

PUBLIC POLICY IN ISLAMIC FRAMEWORK: EXPLORING PARADIGM BASED ON ISLAMIC EPISTEMOLOGY

Abdulkader Cassim Mahomedya

School of Accounting, Economics and Finance
University of KwaZulu-Natal, Rep. of South Africa
Email: mahomedya@ukzn.ac.za

ABSTRACT

Despite the concerted efforts of recent Islamic scholarship to establish a distinct identity for Islamic economics, they have enjoyed little success in doing so. One of the most important reasons for this vision of Islamic sciences remaining unfulfilled is that scant attention has been paid to the critical role of epistemology in the founding of an academic discipline. Consequently, and not unlike the other areas of Islamic social science, Islamic Economics has remained embedded within the epistemological-ontological foundations of Occidentalism, thereby enslaving itself to the mainstream theories and tools of neoclassical microeconomics and Keynesian macroeconomics. This has been the central debility facing Islamic economists in establishing a distinct identity for their field of enquiry. This paper aims to highlight the importance of the relationship between epistemology, science, and Islamic economics. Only after this nexus is understood and appreciated, will it be meaningful to articulate an episteme for Islamic economics, and to derive therefrom and construct thereupon a matrix of concepts, ontological categories and axioms apposite to that episteme. This is critical if Islamic economists and Muslim social scientists aspire to realise the objectives of Islam and avoid the pitfalls of their counterparts in the western world. They have to chart a new and fresh way forward for their science, consistent with a worldview based on Islam's authentic sources.

Keywords: Epistemology, Paradigm, Science, Islam, Economics, Islamic Economics, Islamisation of Knowledge

ABSTRAK

Meskipun upaya-upaya terpadu pengetahuan Islami terkini untuk membangun suatu identitas yang berbeda bagi ilmu ekonomi Islam, ada sedikit keberhasilan dari upaya-upaya tersebut. Salah satu alasan yang paling penting untuk visi ilmu pengetahuan Islami yang masih belum diisi adalah minimnya perhatian yang ditujukan kepada peranan kritis epistemology dalam membentuk suatu disiplin akademik. Oleh karena itu, tidak seperti area-area lain dalam ilmu sosial Islami, Ekonomi Islam telah dan masih menyertakan dasar-dasar epistemology-ontology kebiasaan orang-orang barat (occidentalisme), sehingga masih terikat pada teori-teori arus utama dan perangkat ekonomi mikro neo-klasik dan dan ekonomi makro Keynesian. Hal ini menjadi kelemahan utama yang dihadapi oleh para ekonom Islam dalam membentuk suatu identitas yang berbeda dalam bidang penelitiannya. Kajian ini bertujuan untuk menekankan pentingnya hubungan antara epistemologi, ilmu pengetahuan, dan ekonomi Islam. Setelah keterkaitan ini dipahami dan disadari, hal ini akan memberi arti dalam mengartikulasikan suatu episteme bagi ekonomi Islam dan untuk memperoleh darinya dan kemudian mengkonstruksikan sebuah matrix konsep, kategori ontology dan aksioma yang tepat bagi episteme tersebut. Hal ini sangat mendesak jika para ekonom Islam dan para ahli ilmu sosial muslim bercita-cita untuk mewujudkan tujuan-tujuan Islam dan menghindari jebakan rekan-rekannya di dunia barat. Mereka harus merencanakan sebuah cara baru dan berbeda dalam memajukan ilmu pengetahuannya, konsisten dengan pandangan yang berdasarkan sumber-sumber Islam yang asli.

Kata Kunci: Epistemologi, Paradigma, Ilmu Pengetahuan, Islam, Ilmu Ekonomi, Ekonomi Islam, Islamisasi Pengetahuan



INTRODUCTION

Following the end of colonialism and the emergence of independent Muslim ‘nations’ during the second half of the last century, the intelligentsia, social reformers and the general populace in these countries have been calling, incessantly, for a revival of their centuries-old Islamic values, institutions and normative practices. Guided by the rich intellectual-scientific history of early Muslim civilisation, and with the concomitant realisation that many of the challenges of modernity stem from its embrace of Western Rationalism, Islamic scholarship realised quickly that any endeavour towards the revival of Islam in its socio-scientific realms was contingent upon a critical re-examination of key aspects of its knowledge enterprise (Iqbal, 2007; Sardar, 1988).

One of the fundamental points of agreement among Muslim intellectuals has been that there could be no dichotomy between the secular and sacred sciences in the Islamic scheme, and therefore no strict compartmentalisation of disciplines. Accordingly, there has been a concerted effort by these intellectuals to establish a framework of knowledge that is able to integrate both humanly-acquired and revealed sources of knowledge, generally not considered admissible as such in modern (Western) science. This attempt to reformulate the process of scientific inquiry became known in Islamic academic circles as the “Islamisation of Knowledge/Science (IOK/IOS)”. The social or human sciences were deemed most amenable to this paradigm shift, and consequently received the greatest amount of attention by scholars (Hussain, 2006). *Islamising* economics (and finance) is an extension of this intellectual effort and is, in fact, considered one of its most important pillars (Haneef, 2007; Hefner, 2006). In a sense then, it serves as an important test case of this ambitious project.

The initial impetus for this intellectual movement was largely inspired by the writings of Jamal al-Din al-Afghani (d. 1897), Muhammad Abduh (d. 1905) and Muhammad Iqbal (d. 1938), Chapra (2008) dan Haneef (2007), whilst the first calls for developing Islamic economic theory specifically, came from Sayyid Qutb (d. 1966), Abul Ala Mawdudi (d. 1979) and Baqir al-Sadr (d. 1980) (Mahomedy, 2013). It was, however, left to the subsequent generation of thinkers¹ to articulate in modern academic parlance the form, shape and content of the nascent enterprise of the ‘Islamic Sciences’. Chiefly among them are the

¹ Interestingly, but not surprisingly, many in this group have received some form of academic training in the West.



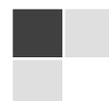
likes of S.H. Nasr (1968), al-Attas (1978, 1985, 1986, 1995), (Al-Faruqi, 1982), Sardar (1985, 1989) and Choudhury (1990, 2004, 2006, 2011).²

But it was two international conferences following in quick succession in 1977, one on Muslim Education, in Saudi Arabia and the other on the Islamisation of Knowledge, in Switzerland that elevated the issue to one of global interest for Muslims throughout the world. Not only did it sensitise Muslim educators to reflect on how they approach the transferal of knowledge to learners but more importantly, it mobilised and ignited the conscience of many Muslim intellectuals to actively participate and contribute to the programme (Adebayo, 2006). To further this research agenda, associations of Muslim intellectuals and professional bodies, Islamic research centres, and Islamic universities have been established in many Muslim countries to actively network and explore ways in which their disciplines and specialised fields of study could be 'Islamised'. Driven by a similar spirit, thousands of books, journal articles and numerous conferences, workshops and symposia, focussing especially on Islamic economics (IE), have all generated a vast body of literature in this area. The wave of enthusiasm spread far and wide such that even a country like South Africa, with its small minority Muslim population, had established its own Muslim professional bodies and was able to successfully host several international conferences in this regard.

BACKGROUND TO THE PROBLEM

It is now almost four to five decades since this enterprise was begun with earnestness and enthusiasm and which imbued within the Muslim psyche a renewed vigour and sense of mission (S.V.R. Nasr, 1991). But despite the plethora of writings in this cross- and multi-disciplinary project, has Islamic scholarship been able to actually deliver on its promises to revolutionise knowledge in the various domains of academic thought? Or at the very least, has even the ground-work been laid for the next generation of Muslim intellectuals to build upon that foundation? Hardly ten years had passed since the formal inauguration of the IOK agenda and many were already beginning to question the shape and form of the burgeoning enterprise unfolding in its wake (Kirmani, 1989; Rahman, 1988; Sardar, 1988). Its application hitherto had been perceived to be so superficial and blinkered that alarm bells were raised that unless the "jejune nature of the [then] current approaches to the issue" was not fundamentally reconsidered, it would eviscerate the

² There are some important differences though, among these scholars, on how this ought to be conceived and what the challenges are for its realisation.



“Islamization project of its creative potential” (S.V.R. Nasr, 1991). The fate of Islamic economics was specifically highlighted in this regard. In fact, so serious were the some of the objections raised at the time that concerns were expressed as to the very survival of the project itself (Haneef, 2005; S.V.R. Nasr, 1986).

So did the proponents of IOK, particularly the Islamic economists, take heed of the critical advice to reflect on, and re-orientate their mission? Notwithstanding the well-intentioned attempt by those involved in this international drive, Muslim scholars who were deeply involved in it are of recent increasingly conceding that their efforts to recast modern science and its various sub-disciplines within an Islamic “mould” have been misconceived, and that “something has gone wrong” (Chapra, 2000; Choudhury, 2001; Sardar, 2004; Siddiqi, 2008, 2011). Various explanations have been proffered for what Siddiqi (2008) laments as the “collapse of the grand Islamic agenda”. And again, Islamic economics was singled out as a case in point.

That the discipline is at a crossroads and in a crisis of sorts is widely acknowledged and recognised (Al-Atas, 2006; Choudhury, 2008b; Haneef, 2007; Khan, 2013; Kuran, 2004; Siddiqi, 2004; Zaman, 2011). IE has been heavily censured by both critics and proponents alike for failing to “articulate a sound and coherent theoretical paradigm for the discipline, let alone in demonstrating how it would find practical expression in the real economy” (Mahomedy, 2013). Several international forums³ have been subsequently convened to specifically address this issue. One of the central themes to emerge from these discussions is whether IE needs to be reconceived *de novo*, requiring a paradigm shift altogether or, alternatively, that it should continue to evolve within its current framework of classical-neoclassical-Keynesian economics and its body of concepts and methodologies. Clearly, the path that it adopts will once again, significantly influence the future trajectory of the growth of the discipline.

Some scholars, such as Kahf (2004, 2012), Al-Jarhi (2004) and Zarqa (2004) argue that IE ought to remain within the purview of mainstream economics and that with relatively minor adjustments and modifications, the former can easily be accommodated within the latter. On the other hand, the more *avant-garde* Muslim intellectuals such as Choudhury (2006, 2008a), Nasr (1986, 1989),

³ E.g. workshops and seminars organised by the Islamic Research and Training Institute (in 2004), by the Islamic Economics Research Centre (in 2008 and 2012), by the International Institute of Islamic Thought (in 2011) and most recently, by ILKE Association of Science Culture Education, among others, in Istanbul (in 2013).

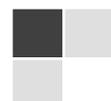


Sardar (1988, 1989, 2004) and Zaman (2005, 2011) are vehemently opposed to developing IE as an off-shoot of mainstream economics. They aver that it is because of this slavish imitation of its Western counterparts that IE has dismally failed to achieve any degree of substantial success. Others yet, some of whom are pioneers in the field such as Siddiqi (1970) and Mannan (1970) favour a more circumspect approach in which the essential concepts of mainstream economic science ought to be juxtaposed and evaluated with those from within an Islamic framework and then subsequently integrated, modified (or rejected from) within IE theory. Invariably, a careful reading of most of the literature on Islamisation generally reveals similar fault lines on how to confront this challenge. And so, despite much constructive debate, both in terms of depth and breadth, still no consensus emerges on this crucial issue.

