



On the Problematic State of Economic ‘Science’

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Abstract

Economics is arguably the most important social science on account of its fundamental and valuational role in human decision-making. Accordingly, it is a fit discipline for probing analysis. In its present dominant configuration as ‘neoclassical economics’, it presents itself as a species of engineering thereby ignoring its evolutionary history. An examination of such will reveal that economics was and is most cognitively comprehensible in its guise as ‘political economy’. Economics’ transition to ‘economic science’ can be best explained by the mathematisation of the empirical world by empirical science and an ideologically derived attempt to evade the serious sociological and political implications of macroscopic political economy as was evidenced in the works of the classical political economists including Marx. The new approach was founded on an abstract and individualised decision-making with little relevance to the real world. Thus the important issues concerning human welfare, equity and the decisive role that politics plays in economic decision-making were all regarded as irrelevant to neoclassical economic theory. A now-dominant neoclassical economic theory means that it has become standard academic fare in African universities. Given the ideological role that neoclassical economics plays in the ongoing *pillage du tiers monde*, new and revived counter-theses are necessary for more effective economic analysis.

Resumé

L’économie est sans doute la plus importante des branches de la science sociale en raison de son rôle fondamental et de son importance dans la prise de décision humaine. En conséquence, elle est une discipline appropriée pour l’analyse profonde. Dans sa configuration dominante actuelle en tant qu’ « économie néoclassique », elle se présente comme une espèce de génie ignorant ainsi son histoire évolutive. Un tel examen révélera que

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l'économie était et est une pensée plus compréhensible dans sa forme en tant qu' « économie politique ». La transition de l'économie vers « la science économique » peut être mieux expliquée par la mathématisation du monde empirique par la science empirique et par une tentative idéologique dérivée pour échapper aux graves conséquences sociologiques et politiques de l'économie politique macroscopique comme démontré dans les travaux des économistes politiques classiques y compris Marx. La nouvelle approche a été fondée sur une prise de décision abstraite et individualisée avec peu de pertinence pour le monde réel. Ainsi, les questions importantes concernant le bien-être humain, l'équité et le rôle décisif que joue la politique dans la prise de décision économique étaient tous considérés comme étant sans apport à la théorie économique néo-classique. Maintenant une théorie économique néoclassique dominante, elle est devenue une norme académique standard dans les universités africaines. Selon le rôle idéologique que joue l'économie néoclassique dans le pillage continue du Tiers Monde, des antithèses nouvelles et ravivées sont nécessaires pour une analyse économique plus efficace.

Introduction

The founder of modern macroeconomics, John Maynard Keynes, known for his often pithy remarks, once (1936) noted that the ideas of economists were much more influential than is usually thought. In fact, according to Keynes, the ideas of economists govern the world. The truth is that economics is essentially about human decision-making, choice, and opportunity costs, which are all part of the set of asymmetric constraints that constrict human action. Humans live in a world of ideas that directly and indirectly influence their choices and subsequent actions. On account of this, individuals known as economists have developed theories according to which optimal choices regarding the world's resource banks are to be made. So in this scramble for finite resources where human wants are unbounded, economic theories of optimality are bound to be varied.

The now dominant neoclassical economics paradigm views the human decision-making through the theoretical lenses of individualistic rather than group optimality. Over decades and centuries, this has set up an essential and necessary tension between theories of equity and efficiency. This tension has been playing out now for centuries ever since the birth of modern economics. But the neoclassical paradigm has assumed dominance for some time now. It treats economic decision-making as a species of engineering without much regard to the evolutionary history of economics and the strident contentiousness of economic issues in the context of political wrangling. As a paradigm focused principally on

individual choice, social issues of equity are solved by the constraining principle of a non-egalitarian Pareto optimality.

The contemporary global reach of neoclassical economics is such that in a world of a very uneven distribution of resources and wealth, students of economics in those areas most affected by the worldview of neoclassical economics are made to understand economics just in those terms. This is the case with the instruction of economics in contemporary Africa. Economics as an evolutionary discipline is evidently the optimal way to comprehend real human choice within society. This is not the approach in the African university in general. In a Gini coefficient diagram reflecting the world distribution of wealth and human welfare, African populations will occupy the rank of the least beneficiaries. Such facts are not seriously debated in core courses of university education in Africa. Marx made some interesting points about the way economies are structured within the context of real economic decision-making, and political and sociological wrangling. The ostensible purpose of instruction in economics in contemporary Africa is merely to train individuals to become bureaucratic factotums of international capital for the benefits of the 10 per cent of corporations and individuals to whom 80 per cent of the world's wealth accrues. This situation needs attention on the basis of issues not only of efficiency but equity. In what follows I propose to unpack the innards of economics as social science to determine in what ways it could be subject to criticism so as to open the floor for discussion by those who may be skeptical about the way this discipline is dispensed in contemporary times.

On Economics as 'Science'

Of all the social sciences economics is evidently the most comprehensive because all the other social sciences depend fundamentally on the economic activity of humans. The other social sciences implicitly have economics as a base. One recalls, of course, that the social sciences came into being in the same fashion as the natural sciences. As testable empirical knowledge grew, 'natural philosophy' morphed into 'natural science'. It was the same with what was called 'moral philosophy' which became 'the moral sciences', then eventually the 'social sciences'. Empirical natural science defines itself as the analysis of the natural empirical world according to the certifiable content of that world and its seeming regularities, usually called 'laws'. Given the fact that the studied empirical objects of the natural world were assumed to have no intrinsic motive forces, their Aristotelian *vis viva* was then discarded. To

understand the actions and behaviour of empirical phenomena, all that was needed for scientific analysis was just static and dynamic analysis. Out of these repeatable observations, measurable principles and laws could be established.

