

# Research Method and Methodology in Finance and Accounting

Second Edition

CENGAGE **brain**.com

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*British Library Cataloguing-in-Publication Data*

A catalogue record for this book is available from the British Library

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**ISBN: 978-1-86152-881-0**

**First edition published by Academic Press Limited 1992**

Typeset by Dexter Haven Associates Ltd, London  
Printed by TJ Digital, Padstow UK

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# The philosophy of financial research

Research is a process of intellectual discovery, which has the potential to transform our knowledge and understanding of the world around us. In this chapter we examine some of the fundamental assumptions upon which research in the financial disciplines is based. These disciplines, like most others within the social sciences, are methodologically highly diverse. Scholars in these disciplines come from a variety of different backgrounds and sometimes make implicit but different methodological assumptions about the nature of reality, the role of theory and the significance of empirical experimentation.

Part of our task in this chapter is to make clear what those assumptions are and how they influence the research process. We start our discussions about research at a somewhat abstract level but, as we will demonstrate in later chapters, the issues we raise here condition much of what we have to say later about such questions as:

- What are the different assumptions about the nature of financial reality that inform research?
- What is the role of theory in acquiring knowledge about financial and accounting reality?
- How does research progress?

Given that research is fundamentally about the discovery, interpretation and communication of new knowledge there is still little agreement about the source of knowledge itself. The financial disciplines have, over the last 40 years, provided a new intellectual arena for some very old debates, and our purpose here is to discuss the range of issues and debates, which are of importance to the practising researcher.

To illustrate the methodological issues presented by financial research, consider two studies recently published in the accounting literature. The first by Maines and McDaniel (2000) is typical of the type of article found in the mainstream US literature and examines the effect of a disclosure requirement on the processing of financial information by investors. This article draws upon prior work in psychology (Hogarth, 1987), which asserts that performance–assessment judgments are formed by individuals from a linear combination of cues. On the basis of this the researchers create two empirical hypotheses, which are tested in

the controlled research environment of 90 Master of Business Administration (MBA) students. Their performance is analysed and the hypotheses empirically confirmed through a variety of statistical tests which allow the authors to conclude: 'the results of our experiment show... the financial statement format... did not significantly affect nonprofessional investors'... evaluation of that information... but generally did significantly influence their information weighting and resulting performance judgments' (Maines and McDaniel, 2000: 199). Note that the conclusion drawn from an empirical domain of 90 MBA students has been generalized to include all non-professional investors.

This type of research is generally called 'positive' accounting research in that it claims to give reliable and empirically sustainable answers to questions that policy-makers regard to be important. This type of research is contested by many researchers, not on grounds of method, but because they do not agree with the philosophical premises upon which the research is based.

Our second example was recently published in *Economy and Society* by Froud *et al.* (2000). This paper addresses the issue of whether maximizing shareholder value results in superior business performance. The authors combine a limited but critical review of the literature before presenting a range of evidence ('empirics on micro performance and the meso limits to shareholder value') to support their case. The evidence cited is in the form of a listing of the value-added performance of a range of companies as illustration of a thread of argument drawn from the author's social and political framework. This research is developed through a lengthy series of natural language arguments (see Chapter 11) containing numerous suppositions and assertions (we use these words in a non-pejorative sense). The paper emphasizes 'interpretation' rather than 'explanation' or 'prediction' when studying social phenomena. No appeal is made to the use of statistical or other formal method although, as was the case with the first example discussed above, a wide range of generalizations are made in the conclusion to the paper.

However, our point is that research of either type, whilst being acceptable in terms of the methods employed, may be subject to hostile and fundamentally non-comprehending criticism because of underlying disputes at the philosophical level. When a piece of research is characterized by poor technique, a critic may argue that the research is 'defective', 'weak' or 'misapplied', however, when a methodological dispute is involved the research is simply labelled as 'nonsensical'.

Notwithstanding the fundamental nature of the debates that permeate much research in accounting and finance, historically the methodological position adopted by the large majority of active researchers in these disciplines has inclined towards the position exemplified by the first of our examples above. That is, they demonstrate a strong commitment to what we would label 'objective' research. By this they view research as a process of constructing precise and economical theories validated by well-designed tests using large and, as far as possible, unbiased samples. Replicability and critical evaluation of method and results are the hallmark of this type of research. We will spend considerable time in this chapter evaluating the 'empiricist' philosophical tradition which informs this type of research and the most important variants of that tradition.

This chapter has a strong philosophical bias as we explore some of the issues which underpin debates in finance and accounting. We have knowledge of the work of philosophers stretching back over 3000 years. This history has two important consequences: first, the language of the subject has become progressively more technical as philosophers, like most other branches of scholarship, tend to talk among themselves and, second, many of the arguments within the subject are returned to time and time again. Obviously, we must be very selective and in this chapter we concentrate on a very limited set of issues. Our principal target will be to show how the dominant methodologies within research in finance and accounting have developed and, in particular, how the empiricist tradition has acquired its current supremacy. We will, however, consider other positions and seek to explain from a philosophical perspective the more important methodological alternatives adopted by other researchers. These alternative methodologies now command a significant literature with a number of journals (*Accounting, Organizations and Society, Critical Perspectives in Accounting* and others) editorially sympathetic to this type of research. This chapter is an important precursor to Chapter 2, where we consider in more detail how scholars within the social sciences, and accounting researchers who draw upon the work of such scholars, have sought to categorize their own and alternative positions and, in particular, we will discuss the important contribution made by two organizational theorists, Burrell and Morgan, to the methodological debate.

## The duality within western thought

Research in accounting and finance is generally accepted as being social scientific, as appropriate standards of scientific enquiry are applied to social issues rather than natural phenomena, which is taken to be the domain of the natural sciences and of physics in particular. Many philosophers, such as Bertrand Russell in his *History of Western Philosophy*, argue that the origins of western thought can be traced back to the Greeks, who in their turn almost certainly drew upon and rationalized ideas from their own social and religious inheritance as well as those other Eastern Mediterranean cultures with which they came in contact. Possibly the most important idea contributed by the Greeks was that reality could be characterized by opposites and that there is an essential duality in all things. To give two important examples: statements are either true or false (in Aristotelian logic: the Law of Excluded Middle) and each individual is a subject in a 'subject-object' relationship with the external world.

Although deeply rooted in our social and cultural heritage, these dualities of thought and understanding do have limitations and have provoked debate within their own terms about the nature of knowledge, truth and reality and, more recently, in terms of their own validity. The Greek perception of opposites endowed western thought with great power, especially when dealing with the natural order or with the development of logic and mathematics. Where they have been less successful is in helping us to gain mastery of our social world where truth and falsity are much more ambiguous concepts and where relationships which are objectified often cease to be

relationships. However, the dualist perspective does permit the ready abstraction of ideas and concepts at one level and the 'objectification' of domains of enquiry at the other.

By characterizing individuals as subjects in subject–object relationships with everyone and everything around them it makes sense to propose that individuals must have beliefs about what is true or false in their objective world. But, it is important to ask what forms these beliefs? One view is that they are formed from the *perceptions* individuals have about the objects that confront them. But do they perceive objects, or as many philosophers argue, the '*appearance*' of objects? We can then propose that the appearance of what we observe should be distinguished from the fundamental nature (if such exists) of what we observe. We might also argue that we can come to know things about objects through reason and thus bypass the problem of appearances and perception altogether.

