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Positive Accounting Theory and Science

by

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Abstract

This paper examines the development of positive accounting theory (PAT) and compares it with three standard accounts of science: Popper (1959), Kuhn (1996), and Lakatos (1970). PAT has been one of the most influential accounting research programs during the last four decades. One important reason which Watts & Zimmerman (1986) have used to popularize and legitimize their approach is that their view of accounting theory is the same as that used in science. Thus, it is important to examine how far accounting has been successful in imitating natural science and how the development of PAT compares with the three standard accounts of science. This paper shows that accounting could not emulate the success of natural science. Further, the methodological positions of PAT conform to none of the standard accounts of science. Rather, PAT contains elements of all three. Finally, this paper identifies some methodological gaps in PAT.

Keywords: Positive Accounting Theory, Philosophy of Science, Methodological Controversies

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Introduction

This paper examines the development of positive accounting theory (PAT) and compares it with three standard accounts of science. There is some confusion about what PAT is. If the definition of accounting theory (i.e., accounting theory seeks to explain and predict accounting and auditing practice) given in Watts and Zimmerman's 1986 book is taken to mean PAT, studies of accounting choices and auditing practices constitute PAT. At the same time, they also seek to explain the economics-based empirical literature in accounting and they describe, in addition to accounting choice studies, capital market-based accounting research. They point out that Ball and Brown (1968) initially popularized positive research in accounting, suggesting that PAT includes both capital market-based accounting research and research in accounting choices. This paper takes PAT to include both research programs. This usage is consistent with Watts and Zimmerman's (1986) assertion that when they use the term "positive" to differentiate it from "prescriptive" theory.

PAT has been one of the most influential accounting research programs during the last four decades. It has spawned a great deal of empirical research on the association between accounting numbers and stock prices and returns, and determinants of accounting choices by management. It has spawned a number of accounting journals, among which the *Journal of Accounting and Economics* is the most prominent. Brinn, Jones, and Pendlebury (1996), in a survey of UK academics' perceptions of journal quality, found that the top four accounting journals are the following: *Journal of Accounting and Economics*, *Journal of Accounting Research*, the *Accounting Review*, and *Accounting, Organizations and Society*. Articles published in the top three journals are predominantly in the positive tradition. The sheer number of articles in these two paradigms published in major accounting journals and the dominance of PAT in PhD programs in US and other universities testify to the dominant position of PAT. Thus, judged by the number of research articles, the number and dominance of the journals it spawned, and the dominance of PAT in doctoral programs, PAT has been immensely influential.

Before the emergence of PAT, normative accounting research had been the dominant research tradition in accounting. Normative accounting theorists had been preoccupied with developing accounting principles¹. The primary concern of these researchers had been recognition and measurement issues in accounting. Typical accounting questions asked and answered by normative accounting theorists include whether to recognize changes in market prices if the entity is not a party to the transaction, what basis (e.g., historical cost, market value, etc.) to use in preparing financial statements, etc. (Chambers, 1966; Ijiri, 1975; Littleton, 1953; MacNeal, 1939; Paton & Littleton, 1940). In contrast with normative accounting theory which deals with "should" type questions, PAT deals with "is" type questions. Instead of asking which measurement basis to use in accounting, PAT asked, for example, whether accounting information is useful to the stock market, which accounting measurement basis management actually uses, and why.

Thus, PAT represents a major shift in accounting research paradigm. One important comparison to which Watts and Zimmerman (1986) have appealed to legitimize and promote PAT is the sameness of their view of theory and that in science. They have cited various philosophy of science authors to assert that their view of theory is the same as that in science and to justify their method; and to discredit, to a certain extent, normative theory. Thus, given that PAT has been of interest to accounting theorists for around four decades, it is important to examine how far PAT has been successful in imitating natural sciences and what the limits have been. It is also important to revisit the methodological positions of PAT. It would be interesting to see how the development pattern of PAT compares with accounts of science to which Watts and Zimmerman appealed to legitimize and promote their theory. This is because such a comparison will enhance our understanding of how PAT progressed and what methodological gaps remain.

PAT has been subject to various criticisms since its emergence. For example, Chambers (1993) called the advocates of PAT a PA cult. Sterling (1990) criticized PAT on the ground that it restricted itself to the positive study of accounting practice and accounting practitioners and hinders accounting progress by neglecting the need for the assessment of accounting practice. Sterling (1990) further assessed its potential accomplishment as being nil. Whittington (1987) criticized PAT for its methodological intolerance and asserted that normative accounting theory had a legitimate place in accounting. Neu (1997) provided a largely negative appraisal of PAT. Sue (1997) said that PAT narrowed the researchers' focus. Hall (1997), on the other hand, disagreed with Sterling's (1990) assessment that the potential contribution of PAT was nil. Deegan (1997) examined how PAT had ignited emotions among academics. It attracted many academics and alienated some at the same time. Milne (2002) judged PAT's attempt to explain an entity's social disclosures as failure.

