways across industries. Besides the obvious regulatory uses of accounting numbers in financial institutions and public utilities, differences in industries' opportunity sets are likely to affect the accepted set of accounting methods. Two types of studies are likely to prove useful and again increase the tests' power. First, studies investigating differences in investment opportunity sets (e.g., the relative amount growth opportunities to assets in place, Myers 1977), accounting policies, organizational structures, and financial policies across industries are likely to produce information useful for the modelling suggested in the preceding paragraph. Second, intra-industry studies of accounting choice while requiring significant amounts of industry-specific knowledge by the researcher, have the potential of generating useful insights about the magnitude of contracting costs.

Third, measurement errors in net accruals can be reduced to increase the tests' power. This requires a model of net accruals not subject to managerial accounting discretion (Kaplan 1985; McNichols and Wilson 1988; DeAngelo 1988b; Moyer 1988). Also, replacing the simple indicator variables used to represent a bonus plan or an accounting-based debt covenant with continuous variables that better measure the relative magnitudes of various contracting costs will probably increase the theory's predictive power.

Conclusions

While the positive accounting literature has yielded empirical regularities and explanations for these regularities, it is clear there are many research opportunities available beyond those currently exploited. The tests of the debt, bonus, and political cost hypotheses represent very limited exploration. Incorporating both *ex ante* contracting efficiency incentives with *ex post* redistributive effects is likely to prove useful. Likewise, investigating the implications of internal contracts and external contracts other than debt and bonus contracts is likely to be

productive. The major breakthroughs are likely to come from viewing accounting as a choice that is endogenous with the choice of organization, contracting, and financial structures. Such a breakthrough will be difficult to achieve, but important foundations can be laid by stressing the linkage between the theory and the empirical tests and by investigating inter- and intra-industry variations in accounting methods and other organizational choices.

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