Before long, the dualism represented in Figure 1.1 leads to a range of derived questions which all nevertheless presuppose the seductively obvious distinction between subject and object. One view that we will discuss is that the knowledge possessed by the subject of an external object is driven by the perception of appearances, another view is that such knowledge is not driven by perception but by the exercise of reason. We will turn to this debate about the source of knowledge in the next section.

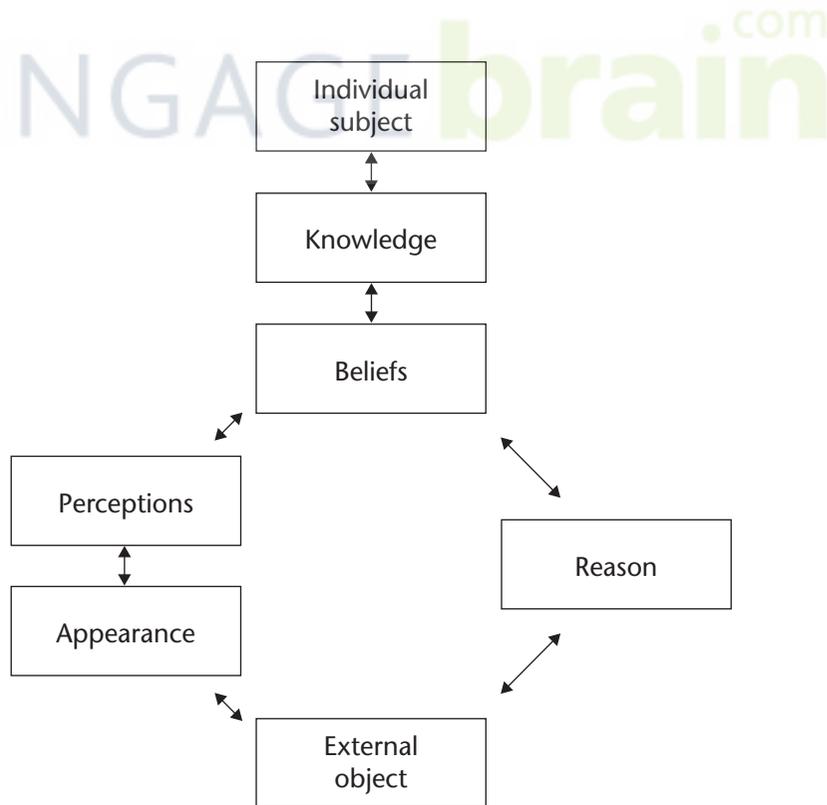


FIGURE 1.1 The subject–object divide

## Epistemology or what is knowledge?

The central problem of epistemology is to decide how we can acquire knowledge which Plato and others following him have defined as *justified true belief*. This definition of knowledge creates three substantive issues: the nature of belief, the basis of truth and the problem of justification. When we reflect upon the statement made in the Maines and McDaniel (2000) article quoted above: 'the financial statement format . . . did not significantly affect nonprofessional investors' . . . evaluation of that information' it is pertinent to ask how this conclusion is justified even assuming the truth of the empirical data upon which it is based. This definition of knowledge is widely accepted, and for now we will discuss its implications in its own terms by addressing such questions as what is the source of our belief, how we determine what is true and how we justify our belief? These weighty issues each have their own branch of philosophical enquiry.

### Empiricism and rationalism

There are a number of sources of our beliefs (see Audi, 1998): we may perceive objects or events (perceptual belief); we may remember facts (memorial belief), we may come to believe by a process of introspection (introspective belief) or we may come to believe by a process of reason (rational belief). We may come to believe through induction (inductive belief), which is a process of inferring general truths from perceptual and/or memorial belief, and we may also come to believe because of the testimony of others (testimonial belief). In principal, however, all of these reduce to two distinct sources: first, that which is grounded within our own rational processes as the enquiring subjects, that is, rational belief, and, second, that which is grounded in the object of our enquiry, that is, perceptual belief.

The first of these two sources of belief (and hence knowledge) assumes that we do not need to look beyond ourselves to form a *justified true belief* about the world. In other words propositional knowledge, that is, knowledge about what *is* can be known a priori and does not have to be perceived. This idea can be traced back to Socrates and Plato who argued the existence of abstract forms of knowledge. Socrates believed that all knowledge is innate and the wise teacher could draw that knowledge from others through the use of leading questions. This is the basis of what is often referred to as the 'Socratic method' in teaching. His pupil, Plato, extended these ideas and taught that there exists a realm of ideas which contain the essence of things (their form). Platonic *ideal forms*, as they became known, could include the abstractions of pure geometry at one extreme to the ideal society (the republic) at the other. Plato believed that these ideal forms were real, in the sense that they had an existence as abstractions independently of any enquiring mind, but that they could be accessed only through the exercise of reason. In this sense Plato was a 'rationalist' in that he held that true belief is accessible only through reason. However, he was also a realist (see below) in that he believed that the world of ideal forms had an objective existence.

In finance, which takes much of its intellectual basis from economics, the concepts of ideal or perfect markets are Platonic abstractions. If Plato had bothered with perfectly efficient capital markets (whether this was a side interest of his, history does not record) he would have argued that what he had conceptualized was a real entity, which does not exist in space or time, but which can be understood and reflected upon by the exercise of reason alone.

Platonic abstraction and its modern variant, rationalism, has proved particularly tenacious in western culture – especially for those who have spent considerable time throughout their education improving their powers of reason (as opposed to their power of observation, for example). A second tradition of thought is derived from Aristotle and is quite different.

Aristotle did not accept the arguments of the academicians and entered into a long dispute with Plato, which led to his expulsion from the Academy. Given the dearth of other institutions of learning at the time, Aristotle formed a rival school called the Lyceum in 366 BC. Aristotle argued that we gather knowledge by observation and categorization, and he challenged the existence of ideal forms. In as far as they do exist, Aristotle saw them as embedded within objects that have a spatio-temporal existence. For example, as we reflect upon different types of market we note that each has certain characteristics that recur in different situations. Through repeated observation of particulars we begin to form an understanding of the properties of a general class of markets and these general properties, in their turn, are amenable to logical extension and analysis.

We can find elements of these two traditions in the writings of St Augustine (354–430) and the thirteenth-century scholastics: St Thomas Aquinas (on the Platonic side) and William of Ockham (on the Aristotelian). However, it was not until the seventeenth and eighteenth centuries that the ideas we now describe as ‘rationalism’ and ‘empiricism’ were fully articulated. ‘Rationalism’ as a term was first used to describe the world view of the French philosopher-mathematician René Descartes (1596–1650). However, as a tradition it underpins much of modern continental philosophy and particularly the work of Hegel and Marx. Empiricism, however, became dominant in Britain where the trade guilds and the professions in the seventeenth, eighteenth and nineteenth centuries created a new social milieu. The entrants to these trades were not generally the product of a classical education system, and their expertise relied on the transfer of skills by word of mouth – master to apprentice. In such a system, the educational tradition relied very heavily on the careful observation and practice of what the apprentice observed. This was also the time of the emergence of the ‘scientific method’ with its foremost champion, Sir Isaac Newton, harnessing the discipline and observational skills of an alchemist with a formidable theoretical and mathematical ability.

