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Creating a Science of Accounting: accounting theory to 1970

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This paper describes the development of what has been regarded as accounting theory concentrating largely on that in the first 70 years of the 20th century. It demonstrates that a major motivation for this theory was the generally accepted belief in the need for greater conceptual rigour in accounting theory and research. A major part of this theorising was designed to solve a major accounting problem, viz accounting in periods of changing prices, notably inflation. In examining this early theorizing the paper describes the elements of theories and their use by academic theorists, practitioner theories and theories from various committees.

The general aim of theory is to provide a reasoned basis for practice. Attempts at constructing accounting theory have been with a view to improving accounting practice. Prior to the twentieth century there were few attempts at providing an accounting "theory", the main aim being to provide instruction in accounting. However, the twentieth century can be seen as a period in which the accounting profession sought to determine a more theoretical foundation for accounting from which appropriate practice could be derived. This search took many forms from mere descriptions of extant practice to the use of highly sophisticated data collection and analysis through the use of complex tests for statistical significance as well as, at times, fiery philosophical debate. To be successful a theory must win acceptance – it must be acceptable to the vast majority of those involved with the practice of the discipline. Throughout the twentieth century there were very many attempts to develop an acceptable theory and they appeared in many different forms. This chapter is devoted to examining some of these, to determine why and how they arose and to making some assessment as to their success.

Also, as indicted in the previous chapter, in order to understand how we gain our understanding of ourselves and our environment and, therefore, how we create theories to assist us in this understanding we need to examine the origins of the terms and ideas used in the theories. Consequently we need to employ some of the tools of the historian. However, this does not imply that we merely establish a chronology – a list of dates on which events occurred – or that there is any linear cause and effect. What we want to do is to uncover the context in which the ideas arose in order to better appreciate them. In the twentieth century there were several major social upheavals which had a considerable impact on all aspects of human societies, including how accounting is practiced. Knowledge of the circumstances surrounding these social disruptions and changing practices better helps us understand our present. It does not mean we recreate the past or implement past solutions to present problems but merely that our understanding of such past occurrences *may* assist in our better appreciating the present. For example, we could ask ourselves what was the impact on accounting practice of world wars, economic

depression, increasing complexity in business ownership and control, rapidly changing information technology, economic internationalisation then globalization, the development of new financial instruments and many other things?

Early Attempts

Accounting as we know it is based on the system of recording known as double entry bookkeeping. Although accounting did exist before double entry came to be widely used, since its appearance its use rapidly spread across the world and today it is difficult to imagine accounting without it. It has been so important that, to some extent, its appearance may be viewed as the origins of modern accounting. No evidence exists that can serve to date the appearance of double entry but the oldest, surviving written record is in an appendix to a book by Fra Luca Pacioli published in 1494 and for many years he was regarded as the inventor of double entry bookkeeping and the "father of accounting". Others have argued that it existed long before Pacioli's book and had been in use outside Europe many years before it was adopted in Europe – perhaps in China, perhaps in Korea, perhaps in India or perhaps in the Arab dominated medieval world. This is not the place to enter into debate on the origins of double entry bookkeeping. However, its use in Europe since that date has been a dominant feature of the European business environment.

If we are interested in the genealogy of (modern) accounting then the adoption of double entry is a significant element in its origins. Why did double entry appear and very quickly come to dominate the spread of accounting? An accounting writer, A C Littleton, has suggested reasons for its appearance. He refers to the seven antecedents of accounting or, in other words, the conditions that arose that made it inevitable that double entry would emerge and be quickly adopted. He divided his antecedents into two groups. There were those that he classified as media, namely, writing, arithmetic, money; and those he referred to as institutional, namely, commerce, capital, private property and credit. All have become so much a part of our everyday life now that we take them for granted but there was a time when they did not exist as we now know them. All were either emerging or becoming more important in the fifteenth century Italian states – in the Early Renaissance – at the beginnings of modernity. Previts and Merino in a table in the Preface to their book indicate that most of Littleton's antecedent existed in some form well before this time (1998, p xvi). However, what is important is that they coalesced - came together - around this time to provide an impetus for the development and growth of trade and commerce that forms the basis of the "modern economy".

The Growth of the Modern Economy

As indicated in the last chapter, the terms modern, modernity and modernism are constantly debated. In everyday use modern usually means up to date with recent developments, whether it be fashions, music, technology or ideas. If it is used in reference to art it often and popularly means non-representationlism, such as abstract art or art since the middle of the nineteenth century. However, in respect of the history of ideas the term modernity is used to indicate the break from traditional societies brought about by the Renaissance or more particularly the Enlightenment. Traditional, feudal

societies are perceived as having hindered economic development. Modernity is viewed as having brought about the radical changes in economies which resulted in industrialisation, specialization and the greater and more creative use of capital resulting in the development of a system that promoted the effective use of capital – capitalism. Double entry bookkeeping was a device that facilitated the growth and expansion of economic modernity. This is largely due to the fact that it is an ordered system of maintaining financial records and was able to provide decision makers with information vital to the maintenance of businesses and later, as it developed into accounting, it enabled the establishment of systems of (cost) control. The Enlightenment ideals were an essential foundation for modernity and many aspects of social activity went hand in hand. For example, the growth of (modern) science produced new technologies that could be exploited economically, hence the growth of trade and commerce and the expansion of capital needed to develop the new technologies.