One is therefore left wondering as to the reason/s for this lack of agreement on an axiomatic principle as fundamental as this. What might help to explain the failure on the part of these distinguished experts to agree on a unified approach at this critical juncture of their mission? It is the thesis of this paper that the reason for this divergence is that not everyone involved has paid adequate attention to the critical role of epistemology in the founding of an academic discipline, more especially in a project as ambitious as that of reconstructing human intellectual thought. It also helps to clarify why the vision of Islamic sciences generally has hitherto remained unfulfilled.

That this indeed might be the case is somewhat surprising: after all, attempting to redefine the boundaries of knowledge and its sources and how they intermesh constitutes the very subject matter of epistemology, as will be detailed in subsequent sections. The founding fathers of the Islamisation project and even those that followed in more recent times such as Nasr, al-Attas and Choudhury have all been too keenly aware of the indispensable need for scholars to fully engage with issues of epistemology and methodology. At inception they had already emphasised its importance for any meaningful construal and recasting of the knowledge enterprise anew, but how the import of this might have possibly slipped the Islamic economists is also an issue that I will revert to later.

Given the primal role that epistemology plays, not only in the process of knowledge creation and its growth (K.R. Popper, 1959), but also in shaping the very 'lenses' through which we 'see' the world i.e. our world-view or *weltanschauung* (Dilthey, 1960), this study seeks to interrogate this central problem, which lies at the very heart of the agenda to establish a uniquely Islamic approach to economic issues. The rest of this paper is therefore



structured as follows. I first explain the derivation and meaning of epistemology within the area of philosophical inquiry, after which I examine its need and significance as a discipline in itself and in relation to the other sciences generally. I then critically analyse the more recent effort to discredit the role of epistemology altogether and replace it with the philosophy of the physical sciences. Once these issues are clarified, I outline broadly some of the fundamental precepts underlying the epistemology of Islamic economics and then conclude by arguing why IE needs to clearly delineate its unique epistemological moorings and principles if it wishes to achieve its *raison d'être*.

EPISTEMOLOGY: DEFINITION, NEED AND SIGNIFICANCE

Along with metaphysics⁴, logic⁵ and ethics⁶, epistemology is considered to be among the most distinguished branches of philosophical enquiry. Etymologically, it is derived from the Greek words *epistēmē* (“knowledge”) and *logos* (“reason”) and is often described as the theory of knowledge (Edwards, 1967). This (narrow) definition, however, does not adequately convey the comprehensive character of the discipline. Epistemology examines critically what actually constitutes knowledge (or not); what are its sources and means of derivation, and through which mechanisms and processes is it conveyed. Its task, accordingly, is (a) to interrogate the very building blocks of knowledge, that is, the concepts that form the basis of any scientific enquiry and how they were arrived at, (b) to explore the processes and methodology that is used to functionally relate concepts and similar to such constructs in other domains, (c) to seek criteria by which knowledge is justified, and finally, (d) to specify the limits to what is humanly knowable. Additionally, its role is also to distinguish between objective-subjective, positive-normative, and factual-hypothetical structures and ideas (Vollmer, 1987) or contrarily (à la post-modernists), to explore whether such polarities could even exist in the first place.

If epistemology is to address human thought at such an elemental and foundational level as described above, then its connection to other areas in philosophy is inextricable. Views about the essential nature of reality (metaphysics), of which man is a part, will unavoidably influence his

⁴ A study of the ultimate structure and constitution of reality (as opposed to appearance). (Encyclopaedia_Britannica, 2010).

⁵ The study of correct reasoning, especially as it involves the drawing of inferences. (Ibid).

⁶ Moral Philosophy that seeks to determine the correct application of moral notions such as good and bad, and right and wrong (Encyclopaedia_Britannica, 2010).

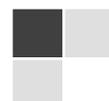


perceptions on his ability or otherwise to make sense of that reality. How man then expresses and conveys this understanding and furthermore acts upon it, leads him into the field of semantics⁷ and ethics, respectively. If we affirm the presence of epistemic concepts of interaction, learning, discovery, growth, etc. then endogeneity and reciprocity of all of these areas of enquiry within human experience becomes well-established. With the specialisation of knowledge and its subsequent professionalization into formal disciplines, philosophers and practitioners of the different sciences may each wish to claim an epistemology distinct, and in some ways exclusive, to that discipline, an issue that I will revert to later. Consequently, on this account, there could arise an epistemology of religion, an epistemology of the (natural) sciences, of economics and so on (Choudhury, 2006).

Given this rich and all-embracing purview of epistemology, its implications for all other socio-politico-scientific domains are far-reaching and profound. Not surprisingly, contemplation on epistemological questions has since time immemorial captured the minds of great thinkers in all civilizations. This incessant quest of man to discover the fundamental truths of his being and the universe around him stems from an inherent desire to move from conjectural states into ever increasing degrees of certainty. Ultimately, it is driven by a need to find meaning and purpose of man's existence and the world around him. These insights then serve as a point of reference, an anchor as it were, to guide man towards purposive behaviour in relation to himself and to all other entities within the diverse world systems that he can potentially relate to. From this perspective alone, one may readily recognise the vital role that epistemology plays in providing for man a platform upon which he is able to live meaningfully in the world.

At the time that the different areas of knowledge enquiry branched off into distinct and formal disciplines several centuries ago, there was deeply held view that for these sciences to gain legitimacy as such there was an indispensable need for a formal system of thought to evaluate the credentials of all knowledge propositions and to assess claims to their validity (Taylor, 1995). Epistemology was thus assured the natural candidacy to fill this niche and to perform the evaluative role required. For epistemology to be elevated to this supra-scientific status, that is, a meta-discipline, however, meant that it had to lay claim to an objective, universal and incorrigible set of epistemic principles and criteria that could serve as the definitive standard of truth. This traditional

⁷ A branch of philosophy dedicated to the study of language as a representation of reality. (Ibid)



character of the discipline formed the basis upon which Foundationalists⁸ chose to erect the entire edifice of ‘justified’ human knowledge. And hence, the metaphor of knowledge as a set of indubitable beliefs forming the foundation upon which the superstructure of other propositions are built and justified (Papineau, 1981).

EPISTEMOLOGY CHALLENGED BY RATIONALIST SCIENCE AND IMPLICATIONS FOR ECONOMICS

That epistemology is integral and indispensable to the construal of knowledge and the search for ultimate truth has, somewhat surprisingly, been challenged from the earliest of times by both classical and modern philosophers and scientists alike. From the ancient Greek sceptics of the Hellenistic tradition (see Palmer (2000) through Hume (1978), from G. W. F. Hegel, Findlay, and Miller (1977) through Heidegger (1978), Boltzmann (1974) and Ayer (1936), and more recently, Quine (1969, 1981) and Rorty (1979), have all disparaged, to varying degrees, the traditional conception and role of epistemology. In some writings Nielsen (1991), the very legitimacy of the discipline has been abjured and even parodied. Much of this critique represents a recent trend, particularly in Europe and America, that aims to strip epistemology of its pre-eminence and, perhaps more seriously, to repudiate the entire enterprise as a mistake altogether Taylor (1995), also McDermid (2000). I will elaborate on each of these arguments and their responses accordingly.

The Sceptical Case

The classic argument brought against the notion of a criterion of knowledge, first raised by early scepticism⁹ and later, in the writings of Hume, Hegel and Boltzmann is the apparent inability to prove unequivocally its universality and truth. This shortcoming leads to the ‘equipollence’ problem which manifests itself in two insuperable ways.¹⁰ Firstly, if there is such a criterion (of truth) then an alternative, contrary one may be advanced with an equal weight of justification as the other. Secondly, if epistemology is to specify a criterion to validate knowledge claims then that criterion would have to be considered a piece of knowledge as well Vollmer (1987), and hence also require

⁸ Those who maintain that all knowledge and justified belief rest ultimately on a foundation of non-inferential knowledge or justified belief (Fumerton, 2010).

⁹ The Western philosophical school that adopted the attitude of doubting knowledge claims set forth in various areas (Encyclopaedia Britannica, 2010).

¹⁰ These were originally referred to as the fourth and second tropes of Agrippa, respectively Annas and Barnes (2000) and Forster (1998).



justification. If another criterion (again, a piece of knowledge?) is used to validate the earlier one, then it would also have to be justified and the process could go on *ad infinitum* setting off an infinite regress. On this account, the dream of a first philosophy of knowledge becomes self-defeating and has to be abandoned as it fails on its own terms. The lofty perch upon which epistemology rests crumbles from within.

Notwithstanding the logical validity¹¹ of the tropes of Agrippa used to buttress the equipollence problem¹², the following warrants careful consideration if we are to avoid the frustrating outcome it leads to. In any rational discourse on epistemology, human knowledge is both the subject and object of critique. Consequently, it is impossible to place a knowledge-induced process outside the circle of knowledge and then, via it, to return to it. As Russell (1952) argued, for participants to engage in any kind of refutation there has to be at least some piece of knowledge that is shared between them; that no meaningful result through engagement – the language-game – is conceivable from a state of blank doubt, and thus he warned against that strain of philosophy which leads to a destructive outcome of this sort. What this implies is that “epistemology does not prove the existence of knowledge, it presupposes knowledge” (Vollmer, 1987). It should not endeavour to prove that knowledge can or does exist anymore than semantics presupposes language without aiming to prove that languages exist. Neither stand in need of proving their areas of study. Engaging in a dialogue on either implies an acknowledgement of the existence of the subject matter at least. As G. Hegel and Wallace (1904) also maintained, it is absurd for an investigation of knowledge to be conducted prior to knowledge.

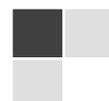
The Rise of Positivism

But apart from the equipollence problem, there is a more serious challenge against the traditional role of epistemology as described earlier. I address this issue in some detail because the implications of the arguments presented in its support are exploited by many in the Islamisation debate to argue that epistemological and methodological issues are uncontentious and consequently does not warrant any detailed critique or ‘reinvention’ see Furlow (2005).¹³ For example, Monzer Khaf, considered a pioneer in Islamic economics, has openly declared “I do not believe that to spend much time on Methodology is

¹¹ But not necessarily logically sound.

¹² See Footnote 11 above.

¹³ See also Choudhury (1998) and Haneef and Furqani (2010) for a detailed discussion of earlier treatments on this aspect.



useful ...[and] Methodology does not belong to Economics ... [and] nor is empiricism in contradiction with our religion” (Kahf, 2012). Why, at a time when even Nobel laureates¹⁴ in economics and other leading institutions¹⁵ of mainstream economics have been appealing for a fundamental re-think on economics, does one still find disinterest and even resistance from the Islamic economists on this issue?

That epistemological concerns and questions relating methodology might serve no useful purpose to economics stems from a view that the modernist approach to science (including economics), its methodology and tools of analyses are value-free, ethically-neutral and objective (Putnam, 2002; Ravetz, 1971; Weber, 1917). The notion that the scientific enterprise can be value free and universally generalizable was first popularised by Francis Bacon¹⁶, wherein he called for the mind to be free from all theoretical preconceptions i.e. cleared of all “idols” (Bacon, 1620). The cause was then taken up by Comte’s positivism in which he extended the project into the ‘social universe’, asserting that positivist science and its methodology could ultimately explain all phenomena, including human behaviour (Comte, 1908; Kincaid, 1998). In the first few decades of the last century, the logical positivists/empiricists, the intellectual successors to the positivists, Weber (1917) relentlessly pursued a crusade to unify and reduce all of the sciences, including the social sciences, to the language of mathematics and physics (Carnap, 1981; Hanfling, 1981).

It was from this tradition that economics suffered a similar fate through the works of the likes of Samuelson (1947) and Friedman (1977), despite the objections of Myrdal (1958), Hutchison (1981) and Hodgson (1983, 1988) against this tendency. It still persists to be the dominant view today that economics is, and ought to be, a positive science, free of ethics and value judgments (Boumans & Davis, 2010; Klappholz, 1964; Rothschild, 1993).