Much has been argued and written about the merits and defects of empiricism. Modern empiricists by and large now accept as untenable the idea that knowledge is uniquely determined by experience, but they would claim that experience can represent a *justification* for our beliefs about what we know. The term ‘empiricism’ is the name we now give to a family of philosophies. Traditionally, classical empiricists accepted that:

- (1) Certainty of belief in what we know can only be approached through perception.
- (2) Ultimately all knowledge is derived from perception through our senses, as Locke said: 'We are all born with a blank sheet upon which sense impressions are written.'
- (3) In the realm of discourse statements are either true or false because of the way the world is or because of some formal properties of the language we use.

These three tenets of the empiricist position lead to the following conclusions: from (1), beliefs based upon non-experiential grounds (that is, not justified by experience or by logically or mathematically derived implications of experience) are termed metaphysical and are meaningless, and from (2) and (3), beliefs about the world cannot be justified by the use of reason alone. The empiricist position leads quite naturally to the idea that science (natural or social) should be 'value free'; that is, free from beliefs and ideologies which cannot be justified in terms of the objects of experience under study.

The influence of empiricism has been extremely pervasive and has led to one of the most significant philosophical movements of modern times: positivism. Positivism is now regarded as rather passé in certain quarters, although it has been particularly influential in the recent development of the disciplines of finance, economics and accounting. However, before we consider positivism in detail it is worth while considering two other important and related areas of philosophical debate: to what extent can we be truly objective in the statements we make about the world and to what extent are scientific beliefs conditioned by or relative to the social context of the researcher?

## Realism versus idealism

Empiricism and rationalism is a classical distinction which focuses on the *source* of knowledge. Realism and idealism are terms used to describe the *ontology* of what we know. Ontology is the study of existence and in this context is concerned with what we discern to be 'real'. Reality is a difficult concept but is concerned with the construction of existence in objects. The questions we now pose is how do we know what is real and how do we know when statements about the world are true or false? Following the ancient Greeks there are two opposite positions: that of the *realists* who hold that reality subsists within objects, and that of the *idealists* who hold that it exists within the mind of the subject. However, the empiricist-rationalist distinction still holds. As we noted before, Plato was a realist in that he believed that his perfect worlds were real but only accessible to reason. Bishop George Berkeley, an eighteenth-century cleric and highly influential idealist philosopher, proposed that, even though knowledge is derived from perception, the objects of perception are mentally constructed and only continue to exist in the presence of a perceiving mind.<sup>1</sup>

At its simplest, realism represents the common-sense view that, when we describe something, that thing has a reality which is independent of our perception of

it. As Popper and numerous other philosophers have pointed out, our belief in a mind-independent reality, which impacts upon our senses and forms our perceptions, is a strong one. The difficulty is that we are not conscious of reality as such, but following the empiricist's account, we are conscious only of our perceptions of what our senses present to us. Naive or empirical realists such as the Scottish empirical philosopher David Hume (1711–76) hold that reality subsists within the objects of perception, and that we construct reality behaviourally as we make conjunctions between different events. Belief in causality (the idea that effect B must have a cause A), and in general laws of behaviour, such as Newton's laws of motion, are 'induced' or inferred from the observation of the repeated conjunction of events. Likewise, for the empirical realist the way to determine whether a statement is true is to compare what is claimed with 'empirical evidence' – this creates what is known as a 'correspondence theory' of truth.

The first coherent account of idealism was given by Bishop Berkeley, who like Hume and Locke was an empiricist, but who argued that the qualities that we perceive, such as colour or texture, are mental representations of sense-data and it is these mental representations which form the 'reality' of what we experience. Knowledge is therefore mentally constructed and the truth or falsity of statements are checked, not in terms of their correspondence with reality but, rather, in terms of their 'coherence' either with the other beliefs of the individual or with the beliefs of others. This leads to the notion that knowledge and, more importantly, reality can be socially constructed. Some social scientists conclude that it follows from the idealist position that all knowledge is socially constructed. However, this conclusion does not follow from idealism: reality is a construction of minds (singular or plural) and is tested for coherence at either the individual or the social level or, indeed, both.

Few philosophers would agree that realism or idealism in their extreme form as described above are tenable. The central problem with empirical or naive realism is bridging the gap between the appearances of reality, which we perceive, and the reality of the *thing in itself*. The problem with idealism is that it takes us to the position that what is true is either what we choose to believe is true or what society believes to be true. The proposition that truth has no objective basis is necessarily true if knowledge is purely a product of minds. However, few would be prepared to go that far – surely there must be some external justification for what we believe and some role for external verification through experimentation or observation? Indeed, in its brute form it is difficult to understand what the term 'observation' would mean to the idealist because to observe implies an object of observation. There have been a number of (more or less successful attempts) to resolve the problem posed by the realist–idealist distinction.

## Kantian philosophy

Immanuel Kant (1724–1804) attempted to resolve the problems posed by both empiricism and rationalism and realism and idealism. He tried to establish the meta-principles which allow us to relate to, and make sense of, the empirical world. In this sense he challenged both the empiricists who denied the possibility of such meta-

principles and the rationalists in that he believed that we had to make sense of our relationship with the world we experience.

Kant's 'transcendental idealism' was his attempt to resolve these four positions. Kant did not deny that there is an objective world of experience to which we relate and ultimately test our claims to knowledge of what is true or false. However, Kant argued that the notion of discrete objects as knowable in an absolute sense is wrong but rather we can know them by the application of certain principles of causality, space and time. These principles are knowable a priori through the use of pure reason and are also *synthetic* in that they are true propositions about the world. These principles are transcendent, in that they are not properties of objects themselves nor are they real objects themselves, rather they are produced through the agency of the thinking mind.

Few philosophers now accept that Kant's transcendental idealism was the final answer, although he has had a profound effect on many social thinkers and philosophers including Hegel and Marx and, more recently, the influential German philosopher Jürgen Habermas. For Kant reality is mentally *constructed* whereas the common orthodoxy in the social sciences is that reality is socially constructed. What is clear, whether we accept Kant's version of idealism or its more modern version in the social sciences, is that reality is a concept which is *constructed* rather than *discovered* and it is this distinction which demarcates idealist philosophies from those of the realists.

### The realist alternative

Roy Bhaskar (1997) employed Kant's transcendental method but argued for a version of realism which has many similarities to that of Plato. Bhaskar and the critical realist school founded on his work argue that naive realism is clearly problematic for the reasons that we have outlined above and that reality does not subsist in the 'surface layer' of objects. Critical realists further argue that Kantian idealism is also problematic: they question whether it is credible to believe that the laws of physical motion or the equations of quantum mechanics would cease to apply if there were no human beings to think about them. The critical realists argue that these laws of behaviour have always existed – they are real descriptions of the world irrespective of their discovery by human beings. For Bhaskar, these laws are discovered not constructed aspects of reality. In many respects Bhaskar is close to the current orthodoxy in cosmology which argues that our existence is made possible because of certain initial conditions (the magnitude of Planck's constant, for example) and the operation of certain key universal laws which took effect at the moment of the Big Bang.