However, not many articles compared the development of PAT with different accounts of science in spite of the fact that Watts and Zimmerman appealed to science as a way of promoting their theory. Mouck (1990) is the notable exception. He likened PAT to the Lakatosian research program. Others (e.g., Christenson, 1983; Sterling, 1990) criticized PAT for not following the methodological dictates of Popper. However, none of these papers have attempted to compare the development pattern of PAT with Popper (1959), Kuhn (1996), and Lakatos (1970). This paper attempts to do this.

This paper focuses mainly on Watts and Zimmerman's 1986 book and the empirical accounting literature of accounting choices and capital market-based accounting research. The empirical accounting literature is surveyed to determine how it has developed during the last four decades.

This paper discusses three interrelated methodological issues: (a) how PAT progressed over time, (b) the role of counterevidence/anomalies in PAT, and (c) how a theory is to be chosen from among competing theories. These three issues are chosen because, as mentioned above, Popper (1959), Kuhn (1996), and Lakatos (1970) do not give the same account of these issues as they apply to science.

The rest of this paper is structured as follows: The next section provides a brief sketch of the development of positive accounting theory, and this sketch serves as the basis for discussion in Sections 3-7. Section 3 discusses the contribution of PAT to accounting practice and Section 4 examines the difficulties of PAT. Sections 5-7 compare the developmental pattern with three standard accounts of the development of science. The last section contains conclusions.

Development of PAT²

PAT started with examining some assumptions underlying normative accounting prescriptions during the 1960s. Two sets of empirical studies³ were conducted. One set of studies (e.g., Ball & Brown, 1968; Beaver, 1968; Foster, 1977; Beaver, Clarke, & Wright, 1979; Beaver, Lambert, & Morse, 1980; Grant, 1980; McNichols & Manegold, 1983) examined the association between accounting earnings numbers and stock prices. Results indicated that earnings numbers reflected factors (e.g., cash flow and risk) relevant to stock valuation. This, according to Watts and Zimmerman (1986), undermined the claim in normative accounting literature that accounting earnings numbers were meaningless because they were computed using multiple valuation bases. The second set of studies (e.g., Kaplan & Roll, 1972; Sunder, 1973, 1975; Ricks, 1982; Biddle & Lindahl, 1982) attempted to discriminate between two competing hypotheses: the no-effects hypothesis and the mechanistic hypothesis.⁴ Evidence in these studies is mixed and could not successfully discriminate between the competing hypotheses.

The above sets of studies have used the Efficient Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM) as their underlying foundation. Furthermore, it was assumed that contracting costs⁵ were zero. Overall, these studies raised doubts about the empirical descriptiveness of the following assumptions underlying normative prescriptions during the 1960s: (a) There is only one source of information about a company, (b) earnings numbers are useless because they were not prepared according to a single basis, and (c) it is possible to mislead the stock market by manipulating the earnings number through accounting choices. Information content studies reveal that these assumptions are unlikely to be descriptive of the real world. The EMH implies that there is competition for information. There are alternative sources of information about the firm such as information releases by management and interviews of corporate personnel by analysts. The observed association between unexpected earnings and abnormal rate of return reveals that the earnings number reflects factors relevant to the valuation of stock despite not being calculated on a single basis. Furthermore, the believers in EMH and CAPM argued that it is not possible to systematically mislead the market by accounting changes. The market differentiates between accounting changes having cash flow effects and changes with no cash flow effects. Thus, the mechanistic hypothesis was unlikely to be descriptive of the real world.

As noted above, early studies could not successfully discriminate between the no-effects hypothesis and the mechanistic hypothesis. This did not lead to the rejection of the no-effects hypothesis. Instead the results led the researchers to examine the methodological aspects of those studies and question the empirical validity of one important assumption (i.e., zero contracting costs) underlying the tests. This has led to a breakthrough in accounting research. It has long been held in economics that contracting costs are non-zero (Coase, 1937). Accounting researchers have abandoned the assumption of zero transaction and information costs.

This breakthrough opened the door to possibilities for explanation and prediction of variation of accounting practice across firms. The major idea behind this literature is that the firm is a nexus of contracts, and accounting methods constitute an integral part of this set of contracts (Sunder, 1997). Accounting numbers are used to write, monitor, and enforce contracts (Sunder, 1997). Viewed in this way, accounting can affect firm value via their impact on contracts. Accounting is no longer mere form as was assumed under the EMH and CAPM regime⁶. The dropping of the assumption of zero contracting costs has shown that accounting methods have the potential to affect the cash flow to the contracting parties. It thus provides incentives to the contracting parties to influence accounting methods.