A key thread that runs throughout the positivists’ writings on the philosophy of science as it evolved over the decades was its emphasis on observability and the reduction of data to the physical realm only. By circumscribing the knowable domain to only that which is empirically testable, and hence verifiable through observational evidence, it was thought that the need for a First Philosophy of knowledge could be dispensed with. As noted by Caldwell

¹⁴ E.g. Stiglitz (Stiglitz, 2010).

¹⁵ E.g. London School of Economics (LSE, 2006) and The Center of Religion, Economics and Politics, University of Basel in Sweden (2011).

¹⁶ A 17th century philosopher frequently considered to be the Father of the Modern Scientific method.



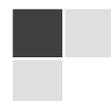
(1980) the agenda of the logical positivists was driven by a “fanatical... belief that their approach constituted the sole and ultimate end of philosophical analysis”, or, in the words of K. R. Popper (1959), by “their anxiety to annihilate metaphysics”. But they could not sustain the devastating critique from within the discipline itself (Suppe, 2000), Ayer (1959) in Zaman (2013), so that by the middle of the last century logical positivism experienced “a rather spectacular crash” (Van-Fraassen, 1980); see also Hempel (1974). Nonetheless, it continued to play a determining role in shaping the social sciences, particularly economics (Boland, 1991; Caldwell, 1994; McCloskey, 1983), and still persists to exert a pervasive influence on them (Fischer, 1998; Novick, 1988; Overman, 1988).

Naturalising Epistemology

In response to the failure of positivism and all of its variants to supplant traditional epistemology with empiricism as the only basis for validating knowledge claims, an alternative approach to demarcate the relationship between science and epistemology had rapidly emerged and is presently gaining currency in epistemic circles (Crowley, 2005; Kertész, 2002). It is based on the works of Dewey (1903), Heidegger (1978) and Quine (1969, 1981), who have all rejected the notion of a strict dichotomy between the human mind and the world it seeks to understand. They contend that human conception of an object derives from the interaction and engagement between the object and the mind, mediated accordingly through our senses (Quine, 1969). But the knowledge gained however, is neither static nor fixed: it is provisional and arbitrary and subject to constant transformation and re-conceptualisation iteratively as encounters between subject and object occur in different experiential contexts (Dewey, 1903). Simply, the external world *as it is* out there, cannot be objectively attested to outside of human cognition. This implies that there can be no *apriori*, permanent or infallible beliefs about anything at all. What role, then, for epistemology if there are no fundamental, objective truths about reality? In this scheme, epistemology becomes effectively stripped of its normative elements and its role, at best, limited to that of a *descriptive* discipline only (Kim, 1993).

A ‘naturalised’ epistemology of this sort, especially of the form¹⁷ advocated by its leading proponent, Quine (1969), means that it loses its primacy and propaedeutic role among the other sciences. Quine (1981) is quite categorical on this: natural science is “not answerable to any supra-scientific tribunal, and

¹⁷ For other variants, see Feldman (2001).



not in need of any justification beyond observation and the hypothetico-deductive method". Science, accordingly, is a self-justifying process to be left unfettered by any supposedly, higher *apriori* criteria (McEvoy, 2002). Whilst Quine does not call for an outright banishment of epistemology altogether, as demanded by Nielsen (1991), he is willing to endorse the discipline but only on an equal footing alongside the other sciences, so that it serves the function of merely describing *how* we arrive at knowledge.

But with this diminution of the discipline in which its *apriori* content is expunged, would it still serve the epistemological purpose? Several of those opposed to this re-characterisation such as Kim (1993), Bonjour (1998) and Putnam (2004) argue that naturalised epistemology, in emptying itself of any kind of *aprioritic* assertions, will, in the process, become devoid of any usefulness for epistemic purposes (McEvoy, 2002). The central thrust in most of their critique is that the ideas of truth, justification and reliability are integral to the epistemological enterprise and is, in fact, its *raison d'être*. Shorn of any normative content it loses its theoretical anchor and consequently, cannot conceivably fulfil its objective. At best, it is positivist in character, merely uncovering how we arrive at our beliefs.

Quine and his adherents Papineau (1981) deny that their project is indiscriminately descriptive. But if there no *apriori* epistemic principles to guide scientific enquiry how then would justifiable and valid knowledge claims be distinguished from dubious ones? As a "truth-seeking technology", in the sense in which Quine (1990) conceives of it, naturalised epistemology would, they contend, still be well positioned to discount assertions made by occultists, soothsayers, telepathists and the like. To perform this evaluative task and thus still serve many of the functions of traditional epistemology, it would draw upon the diverse sciences of psychology, neurology and physics (Quine, 1986). Effectively then, what is really proposed here, is in fact a reversal of the roles of epistemology as a discipline and the other sciences.¹⁸ The natural sciences would determine which avenues are conducive for knowledge acquisition and truth seeking from those that are to be discredited, and accordingly pronounce on their validity. As Woods (1989) asserts, this treatment of epistemology "is hardly more than positivism stripped down and retrofitted...without the trimmings... and no retreat to first principles". The upshot of all of this, is simply that only science, and science alone, with its empirical method can serve as the ultimate arbiter of knowledge claims.

¹⁸ In a sense, as acknowledged by Papineau (1981), it may amount to placing the cart before the horse.



To summarise then on the above, one is led to conclude that from the sceptics and early empiricists (Hume) to those who succeeded them later (logical positivists) and naturalists (Kitcher, 1992; Maffie, 1995; Quine, 1981), the attack on the traditional role of epistemology had never really abated, even post the official collapse¹⁹ of positivism. Similar arguments against the discipline, not considered in detail here for want of space and also because they broadly tend weave around the same themes, can also be found in the writings of the epistemological relativists (Campbell, 1974), (pan)critical rationalists (K.R. Popper, 1959), and (neo)pragmatists (Rorty, 1979).²⁰ Whilst each of these positions tend to accentuate some aspects of the critique and attenuate others, one can discern the central thesis that binds them all together on this issue: the denunciation and repudiation, to varying degrees, of any form of commitment to *apriorism* in scientific thought.

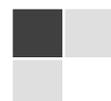
The scientific enterprise, it is argued, should not be encumbered with any form of externally imposed (i.e. presupposed) principles or antecedent commitments relating either to its content or methodology. Science therefore, should purge itself of all metaphysical notions (Zahar, 1977). But is it practically viable or even logically possible for scientific enquiry to be absolutely free of any assumptions or preconceptions, to be released *tout court* from any of its epistemological moorings and, in the tradition of Locke (1690), to proceed *tabula rasa*? It is to this issue that I now turn to.

CAN SCIENCE BE FREE OF METAPHYSICS AND PRESUPPOSITIONS?

Since Kuhn's (1962) and Feyerabend's (1975) celebrated publications of their *The Structure of Scientific Revolutions* (1962) and *Against Method* (1975), respectively, and the post-modernist/social-constructivist critique of modernist science that exploded in its wake (Knorr-Cetina, 1981, 1999; Rosenau, 1992), the notion of a value-free science, for both the natural and social sciences, has been hotly debated in the literature cf. Proctor (1991), and Kincaid, Dupré, and Wylie (2007). But the ontological foundations and methodological presuppositions integral to the practice of modern science has not received the same degree of attention. For a long time it was therefore maintained that science as a realm, in its search for truth, could still be impartial and ideologically neutral (Agazzi, 2014). Consequently, the belief still persists in both intellectual circles and the popular mind that science presents to us an

¹⁹ Suppe (2000) marks this date as the 26 March 1969.

²⁰ One may also, in this context, mention the works of the post-modernists/post-structuralists e.g. Derrida (1973) and Foucault (1980), but these are of a different genre.



objective or disinterested view of the world, or as appropriately described by Nagel (1986), a “view [of] the world from nowhere within it ... [but]... outside of ourselves” or over it.

The misconception that the natural sciences in particular are largely aperspectival and pure ‘in itself’ is widespread and stems from the mistaken assumption that modern science is presuppositionless and that its only distinction is its empirical method. Kuhn (1962) work brought to the fore, among other ideas (some what controversial at the time) that normal work-a-day scientific practice occurs within a given set of presumptions that provides for the community of scientists a framework within which they operate and make their discoveries. These presuppositions that cohere and form a *paradigm*, as it were, is for the most part, rarely questioned by the practising scientists themselves. It is only when the paradigm is unable to account for a significant number of anomalous results i.e. not explainable by the current framework, that a crisis is experienced and the old paradigm is replaced with a rival and new emergent one, leading to what Kuhn calls a *scientific revolution*.

It is becoming widely accepted (but only) recently that the adoption of at least some metaphysical assumptions in scientific discourse cannot be avoided, as any cognition by means of scientific concepts and precepts invariably hinges on such presuppositions (Collingwood, 1940; Hübner, 1988; Popper, 1972). The defining characteristic of these presuppositions is that they are not the result of empirical discoveries nor truth-claims formulated within science (Dilworth, 2007; Holtzman, 2003). They are therefore extraneous to the scientific enterprise *per se*, yet they provide for science the basic categories so that together they cohere to form a framework within which scientific activity may be conducted. These categorical presuppositions govern all aspects of the enterprise, to the extent that they “practically recolour(ed) our mentality” (Whitehead, 1925) and become “the final controlling factor in all thinking whatever” (E.A. Burt, 1932). Consequently, they pervade all aspects of the culture within which they emerge and embed themselves.

That we can only think,²¹ and perforce have to, within *some* framework is acknowledged even by Quine (1960), and Popper (1970) when he concedes “I do admit that at any moment we are prisoners caught in the framework of our theories; our expectations; our past experiences; our language”. If there were to be no framework with its supporting set of preconceptions, then on what basis

²¹ MacIntyre (1986:4) goes so far as to assert that even rationality itself “is inescapably historically and socially context-bound”.



would a scientist demarcate his field of enquiry from the mass of perceptions out there, or where to begin with within that area or whether any investigation *ab initio* is warranted at all? Given the determining role of these ‘thought-frameworks’ then, why are their presumptions so seldom subjected to any form of critique and readily taken as incontrovertible?²²

There are two possible interrelated reasons for this. One is that at this level of analysis there is a clear overlap and intersection between ontological²³ assumptions, epistemological concerns and methodological issues.²⁴ We would not search for that which we did not believe existed out there, nor formulate any appropriate means²⁵ to do so either. As outlined earlier, one of the explicit aims of modernist science was to expunge all metaphysical notions from its repertoire of ‘meaningful’ concepts and idea. If any notion could not be operationally defined, or at the very least, did not have any observable implications, then to strive to even describe it had to be rejected as simply “the production of nonsense” (Ayer, 1936). Given such an uncompromising stance towards the metaphysical, ontology, or the question of being, was precluded from science (Chmielecki, 1998; Meador, 2003) and hence any deliberation on these issues branded as outright anathema.