As science advanced, the observed behaviour of humans also became a fit subject for empirical analysis. Thus, as was noted, the moral sciences became the social sciences, known too as the human sciences. But there was a double problematic. Humans could not be subjected to the strict laboratory data control as with the natural and biological sciences. Thus, in this instance, the natural sciences requirement of prediction with its concomitant explanations could not be realised. Once the prediction and explanation of phenomena were possible, the issue of control of the observed phenomena naturally followed. In fact, this is the normal path for medically curative research. In the case of the social sciences which dealt with the behavioural choices of humans, the predictive aspects of social science theory was thereby compromised. The social sciences can often offer plausible explanations for social phenomena but in terms of prediction there is an evident weakness.

The second problematic is more important because it involves an issue not germane to the natural sciences. Human behaviour is characterised not only by overt behaviour but also by subjective motives and reasons. This dual consideration is not applicable to natural science phenomena. The problematic here is that in order to explain the behaviour of human agents, the social scientist must appeal ultimately to motives and subjective reasons. But such are not empirically accessible as is the behaviour of the inanimate objects of natural science or the instinct-driven behaviour of non-human animals. This disjunction between overt empirical behaviour on the part of humans and their non-observable reasons is what has set up the perennial 'reasons-causes' debate in social science theory.

Perhaps the most interesting thing about humans as sentient beings is the fact that they are all fully self-conscious. This is not the case with other sentient beings. On account of this, human behaviour is only partially instinct-driven. In most cases behaviour is deliberative and effected with full recognition that such behaviour is consciously rule-governed. Thus in most cases – except in cases of clinically perverse behaviour – when some human effects some action, A, he or she could at the same time have chosen not to effect A. It is for this reason that human behaviour is deemed non-predictable. The question is how does social science deal with this issue? Social science deals with this issue optimally by arguing more for explanation than for prediction – though, in this instance, appeals

to motives and reasons do not reduce to neuronomic causes. Explanation is deemed more effective when a macroscopic approach is taken, as is the case with all the social sciences except economics in its expression as microeconomics. Quantitative data collection allows the sociologist and political scientist to document macroscopic social phenomena and to offer explanations in terms of beliefs and motives of the agents involved.

As mentioned above, economics is the foundational social science for all the other social sciences; but prefers now to distance itself from them, given its heavy reliance on quantitative expression. At one time economics was known as 'political economy', a discipline which included elements of all the other social sciences. And given what was stated above about the nature of human behaviour, normative considerations necessarily entered the picture given that self-conscious human choices are always made in the context of value-laden motives and reasons.

The fact that economics, as expressed according to its dominant paradigm, neoclassical economics, views itself as a positive science along the lines of applied sciences such as engineering, it was forced to make fundamental assumption that allowed its theories to make predictions according to its principles and laws. But there is an evident problematic in all this. The predictions of neoclassical economic theory are hardly as robust as the predictive theories of the natural sciences. The joint research of Kahneman and Tversky amply bears this out. It is for this reason that mainstream neoclassical economics is now being challenged by newer theories such as behavioural economics (Camerer et al. 2004) and neuroeconomics (Camerer et al. 2005). But old paradigms are hardly ever replaced until there is a complete breakdown and a more effective theory is at hand. Thus, at the moment, the neoclassical paradigm remains so dominant that even its challengers such as behavioural economics have seen fit to adopt some of its measures. Evidence of this is afforded by the fact that the university training of economists at the world's leading universities still uphold the neoclassical paradigm in instruction. And it is this approach that informs the way highly influential international institutions such as the IMF and the World Bank appraise economic phenomena. In practice neoclassical economics translates into what is known universally as 'neoliberalism'.

Thus neoliberalism has become the dominant paradigm in economic practice world-wide. The result is that the international status quo in terms of economic structures and exchange remain intact to the benefit of those nations and institutions that enforce the principles of neoliberalism. Thus the purpose of this article is to demonstrate that economics in its reified

forms of neoclassical economics and neoliberalism can be subjected to critique on grounds of empirical inadequacy in terms of prediction, explanation, and a normative universalism. I will begin first by showing how political economy morphed into 'economic science' which is now formulated according to the theories of neoclassical economics. The practice of contemporary neoclassical economics as neoliberalism will also be examined. Under these circumstances, alternative approaches such as the Marxian and Austrian paradigms, and contemporary institutionalism, will also be examined in terms of theory and practice. A final section will make the recommendation that economics is most effective as an explanatory social science when it adopts its expression as political economy which is what made Adam Smith's and Keynes's analyses so comprehensively analytical.