It may be that the natural laws of physics and biology are permanent features of existence irrespective of the minds that perceive them. However, is this also true of social systems? Some would argue that the laws controlling social systems only hold until the point that the social scientist attempts to test them. The mere intervention of the social observer changes the system which he or she is attempting to observe. In what sense, therefore, can we argue for the existence of laws which transcend the objects of social systems? One essential problem is that the so-called laws of social

behaviour fail as soon as one attempts to observe them in operation. However, critical realists do not regard this problem as insurmountable.

One way of explaining the critical realist position is through an understanding of time. We can argue that our notion of the present and what is currently real is an illusion. The present is simply the objective point of our existence, which is the point at which the future is being translated into the past. Our perception is thus revealed as a memory of a reality which has passed rather than an experience of the present. This radically reduces the range of beliefs described above; perceptual belief is always memorial belief because even if we look in a mirror what we are observing is not our face as it is now but our face as it once was. But how does this affect the problem of social laws?

As far as the future is concerned we tend to believe two things: first, we can change the course of events and, second, that the translation of the future into the past is governed by laws of behaviour which we cannot change. I see a glass just about to fall from the edge of a table and I jump forward and catch it. In doing that I have changed what appeared to be an inevitable sequence of events where the spatial stability of the glass was about to be radically altered by the gravity acting in accordance with Newton's Law. However, a moment's reflection shows that all I have done is to bring into play, through my intended act, a whole range of other laws to do with catching and holding. Therefore, the mutability of events is, in reality, the summation through my action of a different set of physical laws, which would not have been brought into play if I had not so acted. Arguably, it is exactly the same with social systems, which by their nature tend to exhibit much higher degrees of complexity than natural systems. Our acting in the social domain where observation and experiment are themselves a form of social interaction brings yet more laws into play all of which are very real but currently, and perhaps forever, are beyond our scientific powers to understand.

## Relativism

'Relativism' is a term given to a group of ideas which argue that truth is relative to the beliefs of the observer. It is not quite the same as arguing that beliefs are individually or socially constructed because it is possible for the social constructionist to argue from a critical realist perspective that truth is constructed on the basis of transcendent laws of human or social behaviour. Relativists argue that these laws are socially constructed as well and that all belief is relative to the social value system and norms that transcend the individual level, but not the social level. There is one paradox with relativism which is apparent as soon as we recast their governing theory of truth as follows: *all truth statements are relative to X or Y*, where X and Y are whatever the relativist proposes to ground their concept of truth. The obvious problem is that this statement is contradictory – a contradiction that is revealed as soon as we extend its logical form: *all truth statements are relative to X or Y except this one*. Thus there must be at least one universally true statement, namely, that *all true statements are relative*. But why should this one statement be privileged? It can be privileged if we deny the applicability of the laws of logic but where does that leave us? This is an issue we will

consider when we return to the claims of *postmodernist* philosophers towards the end of this chapter.

## Logical positivism and instrumentalism

A variant of empiricism called 'logical positivism' became a major force in the early part of the twentieth century through the work of the Vienna Circle of Philosophers – Schlick, Carnap, Feigl and others. Logical positivism<sup>2</sup> is a linguistic derivative of empiricism where the world of 'meaningful discourse' is controlled by a particular variety of the correspondence theory of truth. Positivists, like empiricists, argue that true belief is grounded in what we perceive and that what we perceive is derived from a value-free, independent reality. However, their most significant innovation was to propose that meaningful statements are only those which can, in principle at least, be verified by appeal to observation. This is the correspondence theory of truth recast in the form of observation statements (which are, for the logical positivists, the substance of 'observation language').

Apart from the verification principle, logical positivism is very similar to the philosophy articulated by Mill, Locke and Hume. In the UK, Alfred Ayer (1936) in his brilliant book *Language, Truth and Logic* popularized the ideas developed by the Vienna Circle. Both Popper and Wittgenstein visited the circle and were influenced by the discussions that took place, although both developed their own particular philosophical positions which were different in a number of crucial respects from logical positivism. In economics, Milton Friedman (1953), at Chicago, produced a very influential positivist essay: 'The methodology of positive economics'. This essay has had a significant impact on economic thought and especially on the thinking of the early writers in the theory of finance. There is no doubt that positivism has had a profound effect on the development of finance and accounting.

For many scholars in the social sciences and, in particular, in accounting, the positivists' appeal to value-free knowledge and their rejection of metaphysics coupled with a hard-nosed instrumentality has led to a polarization of debate and a degree of mutual incomprehension. In part, the issue of value-free knowledge is derived from the British Empiricist School, particularly Mill and Hume, who also held to the correspondence theory of truth (realism). Hume in particular argued that injunctive statements cannot be reduced to existential statements. In other words because I believe that X *ought* to be true I cannot infer that it *is* true.<sup>3</sup> This logical inference from the correspondence theory coupled with exclusion of synthetic a priori statements within empiricism led to the logical positivist position that metaphysical statements are meaningless.

At one level our examination of the alternatives to empiricism and realism has probed the weakness behind the 'value-free' debate. However, even accepting the correspondence theory of truth which entails that there is an objective domain of scientific enquiry which can legitimate beliefs, the question still remains as to what motivates the scientific enquiry in the first place. Clearly, scientists are motivated by what they deem, for whatever reason, to be important and it is at this

level that the question of the values embedded within scientific research become important, even accepting for a moment the argument that scientific facts are value neutral.

We have already dealt with many of the central issues within positivism. However, it does present two further difficulties: first, concerning the validity of the verification principle itself and, second, the logical positivists approach to general laws and theoretical terms.

A law in the sciences (both natural and social) always makes some appeal to a universal generalization. The law of demand, for example, asserts that reducing the price of a commodity always increases its demand – note not ‘sometimes’ or ‘usually’ but *always*. Scientific theories, in particular, contain many of these laws and apart from testing all possible instances of the operation of that law its truth cannot be definitively established. So, in the case of laws the verification principle breaks down. Furthermore, a law cannot be extrapolated with certainty from any number of singular observations (induction) and, therefore, propositions containing laws expressing universal generalizations exist in a different logical realm, as they are neither analytically derivable from observation nor provable as contingent propositions.

Theoretical terms pose another severe difficulty for logical positivism and the verification principle. Take, for example, the word ‘value’. This is a common word used in everyday discourse and most people would say that they have, at least, an intuitive notion of its meaning. However, when we attempt (following logical positivist principles) to define the meaning of the term ‘value’ in purely observational terms we run into difficulties. The term ‘value’ is both *under* and *over*defined observationally, which renders impossible a direct reduction of the term to observational language.

When we use a term such as ‘value’ we believe it to be meaningful with respect to a given asset even though no direct observation of that asset’s value is being made. Most corporate assets, for example, would only be valued for accounting purposes at each year end and, even assuming that such valuations are objective observation statements concerning the assets, no direct observation of value is made when we use the term at intermediate points. In this sense the meaning of the term ‘value’ is observationally underdefined.

At another level the term ‘value’ subsumes a variety of different measurement systems. When valuing corporate assets, for instance, we have a wide choice of valuation bases: historic cost, replacement cost, realizable value, current cost (to name just a few of the possibilities). We would also have to include some definition of the amortization principle we deem appropriate. In this sense, the term ‘value’ is observationally overdefined in that any one of a number of observational criteria would give it meaning. It is for this reason that auditors can certify any number of different valuation bases as presenting a true and fair view of the affairs of a given company.