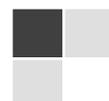
Secondly, despite the disavowal and hostility of modernist science towards any consideration of the metaphysical, during periods of intellectual crisis contemplation on these issues is irresistibly forced upon scientists. But a reading of the history of science reveals that scientific revolutions, à la Kuhn, or, epochal shifts in thinking, Tarnas (1993), during which foundational propositions are re-examined, do not occur frequently. It may take centuries or even millennia for an old paradigm to be overthrown and a new one to emerge and mature; the Copernican heliocentrism in cosmology and quantum mechanics in physics are cases in point. And this also helps to explain, why, perhaps, the presuppositions that undergird scientific thinking in any one milieu generally are rarely, if ever, interrogated: practitioners and the broader public may never *experience* the need to (re)evaluate them in their individual

²² It is only when one experiences a severe intellectual crisis of perhaps existential proportions that one feels compelled by *oneself* to re-examine their hitherto unquestioned assumptions of thought and praxis. The celebrated examples of those who experienced this in the western world is Descartes (1596 –1650, cf. Descartes 1985) and much earlier in the Muslim world, al-Ghazali (1056 –1111, cf. Hozien 2001)

²³ Ontology: the philosophical study of existence, or being (Craig, 1998).

²⁴ I.e. our conceptions about the nature and structure of the world impact on our quest to search for and discover that reality, and the means that we might adopt to gain that knowledge accordingly.

²⁵ Any of these as-yet unconceived entities, if ever ‘discovered’, will occur purely through accident but still necessitate some cognitive (re)orientation (Barnes 1982)



lifetimes. Furthermore, it is also conceivable that when an older paradigm is replaced, not all of its presuppositions are abandoned *in toto*. Some of them may become integrated into the new paradigm so that they continue to abide in scientific thinking for a long time to come.

The above discussion serves to highlight several important issues: firstly, to debunk the notion that modernist science provides us with a neutral /purist view of the world, devoid of any preconceptions, howsoever scientists may aspire for this ideal. Secondly, these presuppositions are integral to any scientific enquiry and are invariably metaphysically located within some paradigm, which nonetheless can, under certain conditions, be revised or supplanted. Thirdly, these axioms that form the core of any scientific endeavour (Dilworth, 2007) and which establishes for it its conceptual paradigms (Smith, 2006) are rarely recognised as such, due to the aversion of modern science towards any form of transcendent notions and concepts outside of itself.

AXIOMS OF MODERNIST SCIENCE AND IMPLICATIONS FOR ECONOMICS

Several leading and distinguished scholars like E. Burt (1924), Whitehead (1925) and Collingwood (1940) had even long before Kuhn argued very convincingly on the pivotal role of metaphysical assumptions in shaping scientific thought in any particular epoch²⁶ What then are these presuppositions of modernist science that sets it apart it from its predecessors, or other, alternative ways of arriving at knowledge?

At the onset of the Scientific Revolution, although there were three very different modes of learning that simultaneously emerged during that period (H. Cohen, 2005), these eventually melded and coalesced to shape for modernity its distinctive way of thinking about nature. Throughout this period, from Kepler and Galileo through to Newton and Darwin and eventually Einstein, Schrödinger and Weinberg, there was the progressive development of just one fundamental idea, physicalism (Maxwell, 1984). Physicalism, or materialism, is the claim that ultimately, everything that exists is physical/material, or the result of physical processes (Seager, 1991; Smart, 1959). From this basic philosophy, emerged the two corollary axioms of modernist science, quantification(ism) and reductionism. How this happened is explained below.

²⁶ But it is perhaps Burt's *The Metaphysical Foundations of Modern Science* (1924) that most lucidly demonstrates the paradigmatic shift towards the modernist conception of science from its early beginnings in the 1600s.



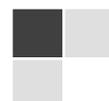
Science as Measurement and Quantification

Despite the differences among the various strands of modernist science (Bartley, 1982), from the early rationalists and empiricists and those who succeeded them later (viz. the logical positivists) to the critical rationalists (viz. Popper), all agreed that, at the very least, the basic ‘stuff’ that constituted the only referent for testing the validity of theoretical statements had to be sense data: “things that are immediately known in sensation: such things as colors, sounds, smells, hardnesses, roughnesses, and so on” (Russell, 1952). This at first, seemed straightforward: if the properties attributed to entities were observable, then assessing the validity of such claims is unproblematic because by merely observing an object one could ascertain if it possessed the claimed property (Suppe, 1974).

But the realisation soon dawned that even this was not adequate enough to ensure objectivity. For example, since sense impressions and the internal experience of an entity (e.g. heat) could vary between subjects and even by the same subject in different contexts, raw sense data was not deemed incorrigible (Ayer, 1959) nor could private sensations form the basis of public, inter-subjective knowledge assertions (Putnam, 1981), to overcome this limitation, only those traits of objects that are ‘subject-invariant’ could to be chosen for scientific purposes (Harre’, 1985) and furthermore, they had to satisfy the requirement of being “testable, intersubjectively, by ‘observation’” (K.R. Popper, 1959). This meant that henceforth, sense data which was previously *empirical* in its general connotation, was now further reduced and limited to only that which is quantitative and subject to measurable outcomes. Because of the close affinity between brute data, in this narrower denotation, and numeric information, the former could easily be mapped onto a numeric scale (Kanbur & Shaffer, 2007).²⁷

That measurement and quantification should become the defining feature of empirical evidence finds intellectual support not only from 20th century science. Its historical roots can be traced back to Descartes and Galileo who sought to describe nature in purely mathematical terms, and to do so, the scientist was called upon to focus only on the ‘essential’ properties of objects – that which could be measured and quantified (Capra, 1982; Dilworth, 2007). Quantity, rather than quality, was therefore the fundamental feature of all things that could be known, eloquently captured by Johannes Kepler when he

²⁷ But as Williams (2000) argues, measurement scales themselves have social antecedents and thus not strictly value-neutral.



asserted: “just as the eye was made to see colors, and the ear to hear sounds, so the human mind was made to understand, not whatever you please, but quantity” (Kepleri, 1858 cited in Burt, 1924). This notion was later epitomised in Hume’s famous remark:

“When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion” (italics his [1777], 1902, pg. 104).²⁸

On this conception of human knowledge then, “Out go sight, sound, taste, touch and smell and along with them has since gone aesthetics and ethical sensibility, values, quality, form; all feelings, motives, intentions, soul, consciousness, spirit. Experience as such is cast out of the realm of scientific discourse.” Laing (1982), as Smith (2008) further asserts, the tacit assumption underlying this kind of epistemology is that quantity is the only thing that has objective reality. Consequently, with the rise and ascendancy of science, with quantification its key yardstick, for truth to claim any sense of objectivity and universality, to enjoy the status of being ‘fact’ as opposed to ‘opinion’, it had to satisfy the criteria and *modus operandi* of empirical science. All claims that failed to meet this scientific standard came to be relegated to the category of the ‘subjective’ and is invariably considered no more within the purview of science and rationality (Capra, 1982; Smith, 2008; Trigg, 1993).

The contraction of the knowable domain to only that which is measurable and quantifiable set the cast for the scientific *Weltanschauung*. In this world-picture, all matter is denuded of its qualitative characteristics, allowing only for the quantitative to have any meaningfulness. With this new vision “there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation” (Weber, 1930). This phenomenalist-quantitative interpretation of the world of being claimed to apply to all of science (Bartley, 1982; Olson, 1991). To this end, even the social sciences, despite the scale and diversity of phenomena that they dealt with, had to be explained with reference to a quantitative-physicalist language and vocabulary (Ayer, 1959). It evoked heated debate even within the natural

²⁸ Thomson (1889), better known as Lord Kelvin, uttered a similar sentiment in 1883: “I often say that when you can measure what you are speaking about and express it in numbers you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind”.



sciences. The biologists, in particular, were particularly critical of what they perceived to be a form of intellectual imperialism of the physical sciences upon their domain of enquiry (Bartley, 1982; Mayr, 1969; Sheldrake, 2012).

Reductionism

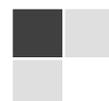
Reducing the explanation of all phenomena, both living and non-living, to a physicalist paradigm and its categories necessitated the adoption by the different sciences, including economics, of its methodology as well (Dilworth, 2007). Atomism, more often referred to as reductionism or methodological individualism, G. M. Hodgson (2007) holds that in any complex system, the behaviour of the whole can be completely understood from the properties of its individual parts. The dominant method of inquiry to achieve this was reduction: using the analytical method, everything was to be reduced to its most indivisible parts to grasp its underlying structure and to determine the forces operating at that level. It involved having to dig deeper and deeper beneath the surface to discover the most fundamental elements²⁹ that constitute matter in every field of human enquiry. The crusade of modern science thus was to decompose all of physical reality in search of its simplest constituents. Critically, it was believed that by understanding the functioning and purpose of individual parts *separately*, then through simple quantitative aggregation a comprehension of the whole could be attained.³⁰

Given this relatively novel approach to epistemic enquiry and the success that it begot vis-à-vis its application in technology, it received wide-spread support among its practitioners and the general populace. Science, narrowly conceived, appeared to have finally yielded to man the keys he eagerly sought to conquer Nature, to enable him, in the Baconian spirit, to “torture nature’s secrets from her” and “bound (her) into (man’s) service” (Merchant, 1983). Within this reductionist, materialist worldview, science is alleged to have ultimately prevailed, fulfilling Nietzsche’s infamous announcement of the “death of God”. All answers to the most vexing of questions to man and the universe around him, their origins and their futurity were to be sought exclusively in and from Science and its methodology alone.

This reductionism in the human cognitive exercise and its subordination to the physical sciences begot the ideology of scientism: the doctrine that physicalist science alone could provide the most authentic worldview based on indubitable

²⁹ For example, in physics, it was the atom; in chemistry, the elements in the periodic table, and in biology, the most irreducible component was the cell (Ackoff, 1993).

³⁰ This is expressed in the dictum that the ‘the whole is equal to the sum of its parts’.



knowledge which satisfied various criteria of objectivity.³¹ Any knowledge claim has to satisfy, inter alia, the canons of neutrality and personal detachability, observability, measurability, testability, and communicability. On this account then, truth can only be searched for vis-à-vis materiality. The realm of matter alone, in this scheme, serves as the sole datum from and within which all spheres of knowledge may legitimately arise. In this new vision “there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation” (Weber, 1930). It is underpinned with a thoroughgoing philosophy of materialism-cum-physicalism (Maxwell, 1984), both with respect to its ontology and reductionist methodology. As Trigg (1993) argues, it is predicated upon “the enormous metaphysical assumption that the reality to which science has access is the whole of reality.”

IMPACT ON ECONOMICS

But it is economics, of all the social sciences, that most ardently and comprehensively embraced the model of rational mechanics (i.e. physics) as the idealised science to be emulated (Boldeman, 2007; Hosseini, 1990). All the way from the classical school, from Smith, Ricardo, Malthus and Mill through to the neoclassical-marginalist movement of Walras, Jevons and Menger, and later, Marshall, Pareto and Fisher, one finds that economic theory is fully laden and impregnated with the scientific worldview. At the ontological level, just as Newton’s cosmos was fine-tuned by universal constants and celestial and terrestrial bodies reacted to a pull/push force (of gravity), so to was the economic sphere, calibrated by its own constants of human nature and social structure, subjected to the singular force of self-interest (Hamilton, 1999). In striking similarity, Smith and Malthus and later, Jevons, Marshall and Edgeworth, all used almost exactly the same ontological categories of physics to describe corresponding concepts and phenomena in economics.³²

The mechanistic-materialistic metaphor and imagery of classical physics was extended and pressed even further into economics. Notions (and processes) of market ‘forces’, the ‘self-adjusting mechanism’ of supply and demand, ‘stable equilibrium’, ‘cause-and-effect linear’ relationship between economic variables, the confining of prosperity to ‘material’ welfare, the quantification of utility, etc. all manifest a commitment to a mechanical conception of a social universe in parallel to the physical one (Gordon, 1991; Keita, 1992). The

³¹ See Brownhill (1983) for a detailed exposition of how these criteria were understood.