The Enlightenment influenced very many aspects of societies. Some of the influences were very positive but some were not so desirable. So, while in some parts of the world the new ideals led to political revolutions (for example, in France and the United States of America), in Great Britain, a "nation of shopkeepers" was bringing about an industrial revolution which gradually spread to other parts of the world. The legacy of the Enlightenment has been constantly debated through the centuries by scholars with very diverse interests. What is certain is that, through the progress of modernity, it has greatly influenced all aspects of life and continues to do so today.

The Birth of Modern Accounting?

While this is a rather simplified description it draws attention to some of the implications of the spread of modernity. Whether double entry bookkeeping resulted from the growth in industrialization and the development of business organization or whether bookkeeping made possible the growth of industrial development and business organizations has been debated in other places. What is clear is that the ordered system of double entry bookkeeping was extended with new and additional developments to accommodate the expanded forms of business and economic activity and organizational structures. It could be claimed that at this stage bookkeeping became "modern" accounting. That is, previously bookkeeping fulfilled a stewardship function in that it made possible the recording of the results of economic activity to indicate to the providers of the capital the success or failure of various ventures. However, with the growth of factories and industry financial information was used to assist in everyday decision making – what was the cost of material, the cost and productivity of labour, how were price and cost related (break-even analysis)? Gradually these activities became part of what was regarded as accounting – information of a financial nature became the domain of the bookkeepers and later accountants.

It should be noted that manufacturing and industrialization had existed earlier and it is claimed that

> . . . a market-based economy led to the development of techniques for gathering cost information for manufacturers in, for instance fourteenth-

> century Italian, English, Flemish and German commerce. (Chatfield and Vangermeersch, 1996, p 180)

Nevertheless, it was the greatly increased manufacturing activity of the Industrial Revolution starting in the latter part of the 1700s that created increased demand for different and new forms of financial reports and information. [1]

The Joint Stock Company

The Industrial Revolution also contributed to major changes in the form of business organization and ownership. The magnitude of some new economic activities required additional financial resources. It became increasingly difficult for individuals or small groups of individuals to provide these resources so larger groups of people contributed the necessary capital which led to the development of the modern corporation – the joint stock company. The company enabled the greater accumulation of capital needed to meet the greater costs associated with industrialization. It also resulted in the increasing separation of management from ownership as management became more specialized. A new accountability relationship developed between the management and owners. New laws were created to facilitate the development of the company and protect all those who dealt with these new organizations – especially the shareholders as providers of the capital. This accountability was satisfied with the provision of information on the management of the companies to the shareholders. A large part of this was in the form of an annual report containing financial statements. This was reinforced by the additional legal requirement of an independent assessment of the veracity of the financial statements; this was the birth of modern financial auditing.

As mentioned above, this is a simplified description of the history of accounting. However, the intention is to draw attention to the fact that accounting has grown in response to social and institutional developments. Thus, accounting is very much a social construction. It has grown in response to a demand created by dominant economic and social forces. Modernity brought about new processes of economic activity and accounting grew to facilitate these developments. Therefore, accounting has been very much a part of the dominant economic ideology, the belief in certain economic ideas that were seen as best suited to economic progress and development. As the economic activity expanded it needed novel concepts of cost determination and control, capital accumulation and accountability, periodic profit determination and many other aspect of accounting which are now taken for granted. In so doing it served to protect the interests of capital providers, a notion which went unquestioned until the latter part of the twentieth century. For example, employees were seen as a “factor of production” and as such there was a belief that cost of labour needed to be controlled like all other costs. As a result many systems for the monitoring and control of labour were devised by innovative entrepreneurs and their accountants who sometimes seemed to have been unaware that workers were their fellow humans.

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[1] There are several works on the history and development of cost and management accounting; see for example, Wells, M C, “Some Influences on the Development of Cost Accounting, *Accounting Historians Journal*, 1977, pp 47-61. One of the most influential sources is Paul Garner’s *Evolution of Cost Accounting to 1925*, Garland, New York, 1990 (reprint) although it makes the modernist assumption of steady progress and development, that is, evolution.

Professionalisation of Accounting
Another consequence of the additional demand for accounting and accountants was the formation of professional accounting bodies to protect and monitor the activities of those offering accounting services. Professionalisation is a process of socialisation. That is, if the activities of those offering accounting services can be controlled this may be a great social advantage and protect societies from the behaviour of unscrupulous individuals and also ensure some consistency in what services accountants provide. However, professional bodies can also then control and direct activities of their members. In so doing, the question arises as to whose interests the professional bodies see themselves as serving – their members, the business community or societies at large?

Early Theorising of Accounting

One of the problems the historian faces is that history is always the subject of interpretation of those presenting it. Therefore the claim that accounting theory is a twentieth century phenomenon is likely to be questioned. However, for the present purposes the claim will be made. Prior to this, much of the accounting literature was designed to serve for instruction in (bookkeeping and) accounting. By the end of the nineteenth century dissatisfaction with the existing texts led some to attempt to provide a more intellectually rigorous treatment of the subject.[2] In 1908 Charles Ezra Sprague published his *The Philosophy of Accounts* which, over the next fifteen years went through five editions in an attempt to add theoretical rigour and consistency to the teaching of accounting and to replace the previous practice of students having to learn by rote a series of rules with a logical and rational system. It was he who also introduced the algebraic notation of the accounting equation (A = L + P). Some of the ideas in his book had been determined by earlier writers but Sprague was one of the first authors to present a rationalization of accounting and the articulation of its various elements. For example, proprietorship increased through profits. In so doing he restated what had been alluded to by several authors before him – capital represented the owners' interest in the entity. This stressing of the ownership elements was referred to as the ***proprietorship theory***: the owner (proprietor) is the centre of accounting interest. This became the dominant view presented in most texts published in the first four decades of the twentieth century.