Therefore, at the heart of empiricism in general, and positivism in particular, lies a significant difficulty concerning the ontological status of theoretical terms which are non-observable and the language we use to describe those entities which has no

direct observational reference. There have been two broad strategies for dealing with these difficulties: the first simply denies the distinction between observational and theoretical terms (that is, it embraces the strongest form of realism outlined above). The second accepts the distinction between theoretical and observational terms but argues that theoretical terms have no real observational meaning. In this view, theoretical terms are merely convenient analytical constructions of observational terms whose purpose is to help in the derivation of novel observational implications and predictions. This latter approach has become known as 'instrumentalism', although it is Kantian idealism in yet another disguise.

Like Kant, instrumentalists would argue that belief is grounded in observables. However, they also hold the view that theoretical language, and especially language that appeals to universal laws of behaviour, are purely mental artefacts or linguistic conventions which allow us to tie up observational terms into loose 'bundles of thought' which we can carry around while they serve their purpose and abandon when they do not. At the observational level, logical positivists argue through the verification principle for a correspondence theory of truth, while at the theoretical level they would argue that truth is what is convenient rather than what is coherent at either the individual or social level.

The point at issue here is that in the instrumentalist programme the realism of given theoretical terms is quite irrelevant in determining the validity of any theoretical constructions (what we term 'theories') derived from them or in which they are embedded. The purpose of theories is to enable us make predictions which can be verified. If they fail in that task then they can be abandoned once a more satisfactory alternative becomes available. The fact that a theory (or perhaps the assumptions which make it up) is unreal is quite irrelevant provided that it works in practice. This was the general thrust of Friedman's (1953) essay which provides an excellent exposition of the instrumentalist position. It is also easy to see why such a philosophical position was so attractive to economists. For the first time they could rebut the often repeated charge that their theories were unreal with the rejoinder, 'it doesn't matter!'

## Prediction and explanation

The principal thrust of the instrumentalist position is the use of theories as convenient artefacts for the generation of observational predictions. Given any law-like generalization it is possible, by invoking certain qualifying assumptions, to produce a consequence or implication. If the argument is couched in conditional form (that is, *if X is true then Y is true*) a prediction is produced. The problem of course is that the qualifying assumptions must be such that the terms contained within the generalizations used to create the predictions are translated into implications that have clear observational reference.

Positivists usually regard explanation as a process of discovering the necessary law-like generalizations that 'cover' the singular instance to be explained. However, the process of explanation is not symmetrical with prediction. Laws that appear to have good predictive power often have poor explanatory power, and vice versa. This is

usually because the qualifying assumptions required to yield an adequate prediction are invariably much more stringent than those required to match a covering law in explanation. Numerous, and quite trivial examples can be cited. Generalizations linking sex and pregnancy, clouds and rain, illiquidity and bankruptcy are often sufficient to produce explanations of particular observations of pregnancy, rain or bankruptcy but are insufficient to generate predictions of these phenomena. With more complex, scientific examples, the qualifying assumptions necessary to generate a prediction reduce its scope considerably and the same is true in reverse with explanation – the greater the number of qualifying assumptions the more specific the scope of the explanatory laws must be.

Explanation in finance and accounting is rarely a technical problem of identifying some particular law of behaviour as is usually the case with explanation in the natural sciences. Explanation in the social sciences invariably entails interpretation. We will discuss the interpretive element of the social science disciplines later in this chapter and in the chapter that follows.

## Popper and falsificationism

Up until this point we have been particularly concerned to identify the crucial features and weaknesses of empiricism and its derivative – positivism. All the time, however, we have had to bear in mind the issue of realism in its varying degrees and the extent to which the realist–idealist distinction informs or clouds the issues discussed. At this point, however, it is appropriate to discuss a major attempt to sidestep at least one of the crucial difficulties of empiricism and positivism.

Karl Popper (1959) in his book *The Logic of Scientific Discovery* was particularly concerned with finding an unambiguous role for observation in the testing of theories and for eliminating the problem of induction. Popper's position entails realism with respect to theoretical entities and can be summarized as follows:

- Science progresses through the creation of conjectured hypotheses which in simple form can be described as one or more universal generalizations acting as premises in a logical argument from which conditional and refutable implications can be deductively drawn. The theoretical endeavour is to formulate theories in such a form that refutable instances can be derived from them. Theories, which do not admit refutation, are deemed non-scientific.
- The role of experimental science is to design suitably punishing tests which will, if at all possible, demonstrate the falsity of the theoretical implications and hence refute the theory concerned.
- A theory which survives a number of attempts to refute it is said to be 'well corroborated' by experiment. Note, however, that a theory can never be said to be proven; it can be well corroborated by the facts but refutation is always fatal. Theories progress accumulating 'truth value' through an almost Darwinian notion of the survival of the fittest. Absolute theoretical truth is an unobtainable ideal but is the ultimate aim of all science.

- Ad hoc modification of a theory as a tactic designed to remove the possibility of refutation is inadmissible. A theory which can never be falsified is useless.

Popper demarcates science from pseudo-science by the falsifiability of the theories produced and argues that science progresses through the attempt to replace refuted theories by ones which perform as well as their predecessors but which survive all refuting instances so far identified. Freudian psychology and Marx's 'scientific' view of history both fell victim to Popper's criterion as both can be used to defend any particular state of the world their protagonists may wish.

Note that Popper's falsificationism contains a strong prescriptive element and is particularly theory orientated. By following his principle of demarcation scientists can hope to produce better theories, that is, better descriptions 'of entities conjectured to be real'. Popper is not particularly concerned with whether or not this is how science really proceeds. As a methodology of science, falsificationism is strongly instrumentalist in tone and Popper showed no inclination to abandon his position in the face of the many refuting instances in the history of science. At one level Popper is advancing a criterion for how science should progress in the search for a better theory.

Popper's ideas have been extremely influential and, although he was not a logical positivist, his falsifiability criterion has some symmetry with the verification principle. It is a seductive notion that any statement which cannot be demonstrated to be false is meaningless and any theory which cannot be falsified is devoid of empirical content. It is true that Popper had surmounted one problem faced by the logical positivists, as any contrary case falsifies a universal law. If the sun fails to rise in the morning the universal generalization that it always will is indeed falsified, and presumably much else that we regard as important as well! Popper, however, did not manage to defeat the problem of theoretical terms – a fact which was pounced upon by his friends as well as his enemies.

## Methodology as history

Popper's falsificationism came under sustained attack from one of his students – Imre Lakatos – and from Thomas Kuhn, both of whom rejected the possibility that a single observation could refute or confirm any given theory. The two planks of their argument were, first, that observation statements are intrinsically 'theory laden' and, second, that all theoretical predictions are so conditioned by qualifying assumptions that no test can uniquely determine whether a given theory is valid or whether one of its qualifying assumptions is at fault. In addition, they held the view that the meaning attributed to all observation terms is solely determined by their particular theoretical context.