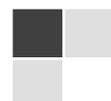
³² See Cohen (1994) for some illustrative examples and further discussion around this issue.



almost dogmatic-like believe in the equivalence of the two realms went so far that “some economists – Jevons, Walras, Fisher, and Pareto, among them – alleged that their equations were identical (or very nearly identical) with those of rational mechanics” (I.B. Cohen, 1994). As Mirowski (1989) reiterates, “The further one digs, the greater the realisation that the neoclassicals did not imitate physics in a desultory or superficial manner; no, they copied their models mostly term for term and symbol for symbol”. Even beyond the micro-economic level, by asserting that the (macro) economy is ineluctably driven by certain fundamental forces towards a given or deterministic end i.e. obeying natural and universal laws through the operation of causal mechanisms within a reified structure, Marxian and Keynesian economics reflect a similar Newtonian allegiance and character (Brown, 1972; Fay, 1975; King, 1994).

The ambition to cast economics within the framework of a physicalist cum naturalist science received a further boost during the first few decades of the last century. Within the prevailing intellectual climate of positivism and reductionism, it was asserted that choices and decisions of agents in the economy could also be completely explained “by reference to complexes of physical laws” (Drakopoulos & Torrance, 1994). This reduction of human behaviour to materialist causes strengthened a version of causality that started with Blaug (1980), and consequently, entrenched the deterministic paradigm for economics. A further and significant implication of these developments was the notion of the uniformity and universality of economic laws so derived from this deterministic conception of economic behaviour, (see (Mill, 2008).

The last aspect that is worthy of mention is the idea of rationality which lies at the heart of mainstream economics. The economic postulate that rational individualistic behaviour of economic participants can be simply aggregated (i.e. the additivity assumption see Hausman (2001) to reflect societal preferences evinces a clear commitment to the atomism of classical physics viz. that the whole is nothing more than the sum of its parts (King, 1994; Rosenberg, 1995). This methodological individualism remains a most sacred analytical principle in mainstream economic thought (Dupre, 2001; Gordon, 1991; Kittel, 2006), despite the intractable problems that arise from its almost universal application in economics. But to give effect to this principle one more critical assumption had to be made: economic agents are motivated only by self-interest, as expressed by Bentham’s pleasure-pain nexus. An important aspect of this assumption was that this self-interest had to be measurable and hence the development of Ordinal Utility Theory. Economic theory was henceforth amenable to complete mathematisation and discipline was finally



ready to become a fully-fledged ‘science’. The “Newton” of economics had finally arrived through the works of Paul Samuelson. Not surprisingly, he was the first American to win the Nobel Memorial Prize in Economic Sciences.

But is human economic behaviour, individually or collectively, as deterministic as other physical systems, and driven only by a few fundamental forces of nature? Is there no place for free will, intent, creativity, teleology or moral choice? Is it realistically conceivable that the individual person constituted the most irreducible unit of analysis and that his context had only a peripheral influence, if at all, on his choices and decisions? Is it even possible to describe or explain the totality of human experience within a narrowly defined set of measurable parameters such as self-interest and utility? If the responses to these are in the negative, why then did economists so single-mindedly pursue this programme of imitating the physical sciences?

Chapra (1992) and Mirowski (1989) are fully convinced that it was the allure of an ‘exact’ science like that of physics that the economists wished to emulate for economics; that physics was *the* role model of science and hence had to be modelled along its lines to lay claim to scientific status. Lawson (1997) similarly argues that it was the obsession with mathematics that led mainstream economics in the direction that it did. Rosenberg (1995) and Toulmin (1998) maintain that it arose from a metaphysical commitment to nature being in a state of equilibrium, changelessness, stability or a, “movement back towards a changeless state” (Rosenberg, 1995). As Toulmin implies, they felt prostrate before ‘the idol of stability’. More recently, other Nobel laureates such as Stiglitz (2002) and Krugman (2010) have proffered that it was ideologically and politically inspired. Whatever the motivations, the implications for such a characterisation of the discipline have been most profound, an issue I will revert to later.

Having expounded upon these essential features of mainstream economics within the modernist epistemology of science, I next review the core elements of Islamic science and its postulates. I will again particularise this analysis to economics and eventually conclude by elucidating to what extent, if any, Islamic economics could be subsumed within mainstream economics.

WORLDVIEW OF ISLAMIC ECONOMICS AND ITS AXIOMS

Islam has at its core the overarching and deeply-embedded reality of the Oneness and Unity of God (*Tawhid* – in Arabic), The Most High. The *raison d’être* of humankind’s creation is the recognition and actualisation of this



Unity in the various socio-politico-economic contexts that humans finds themselves in.³³ They are guided to this fulfilment through the agency of Revelation and Prophethood³⁴ that God, The Most High had sent from time to time to the different nations of the world. To facilitate mans' earthly sojourn towards his permanent abode in the Hereafter, God has produced and made amenable for man's beneficial use all that he finds on this earth.³⁵ Man, electing to have temporal mastery over much of this creation, therefore has to bear a weighty responsibility and solemn accountability for how he exercises this Vicegerency³⁶ granted to him. All that is observable (or not) in creation therefore has meaning and serves a distinct purpose and objective³⁷, for a term appointed, after which it will perish and cease to exist.³⁸ Humankind's existence from beginning to end is therefore integral to the rest of creation in terms of both means and ends.

But there is in addition, or rather, complementary to the Scripture of Revelation, the Scripture of Creation, through which man also gets to recognise and behold the Oneness of God and His most Sublime Attributes (see also (Paine, 1880). The Grand Design of the entire universe at the various multi-levels of existence, within and between the animate and inanimate worlds; all reflect and manifest this Tawhidi precept of Oneness. The intra-and-inter-systemic relationships between these world-systems occur through diverse forms of complementary relations of interactions and linkages, leading to systemic unity across the continuums of both time and space (Choudhury, 2004). This divine law of Unity over-arches and pervades all of the socio-scientific domains of existence such that it manifests itself most clearly all at levels of macro, meso and micro perception. As God, The Most High, declares in the Qur'an (Ch. 41: V.53) "We will show them Our Signs in the universe, and within their selves, until it becomes manifest to them that it is the truth. Is it not sufficient for you that your Lord witnesses all things?" Within such a scheme, God, though ontologically distinct and independent from creation, continuously interacts functionally, omnipotently and creatively within the

³³ Al-Qur'an (Ch. 51:V.56).

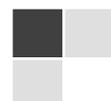
³⁴ All the prophets from Adam to Noah, Abraham to Ishmael and Isaac and through Moses, David, Jesus and finally Muhammad, including some other prophets, (May the Peace of God be upon them all) are recognised as such in the Islamic Faith, and similarly so with regard to the Revealed books such as the Torah, The Psalms, the Bible and finally, the Qur'an.

³⁵ Al-Qur'an (Ch. 2:V.29).

³⁶ Al-Qur'an (Ch. 2:V.30; Ch.33:V.72).

³⁷ Al-Qur'an (Ch. 24:V.115).

³⁸ Al-Qur'an (Ch. 35:V.13; Ch. 55:V.26).



complexities of universal life (al-Attas, 1986; al-Ghazali, 1997; Choudhury, 2011).

A worldview premised on this conception of a single, unified (ontological) reality consequently demands an episteme that is correspondingly complementary to it. It should be capable of spanning across all systems, explaining both the particular and the universal, and integrating the a priori with the a posteriori. The process of learning has to be interactive, integrative and participatory within a unified framework that allows for multi- and interdisciplinary and connectedness, though, as Choudhury (2006) reminds us, different problems could be dealt with by systems more specific to them. Such a general systems methodology requires the invoking of the Qur'anic Revelation (referred to earlier) and the Prophetic tradition, navigated appropriately through the use of humanly-endowed faculties of reason and observation. It is through this continuous process of evolutionary learning that man may comprehend with ever-increasing degrees of certainty all that can be possibly known.

That human life, nay, all of creation exists within such an organismic whole and therefore requires a holistic approach to comprehend its reality brings into sharp focus the very notion and validity of disciplinary boundaries. Activities, both human and non-human, in the real world do not occur as isolated or discrete moments of events, each spatio-temporally separated from the other. Any authentic understanding of them therefore simply cannot be divided into watertight compartments marked 'economics', 'sociology', 'psychology', 'anthropology', etc. As the Nobel Laureate economist Gunnar Myrdal (1979) concluded:

“I came to see that in reality there are no economic, sociological, psychological problems, but just problems and they are all mixed and composite. In research the only permissible demarcation is between relevant and irrelevant conditions. The problems are regularly also political and have moreover to be seen in historical perspectives.”

Economics, perhaps more than any other social science, reflects this multi-disciplinary character and classical Islamic scholarship was most keenly aware of this interconnectedness. Consequently, in all of the earlier writings³⁹

³⁹ Islahi (2005) has undertaken an encyclopaedic review of not only the role and impact of medieval Muslim scholars in Islamic economic thought but also their influence in the evolution of mainstream conventional economics.



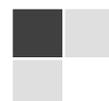
economic issues were always examined as a subset within the unified social and moral philosophy of Islam (Chapra, 1996). Any contemporary revival of Islamic science would thus also have to carefully re-consider the utility, if any, of maintaining current academic disciplines. In all likelihood, these artificial boundaries may blur and disappear altogether, eventually coalescing to form super-disciplines that better capture and explain the totality of experience of real-world phenomena.

If all of creation has a transcendental link and is intrinsically related to man and his destiny then morality, values and ethics play a central role within the framework of the Islamic knowledge enterprise. It was this very value system, which sparked and sustained the phenomenal rise of science during the early periods of Islamic history (Kettani, 1984). Islamic science and economics has to therefore explicitly and unapologetically serve and promote the values of its worldview (Manzoor, 1991; Sardar, 1988). But more importantly, as Choudhury (2011) forcefully argues, its moral law and ethics have to be “organically functional and endogenously embedded” within the general system of causal and complimentary relations from which they are derived and within which they logically operate. Without this relational reference, they will remain isolated from its fundamental premise of Oneness, and as a result, will need to be exogenously imposed with all the associated difficulties that this entails. Within the *Tawhidi* epistemological framework, these ethics will guide human behaviour as they derive and find expression through the continuous processes of learning and participation. So crucial is the role of ethical behaviour in even the this-worldly felicity of man, that his external environment and the conditions that prevail therein are in large part a reaction and response to the choices that he makes in this regard.⁴⁰

The last distinguishing feature of Islamic economics to emerge from its ontological and epistemological roots is the explicit recognition of the qualitative, the unmeasurable, the unknowable and the hidden, and their (potential) role on the outcome of worldly events. The Qur’an for example is replete with verses affirming these notions and phenomena.⁴¹ The need to incorporate them into the very constitution of Islamic economics are inevitable if one wishes to uncover and appreciate the richness, complexities and dynamic forces that continuously interact and integrate in the real world. It responds to the call for greater inclusivity of different modes of methodological enquiry (Anees, 1984; Tebes, 2005), recognises the multidimensional world of nature

⁴⁰ Al-Qur’an (Ch. 30:V.31).

⁴¹ See for example, Al-Quran (Ch. 18, V.7; Ch. 2; V3; Ch. 74; V31)



(Ford, 1984), factors in the indelible influence of habit, culture and history in explaining especially economic behaviour (Hosseini, 1990; Zaman, 2013), and explicitly acknowledges that our knowledge of the world will always remain imperfect and incomplete.