Though the above idea is general, early empirical studies of accounting choices investigated the impact of variables related to earnings-based bonus plans, debt, and the political process affecting the firm. Three major hypotheses tested are as follows: (a) the bonus plan hypothesis, (b) the debt-equity hypothesis, and (c) political cost hypothesis (Watts & Zimmerman, 1986). The bonus plan hypothesis states that firms with bonus plans choose accounting methods so as to increase current period earnings. The debt-equity hypothesis says that firms with higher debt-equity ratios choose accounting procedures so as to shift earnings from future periods to the current period. The political cost hypothesis says that large firms rather than small firms choose accounting methods so as to shift earnings from the current period to future periods. Size has been used as the proxy variable for political attention in early studies (e.g., Watts & Zimmerman, 1986). Underlying all these hypotheses is the assumption of non-zero contracting costs (Watts & Zimmerman, 1986). Empirical evidence is generally consistent with these hypotheses (Watts & Zimmerman, 1986, chapter 11; Christie, 1990). Another stream of research examines the stock price effects of accounting changes – both mandated and voluntary (Watts & Zimmerman, 1986, chapter 12).

The initial studies of earnings management have been expanded to investigate earnings management in different situations. For example, research has examined earnings management around specific events (e.g., management buyouts, DeAngelo, 1986; labor negotiation, Liberty & Zimmerman, 1986; proxy contests, DeAngelo, 1988; import relief investigation, Jones, 1991; non-routine executive changes, Pourciau, 1993; and initial public offerings, Teoh, Wong, & Rao, 1998). Still other studies have investigated the linkage between corporate governance characteristics and earnings management (e.g., impact of institutional ownership on R & D behavior, Bushee, 1998; impact of independent directors and CEO stockholdings on earnings management, Reitenga & Tearney, 2003; impact of the then Big 6 auditors on discretionary accruals, Becker, et al, 1998; Francis, Maydew, & Sparks, 1999; impact of Big 6 auditor industry expertise on earnings management, Krishnan, 2003; association between auditors' fees for audit and nonaudit services and earnings management, Frankel, Johnson, & Nelson, 2002; impact of outside directors and audit committee on abnormal accruals, Peasnell, Pope, & Young, 2005; association between board of director characteristics and conservatism, Ahmed & Duellman, 2007). Also, some studies have examined the rationale of accounting conservatism (Watts, 2003a, 2003b).

On the other hand, the capital market-based accounting research has expanded to investigate the value relevance of accounting numbers. This branch of capital market-based accounting research is motivated by standard-setting considerations (Barth, Beaver, & Landsman, 2001). For example, capital market-based studies have examined whether fair value is value-relevant in different settings (American Accounting Association Financial Accounting Standards Committee, 2005; Barth, Beaver, & Landsman, 1996, 2001; Barth & Clinch, 1998; Landsman, 2007; Eccher, Ramesh, & Thiagarajan, 1996). More recently, empirical research has examined the value relevance of accounting numbers reported under different sets of Generally Accepted Accounting Principles (e.g., German GAAP, International Financial Reporting Standards, and US GAAP; Clarkson et al, 2009; Hung & Subramanyam, 2007; Morais & Curto, 2009).

PAT and Accounting Practice

PAT has enhanced the understanding of various accounting phenomena and issues. For example, it has yielded important insights into the linkage between accounting numbers and stock returns and management's financial reporting incentives. Despite this, its contribution to accounting practice has been very limited. Accounting practice has evolved over hundreds of years through the interplay of a myriad of factors (Edwards, 1989) and the process of change in accounting practice has been slow.

Findings of positive accounting research, however, have informed debates on important accounting issues. For example, positive accounting research has helped shape the recent fair value debate (Barth et al., 2001; Holthausen & Watts, 2001). The fair value debate centers on whether fair value should be mandated as a measurement attribute in financial statements. The debate on market value is actually very old (Chambers, 1966; Ijiri, 1975; Littleton, 1953; MacNeal, 1939; Paton & Littleton, 1940). Empirical evidence, however, now exists on the pros and cons of fair value measurement. For example, the value relevance literature has documented that fair value of assets is value relevant in some settings (American Accounting Association Financial Accounting Standards Committee, 2005; Landsman, 2007). On the other hand, such accounting sources argued that fair value is a soft measure

especially when it is measured by reference to models and it is easy to manipulate fair value estimates. The PAT literature documents that management manages reported earnings to serve its purpose (Watts & Zimmerman, 1986). More recently, studies document that management manipulates fair value estimates. For example, Benston (2006) provided evidence on fairly extensive use of fair value by Enron and argued that misuse of fair value by management contributed to its demise. Byrne, Clacher, Hillier, & Hodgson (2008) have reported substantial variations in assumptions – discount rate, wage growth, expected return on equity, discount rate spread and equity return spread – used in fair value accounting for pensions in the UK. They have further suggested that the variations in assumptions are related not to economic fundamentals but to management's motives to inflate income from pension scheme assets. Similarly, the PAT literature has informed the intangible assets debate, which centers on whether internally generated intangibles should be recognized in financial statements. The value relevance literature has suggested that disclosure of intangibles in financial statements is value relevant. These findings have served as the basis for the proposal that the current accounting for intangibles be changed (see, for example, Lev & Zarowin, 1999; Lev, 2001).