On Political Economy

One can argue that all living biological creatures do practice a form of economics of some sort. The economic activities involve the acquisition of the wherewithal for survival including energy-producing inputs and the establishing a lived-in habitat within a claimed territorial space. In the case of mammals, ethologists who describe such hardly see themselves engaging in the economics of animal behaviour in the way that modern economists do. There is no need for Lagrange multipliers or bordered Hessians for such analysis. After all, animals do maximise and minimise their 'expected utilities' the way humans seek to do. Similarly, the pre-modern economy as described by anthropologists such as Malinowski (1922) and Karl Polanyi (1944) offered fully comprehensive analyses of the economic structures of the non-market economy. The result of the mixing of land, labour, and capital in such economies measured optimality in terms of concepts such as 'reciprocity and redistribution'. Admittedly such economies were quite small and self-enclosed; but, again, there was no need for optimisation techniques as is the case with the analysis of microeconomic units. That tradition has continued with contemporary economic anthropology in which intelligible explanations are obtained without appeal to the ornate techniques of microeconomic analysis. Analysis was more descriptive and anthropologically predictive.

Matters were almost similar with the advent of analysis according to the principles of political economy as expressed in the writings of Smith, Ricardo and Malthus. It was evident to these authors that the empirically observable lives of humans in their capacities as economic beings were much intertwined with their political and sociological lives. Smith's

contribution to political economy was essentially a political attack on mercantilism and a thesis for the promotion of free markets. There was an argument too on behalf of the idea that human self-interest best explains the dynamics of economic exchange. The same ideas were held by David Ricardo who made interesting observations on the dynamics of economic growth and the logic behind the ideas of comparative and absolute advantage in trade matters. All these ideas were expressed in his *Principles of Political Economy and Taxation* (1817). In like vein, Thomas Malthus (1798), was noted for his theory of economic growth as expressed in his *An Essay on the Principle of Population* in which he argued that population growth in Britain had to be curbed if famines were to be averted, on the grounds that food production was being outstripped by population growth. This political-economic approach was still pursued by theorists such as J.B. Say, John Stuart Mill, Karl Marx, von Thunen, and others. The motivating principle here was that economic analysis was umbilically linked to the economic conditions that existed in the real world. As an example, we can take the case of J.B. Say and his idea that supply of produced commodities always elicits an equal demand under conditions of equal flexibility of prices and wages. Say's law ($\sum_{I=1}^n P_i D_i = \sum_{I=1}^n P_i S_i$) was a cornerstone of classical economics and represented the axiomatic instantiation of how the market economy works in actuality. This does make empirical sense for the generic barter economy but becomes problematic when money as a store of value enters the picture.

Say's Law was eventually challenged by Marx whose central equation of M-C-M' demonstrated that the quantitative difference between M and M' refutes that law. On this basis, it is quite possible that an economy's supply of goods would not automatically match the demand for such goods. Marx's theory of surplus value which lies at the heart of his critique of capitalism constitutes the political economy of Marxism as it seeks to explain the fact that capitalist market economies periodically experience periods of recession and depression when demand is less than supply, potential or actual. Keynes (1936) also recognised the fallacy of Say's law in his magnum opus, *The General Theory of Employment Interest and Money*, when he observed that market economies could be in equilibrium when demand and supply are not equal on the basis that wages could no longer be adjusted downwards in order to bring forth more demand and the full utilisation of all factors of production. This Keynesian response to Say is what warranted the development of modern macroeconomics. And the ongoing theoretical conflict with

monetarism affords further proof that political economic conditions are still very much at the heart of the modern economy. Such considerations also apply to branches of economics such as international economics and development economics.

So what were the considerations that led to the transformation of economics as political economy to become 'economics as science'? The answer is that as empirical science as a mode of exploring and analysing nature grew in importance, the idea developed that its methodology could also be applied to the social sciences, especially political economy. Whether in reaction to Marx's strictures on capitalism and its supporting class, 'the bourgeoisie', economics began to shed its political economic identity and to shift its interests from the macroscopic to the individual units of economics, both the consumer and the firm. This was the period that witnessed the birth of microeconomics with the formulation of the marginalist paradigm as expressed principally by Jevons, Menger, and Walras. The utilitarianism of Mill and the quantitative psychometrics based on the Weber-Fechner Law (Fechner 1860) were the tools apparently appealed to as in the case of Jevons (Blaug 1996). The assumption was that subjective utilities of economic agents could be measured incrementally, giving birth to the problematic idea of cardinal utility. It was during this period that the transition from political economy to economics as science began. There were also the reactions from researchers such as Menger, Bohm-Bawerk, Wieser, and others on the issue of the measurability of utility in its cardinal sense.

With the marginalist paradigm economics was now entering the phase where strict quantification based on the measurable choices of individual units paved the way for the formulations of general equilibrium theory. The preferred approach to economic thinking was no longer the macroscopic approach of political economy as was the case with the classical political economists. Of interest too is the fact that it is claimed that both Jevons and Menger arrived at the same marginalist conclusions as Walras. The individual, instead of the whole economy, was now the central element in economic analysis. It was at this juncture that utility theory became the dominant paradigm in microeconomic theory. At that point it was easy, eventually, to introduce concepts such as marginal utility, diminishing marginal utility, indifference curves, maximisation of utility, all under the quantitative rubric of differential calculus. Jevons promoted this new approach to economics in his *The Progress of the Mathematical Theory of Political Economy* (1862) and *The Theory of Political Economy* (1870). With the classical political economists, it was the macroeconomy with its

three components – land, labour, and capital – that was discussed within the context of a political system.