The admission of these qualitative or non-observable variables should not provoke concern that Islamic economics will degenerate into the occult, anarchy or dogmatism. Nor does it imply that it will necessarily lose all sense of ‘objectivity’. The value system that underpins the Islamic faith will prevent this outcome and thus help to assuage any concerns in this regard. Islamic economics may still be as ‘objective’ and ‘rational’ as the Secular sciences, though it would draw its legitimacy and authenticity from a different philosophical base (S.H. Nasr, 1976). As Sardar (1985) clarifies, “Islamic science [and economics] is subjectively objective; that is, it seeks subjective goals within an objective framework”. Furthermore, contemporary pioneers and leaders in this field such as Choudhury⁴² have adequately demonstrated through rigorous methodological and logical formalism how the *Tawhidi* knowledge centred worldview, applied to diverse socio-scientific systems, yields results that are intellectually acceptable and rationally satisfying as a scientific and explanatory praxis.

IMPLICATIONS AND CONCLUDING REMARKS

Given the above discussion, it is clear that the Modernist paradigm of science and that of Islamic economics are too distinct and divergent from each other to be reconciled harmoniously. At both the ontological and epistemological levels their axioms are fundamentally incompatible, largely because of sharp differences in their worldviews. Not surprisingly therefore, the very form and substance of their knowledge enterprises are unique. Consequently, their programmes and outcomes are naturally expected to differ.

Returning now, therefore, to the original point of departure: how should Islamic economics proceed with its agenda? Until now most of the literature on Islamic Economics, particularly those that attempted to construct the discipline on the foundations of modern science, has produced an admixture of (sometimes contradictory) notions, theories and policies (Kuran, 2004; Mahomedy, 2013; Philipp, 1990). This divergence in the characterisation of the discipline was bound to occur due to the application of differentiated thought processes that arise out of rationalist epistemology. As a result, the groundwork

⁴² See the list of references for some of his works.



of thought on the subject had become vitiated and the vision for a unified premise for Islamic Economics remains heretofore largely unfulfilled. And this is the fundamental thrust of the argument that writers on Islamic Economics have remained oblivious to; an authentic science of (Islamic) economics can only be established upon an irreducible premise that is both self-referencing and universal, so that it can explain the world as a unified macro-system including all its micro-system parts (Choudhury, 2008a).

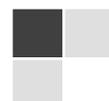
That Islamic Economics could have as its epistemological premise the development of a science undergirded by its distinct worldview is not unique, nor does it militate against the aims of economic enquiry. Modern economics, in all its shades and varieties, whether of its classical-neoclassical, Keynesian or Monetarist, Marxist or Institutional types, are all value-laden and ideologically or politically driven, as previously indicated. They are predicated upon by implicit (and sometimes explicit) sets of presuppositions, rarely acknowledged or even recognised as such by their proponents. These presuppositions are not arbitrarily selected nor chosen on the basis of any neutrally-objective criteria. Though often cloaked in the garb of positivist science, the various schools of economics actually serve a distinct agenda, a point emphasised quite convincingly by Myrdal (1958), Schumpeter (1949), Heilbroner (1988), and Robinson (1962).⁴³ What is perhaps to a greater degree less known, is that even the natural sciences, beneath their veneer of a purely empirical enterprise, adopt a set of metaphysical assumptions⁴⁴ which form the core of modern science (E.A. Burt, 1932; Dilworth, 2007; Safi, 1996) and which establishes for it its conceptual paradigms (Smith, 2003, 2006). Clearly then, no scientific enquiry may ever claim to be a presupposition less activity.

If the Islamic scientific schema (in which economics would be but an integral component) is indeed, as argued above, incompatible with Modernist science, does it necessarily imply that any sense of rationality is therefore altogether absent from its repertoire of intellectual tools? Certainly not. The Quraan⁴⁵ in fact, enjoins upon man in no less than 750 verses (about one-eighth of the total) to employ his perceptual and intellectual faculties to reflect on the study of nature (Atighetchi, 2007). Consequently, rational modes of enquiry such as

⁴³ Even Milton Friedman (1953, pg. 3-4) himself was forced to acknowledge in this respect, "Laymen and experts alike are inevitably tempted to shape positive conclusions to fit strongly held normative preconceptions and to reject positive conclusions if their normative implications - or what are said to be their normative implications - are unpalatable".

⁴⁴ These epistemological and ontological presuppositions are rarely acknowledged, less so subjected to critical scrutiny by the scientific community (See Smith, 2003).

⁴⁵ The final Divine Book of Revelation sent down to God's Last Prophet, Muhammad (P.B.U. H).



deduction and induction have always formed an integral part of scientific enquiry and application in Islamic scholarship. The Muslim World had already many centuries prior to the Scientific Revolution in Europe, embraced the methods of ratiocination and experimentation in scientific enquiry which they subsequently transmitted to the Latin West (Draper, 1875; Durant, 1980; Gilson, 1955; Haskins, 1924; Lewis, 2009). As long as these methods were integrated within the fundamental epistemological and ontological premise of what Choudhury (2008a) terms, *Tawhidi* phenomenology, Muslim scientists were able to richly cultivate and develop the various natural and social sciences harmoniously

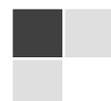
REFERENCES

- Adebayo, R.I. (2006). The Viability of Islamization of Knowledge Programme in Nigeria: Motivating Factors and Problems of Implementation. In M.A. Muhibbudin (Ed.), *Globalization and Terrorism: The Islamic Response*. Nigeria: Nigeria Association of Teachers of Arabic and Islamic Studies (NATAIS).
- Agazzi, E. (2014). *Scientific Objectivity and Its Contexts*. UK: Springer.
- Al-Atas, S.F. (2006). Islam and the Science of Economics. In M.A.R. Ibrahim (Ed.), *The Blackwell Companion to Contemporary Islamic Thought* (pp. 587-606). London: Blackwell Publishing.
- al-Attas, S.M.N. (1978). *Islam and Secularism*. Kuala Lumpur.
- al-Attas, S.M.N. (1985). *Islam, Secularism and the Philosophy of the Future*. London: Mansell.
- al-Attas, S.M.N. (1986). *A Commentary on the Hujjat Al-Siddiq of Nur Al-Din Al-Raniri*. Kuala Lumpur: The Ministry of Culture, Youth and Sports.
- al-Attas, S.M.N. (1995). *Prolegomena to the Metaphysics of Islam*. Kuala Lumpur: ISTAC.
- Al-Faruqi, Ismail Raji. (1982). *Islamization of Knowledge*. Herndon, VA: International Institute of Islamic Thought.
- al-Ghazali, A.H.M. (1997). *The Incoherence of the Philosophers* (M.E. Marmura, Trans.). Brigham: Brigham Young University Press.
- Al-Jarhi, M.A. (2004). *A Short Discourse on Markets in an Islamic Economic System*. Paper presented at the The Islamic Development Bank



Roundtable on Islamic Economics: Current State of Knowledge and Development of the Discipline, Jeddah.

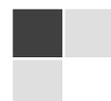
- Anees, M.A. (1984). Islamic Science: An Antidote to Reductionism. *Inquiry*, 1(2).
- Annas, J., & Barnes, J. (2000). *Outlines of Scepticism*. Cambridge: Cambridge University Press.
- Atighetchi, D. (2007). *Islamic Bioethics: Problems and Perspectives*. New York: Springer.
- Ayer, A. (1936). *Language, Truth, and Logic*. London: Gollancz.
- Ayer, A. (1959). *Logical Positivism*. New York: The Free Press.
- Bacon, F. (1620). The New Organon or True Directions Concerning the Interpretation of Nature. In J. Spedding, R.L. Ellis, & D.D. Heath (Eds.), *Review of Islamic Economics* (Vol. 8). Boston: Taggard and Thompson.
- Bartley, W.W., III. (1982). Philosophy of Biology Versus Philosophy of Physics. *Fundamenta Scientiae*, 3(1).
- Blaug, Mark. (1980). *The Methodology of Economics* (Cambridge, England: Cambridge University).
- Boland, L. (1991). Current Views on Economic Positivism. In D. Greenaway & I. Stewart (Eds.), *Companion to Contemporary Thought*. London: Routledge.
- Boldeman, L. (2007). *The Cult of the Market: Economic Fundamentalism and Its Discontents*. Australia: ANU E Press.
- Boltzmann, L. (1974). Theoretical Physics and Philosophical Problems. In B. McGuinness (Ed.): Reidel, Dordrecht.
- Bonjour, L. (1998). *In Defense of Pure Reason*. Cambridge, MA: Cambridge University Press.
- Boumans, M., & Davis, J. (2010). *Economic Methodology: Understanding Economics as a Science*, Basingstoke. UK: Palgrave Macmillan.
- Brown, M.B. (1972). Marx's Economics as a Newtonian Model. In T. Shanin (Ed.), *The Rules of the Game*. London: Tavistock.



- Burt, E.A. (1932). *The Metaphysical Foundations of Modern Science*. New York: Doubleday Anchor Books.
- Burt, EA. (1924). *The Metaphysical Foundations of Modern Science. The Scientific Thinking of Copernicus, Galileo, Newton and Their Contemporaries*: London: Doubleday & Anchor Books.
- Caldwell, B. (1980). Positivist Philosophy of Science and the Methodology of Economics. *Journal of Economic Issues*, 14(1), 53-76.
- Caldwell, B. (1994). *Beyond Positivism: Economic Methodology in the Twentieth Century*. New York: Routledge.
- Capra, F. (1982). *The Turning Point: Science, Society, and the Rising Culture*. New York: Simon & Schuster.
- Carnap, R. (1981). Protocol Statements and the Formal Mode of Speech. In O. Hanfling (Ed.), *Logical Positivism*. Oxford: Basil Blackwell.
- Chapra, M. Umer. (1992). *Islam and the Economic Challenge*. Herndon, VA: International Institute of Islamic Thought.
- Chapra, M. Umer. (1996). *What Is Islamic Economics?* (Vol. 29). Jeddah, Saudi Arabia: Islamic Development Bank.
- Chapra, M. Umer. (2000). Is It Necessary to Have Islamic Economics? *Journal of Socioeconomics*, 29(1), 21–37.
- Chapra, M. Umer. (2008). *Muslim Civilization: The Causes of Decline and the Need for Reform*. Leicestershire, UK: The Islamic Foundation.
- Chmielecki, A. (1998). *A Vindication of Ontology*. Paper presented at the 20th World Conference on Philosophy, Boston, USA.
- Choudhury, M.A. (1990). Islamic Economics as a Social Science. *International Journal of Social Economics*, 17(6), 35-59.
- Choudhury, M.A. (1998). *Studies in Islamic Social Sciences*. London: Macmillan.
- Choudhury, M.A. (2001). Perspectives on the Islamization of Knowledge and Their Implications for Organization of the Occupational Composition: The Case of the Canadian Muslims in the Labour Market. *Journal of Muslim Minority Affairs*, 21(1), 93-107.