Further, results in PAT have suggested situations in which management is likely to manage earnings. For example, earnings are managed when management's bonus depends on reported earnings (Healy, 1985), when firms are about to violate debt covenants (Duke & Hunt, 1990; Press & Weintrop, 1990), when current year's earnings is likely to fall short of certain benchmarks (e.g., last year's earnings, avoiding loss, and securities analysts' forecasts; e.g., Burgstahler & Dichev, 1997), when companies issue shares (Teoh et al., 1998), when there are changes in management (Pourciau, 1993). Auditing standards require the auditor to identify and assess risks of material misstatements in financial statements (e.g., International Auditing and Assurance Standards Board [IAASB], 2009). These findings may help the auditor identify situations of possible earnings manipulation.

Difficulties of PAT

In pursuing accounting research in the mould of science, PAT has faced two difficulties. First, there is a long-running debate on whether the methodology of the natural sciences is appropriate for social sciences. Durkheim (1964) believed that the methodology of natural sciences can be used to study social phenomena. He treated social phenomena as things and argued that they be treated as things. Thus, they can be studied objectively as external things. On the other hand, Lessnoff (1974) believed that the model of physical sciences is not appropriate for social sciences in several aspects. He argued that to see an event as a human action, it is necessary to interpret empirically observable behavior in terms of mental categories. It is the subjective aspect of behavior, not its physical aspect, which provides meaning to an action. Consistent with the view of Lessnoff (1974), both Whitley (1988) and Mouck (1990) argued against the reliance of accounting researchers on the philosophy of natural science.

One major question that PAT researchers seek to answer is why managers make accounting choices as they do. According to intentionalism, the explanation must be couched in terms of the mental processes of the agent (i.e., the manager, Fay, 1996). The explanation must be couched in terms of beliefs and reasons that weighed in the mind of the manager at the time of making accounting choices. The validity of explanation does not depend on the regularity of the particular accounting choice behavior in the same situations by the agent himself or herself and others (Lessnoff, 1974). This is because the human being does not always resort to the same action in the same situation. Two persons can take two different actions in the same situation and the same action in different situations.

The methodological position of PAT researchers is similar to the behaviorist position. The idea is that mental processes can be defined in terms of observable behavior. This methodological position underlies earnings management research. For example, when empirical research finds that managers tend to shift income from future periods to the current period when the conditions in the debt covenant reach their limit, the assumption is that the tightness of the conditions caused the current period income-increasing accounting choices (Duke & Hunt 1990; Press & Weintrop, 1990). Watts and Zimmerman (1986) emphasize large sample and statistical methods.

However, using large sample and statistical methods cannot fully resolve the problem raised by Fay (1996) and Lessnoff (1974). For example, earnings management research has relied on separating discretionary accruals from non-discretionary accruals and designed various regression models to

estimate non-discretionary accruals. The predicted magnitude of accruals from the models has been treated as non-discretionary accruals and the error term from those regression models has been interpreted as discretionary and, hence, opportunistic (Ball & Shivakumar, 2006). The validity of the interpretation of the error term as discretionary and opportunistic depends on the assumption that the relationship between accruals and model variables is mechanistic, which is untenable. Accounting standards (e.g., International Accounting Standards Board [IASB], 2009) recognize that management uses its judgments and estimations in the accounting process.

Second, the generalizability of PAT hypotheses is limited by accounting environments and time. For example, the three widely tested hypotheses of earnings management (i.e., the bonus plan hypothesis, debt-equity hypothesis, and the political cost hypothesis) have particular institutional environmental backgrounds and may not be equally valid in all cultures (Sunder, 1999; Sawabe & Yamaji, 1999). Ali and Hwang (2000) found that value relevance of earnings and book value of equity depended on country-specific factors. More recent research has found that earnings quality depends on institutional factors such as ownership structure, tax-book conformity, importance of the stock market in the country's economy, rule of law, etc. (Ball, Robin, & Wu, 2003; Soderstrom & Sun, 2007). Begley and Freedman (2004) found that the role of accounting numbers in public debt contracts changed during the 1975-2000 period. The frequency of accounting-based restrictions on dividends and borrowings declined significantly from the 1975-1979 sample to 1999-2000. Thus, in contrast with natural science, the generalizability of PAT is limited by institutional environments and time.

PAT: Normal Science or Extraordinary Science?

According to Popper (1959), science as practiced by scientists is extraordinary in nature in that scientists constantly attempt to refute theory. On the other hand, Kuhn's (1996) position was that *normal science* constitutes most of the scientific activity of the scientific community. It is to be noted that Popper (1970) acknowledged the existence of normal science. However, his attitude towards normal science was strikingly different from Kuhn's. While Kuhn viewed normal science as essential to scientific progress, Popper considered the uncritical attitude of normal scientists unfortunate.