With Menger (1871, 2007), economics was reduced to a subjectivist discipline according to which the value of commodities was determined according introspective subjective tastes that were subject to marginal calibration. Menger's instantiation of his subjectivist approach was offered by his explanation of the diamond-water paradox, first discussed by Smith in his *Wealth of Nations*. Though Menger approached economic decision-making from the marginalist positions of Jevons and Walras, his subjectivist position was at variance with the objectivist and quantitative orientation of Jevons and Walras. It was this subjectivist approach that set the foundations for what became known as Austrian economics, a school of thought later developed by theorists such as Bohm-Bawerk, von Mises, and Hayek. The key principle here is that the basis for economic decision-making was subjectively introspective and not subject to quantitative analysis. In a series of exchanges with Walras, Menger made the point against the former by arguing that mathematics was not the proper tool to explicate economic operations. As Sandye Gloria-Palermo (1999) put it: 'Through a close look at the correspondence between Walras and Menger, it is possible to understand the circumstances giving rise to the differences in their positions regarding the use and the type of mathematical tools in economics' (Gloria-Palermo: 33). Menger refused 'to consider mathematics as a method of investigation. In this perspective, the author remains strictly loyal to the analytico-compositive approach guiding his developments as a whole. Menger clearly states that it is not mathematics in itself that he rejects but rather the role attributed to it by Walras, because it goes beyond the scope of mere exposition (Gloria-Palermo: 33). In sum, 'the mathematical method used by Walras seems far from being appropriate to Menger's objective, that is knowing how to determine the *essence* of complex phenomena' (Gloria-Palermo: 33).

But the attraction of quantitative formalisation for the marginalists was sufficiently strong for the mathematical method of Walras to be eventually adopted. Walras attempted to set down the dynamics of the total economy by setting up a set of simultaneous equations that would signify the trading activities of all agents within the economy. This trading activity between economic agents was described by Walras as a moment by moment tatonnement process of marginal demand and supply. Equilibrium would be attained when all the equations are solved for a unique solution. The key question here was to determine whether at equilibrium there could be proof for the existence, uniqueness, and stability of equilibrium.

The point is that whereas classical economics focused on the economy as whole in comprehensive fashion with the labour theory of value as the underlying dynamic, Walrasian marginalism focused on the sum of the individual demand and supply units in the economy, each with a subjective interpretation of the dynamics of the situation. On account of its comprehensive scope, Walrasian marginalism became the foundational matrix on which modern neoclassical economics was founded. This fact is underscored by the later work of theorists such as Arrow and Debreu (1954) and Debreu (1959).

At this point the formalisation of all aspects of the marginalist paradigm was effectively being put in place. The transition from ‘political economy’ to ‘economic science’ had been undertaken from the decades following the marginalist transformation. What was common to the marginalist trio was that economic analysis began with the microeconomics of individual choice and not with the overarching macroeconomics of the classicals. It was on this basis that the concept of utility was introduced to hold a central role in economic decision making. This takes us to the well-known ‘diamond-water paradox’ that Smith discussed in his *Wealth of Nations*. Smith argued that some commodities had use value – as in the case of water – but did not have as much exchange value as diamonds which have negligible use value. However, in the final analysis, Smith argued, the real value of a commodity was determined by the cost of the labour and other inputs that went into its production.

The marginalists attempted to refute Smith and his labour theory of value by arguing that value was determined not by labour inputs but by the incremental utility subjectively experienced by the consumer as principal economic agent. This standing of political economy on its head could be seen as an attempt to undermine the labour theory of value central to classical political economy. The problematic here is that the critique of Smith’s example of the relative values yielded wrong results. First of all, Smith’s example of water and diamonds demonstrates the difference between use and exchange value are not really apt. On account of their scarcity, implying that much labour must be expended to obtain them, they are deemed more valuable than water which in most circumstances is more easily obtainable. But there are situations in which the difficulty of obtaining water makes water just as scarce as diamonds. At that point the exchange value of water approaches that of diamonds. Smith’s point is that diamonds have exchange value but little use value. Not really, given that they may be used for ornamental purposes. In modern times there are a number of industrial purposes which diamonds may be used.

But given the fact that diamonds do have exchange value on account of human fiat, they do indeed have use value in much the same way that paper money does. Thus diamonds – along with gold and silver – have been used as a kind of numeraire.

Yet all this does not deny the fact the shifting values of water and diamonds are determined by the demand for such items. In cases where water is scarce and diamonds are plentiful, as near a newly discovered diamond mine, diamonds would indeed carry much use value with their capacities for exchange for items of immediate use.

On Value Theory

The fundamental issue in theoretical economics is that concerning how 'value' is ascribed to items in economic exchange. In fact many of the disputes in economics from the days of classical political economy to modern times stem from the question of how to calculate value. For the early theorists of the market economy the value of a commodity was determined by the cost of the quantity of labour that went into its production. In fact this was the standard position taken with some modification by Smith, Ricardo, and Malthus of classical British political economy. This idea was later adopted by Marx in his attempt to demonstrate that labour was exploited in the generic capitalist economy. According to Marx, the value of a produced item was the 'socially necessary labour' to produce the item. Of course, it is a fact some item could be produced at the labour cost of X but could be eventually sold at a cost less than X owing to lack of effective demand, and so on. In fact, this is a normalcy for producers in the capitalist market system: businesses often fail because selling prices are persistently less than costs of production or the 'socially necessary labour' to produce the items.