In 1962 Kuhn published one of the most influential texts in the modern philosophy of science: *The Structure of Scientific Revolutions*. Kuhn's work is highly derivative and from a philosophical perspective relies heavily upon the work of Fleck who published his *Genesis and Development of a Scientific Fact* in 1935. Kuhn, however, took a particularly socio-historic view of science and was opposed to the view that a

definitive, prescriptive methodology of science could ever be constructed. Kuhn viewed science as a process where 'paradigms' consisting of the corpus of theories and observations within a particular subject area pass through a definable 'life cycle'. During the life of a paradigm scientists engage in 'normal' science which consists of relatively minor problem-solving and experimentation. However, as the weight of anomalous evidence piles up, some scientists (particularly young ones!) will create a new theoretical structure with greater explanatory power and through an intellectual revolution supplant the old paradigm with the new. Once established, the new paradigm will itself settle into a 'normal' science stage until the time comes when it too becomes overburdened with anomalies (theoretical and empirical) and is replaced with something new.

Kuhn's methodology has little prescriptive content in that it does not help us decide between what is good and what is bad science and it gives us no rules for judging between competing hypotheses. At best, Kuhn has produced an interpretation of historical processes in the development of science but does not explain why it should happen in the way he describes rather than in any other. Kuhn's *Structure of Scientific Revolutions* offers a description of a process, which may be an approximation of what has happened in the past, but it has come under sustained criticism because it does not provide the necessary tools to either allow us to predict the future or to establish rules for demarcating good from bad science.

Lakatos's (1970) methodology contained a greater prescriptive element than Kuhn's. According to Lakatos, scientists commit themselves to a group of 'core terms', which they hold as irrefutable. An example of a core term in most of the economic and financial disciplines would be the notion of rationality – the idea that individuals are rational utility maximizers. Lakatos referred to the adherence to core terms as the 'negative heuristic' of the research programme. Throughout the life of the programme, researchers attempt to create a shell of ad hoc modifications consisting of confirmatory experimental evidence and theoretical adjustments to 'protect' the core from refutation. This process he referred to as the 'positive heuristic' of the research programme. Finally, a research programme is said to be progressing if the ad hoc modifications enhance its empirical content (that is, make it richer in predictive power) and degenerating if they reduce its empirical content. So, a research life cycle comprises innovation, progression and degeneration. But research programmes never die – they merely fade away. Some later finding or theoretical innovation may well reactivate a programme and renew interest in it within the scientific community.

## The theory dependence of observation

The meta-theoretical presupposition which underpins the work of Kuhn and Lakatos is the notion that observation is overwhelmingly conditioned by theory. This nullifies any attempts to use empirical work as a final 'court of appeal' for any theory and, therefore, undermines any attempt to put theory construction and testing at the heart of the philosophy of science. But, to get to their position it is necessary to

backtrack a little to 1959 and consider for the moment Hanson's (1958) *Patterns of Discovery*.

In that text Hanson coined the term 'theory laden' to express the idea that the language we use to describe observation is conditional upon a wide variety of linguistic rules and held theories. The fact that all linguistic terms depend, to a certain extent, for their meaning on the rules of the language concerned and on a variety of implicit theoretical assumptions is not surprising. What is surprising is the view held by Kuhn and Lakatos that observation is so completely theory dependent that the distinction between theory and observation is rendered meaningless. Indeed, both argued that any methodology of scientific development is intrinsically flawed if it presupposes that science proceeds through theory construction and experimental testing (by verification or falsification). Both challenged any methodological dependency upon experimental results, which they argued are conditioned by the theoretical presuppositions of the observer. We can never tell, according to them, whether any given observation is refuting a particular theory or the particular theoretical presuppositions of the observer.

The interesting point to note about Kuhn's concept of paradigm is that different paradigms represent quite separate and largely incommensurable ways of viewing the world. Scientists' interpretations of the empirical world are, for Kuhn, intensely theory (or rather 'paradigm') laden. Interpretations of reality, indeed the very meaning imputed to reality, change when one paradigm overthrows another. The revolution to which Kuhn alluded in the title of his book is not just a revolution in the range of possible explanations of a given reality, but a fundamental shift in the way scientists perceive that reality.

The problem of the theory dependence of observation has taken its most extreme form in the 'meaning variance hypothesis' that proposes that as we change a theory so all of the meanings attached to any related observation also change.

Our observation of reality and the meaning we attach to that observation is dependent upon our intellectual constructs (or theories). However, the meaning variance hypothesis can be shown to produce a paradox. If we accept that any term changes its meaning given a different theoretical context, then we would not expect to be able to use a given observation statement in more than one competing theory. Put another way, we would never be able to use an observation statement to test the rival claims of conflicting theories. This is a rather uncomfortable consequence as well as apparently conflicting with the history and practice of science.

Often, scientists are able to distinguish between the raw data of experiment (where objectivity can be checked by replication) and the admittedly fallible and conditional language we use to interpret that reality. Indeed, the history of science gives many examples of observation reports which have survived cultures and changes in explanation and theory. One example of this was the planetary and stellar observations made by Persian astronomers 1000 years before Christ. Their observations were regarded as definitive up until the eighteenth century. Scientists have used these observations to adjudicate between one theory and another, and have been able to interpret their meaning for theory changes. In the field of finance, price data observations support many different and largely incommensurate theories of the

nature of the market and, in particular, the ability of such share price data to predict future price data and hence returns. It may be objected that price itself is a theory laden concept – which it is – however, when we talk about share price data what we are referring to is the reports of share prices which, once posted, become part of a historical record. It is this historical record which becomes the objective ‘raw data’ for research and the reading of that data can be conducted with a high degree of objectivity.<sup>4</sup> What is conjectural, however, is the theoretical meaning that is attached to that data not the verisimilitude of the data itself.

As you reflect on this debate and ponder the linkages between theory and observation it is worth noting that we are dealing with the ontological location of reality and the location of truth. Popper was an empirical realist who believed in the possibility of objective knowledge at the observational and the theoretical level of discourse. Lakatos and Kuhn proposed a meta-theoretical reality where theories are socially constructed by the community of relevant scholars although Lakatos was a realist as far as observables were concerned, and Kuhn<sup>5</sup> was not even prepared to concede that.

## A critique of Kuhn’s relativism

The writings of Kuhn and in particular those of Paul Feyerabend present a strong form of theoretical relativism which we can summarize as follows:

- All observation statements are theory laden and thus, in contradiction to Popper, provisional.
- Theory development is a competitive social process and is embedded within the social structure of science.
- Theories or paradigms are more or less internally coherent within the terms of the language in which they are constructed but represent incommensurable ways of describing reality (the meaning variance hypothesis).

However, Kuhn did not go as far as Feyerabend (1970) whose theoretical relativism led him to argue that there is no way of deciding which competing theory is better except in terms of its political success. In science, he argued, ‘anything goes’ and as scientific descriptions of reality medical science and witchcraft are of equal value.