At about the same time as proprietorship theory was being formalized and accepted an alternative view emerged. This was known as the ***entity theory***.[3] Its emergence as an important consideration for accounting at this time is directly related to the changing nature of the modern corporation. As corporations grew in size and significance the separation of ownership and control became more pronounced. Some believed that as the corporation existed as a separate legal entity, accounting for the company should reflect the interests of the company and not what the proprietorship theorists held: the shareholders (the owners). In entity theory, the shareholders become just one group of equity providers so profit measurement should not be viewed as the determination of potential dividends for shareholders. Profit is what is available to management to

[2] For example, George Soule published his *Soule's New Science and Practice of Accounts* in 1881.
[3] Once again the history of the entity theory has been traced back much earlier than the turn of the century.

distribute to owners *and* to other parties such as through interest payments and taxes. Therefore, management had a right to retain profits for the future development of the company because it accrued to the company not the owners.

Taken at face value there appears to be little difference in terms of bookkeeping between the two theories. However, each represents a very different set of assumptions. Assumptions form an important part of theorising so the differences will be reflected in the elements that comprise the accounting theory. For example, the proprietary theory holds that profits are increases in the capital of the shareholders. On the other hand, entity theory holds that it is attributable to the company itself. Consequently the important elements of its determination may change such that the former will view the balance sheet as the most significant statement and all measurements should be at historical costs. Entity theory is designed to reflect economic rather than legal considerations and profit then becomes a major element in the company's survival such that the profit and loss statement becomes the more significant document with resources measured in terms of their future economic benefits (that is, to maintain the future continuation of the company). With entity theory, profit became a measure of managerial efficiency and an indication of future earnings.

The best known exponent of the entity theory was William Paton and its expression is found in his book of 1922, *Accounting Theory*. Paton was to exert an immense influence on accounting in the United States but his strong advocacy of the entity theory never won full acceptance by the accounting community for very many years. However, elements of it did find their way into accounting thought and practice. His realisation of the changing nature of the corporation was perceptive as the corporation has come to dominate the economic affairs of most societies and they have long since departed from what was probably the original intention of merely accumulating capital to permit expanded economic activity.

Corporations, Crises and Accounting

In the twentieth century there were several major social disruptions which impacted on accounting. The development of accounting thought and theory for most of the century was dominated by developments in the USA. Although there were some developments in some European countries, the ideas behind which significantly impacted on US accounting thought, most of the overt developments in accounting found expression in the USA.

Consolidated Financial Statements

As alluded to earlier, there were significant developments in the corporate form of business organization towards the end of the nineteenth century. The dominant economic ideology was laissez-faire capitalism – minimum government regulation of economic activity. Businesses developed and grew stronger, and bigger. One method of growth was by stronger businesses subsuming weaker ones. As legal entities, companies started buying the shares of other companies leading to some corporations owning a proportion

of the issued capital sufficient to enable them to "control" that company: the former became the holding company, the latter its subsidiary. Consistent with an entity theory type of philosophy, the holding company then issued consolidated financial reports which reflected the financial position of the economic unit rather than the strictly defined legal entity (entities). Because corporate financial reporting was regulated through the Companies Acts in the UK and Commonwealth countries, such as Australia, consolidated financial statements were not commonly encountered until after their recommendation in the legislation of the 1930s. However, in the USA they were common before the First World War (1914-18) and were expected to be prepared by investors and investment advisors in the 1920s. Thus, the changing nature of the company was shaping developments in accounting which supports the view that accounting responds to social pressures.

Economic Disaster

The business optimism of the 1920s is well known as is its abrupt end in the "Crash" of 1929 which started in the US but soon spread around the (Western) world. This crisis proved to be one of the most important influences on accounting thought. There was first the issue of professionalism – who could be an accountant or offer accounting services. Then, how were the activities of these "accountants" to be regulated? Thirdly, there were questions concerning the lack of a conceptual or theoretical basis for accounting practice which would lead to consistent and uniform practices. Accounting practices in the 1920s were many and varied, some deliberately designed to mislead, some were highly questionable as a result of the ignorance of those carrying them out but all were lacking a "principled" basis. In the rest of the twentieth century the accounting profession sought those principles which would be generally accepted by the practicing community – GAAP, generally accepted accounting principles.

The Professional Bodies' Search for Principles

One immediate consequence of the economic crash and the ensuing public outcry was the establishment of the Securities and Exchange Commission (SEC), a governmental regulatory body whose responsibilities included ensuring appropriate and full disclosure of accounting information by listed companies to their shareholders. Regulation was viewed as a challenge to the professional status of accountants so to avoid total government regulation of accounting the profession responded by seeking those GAAP that would ensure accounting information would be reliable. This "search" lasted for the rest of the century, taking slightly different forms but with essentially the same basic idea, namely, the establishment of a theoretical foundation for accounting.

There are three broadly defined periods in which the profession in the USA attempted to determine this theoretical base, each marked by a different organizational structure:

1. 1938 to 1958 - the Committee on Accounting Procedure (CAP),
2. 1959 to 1973 - the Accounting Principles Board (APB), and
3. 1973 on - the Financial Accounting Standards Board (FASB).