The brief sketch of the development of PAT drawn in section 2 seems to suggest that what Kuhn (1996) called normal science characterizes the development of PAT in important aspects. According to him, normal science involved detailed efforts to articulate the paradigm with the aim of improving the match between it and nature. He argued that a paradigm would always be sufficiently imprecise and open-ended to leave plenty of that kind of work to be done. Kuhn depicted normal science as a puzzle-solving activity governed by the rules of the paradigm. The puzzles are of both a theoretical and experimental nature.

Kuhn (1996) asserted that normal scientists must be uncritical of the paradigm in which they work. It is only by being so that they can concentrate their efforts on the detailed articulation of the paradigm and to perform esoteric work necessary to probe nature in depth.

PAT has defined the legitimate problems and methods for the researchers. The problems that concern the positive researchers are the following: Why does management choose certain accounting methods, not others? Why does management switch from one accounting method to another? What incentives and constraints does management face in making accounting choices? Do accounting earnings contain information for stock pricing? These questions have occupied the positive accounting researchers for the last four decades.

Watts and Zimmerman (1978) propagated the idea that management's incentives determined their lobbying position on an accounting standard. Later researchers expanded this idea and developed many hypotheses linking management's incentives and his or her accounting choice behavior. Since 1978, PAT researchers have engaged themselves in the expansion and articulation of this theory.

Two examples illustrate the above point. The first one is the measurement of the dependent variable (i.e., accounting choice by management) in studies of earnings management. Early researchers (e.g., Deakin, 1979; Hagerman & Zmijewski, 1979; Dhaliwal, 1980) investigated the choice of a single accounting procedure (e.g., depreciation methods, inventory costing methods) at a time. This led to the

criticism that managers manipulate earnings numbers not through a single accounting procedure but through a number of accounting procedures that are available to management. Zmijewski and Hagerman (1981) improved upon previous studies by investigating a portfolio of accounting procedures. Healy (1985) went further and used accounting accruals as the dependent variable to capture the effects of a host of discretionary decisions – both accounting and real – by management. While accruals provide a summary measure of managerial discretion and are possibly an improvement over previous studies, it suffers from certain shortcomings (Kaplan, 1985). Healy (1985) uses total accruals as a proxy for discretionary accruals. Researchers (e.g., Kaplan, 1985; McNichols & Wilson, 1988) have asked whether total accruals are all discretionary in nature. This then engages positive researchers to design better models of discretionary accruals. DeAngelo (1986), Dechow & Dichev (2002), Dechow & Sloan (1991), Dechow, Sloan, & Sweeney (1995), Jones (1991), Kothari, Leone, & Wasley (2005), and Teoh et al. (1998) have developed different models of discretionary accruals.

Secondly, as mentioned earlier, the three most tested hypotheses are the bonus plan hypothesis, the debt-equity hypothesis, and the size hypothesis. Early studies used crude proxies of variables representing managerial bonus, debt covenant constraint, and political cost. However, as time passed, researchers refined both theory and the variables. For example, early researchers used a dummy variable to represent the existence of bonus plan to test the bonus plan hypothesis. Later researchers (e.g., Healy, 1985) examined the details of bonus plan and generated hypotheses linking bonus plan details and direction of earnings management. Similar efforts are extant (e.g., Duke & Hunt 1990; Press & Weintrop 1990) in articulating the debt-equity hypothesis. Furthermore, early researchers (e.g., Watts & Zimmerman, 1978) used size as a proxy for political cost. This was criticized on the ground that size might be a proxy for variables other than political cost (Watts & Zimmerman, 1990). Later studies examined managers' accounting choice behavior in response to situations that reflect firms' sensitivity to specific political situations. Jones (1991) investigated the accounting choice behavior of managers of domestic producers that would benefit from import protection.

The above examples illustrate (a) how one study built on previous studies and (b) how PAT defines the particular questions addressed. These examples also illustrate that while PAT researchers have been committed to the basic framework for investigating accounting choices (i.e., management incentives explain accounting choices), they have been critical within that framework. Thus, they have made constructive criticisms of colleagues' works and engaged themselves to developing better models.

Role of Anomalies

Popper (1959) gave one of the most famous accounts of science. He was a falsificationist. Lakatos (1970) described three brands of falsificationism: dogmatic, naive and sophisticated. Dogmatic falsificationism says that all theories are conjectural and science cannot prove; it can disprove. Proponents demand that once a theory is disproved, it must be unconditionally rejected. This means that science grows by the repeated overthrow of theories by hard facts (Lakatos, 1970). Naive falsificationism is similar to dogmatic falsificationism except that some methodological decisions⁷ need to be taken in naive falsificationism. Lakatos (1970) mentions two characteristics common to both dogmatic and naive falsificationism: (a) a test is – or must be made – a two-cornered fight between theory and experiment and (b) the only interesting outcome of this confrontation is refutation of the theory. PAT researchers do not subscribe to this methodological dictate of falsificationism.