Humans as all living organisms must do work in the form of transforming nature for survival purposes. That is why the human species has been variously referred to as the 'tool making species'. Tools are created which are then used in harvesting the resources of nature for survival purposes. This harvesting takes the form of what economists refer to as 'production'. Thus it would follow logically that the value of items produced would be determined principally by the costs that were incurred in the production process. This was the basis for the 'labour theory of value' and the Marxian argument that the costs to labour were the major determinants of value. From this idea was generated Marx's idea of 'surplus value' and its ramifications.

Marx's key observation was that the incentive to capitalist production stemmed from expected realisation of the following situation. Money is first presented which in turn is then employed as capital with hope that at the end of the operation it has increased in value: $M-C-M'$. It is the calculated difference between M and M' that determines the amount of surplus value gained by the capital initiative. It is this calculated difference that includes interest, depreciation, rent, wages for labour, and, most importantly, profits for the investors. Thus, it is always in the interest of the entrepreneur to widen as much as possible the monetary gap between M and M' . It is also always in the interest of labour as a factor of production to garner as much as possible of the difference between M and M' . This is the basis for the unceasing primordial conflict between capital and labour. According to classical political economy, the implicit argument is that labour produces items for consumption and it is for this very reason that labour embarks on the production enterprise. This is the basis for the adoption of the labour theory of value on the part of the classical political economists. On this basis, the inferred point here is that the quantitative difference between M and M' is to be founded on the collective efforts of all those involved in the production process. The point is that if too much of the surplus accrues to those who provide and manage investment capital (M) over time the market economy would be affected by periodic downturns. This is exactly what the Marxian critique of capitalism is founded on, and what Keynes (1936) sought to analyse in his *General Theory of Employment, Interest, and Money*.

Keynes' key point was that an economy could attain a level of stationary equilibrium at less than full employment, due principally to lack of effective demand for produced items. The assumption that the entrepreneurial class to which a disproportionate portion of the surplus accrued would spend that surplus on the rest of the consumption items has been demonstrated to be empirically wrong over time. The logical solution has always been to ensure that for each accounting period consumption of all output approaches a maximum and that inventory accumulation be reduced to a minimum. Under such circumstances the classical labour theory of value is justified. But the problematic here lies with the 'animal spirits' that, according to Keynes, motivate human behaviour. Individuals in the modern era, and in large societies where kinship bonds are non-existent or minimally controlling, prefer to engage in economic transactions based on the expectation of gain. But given the imbalance between those who provide capital and those who join with capital to produce commodities economic, productive investment occurs

only when the owners of capital believe that M' will be greater than M . The problematic for the labour theory of value arises when capital and labour are owned differentially. Marx's critique led to the conclusion that labour should own capital maximally. The Keynesian and the mixed economy solution is that government could play the role of arbiter in determining what portion of the economic surplus should be returned to labour. Politics in the so-called Western democracies is essentially about that issue – conservative political parties engaged in constant wrangling with democratic/liberal/socialist parties about the modalities of sharing the surplus.

On account of this ongoing conflict and scramble for ΔM , capital seeks to increase its share of the surplus by engaging in technological innovation. The result is that productivity increases, relatively less labour is employed and as a consequence less of the surplus accrues to labour. But on account of just that, the overall rate of profits tends to fall so capital sets out to further exploit labour, hence a relentless search for cheaper labour with pressures put on labour organisations. One solution has been that adopted by welfare state societies where progressive taxation measures are adopted as the mechanism by which economic surpluses are redistributed across society. This helps in boosting demand by way of a more universal sharing of the economic surplus, ΔM . Under these circumstances, the classical labour theory of value is salvaged. The implicit principle here is that the Keynesian argument vindicates the old labour theory of value. It is on this basis that Say's Law and Walras's general equilibrium theory of zero excess demand are seen to approach vindication. In both cases $P_i(D) = P_i(S) = 0$

But the discussion on value just did not immediately come to that conclusion. The vindication of the role of labour in the production process was challenged by theorists who argued that the value of commodities was determined not by 'socially necessary labour' but by subjective tastes and utility. This was the basis on which the 'marginalist revolution' was founded. The general thesis put forward by Jevons, Menger, and Walras was that the value of a commodity was determined by the amount of subjective utility that the consuming agent derived from decreasing or increasing quantities of the commodity. The principle of diminishing marginal utility was derived from this, together with the idea of a measurable or cardinal utility. But a problematic was immediately created with the idea of a measurable utility given that utility is a subjective concept that is impermeable to objective measurement. The idea of a measurable utility was borrowed from the idea of measurable

stimuli according to the Weber-Fechner law (1860) of ‘just noticeable differences’ in the invented field of psychophysics. Since measurement was involved, mathematics was invoked to do the measuring. But the question still arose: how does one measure ‘utils’? Both Jevons and Walras saw the merit of subjecting the individual choices of individuals to mathematical measurement by way of the calculus, but Menger, though a marginalist, was not convinced. The measurability of utility was cast in doubt because for the Austrian version of utility the discreteness of choice and the accompanying indeterminism in terms of behaviour militated against a continuously measurable utility according to the way Jevons and Walras saw it. According to Jevons and Walras, utility could be understood cardinally while for Menger it should be understood ordinally. When individuals made choices it was always in terms of comparisons between discrete objects or discrete amounts of some item. The differential calculus was not the proper operational tool.