It was the express intention of CAP to develop a theory of accounting to help solve the problems in accounting. However, the task proved too big and CAP was reduced to

issuing, over its life, fifty-one Accounting Research Bulletins (ARBs). Although well intentioned these pronouncements were criticised as representing a "bushfire" approach, that is, a problem emerged and an ARB was issued to "put out the fire". CAP was a volunteer organization comprising members voluntarily giving their time. It never succeeded in ever achieving a firm authoritative status. Consequently it could not "enforce" its pronouncements and even its own members disagreed significantly over proposed solutions to problems (see Zeff, 1984).

In 1959 a new approach to determining an acceptable accounting theory was created: the APB was established with a semiautonomous, full time, research division, the Accounting Research Division (ARD) which was charged to provide Accounting Research Studies (ARS) which were to be the basis of the accounting standards, called *Opinions*, issued by the ABP. The APB had eighteen to twenty-one members who, like the CAP were all part timers and all were accountants. The APB did not last as long as its predecessor and, after considerable controversy and debate, it was replaced by the Financial Accounting Standards Board (FASB), a body that continues to exist today. Members of the FASB are full-time and not all are accountants as other "interested parties" (other stakeholders) are represented.

The Search of Others for Principles

The professional body's response to the demand for principles on which to base accounting practice was mainly through its committees described above. Some felt that it would not be possible for practitioner bodies to develop a sound theoretical foundation as there was always the potential for a conflict of interests if a proposal affected the reported financial position of a major client. Therefore attention was turned towards the largely academic body, the American Accounting Association (AAA), which it was felt was more disinterested and therefore capable of establishing accounting principles. The AAA issued a series of statements, the first of which was published in 1936 under the heading of "A Tentative Statement of Accounting Principles Affecting Corporate Reports". It was re-issued in revised form in 1944 and 1948. Practitioners believed the statement departed too much from practice – accounting principles should be no more than reflections of existing practice. Therefore, the professional body responded by commissioning another report which was published in 1938 and entitled a *Statement of Accounting Principles* and was written by Sanders, Hatfield and Moore. The report consciously sought to catalogue best practice and the statement was merely a listing of what practitioners believed to be best practice with no "theoretical" speculation or conceptualisation.

In 1940 the AAA published a sponsored monograph by W A Paton and A C Littleton entitled *An Introduction to Corporate Accounting Standards*. This was to be one of the most influential works in the accounting literature (AAA, 1977, p 9) and it went through various reprints and is still used in some university courses today. It was significant in that it represented the work of two of the most influential accounting professors in the USA and took a conscious "theoretical" approach. It introduced notions such as the matching concept and, unlike other works of the same period, represented a serious attempt to establish an entity theory perspective.

Elements of Theories

The reason for the brief historical background to the search for accounting principles above is that such search was for a theoretical foundation for accounting, a rational basis for accounting practice. In each of the attempts described above (and others) there are features the authors believed were necessary for the construction of a theory of accounting. Various terms are used to indicate these elements. In fact so many terms were introduced into the literature that there was at times confusion as to what they indicated. It is important to appreciate these terms in order to appreciate the process of theorising, the construction of theories.

So much energy was expended in the search for generally accepted accounting principles (GAAP) that it seems that most people believe a principle to be an important and fundamental element in a theory. The word principle has various shades of meanings. In one sense it means a rule, law or belief which determines actions. For example, you live by your principles. It also means a fundamental truth or proposition on which many other truths or propositions depend. The American Institute of CPAs (AICPA) in sponsoring the search for GAAP of the ARD used the term in both senses by describing a principle as

> A general law or rule adopted or professed as a guide to action; a settled ground or basis of conduct or practice . . . . (Moonitz, 1961. p 1)

They also claimed that postulates would form the basis of principles:

> . . . initially, accounting postulates are derived from experience and reason; after postulates so derived have proved useful, they become accepted as principles of accounting. (quoted in Moonitz, 1961, p 1)

Accounting research Studies

Consequently, the ARD first undertook to establish the basic postulates of accounting (Moonitz, 1961) on which broad principles for business enterprises (Sprouse and Moonitz, 1962) could be built. In seeking the principles the authors claimed that GAAP to date had been directed to accounting for large corporations; they intended to establish principles to apply to accounting for *all* entities.

Both ARS 1 and ARS 3 were consciously developed on modernist theory construction lines. Many other terms are employed such as axioms, concepts, assumptions, definitions, propositions, hypotheses, premises, primitives and others. There is very little difference in the meanings of postulates and axioms as both are regarded as self evident truths and cannot be proved; similarly with definitions and primitives. There are fine shades of differences in the meanings but for everyday purposes these differences are not important However, the terms are used by different writers in different situations which tends to confuse the uninitiated. Propositions, hypotheses and premises are also similar in meaning but are generally used in different contexts. They are all conjectural statements. Premises are statements used in (deductive) logic; propositions are used in theory construction and hypotheses are used in research used to establish theories. Unlike the

earlier described terms, propositions, hypotheses and premises can be true or false and research is often designed to prove their truth or falsity. Concepts are not true or false but are single or compound terms.

A Conceptual Framework

Unfortunately, all these terms and expressions are found in the accounting literature so it is important to be aware of their meaning if there is to be an understanding of accounting theory. This is evident in the Accounting Research Studies 1 and 3 – one refers to postulates, the other to broad accounting principles. In fact, the profession, as described above, was searching for generally accepted accounting principles which would form the basis of a theoretical foundation of accounting. With the demise of the APB and its ARD the profession turned to establishing a conceptual framework for financial reporting. This was to be the theoretical basis on which to build an accounting theory.

