ABSTRACT: In this article the PAT and its conformity with natural sciences is studied. PAT has been one of the most effective accounting research programs over the past four decades. One of the reasons of the success of Watts and Zimmerman (1986) in population and legitimization of their approach was that their view about accounting theory was the same as the one they had about science. Therefore, it is important to examine to what extent accounting has been successful in conformity with Natural Sciences and why it could not imitate the successes of the natural sciences. This paper presents the failure of PAT to follow valid scientific justifications. In contrast, the PAT encompasses all the elements of three valid scientific justifications. Finally, this article will identify some of the methodological gaps of the PAT.

Keywords: PAT, philosophy of science, methodological issues

INTRODUCTION

This paper presents a study of the PAT and its conformity with natural sciences and compares it with three major scientific justifications. There are different opinions about the benefits of PAT. If the presented definition of accounting theory (e.g., accounting theory seeks to explain and predict accounting and auditing practice) in Watts and Zimmerman (1986), means the PAT, accounting research choose PAT make its auditing practices. At the same time they are also wanted to explain the empirical literature on economic accounting; also in addition to the selection of accounting studies, they wanted to study the market based accounting. They pointed out that initially Ball and Brown (1968) made the positive research in accounting popular, the proposal that includes both PAT in market-based accounting research and the study of the choice of accounting. This article assumes that PAT includes both research programs. These findings are consistent with Watts and Zimmerman (1986), when they used the so-called positive term in order to distinguish it from the normative accounting theory (NAM).

PAT is one of the most effective accounting research programs over the past four decades. This theory led to much empirical research on the relationship between accounting numbers, price and return on equity, as well as the factors affecting the choice of accounting made by the management. It also led to the publication of a number of accounting magazines, the most popular of which include the Journal of Accounting and economics. Brain, Jones and Pandelbry (1996) in a survey of perceptions of the University of Great Britain of the quality of the journals found that four of the top accounting journals are as follows: Journal of Accounting and Economics, Journal of Accounting Research, Accounting Evaluation, and Journal of Accounting, Organizations and the Community. The published articles in the top three magazines were mainly positive. A wide number of top accounting journals published articles on these two paradigms and the PAT priority at universities in the United States and other universities is imply the priority of PAT. Therefore a number of judged research papers, the number of magazines and the priority of PAT in doctoral programs indicate its importance.

Before the advent of PAT, the normative accounting theory was the major area of research in accounting. Normative accounting theorists were busy with developing accounting principles. The main focus of the researchers was to identify and measure the results in accounting. Certain accounting questions were asked and answered to by normative accounting theorists. What questions should be dealt with normative accounting theory? PAT addressed specific questions. For example, PAT will respond to the questions whether the accounting information is useful for the stock market, what types of accounting basis should be used by the management and why.

Therefore PAT offers a major change in the pattern of accounting theories. An important comparison that led to the legitimacy and promotion of PAT made by Watts and Zimmerman the (1986) was their uniform viewpoint of their theory in science. They referenced various philosophies of the science writers and claimed that their theory
is similar to the view existing in science and scientific methods justification. So given that PAT has been in favor of accounting theorists, it is important to examine to what extent the PAT has been successful in modeling the natural sciences and restrictions there were in this way. It is also important to re-examine the methodological position of PAT. It would be interesting to see how the PAT model is compared with the scientific justifications used by Watts and Zimmerman to legitimize and promote their theory. This comparison advances our understanding of the development of PAT and the remaining gaps in methodology.

The present article focuses of Watts and Zimmerman book and empirical literature on accounting choices and capital market oriented accounting research. Empirical literature on accounting analyzes the development of accounting based on the capital market in the past four decades. The article discusses three related methodological outcomes: a) how PAT improved over time b) the role of anomalies in the PAT, and c) how a theory is chosen among conflicting theories.

**Development of PAT**

PAT began during the 1960s with analyzing some underlying guidelines of normative accounting assumptions.