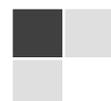
- Choudhury, M.A. (2004). *The Islamic World-System: A Study in Polity-Market Interaction*. London: Routledge.
- Choudhury, M.A. (2006). *Science and Epistemology in the Qur'an*. New York: The Edwin Mellen Press.
- Choudhury, M.A. (2008a). Islam Versus Liberalism: Contrasting Epistemological Inquiries. *International Journal of Social Economics*, 35.
- Choudhury, M.A. (2008b). *Islamic Economics and Finance – a Fiasco*. *Middle East Business and Economic Review*.
- Choudhury, M.A. (2011). Islamic Economics and Finance: An Epistemological Inquiry. *Contributions to Economic Analysis*.
- Cohen, H. (2005). The Onset of the Scientific Revolution: Three near-Simultaneous Transformations. In P.R. Anstey & J.A. Schuster (Eds.), *The Science of Nature in the Seventeenth Century: Patterns of Change in Early Modern Natural Philosophy* (pp. 9-33). Dordrecht: Springer.
- Cohen, I.B. (1994). Newton and the Social Sciences, with Special Reference to Economics, or, the Case of the Missing Paradigm. In P. Mirowski (Ed.), *Natural Images in Economic Thought*. Cambridge: Cambridge University Press.
- Collingwood, R.G. (1940). *An Essay on Metaphysics*. Oxford: Clarendon Press.
- Comte, A. (1908). *A General View of Positivism* (JH trans. by Bridges, Trans.). London: George Routledge & Sons Limited.
- Crowley, Stephen J. (2005). *Moderate Rationalist Naturalized Epistemology*. Paper presented at the 29th Annual Midsouth Philosophy Conference, Memphis, TN.
- Dewey, J. (1903). *Studies in Logical Theory*. Chicago: University of Chicago Press.
- Dilthey, W. (1960). *Dilthey's Philosophy of Existence: Introduction to Weltanschauungslehre* (W transl. by Kluback, Trans.). London: Vision.
- Dilworth, C. (2007). *The Metaphysics of Science: An Account of Modern Science in Terms of Principles, Laws and Theories* (Vol. 173). Netherlands Springer.



- Drakopoulos, S.A., & Torrance, T.S. (1994). Causality and Determinism in Economics. *Scottish Journal of Political Economy*. *Scottish Journal of Political Economy*, 41(2), 176-193.
- Draper, J.W. (1875). *A History of the Intellectual Development of Europe* (Vol. 2). London: George Bell and Son.
- Dupre, J. (2001). Economics without Mechanism. In U. Maki (Ed.), *The Economic World View: Studies in the Ontology of Economics*. Cambridge: Cambridge University Press.
- Durant, W. (1980). *The Age of Faith (the Story of Civilization)* (Vol. 4). New York: Simon & Schuster.
- Edwards, P. (1967). *The Encyclopedia of Philosophy*. New York: The Macmillan Co. and the Free Press.
- Encyclopaedia Britannica, (2010).
- Fay, B. (1975). *Social Theory and Political Practice*. London: George Allen and Unwin Ltd.
- Feldman, R. (2001). Naturalized Epistemology. In E. Zalta (Ed.), *Stanford Encyclopedia of Philosophy*.
- Feyerabend, F. (1975). *Against Method*. London: Verso.
- Fischer, F. (1998). Beyond Empiricism: Policy Inquiry in Postpositivist Perspective. *Policy Studies Journal*, 26(1), 129-146.
- Ford, G. (1984). Rebirth of Islamic Science. In Z. Sardar (Ed.), *The Touch of Midas*. London: Manchester University Press.
- Forster, M. (1998). *Hegel's Idea of a Phenomenology of Spirit*. Chicago: University of Chicago Press.
- Friedman, M. (1977). *Inflation and Unemployment (1976 Nobel Memorial Lecture)*. London: Institute of Economic Affairs.
- Fumerton, R. (2010). Foundationalist Theories of Epistemic Justification. In E. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*.
- Furlow, C. A. (2005). *Islam, Science, and Modernity: From Northern Virginia to Kuala Lumpur*. Gainesville, FL: University of Florida.



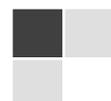
- Gilson, E. (1955). *History of Christian Philosophy in the Middle Ages*. New York: Random House.
- Gordon, S. (1991). *The History and Philosophy of Social Science*. London: Routledge.
- Hamilton, D. (1999). *Evolutionary Economics: A Study of Change in Economic Thought*. New Jersey: Transaction Publishers.
- Haneef, M.A. (2005). Can There Be an Economics Based on Religion? The Case of Islamic Economics. *Post-Autistic Economics Review*, 34(3).
- Haneef, M.A. (2007). *Islamization of Economics: Where Have We Gone Wrong?* International Institute of Islamic Thought Malaysia. Kuala Lumpur.
- Haneef, M.A., & Furqani, H. (2010). Contemporary Islamic Economics: The Missing Dimension of Genuine Islamization. *Thoughts on Economics*, 19(4), 29-48.
- Hanfling, O. (1981). *Logical Positivism*. Oxford: Basil Blackwell.
- Harre', R. (1985). *The Philosophies of Science*. Oxford: Oxford University Press.
- Haskins, C.H. (1924). *Studies in the History of Mediaeval Science*. New York: Harvard University Press.
- Hausman, D.M. (2001). Tendencies, Laws, and the Composition of Economic Causes. In U. Maki (Ed.), *The Economic World View: Studies in the Ontology of Economics*. Cambridge: Cambridge University Press.
- Hefner, R. (2006). Islamic Economics and Global Capitalism. *Society*, 44(1), 16-22.
- Hegel, G., & Wallace, W. (1904). *The Logic of Hegel: Translated from the Encyclopaedia of the Philosophical Sciences*: Clarendon Press.
- Hegel, G.W.F., Findlay, J.N., & Miller, A.V. (1977). *Hegel's Phenomenology of Spirit*. Oxford: Oxford University Press.
- Heidegger, M. (1978). *Being and Time* (J. Macquarrie & E. Robinson, Trans.): Blackwell.
- Heilbroner, R.L. (1988). *Behind the Veil of Economics: Essays in the Worldly Philosophy*. New York: W.W. Norton.



- Hempel, C.G. (1974). Formulation and Formalization of Scientific Theories. In F. Suppe (Ed.), *The Structure of Scientific Theories* (pp. 244-254). Urbana: University of Illinois Press.
- Hodgson, B. (1983). Economic Science and Ethical Neutrality: The Problem of Teleology. *Journal of Business Ethics*, 2(4), 237-254.
- Hodgson, B. (1988). Economic Science and Ethical Neutrality II: The Intransigence of Evaluative Concepts. *Journal of Business Ethics*, 7(5), 321-335.
- Hodgson, Geoffrey M. (2007). Meanings of Methodological Individualism. *Journal of Economic Methodology*, 14(2), 211-226.
- Holtzman, S. (2003). Science and Religion: The Categorical Conflict. *International Journal for Philosophy of Religion*, 54(2), 77-99.
- Hosseini, H. (1990). The Archaic, the Obsolete and the Mythical in Neoclassical Economics: Problems with the Rationality and Optimizing Assumptions of the Jevons-Marshallian System. *American Journal of Economics and Sociology*, 49(1), 81-92.
- Hübner, K. (1988). Metaphysics and the Tree of Knowledge. *Epistemologia*, 1(1).
- Hume, D. (1978). *A Treatise of Human Nature* (L. A. & Nidditch trans. by Selby-Bigge, P. H, Trans.). New York: Oxford University Press.
- Hussain, M.Y. (2006). *Islamization of Human Sciences*. Kuala Lumpur: IIUM.
- Hutchison, T.W. (1981). *The Politics and Philosophy of Economics*. Oxford: Blackwell.
- Iqbal, M. (2007). *Science and Islam*. Westwood, CT: Greenwood Press.
- Kahf, M. (2004). *Islamic Economics: What Went Wrong?* Paper presented at the The Islamic Development Bank Roundtable on Islamic Economics: Current State of Knowledge and Development of the Discipline, Jeddah, Saudi Arabia.
- Kahf, M. (2012). *Comments on Methodology Papers*. Paper presented at the Workshop on The Future of Islamic Economics: A Call for Discussion, Islamic Economics Institute, Jeddah, Saudi Arabia.



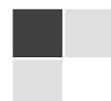
- Kanbur, R., & Shaffer, P. (2007). Epistemology, Normative Theory and Poverty Analysis: Implications for Q-Squared in Practice. *World Development*, 35(2), 183–196.
- Keita, L. D. (1992). *Science, Rationality, and Neoclassical Economics*. Cranbury, NJ: Associated University Presses.
- Kertész, A. (2002). On the De-Naturalization of Epistemology. *Journal for General Philosophy of Science*, 33, 269-288.
- Kettani, A. (1984). Science and Technology in Islam: The Underlying Value System. In Z Sardar (Ed.), *The Touch of Midas*. London: Manchester University Press.
- Khan, M. F. (2013). *What Is Wrong with Islamic Economics? Analysing the Present State and Future Agenda*. Cheltenham, UK: Edward Elgar Publishing.
- Kim, J. (1993). *What Is Epistemology Naturalized?" Reprinted in Pojman, L. (Ed.) the Theory of Knowledge -Classical and Contemporary Readings*. Wadsworth, CA: Belmont.
- Kincaid, H. (1998). Positivism in the Social Sciences. In E Craig (Ed.), *Routledge Encyclopedia of Philosophy*. London: Routledge.
- Kincaid, H., Dupré, J. , & Wylie, A. . (2007). *Value-Free Science? Ideals and Illusions*. Oxford, UK: Oxford University Press.
- King, I.T. (1994). *Explorations Beyond the Machine: A Philosophy of Social Science for the Post-Newtonian Age*. New York: Nova Science Pub.
- Kirmani, M.Z. (1989). Islamic Science: Moving toward a New Paradigm. In Z. Sardar (Ed.), *An Early Crescent: The Future of Knowledge and Environment in Islam*. London: Mansell.
- Kitcher, R. (1992). The Naturalists Return. *The Philosophical Review*, 101(53-114).
- Kittel, B. (2006). A Crazy Methodology? On the Limits of Macro-Quantitative Social Science Research. *International Sociology*, 21(5), 647–677.
- Klappholz, K. (1964). Value Judgements and Economics. *British Journal for the Philosophy of Science*, 15(58), 97-114.



- Knorr-Cetina, K.D. (1981). *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*. Oxford: Pergamon Press.
- Knorr-Cetina, K.D. (1999). *Epistemic Cultures: How the Sciences Make Knowledge*. Harvard: Harvard University Press.
- Krugman, P. (2010, 16th of Dec., 2010). Wall Street Whitewash. *New York Times*, A39.
- Kuhn, T.S. (1962). *The Structure of Scientific Revolutions*. Chicago, IL: University of Chicago Press.
- Kuran, Timur. (2004). *Islam and Mammon: The Economic Predicaments of Islamism*. Princeton: Princeton University Press.
- Laing, David G. (1982). Characterisation of Human Behaviour During Odour Perception. *Perception*, 11(2), 221-230.
- Lawson, T. (1997). *Economics and Reality*. London and New York: Routledge.
- Lewis, D. L. (2009). *God's Crucible: Islam and the Making of Europe*: W. W. Norton.
- Locke, J. (1690). *An Essay Concerning Human Understanding* (PH 1975 Nidditch Ed.). Oxford: Clarendon Press.
- LSE. (2006). *The Future of Finance: The Lse Report*. Retrieved from London: <http://www.futureoffinance.org.uk/>
- Maffie, J. (1995). Naturalism, Scientism and the Independence of Epistemology. *Erkenntnis* 43, 43, 1–27.
- Mahomedy, A.C. (2013). Islamic Economics: Still in Search of an Identity. *International Journal of Social Economics*, 40(6), 556 – 578.
- Mannan, M.A. (1970). *Islamic Economics, Theory and Practice*. Lahore: Sh. Muhammad Ashraf.
- Manzoor, S.P. (1991). Studying Islam Academic. In Z. Sardar (Ed.), *How We Know: Ilm and the Revival of Knowledge*: Grey Seal.
- Maxwell, N. (1984). *From Knowledge to Wisdom*. Oxford, England: Blackwell.