Figure 2.1 presents a simplified visual scheme of the process of theory construction. The starting point for the process of theorising will be based on assumptions. These will be beliefs about the area to be subject to the research or theorising. They will include what some writers refer to as objectives. That is, an objective will emerge from an assumption that there is some "problem" worth theorising or researching. Advocates of modernist theorising could not provide an answer to the question of how assumptions emerged.

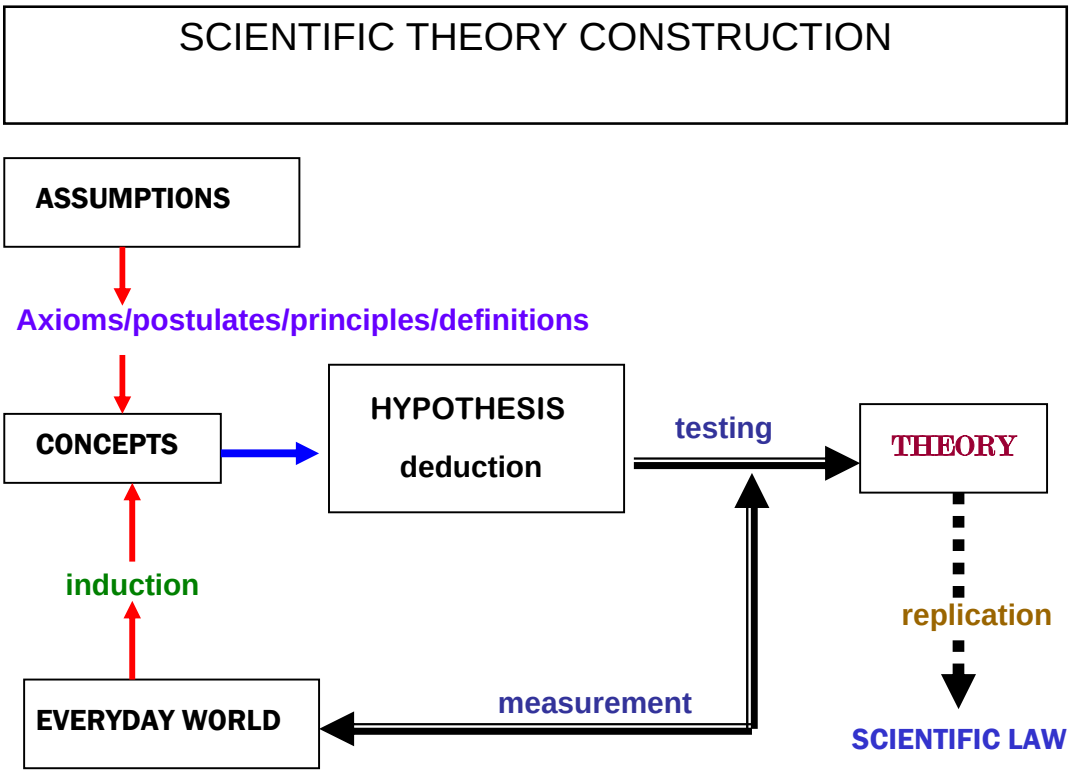

FIGURE 2.1 Scientific theory construction.

In order to overcome the problem of not being able to describe the initial stages of theorising, philosophers of science distinguished between a ***context of discovery*** and a ***context of justification***. It was to the latter that they directed attention because they believed that it was not possible to reconstruct (and describe) the former which was "psychologism". That is, they believed it was not possible to recreate and explain how theorists came up with their original ideas – it was a creative activity and part of their psychology (mind) in the same way an artist conceives of a work of art. Therefore, descriptions of modernist, scientific method have concentrated on how theories are "proved" and demonstrated to solve problems – how they can be justified.

Assumptions will be based on past knowledge, or knowledge and understanding gained to date. Some will clearly be derived from observations of the everyday world and they are said to be derived ***a posteriori*** – knowledge derived from experience. Its opposite is ***a priori*** – knowledge independent of experience: ideas we have but cannot precisely state why in terms of direct experiences. Although the terms are Latin ones, the distinction between the two types of knowledge are derived from Aristotle. They have been the subject of considerable debate in Western philosophy. They have also been employed in the accounting with a priori coming to mean an inferior type of knowledge.[4] The field of ethics relies on a priori knowledge in that we assess it in terms of prior beliefs and prejudices the derivation of which we cannot necessarily specify other than through general statements such as "it is a result of my upbringing". On the other hand we can observe the effect on share prices of a change in accounting method so, our knowledge is directly related to experience and is said to be derived a posteriori.

False Dichotomies

The claim that some accounting theories are a priori theories and others are a posteriori is, as will become clear later, one of great misconceptions in accounting. Another great accounting misconception is the claim that some theories are deductive theories and some are inductive.[5] It is clear from Figure 2.1 that modernist theory construction employs both inductive and deductive (recall the syllogism described in the previous chapter) reasoning. The only difference is in the emphasis placed on deduction or induction. However, they are tools of theorising not different types of theorising. Hypotheses will be derived from a process of deduction using concepts derived from a priori knowledge (such as postulates and principles) and a posteriori knowledge (a process of induction through observations of the everyday world). Some theories will make greater use of induction (claiming to describe reality) while others will combine observations (induction) with previously held theories and beliefs. However, even the so-called descriptive theories will be based on a set of prior beliefs and assumptions about the

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[4] See Nelson, Carl L, "A Priori Research in Accounting", in Dopuch N and L Revsine (eds) (1973), *Accounting Research 1960-1970: A Critical Evaluation*, Champaign Urbana, Centre for International Education and Research in Accounting.