PAT has so far emphasized verification. Evidence consistent with hypotheses has been taken to lend support to the hypotheses. From a logical viewpoint, a hypothesis cannot be necessarily true just because it accords with facts (Blaug, 1992). While consistent evidence lends a certain degree of support to hypotheses, it need not necessarily entail the truth of the hypotheses. Watts and Zimmerman (1990) implicitly recognized this. Despite the corroborating evidence accumulated in support of PAT, they recognized problems of interpretation of the empirical regularity observed in positive accounting research. Especially, they argued that omitted variables may be responsible for the evidence gathered in accounting choice studies. Thus, it may be erroneous to attribute this regularity to the contracting variables related to management compensation, debt, and the political process⁸.

Some (e.g., Christenson, 1983; Sterling, 1990) have criticized PAT because it does not follow the methodological dictates of Popper. This criticism is misplaced. Anomalies abound in science (Lakatos,

1970). Chalmers (1999) is probably correct when he says that theories that are considered as being among the best examples of scientific theories would never have been developed if they had been rejected in their infancy. In a similar vein, Watts and Zimmerman (1990) argued, in response to Hines' (1988) criticism of laxity in Watts and Zimmerman's 1978 paper, that if all the methodological dictates were applied to a single paper, no research paper would ever be published. Popper (1970) later admitted that dogmatism had an important role to play in science. If scientists gave in to criticism too easily, they should never find out where the real power of theories lay.

Watts and Zimmerman (1986) proposed that anomalies need not lead to the abandonment of a theory. Watts and Zimmerman (1990, p. 150) claimed that a theory should not be discarded merely in the presence of inconsistent observations. No theory ever predicts all the phenomena successfully. The data-theory fit is never perfect. What leads to the abandonment of a theory is the emergence of an alternative theory with greater explanatory power (Watts & Zimmerman, 1990, p. 140). In an important sense, this position resembles both Kuhn's (1996) and that of sophisticated falsificationism. Kuhn's (1996) study of the history of science suggested that a paradigm is declared invalid when an alternative paradigm emerges to take its place (p. 77). The decision to abandon a paradigm is simultaneously a decision to accept an alternative paradigm. That decision involves a comparison between alternative paradigms and between the paradigms and nature. According to sophisticated falsificationism, a scientific theory T_0 is falsified if another theory T_1 has emerged with the following characteristics: (a) T_1 has excess empirical content over T_0 ; that is, T_1 predicts novel facts, (b) T_1 explains the previous success of T_0 , and (c) some of this excess empirical content of T_1 has been corroborated (Lakatos, 1970, p. 116).

Accounting-based stock market anomalies illustrate the attitude of PAT researchers towards anomalies. Ball and Brown (1968) reported evidence on post-earnings-announcement drift (PEAD), and since then, other studies (e.g., Sloan, 1996; Hirshleifer, Hou, Teoh, & Zhang, 2004; Taffler, Lu, & Kausar, 2004) documented other accounting-based anomalies. As Nichols and Wahlen (2004) noted, PEAD remains one of the most puzzling anomalies in accounting-and finance-based capital market efficiency tests. Yet capital market-based accounting researchers have not abandoned the efficient market hypothesis. Rather, researchers have looked at the data and statistical tests more critically, redefined market efficiency, and suggested alternative explanations for anomalies and further research opportunities. Basu (2004) is an example.

Every observed fact is fact in the light of an *interpretative theory* (Lakatos, 1970). When any observed fact clashes with a theory, that clash may be between the theory under test and the interpretative theory. Thus, the clash between facts and the theory need not indicate that the theory under test be eliminated; rather, it may indicate the need for reviewing the interpretative theory. Both Lakatos (1970) and Feyerabend (1993) have claimed that this happened in the history of science.

As discussed earlier, accruals models have been used to estimate discretionary accruals, which have been used as the dependent variable in earnings management research. Thus, accruals data are discretionary in the light of a theory that underlies the particular accruals model. If discretionary accruals data fail to confirm earnings management, the failure need not indicate that the theory under test (i.e., earnings management) be rejected; rather, it may indicate the need for review of the accruals models. Indeed, PAT researchers have invested considerable research efforts in constructing different models of accruals. This investigation of accruals models actually started without any significant anomaly. In fact, Healy's 1985 paper, which used accruals in investigating earnings management for the first time and came up with evidence consistent with his hypotheses, caused Kaplan (1985) to raise questions about the appropriateness of Healy's accruals model.