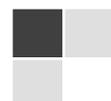
- Mayr, E. (1969). Footnotes on the Philosophy of Biology. *Philosophy of Science*, 36(2), 197-202.
- McCloskey, D.N. (1983). The Rhetoric of Economics. *Journal of economic literature*, 21(2), 481-517.
- McDermid, D. (2000). Does Epistemology Rest on a Mistake? Understanding Rorty on Scepticism. *Critica*, 32(96), 3-42.
- McEvoy, M. (2002). Naturalized Epistemology, Normativity and the Argument against the a Priori. *Essays in Philosophy*, 3(2).
- Meador, D.M. (2003). What Did You See? Different Visions of Economic Methodology. *Oeconomicus*, 6(Winter), 77-87.
- Merchant, C. (1983). *The Death of Nature*. New York: Harper and Row.
- Mill, J.S. (2008). *A System of Logic, Ratiocinative and Inductive: Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation*. New York: Cosimo Classics.
- Mirowski, P. (1989). *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics*. Cambridge: Cambridge University Press.
- Myrdal, G. (1958). *Value in Social Theory: A Selection of Essays on Methodology* (P. Streeten Ed.). London: Routledge.
- Myrdal, G. (1979). *Institutional Economics*. Essays and Lectures after 1975. Keibunsha. Kyoto, Japan.
- Nagel, T. (1986). *The View from Nowhere*. New York: Oxford University Press.
- Nasr, S.H. (1968). *Science and Civilization in Islam*. Cambridge, MA: Harvard University Press.
- Nasr, S.H. (1976). *Islamic Science: An Illustrated Study*. London: World of Islam Festival Trust.
- Nasr, S.V.R. (1986). Whither Islamic Economics? *Islamic Quarterly*, 30(4), 211-220.
- Nasr, S.V.R. (1989). Towards a Philosophy of Islamic Economics. *Hamdard Islamicus*, 12(4), 45-60.



- Nasr, S.V.R. (1991). Islamisation of Knowledge: A Critical Overview. *Islamic Studies*(Autumn), 387-400.
- Nielsen, K. (1991). Farewell to the Tradition: Doing without Metaphysics and Epistemology. *Philosophia*, 20(4), 363-376.
- Novick, P. (1988). *That Noble Dream: The 'Objectivity Question' and the American Historical Profession*. Cambridge: Cambridge University Press.
- Olson, R. (1991). *Science Deified and Science Defied: The Historic Significance of Science in Western Culture* (Vol. 2). Berkeley: University of California Press.
- Overman, E.S. (1988). Introduction: Social Science. In Donald T Campbell (Ed.), *Methodology and Epistemology for Social Science*. Chicago: University of Chicago Press.
- Paine, T. (1880). *The Age of Reason*. London: Freethought Publishing Company.
- Palmer, J. (2000). Skeptical Investigation. *Ancient Philosophy*, 20, 351-373.
- Papineau, D. (1981). *Is Epistemology Dead?* Paper presented at the The Aristotelian Society.
- Philipp, T. (1990). "The Idea of Islamic Economics", *Die Welt Des Islam's*. 30, 117-139.
- Popper. (1972). *Objective Knowledge: An Evolutionary Approach*. Oxford: Clarendon.
- Popper, K.R. (1959). *The Logic of Scientific Discovery*. New York: Basic Books.
- Popper, K.R. (1970). *Objective Knowledge: An Evolutionary Approach*. Oxford: Clarendon.
- Proctor, R.N. (1991). *Value-Free Science? Purity and Power in Modern Knowledge*. Cambridge: Harvard University Press.
- Putnam, H. (1981). *Reason, Truth and History*. Cambridge: Cambridge University Press.
- Putnam, H. (2002). *The Collapse of the Fact/Value Dichotomy and Other Essays*. Cambridge, MA: Harvard University Press.



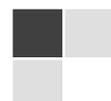
- Putnam, H. (2004). Why Reason Can't Be Naturalized. In E. Sosa & J. Kim (Eds.), *Epistemology: An Anthology* (pp. 314–324). Malden, MA: Blackwell Publishing.
- Quine, W.V. (1969). *Epistemology Naturalized, in Ontological Relativity and Other Essays*. New York: Columbia University Press.
- Quine, W.V. (1981). *Theories and Things*. Cambridge, MA: Harvard University Press.
- Quine, W.V. (1986). Reply to Morgan White. In E.L. Hahn & P.A. Schilpp (Eds.), *The Philosophy of W. V. Quine* (pp. 663–665). La Salle, Illinois: Open Court, The Library of Living Philosophers.
- Quine, W.V. (1990). Comment on Lauener. In R. Barrett & Gibson R. (Eds.), *Perspectives on Quine* (pp. 229). Cambridge, MA: Bradford MIT.
- Rahman, F. (1988). Islamization of Knowledge: A Response. *The American Journal Of Islamic Social Sciences*, 5(1), 3-11.
- Ravetz, J. (1971). *Scientific Knowledge and Its Social Problems*. Oxford: Clarendon Press.
- Robinson, J. (1962). *Economic Philosophy*. London: C.A. Watts.
- Rorty, R. (1979). *Philosophy and the Mirror of Nature*. Princeton, NJ: Princeton University Press.
- Rosenau, P.M. (1992). *Postmodernism and the Social Sciences: Insights, Inroads, and Intrusions*. Princeton, NJ: Princeton University Press.
- Rosenberg, A. (1995). The Metaphysics of Microeconomics. *The Monist*, 78(3), 352-367.
- Rothschild, K.W. (1993). *Ethics and Economic Theory*. Aldershot, UK: Edward Elgar Publishing Company.
- Russell, B. (1952). *The Problems of Philosophy*. London: Oxford University Press.
- Safi, L. (1996). *The Foundation of Knowledge : A Comparative Study in Islamic and Western Methods of Inquiry*. Malaysia: International Islamic University and International Institute of Islamic Thought, Malaysia.



- Samuelson, P.A. (1947). *Foundations of Economic Analysis*. Harvard: Harvard University Press.
- Sardar, Z. (1985). *Arguments for Islamic Science*. Aligarh: Centre for Studies on Science.
- Sardar, Z. (1988). *Islamic Futures: The Shape of Ideas to Come*. Kuala Lumpur: Pelanduk Publications.
- Sardar, Z. (1989). Islamization of Knowledge: A State of the Art Report. In Z. Sardar (Ed.), *An Early Crescent: The Future of Knowledge and the Environment in Islam*. London: Mansell Publishing Limited.
- Sardar, Z. (2004). *Desperately Seeking Paradise: Journeys of a Sceptical Muslim*: Granta Books.
- Schumpeter, J. (1949). Science and Ideology. *American Economic Review*, 39, 345-359.
- Seager, W.E. (1991). *Metaphysics of Consciousness*: Taylor & Francis.
- Sheldrake, S. (2012). *The Science Delusion: Freeing the Spirit of Enquiry*. London: Hodder & Stoughton.
- Siddiqi, M.N. (1970). *Some Aspects of Islamic Economy*. Lahore: Islamic Publications.
- Siddiqi, M.N. (2004). *Keynote Address at Roundtable on Islamic Economics: Current State of Knowledge and Development of the Discipline*. Jeddah and Kuwait: Islamic Research and Training Institute and the Arab Planning Institute.
- Siddiqi, M.N. (2008). *Obstacles to Islamic Economics Research*. Paper presented at the Seventh International Conference on Islamic Economics, Jeddah
- Siddiqi, M.N. (2011). Islamization of Knowledge: Reflections on Priorities. *The American Journal Of Islamic Social Sciences*, 28(3), 15–34.
- Smart, J.J.C. (1959). Sensations and Brain Processes. In D. Rosenthal, 1987 (Ed.), *Materialism and the Mind-Body Problem* ((ed, 1987). *Materialism and the Mind-Body Problem* ed.). Hackett: Indianapolis.
- Smith, J.W. (2003). The Plague of Scientistic Belief. In Zarandi (Ed.), *Science and the Myth of Progress* (M. (ed). *Science and the Myth of Progress* ed.). Bloomington: World Wisdom.



- Smith, J.W. (2006). Science and Myth: The Hidden Connection. In S.H. Nasr & K. O'Brien (Eds.), *The Essential Sophia*. Bloomington: World Wisdom.
- Smith, J.W. (2008). *Cosmos and Transcendence: Breaking through the Barrier of Scientific Belief*. San Rafael: Sophia Perennis.
- Stiglitz, J.E. (2002). Information and the Change in the Paradigm of Economics. *The American Economic Review*, 92(3).
- Stiglitz, J.E. (2010). Needed: A New Economic Paradigm. <http://economistsview/2010/08/stiglitz-needed-a-neweconomic-paradigm.html>.
- Suppe, F. (2000). Understanding Scientific Theories: An Assessment of Developments, 1969–1988. *Philosophy of Science*, 67(Symposia Papers), 102–115.
- Suppe, F. (Ed.) (1974). *The Structure of Scientific Theories*. Urbana: The University of Illinois Press.
- Tarnas, R. (1993). *The Passion of the Western Mind: Understanding the Ideas That Have Shaped Our Worldview*: Ballantine.
- Taylor, C. (1995). *Philosophical Arguments*. Cambridge, Mass: Harvard University Press.
- Tebes, J.K. (2005). Community Science, Philosophy of Science, and the Practice of Research. *American Journal of Community Psychology*, 35(3/4), 213-230.
- Thomson, W. (1889). *Popular Lectures and Addresses*. London: Macmillan.
- Toulmin, S. (1998). *The Idol of Stability*. Paper presented at the The Tanner Lectures on Human Values, University of Southern California.
- Trigg, R. (1993). *Rationality and Science: Can Science Explain Everything?* Oxford: Blackwell.
- Van-Fraassen, B.C. (1980). *The Scientific Image*. New York: Oxford University Press.
- Vollmer, G. (1987). On Supposed Circularities in an Empirically Oriented Epistemology. In G. Radnitzky & W.W. Bartley-III (Eds.), *Evolutionary Epistemology, Rationality, and the Sociology of Knowledge* (Evolutionary Epistemology, Rationality, and the Sociology



of Knowledge Open Court ed., pp. 163-200). La Salle, Illinois: Open Court.

Weber, Max. (1917). *The Methodology of the Social Sciences*. Glencoe: The Free Press.

Weber, Max. (1930). *The Protestant Ethic and the Spirit of Capitalism* (T. Parsons, Trans.). London: George Allen & Unwin.

Whitehead, A.N. (1925). *Science and the Modern World*. New York: The Free Press, Macmillan Pub. Co.

Woods, J. (1989). The Philosophy of Wv Quine. *Canadian Journal of Philosophy*, 19(4), 617-659.

Zahar, E. (1977). Mach, Einstein, and the Rise of Modern Science. *The British Journal for the Philosophy of Science*, 28(3), 195-213.

Zaman, A. (2005). Towards a New Paradigm for Economics. *Journal of King Abdul Aziz University: Islamic Economics*, 18(2), 49-59.

Zaman, A. (2011). *Crisis in Islamic Economics: Diagnosis and Prescriptions*. Paper presented at the The 8th International Conference on Islamic Economics and Finance, Doha, Qatar.

Zaman, A. (2013). Logical Positivism and Islamic Economics. *International Journal of Economics, Management and Accounting*, 21(2), 1-28.

Zarqa, M.A. (2004). *Methodological and Systemic Implications of the Theory and Practice of Islamic finance*. Paper presented at the The Islamic Development Bank Roundtable on Islamic Economics: Current State of Knowledge and Development of the Discipline, Jeddah.