[5] This was probably introduced into accounting by one of the earliest textbooks in accounting theory, Hendriksen, E S (19), *Accounting Theory*, Richard D Irwin, but has persisted in theory texts and other accounting literature since.

phenomena being theorised or researched[6]. The emphasis will then turn to the context of justification; that is, how systematic the testing is (for example see Nelson, 1973, especially pp 14-16). Consequently, there will certainly be a difference in emphasis but all will employ the same basic tools of theorising – induction and deduction – as well as a priori and a posteriori knowledge.[7]

A simpler description of this theorising process is referred to as **hypothetico-deductivism** (sometimes referred to as the covering law model or deductive-nomological method) which philosophers such as Karl Popper believe to be the essence of scientific method. In this form an hypothesis is proposed and certain statements are made as premises (antecedent conditions) from which a conclusion (theory?) is deduced which will then need to undergo a process of rigorous empirical testing to determine whether the hypothesis is "true" or not. For example, we could start with an hypothesis that lead is heavier than water from which we can deduce certain conclusions such that lead will sink in water. We then test the proposition by experimentation – placing lead in water. If it sinks we have confirmed the original hypothesis. While this is a simple example a series of such confirmed hypotheses can be interrelated and make up a complex system of theories. The emphasis is on empirical testing to confirm the proposition. As explained in the previous chapter, testing was initially thought to be able to **verify** theories. However, because of the problem of induction, Popper proposed that testing should be used to try to falsify a proposition and until, after extensive testing. A proposition is demonstrated to be false it should be accepted as "true" or confirmed. His ideas are referred to as falsificationism or critical rationalism.

Measurement

Many people believe accounting is a measurement-communications process. Sterling believes that "accounting ought to measure something and then communicate that measurement" (Sterling, 1970, p 454). Christensen and Demski state that "surely accounting is a formal financial measurement system. It . . . reports measures of accounting stocks on the balance sheet and accounting flows on the income statement." (2003, p 4)

If measurement is the application of numbers to properties or attributes of things or events then it is an important aspect of accounting. Financial reports are money number representations of economic events and resources or commitments of an entity. However, there has been debate in accounting as to what properties of these events, resources and commitments are being measured. To Sterling they would be measuring values, while Christensen and Demski claim that, as accountants, they are measuring informative

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[6] Similalry with so-called positive and normative theorising: for example, Hakansson makes the statement "In examining the literature of the social sciences, one is struck by the intertwinement of the positive, or descriptive, and the normative, or prescriptive" (1973, p 139)

[7] This was first made clear by the great philosopher, Immanuel Kant in the eighteenth century and has been a part of the western philosophical tradition ever since: see his *Critique of Pure Reason* (1781), Dover Publications (2003), New York; translated by J M D Meiklejohn.

events. Thus, the latter claim that the goals are different – the first views valuations as an end in itself whereas the other perspective views valuation as necessary only to convey some information (content). The distinction is difficult to discern as those who see accounting as measuring values are, as Sterling asserts above, only doing to so to communicate to users that information.

There are various aspects to measurement. There is a hierarchy of measurement types – measurement scales. On the simplest level if numbers are simply replacing names as in the numbers allocated to a football team there is very little we can do with the numbers. The number may represent the position of the footballer so that is the information being conveyed by the measures. Adding the numbers would not produce any meaningful information. This measurement is referred to as the *nominal scale*. If we ranked objects in order - first, second, third and so on, it would similarly not produce any meaningful information if the numbers were added. This is referred to as the *ordinal scale*. In neither of these two scales is there any indication of magnitude between measures. Someone could just come first in a race but the third place getter could be quite a distance back. So, while the ordinal scale provides more information than the nominal scale both are very restricted in the information they convey and would not seem to be of much use in accounting. Accounts could be represented by numbers rather than verbal descriptions and they could be ranked in some order of importance but neither type of measure would be useful in conveying financial information to users. A third scale, the *interval scale*, comprises numbers with a fixed interval between each measure. This is much more relevant to accounting as numbers in monetary units indicate considerably more information. Two dollars is twice one dollar and the reason is that there is a rational zero and then numbers in equal increments (one dollar is 100 cents). Most accounting measures would be on this scale. A fourth scale is the *ratio scale* in which, as its name implies, the relationship between two or more measures is the objective. For example, in accounting, financial analysis involves determining the relationship between different measures – the measure of current assets is twice that of current liabilities.

The significance in being aware of measurement scales lies in the permissible mathematical operations – addition, division, multiplication etc– how the numbers can be used and related to each other?

A further distinction in measurement is ***how*** the measures are obtained. If they are directly derived from the object or event they are said to be *fundamental* measures. If they are the result of two or more fundamental measures they are said to be *derived* measures. A fundamental measure is supposed to bear a direct relationship to the properties being measured. For example, the statement I have $200 in my wallet means that I have notes (and coins) that add to 200 monetary units, that is dollars, which can be directly observed. Although in some instances there would be general agreement as to the measure there are very significant ontological implications of measures – to what extent they represent a “reality” or the “truth”. Largely as a result of the inability to get agreement as to the most appropriate measures there is another type of measurement being increasingly used in accounting: measurement by *fiat*. This is where a measure is arbitrarily determined and mandated. As the world moves toward global accounting

standards – international financial reporting standards (IFRS) – there is a strong tendency for the regulators to dictate how to measure various items. Measurement by fiat is measurement by decree.