The ordinalist approach to utility measurement was ultimately adopted by way of Hicks-Allen (1934) and Hicks (1939) who popularised – Edgeworth, Pareto, Slutsky, Johnson, et al. all made contributions – the idea of the indifference curve to describe the discrete choices made by individuals. In ordinary cardinal utility analysis the simple model used – introduced by Jevons then adopted later by Marshall – was based on a single consumer obtaining less and less satisfaction as more and more of an item is consumed. The idea of ‘diminishing marginal utility’ in terms of utils was the explanatory mechanism here. The recognition that utility itself was a subjective concept that was proper to the individual consumer only meant that alternative explanatory mechanisms had to be devised to explain individual economic choice. The consumer was now seen to operate on the basis of choosing different quantities of two items that offered the same satisfaction. All this was laid out on an ‘indifference curve’ map consisting of ‘indifference curves’ the shapes and positions of which were determined by set rules. For example, normal indifference curves were required to be convex to the origin on a positive plane quadrant and could not intersect. Central to these assumptions was the principle of the ‘diminishing marginal rate of substitution’ and the principle of transitivity.

At this point all of the machinery was in place to establish the conditions for consumer maximisation. The consumer maximised utility when there was a tangent between the highest indifference curve and his or her linear budget constraint line. At that point maximum satisfaction is attained with the choice of a mix of the two commodities, say, x and y . For situations

where the consumer purchased a set of items, maximisation instruments involving Lagrange multipliers and other techniques were introduced. But the issue of the measurability of utility still lurks on account of the continuous exchange of items and the fact that the consumer is seen at equilibrium to maximise utility. In fact, the orthodox formulation of such is that at equilibrium the consumer 'maximises expected utility subject to a budget constraint'. But the methodological issue remains: how does one measure utility? It is on this basis that ordinal theory in terms of the strict revealed preferences of economic agents according to the 'axioms of revealed preference' took centre stage. Very similar operational principles are employed for the optimisation schedules for firms with the appeal to concepts such as isoquant lines and isocost constraints. It should be noted though that under such conditions optimisation in terms of profits or costs turns out to be much more manageable than maximisation in terms of utility.

The first key point that one must recognise in all this is that as the ideology behind the labour theory of value began to be embraced by those who recognised that labour was being exploited in the developing capitalist system, the switch to an individualist and subjectivist approach to economics became the new programme for theoreticians who saw that the labour theory of value could threaten the established order. The second point is that in an age – the latter part of the nineteenth century – that witnessed the growing influence of empirical science, especially physics, it was believed that creating an economics that was seemingly scientific in structure would augur well for its intellectual reputation. This explains the direction into which theorists such as Walras, Jevons and Pareto were taking the discipline. Later theorists such as Marshall, Edgeworth and Johnson followed suit in seeking to transform political economy into the supposed science of economics.

A culmination point was reached when Lionel Robbins (1945) in his path-breaking *An Essay on the Nature and Significance of Economic Science* in which it was argued that there is such a science that deals with humans as they make choices in the context of scarce means to attain chosen ends among alternatives (Robbins 1945:16). Robbins also argued that economics as a science could not countenance normative questions that were ethical in nature. In other words, economics was no longer the empirical and moral science of political economy. Thus the idea of positive and normative economics was developed. Consider, in this regard, Robbins' statements on the matter. 'Economics is neutral as between ends. Economics cannot pronounce on the validity of ultimate

judgments of value' (Robbins 1935:147). Recognising the limitations put on economics as a neutral value-free science some of Robbins' contemporaries argued for a normative economics. Robbins wrote: 'Mr. Hawtrey and Mr. J.A. Hobson, for instance have argued that Economics should not only take account of valuations and ethical standards as given data in the manner explained above, but that also it should pronounce upon the ultimate validity of these valuations and standards' (Robbins 1935: 148). Robbins then writes: 'Unfortunately it does not seem logically possible to associate the two studies in any form but mere juxtaposition. Economics deals with ascertainable facts; ethics deals with valuations and obligations. The two fields of inquiry are not on the same plane of discourse' (Robbins:147).

Before Robbins wrote this determinative statement on economics there was ideological ferment from the period of the marginalists onwards. Political economy was increasingly seen as a science with Walras arguing that it was a mathematical science as opposed to Jevons who saw it as a more empirical discipline. Then Marshall, John Neville Keynes, Edgeworth, and others – all in the latter part of the nineteenth century – argued for political economy as a scientific discipline. The German historical school led by Schmoller was being ultimately pushed by economic marginalism as it grew in influence in Britain and France. It eventually lost the *methodenstreit* battle. In Britain, J.N. Keynes' (1890) *The Scope and Method of Political Economy* became the wave of the future. Political economy was a science that was tripartite in structure according to J.N. Keynes. There was its positive, normative, and applied sections. The positive component included the supposedly scientific content of political economy, the normative aspect deals with the evaluative aspects of economics, while applied political economy dealt with political economy as an art.