The first set of theories analyzed the relationship between accounting profit and stock prices. The results showed that the amount of benefit reflects the criteria for the valuation of stocks (such as cash flow and risk). This issue, according to Watts and Zimmerman (1986) claims, weakened the claim about normative accounting literature as accounting earnings is meaningless because the amount is calculated using the multiple valuation. The second set of studies tried to distinguish between competing hypotheses: non-impact hypothesis and mechanical theory. The evidence was mixed in these studies and could not distinguish between competing hypotheses successfully. The above set of data was used in the efficient market hypothesis and capital asset pricing model as the basis of the assumptions. In addition, the studies assume that the cost is zero. Generally the studies increased doubts about the experimental descriptions of underlying normative guidelines of the assumptions during 1960s as follows:

- There is only one source of information about the company,
- The amount of profit is meaningless because it has not been prepared in accordance with a base unit, and
- There is a possibility that stock market may be misleading due to the manipulation of the value of profits through accounting choices.

The content based analysis of information indicated that it is unlikely that these descriptive assumptions are based on real world. Efficient market hypothesis suggests that there is a competition for information. There are alternative sources of information about the company, including information published by the management and interviews made with staff by the analysts. The relationship observed between unexpected revenues and abnormal returns show that the amount of profit reflects the criteria for the assessment of the stock even though the unit is unique. In addition, in the efficient market hypothesis and the capital asset pricing model they showed that it is impossible for the market and accounting changes to be systematically misleading. The market considers difference between effective and ineffective accounting changes on cash flow. Thus, it seems unlikely that the mechanical theory is a description of the real world.

As mentioned above, early studies failed to successfully distinguish between the Non-impact hypothesis and the mechanical theory. This did not result in rejection of Non-impact hypothesis. In fact the result led the researchers to investigate the methodological aspects of it and conduct tests about the empirical validity of an important assumption (ie, the cost of the contract is zero). This has led to progress in the accounting research. It has been a long time that the costs of contract are not zero. Accounting researchers left the zero cost of the contract and information behind.

These progresses have opened a window on to explain and predict changes in accounting procedures in all companies. The main idea support the hypothesis that the company is a series of contracts and the accounting procedures is an integral part of the contracts. Accounting figures are used for writing, supervision, and execution of contracts. In this method it was observed that accounting methods could impact the value of the company through affecting contracts. Accounting was not considered merely under the efficient market hypothesis and the capital asset pricing model. Abandoning the zero cost of the contract showed that accounting methods are capable of affecting the cash flows of the contract's parties. This creates an incentive for contract's parties to affect accounting methods.

Anyway, the idea evaluated the initial empirical studies on accounting choices, the impact of variables related to bonus programs based on profit-, debt, and political processes affecting the company. Three main hypotheses were tested as follows:

- A) bonus plan hypothesis
- B) debt - equity hypothesis
- C) political spending hypothesis
The bonus plan hypothesis states that companies by selecting the accounting methods use bonus plans to increase the income of the current period. Debt - equity hypothesis says that companies with a higher ratio of debt to equity select the accounting procedures for the transfer of income from future periods to the current period. The political spending hypothesis suggests that corporations use accounting procedures for the transfer of income from current period to the future periods. In early studies the size was used as a substitute for political variable. The base of all these assumptions in the non zero cost of contract. Generally the empirical evidences are consistent with the hypothesis. Another stream of research examined the impact of mandatory and optional accounting changes on stock prices (Watts and Zimmerman, 1986, Chapter 12).

The initial studies of were developed to examine earnings management in various situations. For example, a study examined earnings management on special events. Other studies still analyze the relationship between corporate governance and earnings management features.

On the other hand, capital market based accounting research developed to examine the value of accounting values. This branch of market-based accounting research is motivated by considerations of capital standards development. For example, market-based studies evaluate whether the fair value is the same as value of different formulations. More recently, empirical research reported the value of different sets of GAAP accounting values.