Measurement in theory construction
Measurement is important in modernist theory construction (see Figure 2.1) as it relates to how and what information is used to construct the theory and to determine the success or not of the theory. Observations are inductively derived so if they are to be useful they will probably have to be converted to a common basis as the input to the theory. This will usually involve conversion to numbers. For example, many theories rely on descriptions of stock market reactions to an accounting event so will be reflected in share prices at a point in time or over a period of time. Once the hypotheses have been determined it will be necessary to test them. This will also necessitate comparison of data (numbers) with observations. This will provide the feedback to the theory – if the observations conform to the prediction in the hypotheses then the theory will be accepted; if not, the theory process will continue. Consequently it is vital to know whether the numbers used are dependable, reliable and accurate. Here too there are epistemological and ontological questions but they will need to be raised in detail later as a modernist position holds that the numbers can accurately reflect reality.

Two Statements on Accounting Theory

It seems that the American Accounting Association (AAA), the primarily academic accounting professional body, was to publish a statement of accounting theory in every decade. Earlier it had issued tentative and other statements on accounting principles and standards. In 1966 it published *A Statement of Basic Accounting Theory* (popularly known by its acronym ASOBAT) and in 1977 it published *A Statement on Accounting Theory and Theory Acceptance* (SATTA). Both statements were the work of committees of very senior members of the profession. Their contents indicate a major shift in thinking about theories that took place after the first and before the second were published. In ASOBAT there is an optimism about the possibility of a single accounting theory; in SATTA there is a distinct pessimism about this possibility as they found little common acceptance of the various attempts that had been made to create an accounting theory. Whereas ASOBAT consciously set out to determine parameters for an accounting theory (Preface, p v), the SATTA Committee viewed its task as surveying the accounting theory literature (p 49).

A feature of later modernity, or late capitalism, is the increasing process of **commodification**. This is the process in which goods and services are increasingly produced for “the market”. In western societies almost every aspect of social life is discussed in terms of its commodification. This has spread to non-western societies so it can be considered a hallmark of globalisation. The change in the emphasis from ASOBAT to SATTA is evidence that accounting was not immune to the processes of commodification in that accounting was increasingly seen as a “commodity” to be exchanged in markets. That is, accounting produced information and the information was

seen as a "good" subject to the conventionally viewed economic pressures of supply and demand. The implications of this are that new concepts emerge such that there is an emphasis on *users* of accounting information and *usefulness* to these users. Previously, accounting had been viewed as an "institutional structure", now it was a process of information generation that was subject to the vagaries of market supply and demand. Therefore, whereas ASOBAT, like ARS 1 and ARS 3, was seeking structural elements which could serve as the foundations for an accounting theory, they were irrelevant in this newer view. This is illustrated in the view of Milton Friedman (the well known economist) that the realism of the underlying assumptions of a theory is irrelevant so long as its predictions are accurate[8].

Therefore, despite the statement in ASOBAT that "No one really knows what individuals or any organization wants [in respect of accounting information], or what they should want" (p 69), there was a change in accounting theory formulation to an emphasis of satisfying users' wants and this was a major message implicit in SATTA.

The Contribution of Accounting Theorists

Throughout the twentieth century there were several individual accounting writers who made major contributions to accounting thought. SATTA presents a useful summary of the work of many of these writers[9].

One very important feature of twentieth century accounting thought is the close association with the discipline of economics. In fact, so strong is this relationship it led many to view accounting merely as applied economics and others to believe accounting must be based on current dominant economic theory. If this is true then there seems little point in attempting to develop an accounting theory as accounting becomes a technological extension (the measurement aspect) of economic theory! The influence of economics came early as the teaching of accounting in universities (first in the USA and then in other countries) was invariably carried out from departments of economics.[10] Consequently, the doctoral dissertations of early accounting professors were written by members of economic departments as economics theses (for example Paton's *Accounting Theory*). Some were written by people who referred to themselves as economists. For example, J B Canning, was professor of economics and head of the Division of Accountancy at Stanford University, and wrote a book entitled *The Economics of Accountancy* (1929) in which he attempted to restate accounting in economic terms, for example, assets to be measured as future economic benefits rather than as the result of other valuation processes. The evidence of the strong influence of economics is seen in other accounting writers and it is interesting to note the differing economic theories. DR

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[8] This is a very well-known feature of Friedman's methodological position and further information on it can be obtained a very wide range of references to neo-classical economics and the work of Friedman.

[9] However, it classifies them as inductivists or deductivists thus perpetuating the mistaken classification of textbooks writers such as Hendriksen as mentioned above.

[10] This was not always the case – remember Sprague wanted a reliable statistical base for accounting practice. However, long before the twentieth century both disciplines were concerned with similar phenomena, for example the notion of capital – each arriving at a distinctly different conclusion.

Scott's book, *The Cultural Significance of Accounts* (1931) shows the influence of Thorsten Veblen's institutional economics; Chambers's work, *Accounting, Evaluation and Economic Behavior* (1966) appears to have been influenced by von Mises (Austrian economics) and Hayek. The work of late twentieth century accounting writing is heavily dependent on neo-classical economic theory and will be discussed in the next chapter. There are many other examples.