The theory dependence argument assumes that reality subsists within the object, which is impenetrable because observation is theoretically determined, and Kuhn and Feyerabend would argue that theories are socially constructed. The circle has thus returned us to the idealism of Berkeley whom we have discussed before. However, the argument is problematic because as we move from observation to theory, and back again, and from theory to theory we discover rules which form a type of ‘linking language’ which allow us to translate from one to another. In both the social and natural sciences, logic and mathematics often provide the bridge. Kuhn was mistaken in believing that paradigmatic revolutions completely restructure the language of the science concerned – if that had been the case scientists embedded within the Newtonian ‘paradigm’ would have been completely unable to understand

Einstein's papers on relativity when they were published. However, even within its own terms this form of theoretical relativity ignores the fact that observation is itself a social phenomenon where groups of scientists confirm observation reports through replication.

Replication is a well-known scientific strategy both in the natural and social sciences. By replication, observational claims are tested sometimes using the same control conditions and sometimes others. This strategy sifts out those claims which are spurious and should not be admitted into the accepted canon of scientific knowledge. For example, in 1990 two chemists, Fleischman and Pons, reported that they had achieved nuclear fusion at room temperature – this was a novel discovery and if true would have revolutionized nuclear physics and the electricity generation-industry. The scientific community engaged in a systematic attempt using the reported experimental conditions to replicate their results. They failed and cold-fusion has been consigned to the scientific waste basket entitled 'embarrassing mistakes'. In finance, in the late 1980s a number of papers cast doubt upon the prevailing academic orthodoxy that capital markets are information efficient. Gradually papers emerged reporting anomalies such as seasonal, day of the week and small-firm effects. These experiments were repeated using different data-sets and in different countries, and have been confirmed to the satisfaction of most scholars working in the field.

In the natural sciences and the social sciences the reality which subsists within objects can be argued to be the product of collective observation and can become so robust in its meaning that it supports more than one theoretical structure. Observations of share price data by many different researchers often working with the same databases have been used to support different theories of price behaviour – some supporting efficiency models and others supporting chart-based prediction techniques.

### **Postmodernism and post-structuralism<sup>6</sup>**

In recent years there has been an attempt by many social and political thinkers to draw a line under what they term 'modernity' which, they argue, is the era of time which commenced with the Enlightenment and came to its apotheosis with the Holocaust in Nazi Germany. As a philosophical tradition, postmodernism traces its roots to the German critical-philosopher, Friedrich Nietzsche, and the founder of modern existentialism, Martin Heidegger. However, as a movement it has been profoundly influenced by architecture, art and linguistics. More recently, postmodern philosophers have drawn inspiration from the attacks on conventional epistemology by the neo-pragmatist Richard Rorty, who argues that philosophy has no privileged access to knowledge, nor is it a superior way of arguing but it is simply another way in which people talk to one another.

Postmodernists argue that the flowering of the sciences during the Enlightenment and the advancement of technology that followed was coercive in that it not only led to a greater understanding of the world but it also led to the creation of more powerful instruments for individual and social control. Postmodernists have pointed

to the contradictions of meaning and the absurdities which modernism has generated, and in particular they denounce the objectification of language, relationships and society. There is now a substantial body of writing within this tradition much of which is difficult to characterize. However, many would maintain, that the postmodernism and the post-structuralism of philosophers such as Foucault and Derrida is a form of unconstrained relativism, although postmodernists reject this along with the charges of nihilism or scepticism.

Derrida argues that there is no absolute foundation for beliefs and that no belief is more fundamental than any other. In this, he is making the same point that Paul Feyerabend made in his claim that all theories are equally valuable (or valueless) and for Derrida the maxim 'anything goes' holds for what we choose to believe. Post-structuralism, the term given to the French school of linguistic philosophy which encompasses the work of Michel Foucault and Jacques Derrida, argues that truth is linguistically constructed within a particular cultural discourse. For Derrida, meaning subsists in the reading and not in the intentions of the author. Deconstruction is a tool to subvert the text and to show that the meaning, which is signified, can be reinterpreted in ways that subvert the intention of the author. More generally, deconstruction is now seen as a 'method' where the critic assumes the position proposed by the subject of the criticism and then within its own terms proceeds to subvert the intended message.

This is a relativist position in that the meaning, which is imputed by the reader, is socially and culturally determined, and that the product of deconstruction succeeds in subverting the surface meaning of the text within the mind of the reader. In its turn, any reading of the text itself can be deconstructed and an endless fabric of alternatives created. Within its own terms, postmodern criticism rejects any attempt at refutation either empirically (by pointing to the facts) or analytically (by the attack of logic). Both, it is argued, fundamentally hinge on the artificial distinctions that pervade philosophy and modernity. The problem that this presents is that we are soon forced to abandon any critical standards and confront an infinite regress of thought with no possibility of achieving any knowledge that can form the basis for future progress.

In some respects, postmodernism is a rebellion against philosophical debates about the nature of knowledge, which as we have already suggested, are incapable of resolution. However, postmodernists do not provide any answers – they would argue there are none – but rather they privilege critical discourse as the only alternative open to us. Whatever one thinks of postmodernism as a philosophical position it is an interesting demonstration of the meaning variance hypothesis where the incommensurable paradigms of conventional and postmodern philosophy indeed appear incomprehensible to proponents from the other camp. However, we have already given some clues as to how its philosophical position can be attacked. Nevertheless, one of the most attractive aspects of postmodernism is that it is an abundant source of frivolity and humour, and although, as we have argued before, extreme relativism leads to absurdity, it has put the fun back into philosophy!

## The dominant methodology of the financial disciplines

Our previous discussion has emphasized the difficulty of constructing a methodology for scientific development based upon theory construction and testing. However, within the financial disciplines, and particularly the field of finance itself, a dominant methodology has emerged. Much of this methodology is implicit rather than explicit within the writings of scholars within the area but, because criticism and historical analysis of the literature of any discipline is an important component of research, it is important to establish that set of methodological principles which appears to form the dominant view of how research should be conducted in the financial disciplines.

Certain key philosophical threads appear in this reconstruction of what we argue is the dominant methodology of the financial disciplines. First, it is empiricist in nature and accepts the distinction between theoretical and empirical domains of discovery. In this respect there appears to be an implicit acceptance of the 'double language model' discussed above. There also appears to be a recognition of the distinct existence of 'models' as abstract theoretical descriptions of reality which are developed through an exhaustive process of refinement and validation. In this respect, therefore, the dominant methodology is Lakatosian but where the focus is on the development of research programmes based upon models rather than theories.

The key to what we argue is the dominant methodology lies in the nature of assumptions and in the linkage between observation and theoretical terms. In a previous section we argued that observational data can be linked to theoretical classes through a 'linking language' which gives meaning to that data in terms of the theories concerned. There are, for any particular attested observational data, a number of inevitably ambiguous linkages that can be created to different theoretical terms. This reflects the well-known fact that observational data can take on radically different interpretations from different theoretical standpoints even though different scientists with those different standpoints may well agree on the fundamental veracity of the data itself.

We now turn our attention to how financial disciplines have progressed over time. The essence of this development starts in a way similar to that proposed by Lakatos except that in the methodology we propose here the negative heuristic consists initially of a theoretical model of behaviour (individual or social) which, in its preliminary form, is invariably specified in terms of a list of assumptions representing limiting behaviour. Indeed, an assumption in this type of model can be characterized as a universal generalization representing, along a single definable vector, extreme behaviour.

Certain of the assumptions will be regarded as crucial to the status of the model (for example, rational utility maximization across risk and return within capital asset pricing). Others will be regarded as purely instruments for the necessary delivery of implications and, as such, will be regarded as less crucial for the status of the model and revisable in the light of empirical research.