**PAT and accounting procedures**

PAT improved the perception of phenomena and different accounting results. For example, the theory created important insights about the relationship between accounting value and Return on equity and the motivations of management financial reporting. However its participation in the accounting procedures has been very limited. The accounting practices evolution through the interaction between many factors and the process of change in accounting policies has been very slow. However PAT research findings reported important debates about accounting publications. For example, PAT research helped to shape debate on current fair value. Discussions related to the fair value focused on whether the fair value must be viewed as a measurement feature in financial statements. The discussion about the market value is too old. However, there are current empirical evidences on the positive and negative aspects of fair value. For example, the literature has demonstrated the fair value of assets is the same as related value in some standard formulation. On the other hand, such accounting sources have argued that the fair value is a poor measure especially when they can be easily manipulated by recommended models as simple as the estimates of fair value. PAT literature proves that the managers manage the reported earnings to manage their reward goals. Recent studies have proved that the management manipulated the estimates of the fair value. For example Benston (2006) prepared evidence of the widespread use of fair value by Enron Co. and argued that the fair value is abused by the management and this caused its destruction.

In addition, the results obtained in PAT has suggested situations in which the managers manage earnings. For example, the earnings is managed when the managers rewards is based on the reported earnings (Haley, 1985), the companies violate the debt agreements when the current benefit is less than a certain amount, or when the companies have released stock data or when is a change in management. Auditing standards asks the auditor to identify and evaluate the risks of important distortions in the financial statements. These findings may help to identify conditions that earnings may be manipulated.

**PAT Problems**

In accounting studies in the form of science, PAT is faced with two problems. First, there was a prolonged debate about whether natural science methodology is appropriate for social science. Durkheim (1964) believed that methodology of the natural sciences can also be used to study social phenomena. On the other hand Lesnof (1974) believed that the material models of science are not appropriate to study social sciences in various aspects. He argued that in order to view an event as a human behavior, it is essential to interpret the observable behavior experimentally based on mental categories. It is the subjective aspect of behavior not its material aspects that provides concept for a behavior.

A major question that PAT researchers are looking to answers to was why the managers conduct the accounting selecitions as they understand the. Due to the international nature, the interpretation should be expressed in terms of managers' certain mental processes. Interpretation should be expressed based on the beliefs and reasons evaluated in the minds of the director at the time of making accounting choices. The validity of interpretation does not depend on the order of certain accounting behavior in similar circumstances by the administrator or others. The reason is that man does not always provide the same behavior in similar
circumstances. Two people can behave differently in similar situations and present similar behavior in different situations.

The condition of PAT researchers’ methodology is similar to the behavior. The idea is that mental processes can be defined in terms of observable behavior. This type of methodology sets the grounds for earnings management research. For example, when empirical research finds managers who need to transfer income from future periods to the current period as the debt reach their maximum level, it is assumed that some challenges lead to the choice of increased current period accounting earnings. Watts and Zimmerman (1986) emphasized on large samples and statistical methods.

However, using large samples and statistical methods cannot solve the problems raised by FI (1996) and Lsnvf (1994) completely. For example earnings management study relies on the separation of discretionary accruals from non-discretionary accruals and multiple regression models designed to estimate non-discretionary accruals. The importance of predicting accruals from the models as the non-discretionary accruals and the error factors of those regression models which has been described have been acted as discretionary.

Generalizing the PAT hypothesis is confined with the environment and time of accounting. For example, the three hypotheses of earnings management (bonus plan, debt to equity and the political spending hypotheses) examine certain areas of the organizational environment widely, and the possibility exists that any of these assumptions may not be effective equally in all cultures. Ali and Huang (2000) found that the relationship between earnings and book value of equity depend on country-specific factors. The results of the most recent research suggests that the quality of earnings depends on organizational factors such ownership structure, compliance of tax laws, the importance of the stock market in the economy and the rule of law. Begley, and Friedman (2004) found that the role of accounting figures has changed in sovereign debt contracts during 1975 to 2000. The accounting frequency based on the restrictions on the distribution of dividends and borrowings reduced significantly within 1975-1979 compared to 1999-2000. So compared to the natural sciences, generalizing PAT is limited by the environment and the time of accounting.