Underlying this transformation of political economy as a 'moral science' into a putatively genuine science according to which subjective and marginal choice were the major modalities of behaviour instead of the valuation of objective labour, there was the strong ideological argument against the role of labour as the *sine qua non* of valuation. Note in this regard the titles of two key books in this regard, Hicks' (1939) *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory*, and Debreu's (1959) *The Theory of Value: An Axiomatic Analysis of Economic Equilibrium*. The fundamental question was: how is value determined? The marginalist approach structured according to the subjective and utility-bearing decisions made by single

individuals became the dominant paradigm of the era. And this approach was clothed in the quantitative language of physical science. There were axioms, theorems, and laws all expressed in the language of mathematics that referred especially to individual choice founded on the principle of marginal utility. But before the new theory could get started its major agent had to be reduced to manageable proportions. This was the basis for the birth of 'rational economic man' who became the major actor in the marginalist theory, neoclassical economics.

Neoclassical Economics and 'Rational Economic Man'

The basis for the development of neoclassical economics was that the foundations of classical political economy of value and distribution were thenceforth understood as determined by a marginally measurable subjective utility of agents rather than by the costs incurred by labour inputs. The shift was from understanding the economy essentially in macroeconomic terms – i.e. the returns to land, labour, and capital – to the microeconomic terms of terms maximisation of utility and the maximisation of profits for entrepreneurs. But once basic economic behaviour was reduced to the marginally incremental choices of some ideal choice maker, the path was opened for the *homunculus* known as 'rational economic man'. The characteristics of rational economic man were all preset by the neoclassical theorist who determined that the choices of rational economic man were to follow the postulate of rationality. The postulate of rationality stated that rational economic man's choices were to be consistent according to stated axioms of reflexivity, completeness, and transitivity. According to this postulate the goal and results are always optimality in terms of utility or profits.

But as sceptics pointed out and as dictated by the principles of scientific research, there was a problematic with the measurement of the differential utilities of different individuals, in other words, the issue of the 'interpersonal comparisons of utility'. It is this that led Samuelson (1938) to introduce the idea of revealed preference as a way of overcoming the issue of how to measure an introspectively sensed utility. As he put it: 'the discrediting of *utility* as a psychological concept robbed it of its only virtue as an *explanation* of human behaviour in other than a circular sense, revealing its emptiness as even a construction.... Consistently applied, however, the modern criticism cuts back on itself and cuts deeply. For just as we do not claim to know by introspection the behaviour of utility, many will argue we cannot know the behaviour of ratios of marginal utilities or of indifference directions' (Samuelson

1938:61). Samuelson also states that: 'Hence, despite the fact that the notion of utility has been repudiated or ignored by modern theory, it is clear that much of even the most modern analysis shows vestigial traces of the utility concept' (Samuleson 1938:61). Samuelson's solution to this issue is as follows: 'I propose, therefore, that we start anew in direct attack on the problem, dropping off the last vestiges of the utility analysis' (Samuelson 1938:62). According to Samuelson, others may continue to use the traditional utility analysis but the virtue of the new approach is that 'it can be carried on more directly and from a different set of postulates' (Samuelson 1938:62).

But Samuelson's newly revealed preference approach is compromised *ab initio* by the fact that the new model is based on what he calls 'an idealised individual not necessarily, however, the rational *homo-economicus*' (Samuelson 1938:62). The point is that once the model is not constructed from the actual choices of real, existent individuals it has failed to satisfy the criteria for genuine scientific status. Samuelson's goal in all this is to establish microeconomic theory on firm scientific foundations according to the model set by Robbins et al. According to those who seek to analyse and explicate the processes of scientific analysis, a genuine science seeks to explain relevant phenomena according to the consistently operational laws or principles of some overarching theory. Explanations are then further confirmed if the theory is successful in making predictions according to variations in its variables. And even sciences that deal with phenomena of the past, such as archeology, do rely on basic predictive theories from foundational scientific research areas such as physics, chemistry, and biology. It is the joint operations of explanation and prediction that allow scientists to control the outcome of their experiments. Thus explanation, prediction, and control, taken together, are the necessary and sufficient criteria for genuine scientific status.

The question then is: did Samuelson and others of similar disposition shape the new economics to conform to the required criteria expected of any science? The answer is in the negative because an *idealised individual* cannot properly represent the individual choices of all individuals whose specific choices are often at variance with the prescribed choices of Samuelson's 'idealised individual'. These prescribed choices are formulated according to three postulates that Samuelson sets down in his 1938 paper. In terms of the principles of scientific analysis Samuelson's third Postulate (Postulate III) is perhaps the most important in that, according to Samuelson, Postulate III already implies Postulates I and II (see Samuelson's addendum to his paper: 'A Note on the Pure Theory of Consumer's Behaviour: An Addendum'),

and that its key point is that the consumer's choices are always consistent and in line with the three postulates.

Samuelson concludes his 1938 paper with the claim that his paper sought to rid microeconomics theory 'from any vestigial traces of the utility concept' and that the new 'revealed preference' theory is logically equivalent to the traditional 'reformulation of Hicks and Allen' (Samuelson 1938:70-71). Samuelson sought later to buttress his theory of revealed preference with a 1948 paper titled 'Consumption Theory in Terms of Revealed Preference' by using as his decisional reference point an 'individual guinea-pig' – much like the 'idealised individual' of his 1938 paper who by 'his market behaviour, reveals his preference pattern – if there is such a consistent pattern' (Samuelson 1948). But what does Samuelson mean by 'consistent pattern'? I would want to think that he means 'consistent' according to his three postulates of his 1938 paper. But as I pointed out above the *a priori* requirements of consistency according to postulates of rationality undoubtedly compromise the scientific project of describing the market behaviour of economic agents.