It appears that the notion of the 'model' as an abstraction of reality is a more meaningful concept for practising researchers to handle than the notion of theory. In the financial disciplines, as in the natural sciences, the model is central to the development of any research programme, and it is evident in the literature of these various disciplines that schools of researchers develop around particular 'primary' or 'core' models and later subdivide into schools associated with examining the implications and variations of particular assumptions.

For this primary model to succeed as the core of a research programme it must possess a certain number of crucial characteristics:

- It must be possible to generate theoretical implications from which observational predictions can be drawn. These observational predictions should permit as well-targeted tests as possible. The more successful a model is at generating testable implications the greater its theoretical credibility.
- The assumptions within the model should be internally consistent in the logical sense and as simple as the logical integrity of the model will permit. This belief in the importance of logical rigour within arguments has been argued (Harre, 1986) to be an important rhetorical device in the construction of the academic literature. We will return to the importance of logic and its role within the literature in a later chapter.
- The model should be theoretically commensurate with any known empirical facts within its domain. Invariably, the creation of a new theoretical model will entail changes in the 'exchange syntax' through which established observational 'facts' are interpreted. In addition, we would expect these interpretations to change as a model develops.
- The model's theoretical scope is defined by the model and its attendant set of explanatory and predictive implications. So, within the finance literature the capital asset pricing model, the Black and Scholes's option pricing model and the arbitrage pricing model each form the core of an individual research programme.
- The combination of a set of related models (related in the sense that they cover the same empirical domain) form, with the relevant observation reports, the literary domain of a particular research programme. Those who control this literature will have a range of both local (domain specific) and general (methodological) criteria for assessing new contributions. A mapping of any research literature can be constructed as an expanding network of theoretical and observational connections where provisional and temporary linkages of meaning are made via the 'exchange syntax'.

From the initial stage of model formulation researchers described above, appear to undertake the following activities:

- They will seek internal economy within the core model attempting, as they do so, to reformulate it in terms of the minimal set of assumptions required to yield the same set of implications (this is sometimes referred to as the application of Occam's Razor or the Law of Parsimony in Logical Inference).

- Empirical research will be conducted to test the primary implications of the model and the range of divergence. Such tests will be rarely fatal to the model but can be highly confirmatory. The impact of falsifying tests will weaken the status of the model itself but may speed up the generation of alternatives.
- Theoretical researchers will attempt to create competing models of the same or greater scope but relying on fewer assumptions or on assumptions which make weaker behavioural claims. This we would equate with the 'positive heuristic' of Lakatos's Methodology of Research programmes.
- Researchers will attempt to formalize the relationships between assumptions to generate indirect areas of implication. For example, the interconnection between informational efficiency, information costs and the bid-ask spread (transactions costs) has become a fruitful area of research.

Through time, by adopting these strategies a subject network will form in the literature with 'nodes' where major assumption shifts have occurred or particular observational data of importance in the development of the literature have been discovered. Major nodes in a literature net occur when alternative models are generated from modified assumption sets. From these nodes, meaning linkages will be created (via the exchange syntax discussed above) radiating to observational data positioned throughout the network. A literature reconstruction, at any point in time will only provide a snapshot of the agreed network of theory – observation meanings existing at any point in time. At the lowest level, the meaning attached to particular observation data reports may appear to be very stable although in other cases there may be considerable divergences on the significance attached to such reports for different models existing in the literature.

Finally, the question arises as to how we determine the state of health of particular research programmes. There are a number of key indicators: the first, and most obvious, consists of a simple headcount of the number of active researchers publishing within a particular research programme. This gives a straightforward indication of the degree of commitment to the programme and the point it has arrived at in its life cycle. Second, individual research programmes become moribund when:

- the process of exploration of all of the assumptions within the model has been worked through, Occam's Razor has been applied to the full, and
- all linkages have been explored and the theoretical and empirical anomalies exposed and discussed.

Although no one can be sure that a programme has reached this stage, a consensus will materialize in the scientific community and the number of research papers relying on that model will dwindle away. Third, new models covering the same empirical domain will be developed but with greater scope (assuming more vectors of reality) and greater explanatory and predictive power.

## Summary

In this chapter, we have considered a number of issues relating to the methodology of research in the financial disciplines. At some length, we have considered the realist and idealist positions in philosophy and how they have influenced the positivist, post-empiricist and critical theory schools, all of which have had a considerable influence upon research in the financial disciplines. In one sense our approach has been reductionist in that we have attempted to argue that many of the positions discussed in the literature of philosophy and the social sciences can be reduced two pairs of polar alternatives: empiricism and rationalism and, realism and idealism. As you will have discerned we have proposed the view that little is new within philosophy and that the methodological position that the researcher adopts is one of choice. However, whichever position is chosen leads to certain methodological implications which we will explore in subsequent chapters.

Having described the variety of epistemological and ontological positions which active researchers may adopt, it is legitimate to ask if we as scholars advocate any agreed positions. Proudly, we answer no to that question because, although we take varying positions on many of the debates discussed above, we believe that a plurality of methodologies is possible and each can lead to fruitful research. However, we would argue that rational debate and enquiry and the sensible use of evidence in the resolution of competing truth claims is most likely to lead to the advancement of knowledge, although every step in the research process is problematic and fallible. But that is as far as we would be prepared to go.

## Notes

- 1 The obvious problem is what happens when there is no perceiving mind. Does the object of perception cease to exist? No, said Berkeley, there is always a perceiving mind – namely God. This led to a key idea in Christian philosophy that if God ceased to think about us then we would cease to exist. The following limerick expresses the idea nicely: There was a young man who said ‘God / Must think it exceedingly odd/ If he finds that the tree/ Continues to be/ When there is no one about in the quad.’ Reply: ‘Dear Sir:/ Your astonishment’s odd:/ I am always about in the quad/ And that’s why the tree / Continues to be/ While observed by Yours faithfully, God’.
- 2 The term ‘positivism’ was first used by the social philosopher Auguste Comte (1798–1857) and, although his philosophical position was heavily influenced by the empiricism of John Stuart Mill and in particular the success of Newtonian mechanics, it was not developed into a distinctive epistemic theory. When positivism is used as a pejorative term it is usually logical positivism which is being attacked.
- 3 This is usually referred to as ‘Hume’s fork’.
- 4 This does not deny the need for data checking and, in the case of star maps and the positions of planets, Edmund Halley, the first Astronomer Royal, took much of the old data and carefully corrected it using the new measuring instruments which were then available. With share prices, the errors take another form in that the share price is simply wrongly reported. This is far less of a problem than it once was given the reduced reliance on manual transcription in modern markets.
- 5 Some have attempted an ex-post defence of Kuhn but it is quite clear from the *Structure of Scientific Revolutions* (Kuhn 1962) and his subsequent revisions that he did argue for

the incommensurability of paradigms. However, it is also fair to say that Kuhn has not fully articulated what the term 'paradigm' means and as Putnam and others have pointed out there are at least 23 discernible definitions in *Structure*.

- 6 Postmodernism is a movement with philosophical implications; post-structuralism is the antithesis of the French structuralist movement which made claims to a scientific model of language.