**PAT: natural sciences or wonderful science?**

According to Popper (1959), knowledge as experienced by scientists is unusual in nature because scientists are constantly trying to prove the opposite theory. On the other hand, the position of Cohen (1996) was that the natural science was formed based on most scientific activities of the community. It is notable that Popper (1970) acknowledged the existence of the natural sciences. However, his attitude toward the natural sciences was quite different from the attitude of Cohen, while Cohen considered natural science essential to scientific progress, Popper considered the uncritical attitude of natural scientists regrettable. According to Cohen, the natural sciences, includes detailed efforts of the paradigm expressed to improve e quality between paradigm and nature. He argued that a paradigm was always vague and indefinite enough to leave a lot of things that should be done. Cohen introduced natural science as an activity to solve the problems that are affected by rules of paradigm. The problems have both abstract and experimental nature.

PAT is defined as the methods and justifiable problems for the scientists. Issues that are related to PAT scientists include: Why management chooses some of the accounting methods and does not choose the others? Why management changes one methods of accounting to a different accounting method? What types of incentives and restrictions is the management faced when choosing accounting methods? Do the accounting earnings provide information for pricing stock? These are the questions that PAT researchers have been faced with in the past four decades.

Watts and Zimmerman (1978) developed the idea that the motivation to manage a condition defined the pressure on the accounting standard. The researchers then developed the idea and lots of theories associated with management incentive and accounting choice behavior. Since 1978, PAT researchers become engaged with the development and expression of this theory.

Two models were mentioned above. One of them was the measure of the dependent variable (for example, selecting the accounting by the management) in earnings management studies. Previous researchers analyzed picking a specific accounting method (For example, the method of depreciation, inventory costing methods) at a given time. This led to criticism that the managers do not manipulate earnings by a special accounting method that is available.

There were three hypotheses in the second pattern, as mentioned previously: bonus plan, debt- equity and the size hypotheses. The early studies applied the alternative variables of management compensation, contract debt limit and political costs. However, over time, the researchers improved the variable and theory. For example, the initial researchers using a dummy variable presented the existence of bonus program for the bonus plan.
hypothesis testing. The researchers then tested the bonus plan details and presented the hypotheses related to details of the bonus plan in the debt – equity. Similar efforts in the bonus plan exist in debt – equity hypothesis. In addition, basic researchers (eg, Watts and Zimmerman, 1978) used the size hypothesis as an alternative to the theory of the political costs. This issue was criticized based on the fact that the size hypothesis can be placed on other variables in addition to political cost. Subsequent studies tested management accounting choices in response to situations that reflect the political sensitivity of the companies under certain conditions. Jones (1991) examined the accounting choices of local manufacturer who enjoyed the government support.

The above examples show that a) How a study is created by previous studies and b) how PAT is defined and addresses specific questions. These examples also show that PAT researchers were committed to make a basic framework for examining accounting choices. For example, management incentives explain accounting choices. They criticized the framework.

Selecting the theory

The position of Watts and Zimmerman (1990, p. 140) based on the assumption that a theory stops when there is an alternative theory with the ability to further interpretation indicate that it is possible to reasonably determine the competition between rival theories. Theory is selected by higher interpretation. This shows that PAT researchers used to combine science in nature. Popper (1970, p. 56-57) agreed with the idea. He believes that a comparison between the main rival frameworks is always acceptable. On the other hand, Cohen suggested that rival paradigms are incomparable with each other. So the debate about competing paradigms results only through logic or test. Persuasion is used to convert the supports of the old to the new paradigms. One of the most important features of Cohen’s description of science is that science and nature are not combined. This vision was in conflict with the view point of the PAT researchers.