Lakatos (1970) admitted that there have been crucial experiments in the history of science and those experiments led to the rejection of a theory. However he showed that the elimination process is slow and sometimes takes decades. He further argued that crucial experiments become crucial after the emergence of a better theory (Lakatos, 1970, pp. 158-59). Hindsight plays an important role in this regard. Furthermore, it has been noted in the history of science that, with the passage of time, anomalies have turned into corroboration of the theory under test (Lakatos, 1970).

The response of positive researchers to the failure of early studies to discriminate between the

competing hypotheses – the no-effects hypothesis and the mechanistic hypothesis – illustrates the attitude of positive researchers towards data and theory. The failure of early studies to discriminate between the competing hypotheses did not lead them to reject the EMH. This is because tests of the no-effects hypothesis are tests of the joint hypotheses of EMH, CAPM, and zero contracting costs (Watts & Zimmerman, 1986, p. 74). The failure might be due to the empirical non-descriptiveness of any one assumption – EMH, CAPM, or zero transaction cost. As noted earlier, instead of rejecting the EMH and CAPM, researchers started to raise questions about the descriptive validity of zero transaction costs and finally dropped the assumption. This suggests that positive researchers do not regard empirical evidence at a point in time as the final arbiter of a theory. Both data and theory have influence over each other. Complex value judgments enter the process of theory evaluation.

Dropping the zero contracting cost assumption, in fact, led Mouck (1990, pp. 236-237) to consider PAT as resembling the Lakatosian research program. The validity of this argument is suspect, because the dropping of the zero contracting costs assumption led to the emergence of a research program distinct from capital market-based accounting research. The new line is the research in accounting choices. It is true that dropping the zero contracting costs assumption enables positive researchers to explain accounting choices. The two research programs, however, address different issues. The new research programs address different questions, let alone explain the success of the capital market-based accounting research program. This developmental pattern does not fit the Lakatosian program, because, according to this program, adjustments are made in the protective belt to accommodate new facts (Lakatos, 1970, pp. 133-37). After adjustment, the Lakatosian research program continues to explain the unrefuted content of the earlier version of the theory.

Choice of Theory

Watts and Zimmerman's (1990, p. 140) position that a theory be abandoned when an alternative theory with greater explanatory power emerges indicated that the competition between rival theories could be decided rationally. The theory with greater explanatory power is selected. This indicates that PAT researchers consider knowledge cumulative in nature. Popper (1970, pp. 56-57) subscribed to this idea. He believed that a critical comparison between competing frameworks was always possible. On the other hand, Kuhn suggested that rival paradigms are incommensurable. Thus the debate over rival paradigms cannot be settled by logic or experiments alone (Kuhn, 1996, pp. 148-150). Persuasion is used to convert the supporters of the old paradigm to the new one (Kuhn, 1996, p. 154). One of the most important features of Kuhn's account of science is that science is not cumulative in nature. This contrasts with the PAT researchers' position.

The problem with the above position of PAT on theory choice is that probably no theory with greater explanatory power emerges all of a sudden. The explanatory power that PAT now has is the result of four decades of research efforts. Thus, if the relative explanatory power of competing theories is to be made the arbiter in theory choice, that has to be applied not at the initial stages but at some later stages. So, three relevant methodological questions are (a) how to decide rationally whether to give chance to a new theory or allow it to die away in its infancy, (b) at what stage of theory development the relative explanatory power criterion is to be applied, and (c) how to choose between two theories when the new theory explains some aspects of the old theory and some new phenomena not explained by the old one. The two diagrams in Figure 1 illustrate the third situation. Doubtless to say, a rational decision is much easier to take in Situation A than in Situation B.

Situation B can be illustrated with the help of the legitimacy theory and the stakeholder theory. These theories have been used to explain social and environmental disclosures by an entity (Deegan, 2007). The political cost hypothesis can also be used to explain social and environmental disclosures. For example, using the agency theory framework, Ness and Mirza (1991) found a positive association between environmental disclosures in annual reports of large UK companies and the oil industry. Thus, the legitimacy theory and the stakeholder theory may be considered competing theories of PAT. However, no theory explains fully the phenomena explained by the other theory. Furthermore, as Deegan (2007) notes, the theories in question are based on different assumptions. Thus, the relative explanatory power cannot be used to choose from among these theories at this stage.