To many, this influence of economic theory on accounting would not be at all surprising. However, what is often forgotten is that economic theory does not remain constant. Accounting will then reflect the current economic hegemony – the current dominant economic ideology. As such, accounting is ontologically reliant on economic ideology. It is evident, after examining the perceived major accounting problems in the twentieth century, that accounting thought changed to reflect an economics basis for attempted solutions. Thus, there was a change in emphasis away from the balance sheet as a statement of valuations at a point in time (stock concept) to the income statement to reflect the return on investment/capital (flow concept). This became so strong in the later part of the century that accounting was believed by many researchers to reflect the interests of one group of stakeholders – the investors in publicly listed corporations. This belief stills holds dominance in this century despite many economic crises and accounting catastrophes.

In the middle of the 1950s there was a marked change in the type of accounting theory literature. Two articles, one by Raymond Chambers (1955) and the other by Richard Mattessich (1956), made calls for greater intellectual rigour in accounting through the use of the works and ideas of philosophers of science and in making such calls they were clearly aligning themselves with the modernist movement. One outcome of this a decade of considerable methodological debate and the publication of several major theoretical books. These works represent a major part of the intellectual heritage of accounting. In other disciplines the works of "past masters" are respected and studied. For example in physics the work of Newton, Maxwell and many others have not been forgotten even though many of their theories have been replaced by those of Einstein and twentieth century quantum mechanics. Similarly, the works of Marx, Weber and Durkheim are studied in sociology despite many of their notions being replaced by newer theories.

A major issue in accounting in the 1960s was asset measurement in times of rapidly changing price levels – how was it possible to present users with reliable financial statements when there was such rapid inflation that the figures in the traditional accounts were quickly outdated and became meaningless? Theorists made various suggested solutions some of which were relatively conservative, others requiring a radical overhaul of accounting as it was then practiced. Some even tried to justify the status quo.

Two economists were among the first to publish a major theoretical work in the 1960s – Edwards and Bell (1961). As economists they argued that the use of historical cost measures by accountants resulted in totally meaningless information for those concerned with the survival of the firm (company).Accountants should try to produce information of what it would cost the firm to continue operating at the same level. Thus they advocated

measuring resources at their current market prices – it was replacement cost accounting. Although revenues would remain much the same as under historical cost, expenses would reflect the replacement cost at the time they were incurred. Deducting these expenses from the revenues would result in a measure of current operating profit. A complication was that the system also required recognizing that if assets are measured at replacement cost during periods of rising prices there will be what they called a holding gain or loss. For example the increased (replacement cost) measure of an asset over its (recorded) historical cost would indicate a "holding gain". These holding gains (and any holding losses) should be separated from current operating profits and disclosed as such.

This was, according to Professor Raymond Chambers, of the University of Sydney, too artificial. In his work he argued that those making decisions about possible courses of future action most need to know what resources that had at their command which would enable them to undertake future activities. The replacement price of an asset indicated the amount needed to replace an asset but gave no indication of how that cost could be met. Therefore, he argued the most relevant measure of all items was the current market *selling* price and his system became to be known as continuously contemporary accounting (CoCoA). Critics argued that this was contrary to the going concern postulate as it implied the sale of assets. However, they missed his point – he never advocated the sale of assets (which would likely result in "low" prices as in a forced sale situation) but what measure of resources the company had at its command if it sold its asset(s) in the normal everyday course of business. The was the current cash equivalent at the command of the managers. A shift to CoCoA would require a radical change in the actions of accountants and this seemed too much for the professional community as his ideas were never fully accepted. However, some companies did produce published financial statements with CoCoA measures. Nevertheless, it is now interesting to note that regulators require some assets to be reflected in the accounts at "mark-to-market" which, of course, is essentially the current market selling price advocated by Chambers.

CoCoA was not the only contribution Chambers made to accounting thought and he is probably the largest single contributor to the accounting literature. As indicated above, Chambers sought to add greater intellectual rigour to accounting thought and his work covered many aspects of accounting theory and related fields. He also believed he should not remain in the "academic ivory tower" so took an active role in the affairs of the professional bodies and was at one stage the National President of (what is now known as) CPA Australia. In his work he drew from a diverse range of disciplines and he was committed to making accounting a discipline which was equal to any science so he can be classified as a modernist thinker.

Richard Mattessich was as committed to establishing an intellectually rigorous discipline of accounting as Chambers. However, they differed in how to achieve this and at times they clashed intellectually. Whereas Chambers was intent on creating a new theory of accounting (CoCoA), Mattessich was more concerned with establishing a sound intellectual base for accounting practice as he saw it. He too was a modernist thinker, with a strong conviction to establishing the scientific credentials of accounting and also drew from a diverse range of disciplines for his support. In his early career Mattessich

was situated at the University of California, Berkeley where he worked with many other major contributors to accounting thought such as Moonitz (the author of ARS1 and ARS3 discussed above), Carl Devine and others.

Another author of a major work published in the 1960s was Yuji Ijiri whose prime objective was to establish a sound theoretical base for historical accounting. The central theme of Ijiri's work is measurement and his book is entitled *The Foundations of Accounting Measurement: A Mathematical, Economic and Behavioral Inquiry*, which gives an indication of its contents.

There were many other major contributors to the accounting theory literature during this period but it is not appropriate to discuss them all here[11]. It is important to note that there was a large response to the call for greater intellectual rigour by Chambers and Mattessich. It is also important to note that these efforts were consistent with the general thrust of the profession since the 1930s, namely, a search for the theoretical foundations of accounting. All shared a modernist vision; that is, they sought to establish a science of accounting, believing that science represented the highest standard in determining intellectual rigour. However, around 1970 these efforts took a new turn and that is the subject of the next chapter.

[11] A fuller discussion can be found in Gaffikin (2003).

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