The problem of PAT researchers was in the choice of theory based on which there was no theory with further ability to interpretation that suddenly appeared. The present ability to interpret of PAT is the result of the research efforts made in the past four decades. So, if the relative explanatory power of competing theories is applied on the selection of theory, the ones that were absent it the early stages will be applied in later stages. So, three questions about methodology are: A) How to logically decide: whether give a chance to the new theory or let it go away in its early stages, b) At which stage of developing the criteria theory the relative explanatory power should be used, c) how to choose between two theories when the new theory interprets the aspects of the old theory and some new phenomena that has not been explained by the old theory. The diagrams of Figure (1) show the third condition. Undoubtedly in condition 1 a logical decision is made easier than the condition 2.

The situation b can be presented by theory of legitimacy and the stakeholders. These theories have been used by an economic unit theory to explain the social and environmental disclosure. The political cost hypothesis can be used to explain social and environmental disclosure. For example, the use of agency theory framework, (Ness 1991) provided a positive relationship between environmental disclosure and Great Britain corporate annual reports and the oil industry. The legitimacy theory and the theory of stakeholders may be considered two competing hypotheses (PAT). However, no theory fully explains the phenomena expressed by another theory. In addition, as the Digain (2007) noted the theories are based on several assumptions. Thus, the relative explanatory power can not be used to choose between theories at this stage.

![Diagram](image)

Condition A: The new theory has all aspects of the old theory and some aspects of the new theory.
Condition B: The new theory has some aspects of the old theory and some aspects of the new theory.
CONCLUSION

This paper discussed the development of PAT and compared it with three standard new reports of Popper (1959), Cohen (1996) and Lakatos (1970). This paper indicated that the PAT methodology conditions do not agree with any of these theories. Instead, the PAT contains elements of all three. The conducted analysis in this paper concludes that the development of PAT in the past decade may have been described by what Cohen (1996) calls 'natural science'. While the PAT researchers remain committed to basic framework for accounting choices (for example explaining the management motivation to make accounting choices) they have presented constructive criticism of the individuals' cooperation. PAT keeps the data that do no exist in final judgment. Instead, it is an interaction between theory and data. Thus, the unusual evidences do not automatically reject a theory. A theory is abandoned only when a competing theory with more explanatory power emerge. Therefore it is logical to choose among theories and the accounting knowledge remains in the field of natural sciences. However, the paper argues that the position of PAT methodology will face trouble in the selection of the accounting methodology. The alternative theory is that theory is replaced by a competing theory with more explanatory power when the old theory fails to solve the problems of choosing theory. If no theory with more explanatory power appears higher explanatory power criteria can not be applied in the early development stage of a theory. Instead, the criterion is used in some aspects of developing of a new theory. Therefore, there are three important methodology questions: a) how to logically decide whether a new theory is examined, b) At what point the higher explanatory power should be used to choose among competing theories and C) How to choose between two competing theories as the phenomena described by one theory are not the underlying phenomenon explained by and old theory. PAT fans are silent on these issues. The paper also notes that despite the fact that the proponents of the PAT have some proposals based on natural sciences, PAT cannot imitate the success of natural sciences. First, it is difficult to determine the intention of the management of accounting choices. Second, although it seems that the main basis of earning management (management incentive effect of accounting choices) appears to be quite broad, generalizing a special PAT hypothesis is limited to organizational environment. As a result, as long as there are corporate environment differences in the world, there is a possibility that we ignore accounting as a global PAT; however this is not limited to ac and applies for social sciences as well. This article addresses the methodology of accounting literature. First it compares the PAT with three standard reports and unlike Mac (1990) it shows that PAT is not appropriate for any of the reports. Instead, the methodology positions reflect methodological elements of all three reports. Second, this article identifies some of the methodological gaps of the PAT. The criteria for selection theory are hardly implemented. Third, it indicates that despite the fact that the PAT follows that the methods of the natural sciences, PAT has never been able to imitate the success of the natural sciences. Generalizing PAT limited to organizational accounting environments and time.

REFERENCES