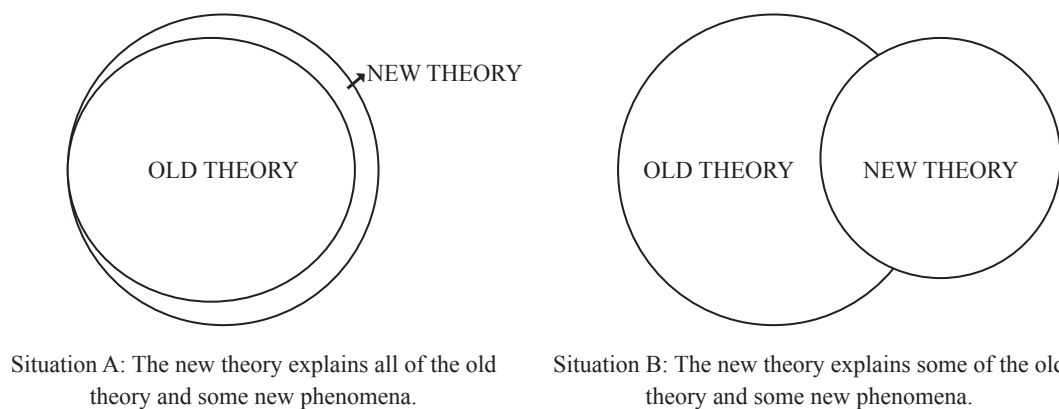


Figure 1. Two possibilities of the relation between an old, established theory and a new one.

Conclusions

This paper examines the development of PAT and compares it with three standard accounts of science: Popper (1959), Kuhn (1996), and Lakatos (1970). This paper shows that PAT's methodological positions fit none of these theories fully. Rather, PAT contains elements of all three.

The analysis in this paper finds that the development of PAT over the last decades may be characterized by what Kuhn (1996) calls normal science. While PAT researchers have remained committed to the basic framework for investigating accounting choices (i.e., management incentives explain accounting choices), they have been constructively critical of colleagues' works.

PAT holds that data are not the final arbiter of a theory. Rather, there is a complex interplay between theory and data. Thus, anomalous evidence does not automatically lead to the rejection of a theory. A theory is to be abandoned only when a competing theory with greater explanatory power emerges. Therefore, the choice between theories is rational and accounting knowledge is cumulative in nature.

This paper, however, argues that PAT's methodological position on theory choice runs into difficulty. The standpoint is that holding that a theory is replaced when a competing theory with greater explanatory power emerges does not resolve the theory choice problem rationally. If no theory with greater explanatory power emerges, the criterion of greater explanatory power cannot be applied at the initial stage of development of a theory. Rather, this criterion is to be applied at some later stages of development of the new theory. Thus, three important methodological questions are (a) how to decide rationally whether to consider a new theory, (b) at what stage the criterion of greater explanatory power should be applied to choose from among competing theories, and (c) finally, how to choose from among two competing theories when the phenomena explained by one theory are not a subset of the phenomena explained by the other. PAT proponents are silent on these issues.

This paper also notes that despite the proposal of the PAT proponents to study accounting in the mould of natural science, PAT could not emulate the success of natural science. First, it is difficult to determine reliably the intention of management making accounting choices. Second, though the basic tenet of earnings management (i.e., management incentives influence accounting choices) seems to be quite general, the generalizability of specific hypotheses that PAT examines is limited by institutional environments and time. As a result, as long as differences in institutional environments persist in the world, accounting may not see a global PAT. However, this is not unique to accounting. It applies to social sciences as well.

This paper contributes to the methodology of accounting literature. First, it compares the development of PAT with three standard accounts of science. Contrary to Mouck (1990), it shows that PAT fits neither of these accounts neatly. Rather, its methodological positions reflect elements of all three accounts. Second, it identifies methodological gaps in PAT. The criterion of theory choice in PAT runs into difficulties. Third, it shows that despite the fact that PAT has been following the methodology of natural sciences, PAT has not been able to emulate the success of natural sciences so far. The generalizability of PAT has been especially limited by the institutional environments of accounting and time.

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Footnotes

- 1 See, for example, Chambers (1966), Ijiri (1975), Littleton (1953), MacNeal (1939), and Paton and Littleton (1940).
 - 2 This section is largely based on Watts and Zimmerman (1986).
 - 3 Watts and Zimmerman (1986, Chapter 3 and 4) review some early studies of this literature.
 - 4 The no-effects hypothesis says that stock price changes are not associated with voluntary changes in accounting procedures unless they have any cash flow impacts. This hypothesis is based on EMH, CAPM, and zero contracting costs. On the other hand, the mechanistic hypothesis posits a mechanical relation between accounting changes and stock price changes. This hypothesis states that managers can systematically mislead the stock market by manipulating the earnings number through accounting changes. The no-effects hypothesis, on the other hand, says that the market can see through the earnings number. See Watts and Zimmerman (1986, pp. 72-76).
 - 5 Contracting costs denote the amalgam of transaction costs, information costs, agency costs, renegotiation costs, and bankruptcy costs (Watts & Zimmerman, 1990, pp. 134-135).
 - 6 Under the EMH and CAPM regime, accounting is mere form and does not affect cash flow except the switch to the LIFO inventory method that affects tax in the USA.
 - 7 One such decision is to demarcate the theory under test from the unproblematic background knowledge. (Lakatos, 1970, p. 107).
 - 8 See Watts and Zimmerman (1990) for this and other criticisms of the positive accounting literature.
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