Samuelson's approach did garner much support from theorists of microeconomics such as Houthakker who extended Samuelson's two good axiom of revealed preference to cover choice sets of more than two commodity bundles and two price vectors. Houthakker's axiom is known as the 'Strong Axiom of Revealed Preference' in contrast to Samuelson's two good case which is known as the 'Weak Axiom of Revealed Preference'. As Houthakker put it: 'Professor Samuelson's "revealed preference" approach has proved to be a useful basis for deriving a considerable part of the static theory of consumer's choice. Its existing versions are not sufficient, however, to determine whether or not consumer's preferences can be described by a utility function of the customary type (the problem of integrability), except in the unrealistic case of two commodities. In this note Samuelson's 'fundamental hypothesis' will be generalised so as to imply integrability while continuing to satisfy the methodological requirements of the revealed preference approach and without losing its plausibility' (Houthakker 1950:159). And theorists such as Varian have later pursued this approach to consumer theory (Varian 2005).

But before the embellishments by Varian et al, theorist Stanley Wong (1978) argued that the Samuelson-Houthakker programme failed on account of its inability to go beyond an operational description and offer a proper scientific explanation of consumer choice (Wong 1978:86). For Samuelson, the purpose of scientific analysis is not about 'explanation' but about 'description' since what we take to be explanation is essentially

about further description (Wong:107). In sum, Wong's critique of the Samuelson-Houthaaker programme is stated as follows: '...revealed preference theory, as revised by Houthakker, is not an explanation but a restatement of ordinal utility theory. Second, revealed preference theory is not verifiable empirically because it uses unrestricted universal statements. Third, it is not empirically verifiable because its key term "revealed preference", is not defined exclusively in observational terms, and therefore does not denote observable experience....' (Wong:121). In the final analysis Wong makes the claim that revealed preference theory 'is not the observational equivalent of ordinal theory, and is not therefore the solution to the problem of finding the observational equivalent of ordinal utility theory' (Wong:121).

The issue all along has been to establish a genuine science of economics as it shifted its paradigm from political economy to 'scientific economics'. Samuelson's 1938 paper was just a more formal approach to the problem following the earlier pioneering works by theorists such as Cournot, Dupuits, Marshall, and Neville Keynes. Robbins later sought to cement matters with his *An Essay on the Nature and Significance of Economics Science* written at approximately the same time as Samuelson's 1938 paper. Yet, again, one must note the influential paper written by prominent theorist, Milton Friedman. Friedman published his influential paper 'The Methodology of Positive Economics' (Friedman:1953) in which he argued that the validity of a scientific theory should be judged mainly on its predictive strength than otherwise. In this regard, the assumptions of a theory are of no special import. But Friedman was not theoretically successful on this because his instrumentalist approach to the evaluation of economic theory failed to vindicate his position. Economic theories were not shown to be successfully predictive in their assessments. But apart from this he was taken to task by Samuelson on this issue.

It was the persistent failure of economic theory founded on the principle of rationality that led theorists such as Hebert Simon to develop the theory of 'bounded rationality' which postulated the idea that actual human decision-making was rarely ever made under conditions of perfect information. Simon pursued this idea in articles such as 'A Behavioral Model of Rational Choice' (1955), and 'Theories of Decision Making in Economics and Behavioral Science (1959). Later articles such as 'Theories of Bounded Rationality' (1972) and 'From Substantive to Procedural Rationality' (1976) are also of note in this regard. The essential point being made in these writings is that we witness a move away from economic man as a theoretical construct to a more realistic model of decision making

founded on the idea that limited information would often lead to sub-optimal decisions in practice. On account of cognitive limitations the economic agent would not maximise satisfaction according to the standard model but would only 'satisfice'.

These developments set the foundations for the development of the behavioural models of human economic decision formulated by Daniel Kahneman and Amos Tversky (1979), and *Choices, Values, and Frames* (2000). In 'Prospect Theory: An Analysis of Decision under Risk' (1979) Kahneman and Tversky write: 'Expected Utility Theory has dominated the analysis of decision making under risk. It has been generally accepted as a normative model of rational choice [24], and widely applied as a descriptive model of economic behaviour, e.g [15,4]. Thus, it is assumed that all reasonable people would wish to obey the axioms of the theory [47, 36], and that most people actually do, most of the time.... The present paper describes several classes of choice problems in which preferences systematically violate the axioms of expected utility theory. In the light of these observations we argue that utility theory, as it is commonly interpreted and applied, is not an adequate descriptive model and we propose an alternative account of choice under risk' (Kahneman and Tversky 1979:263). The new theory that Kahneman and Tversky provide is what is known as 'prospect theory' according to which individuals are observed to be 'irrational' in their flouting of the axioms of expected utility theory and demonstrate different choice patterns according to their psychological dispositions as 'risk takers' or 'risk averters'. Individuals who observe human behaviour are all aware of the fact that there exists a minority of individuals who are inordinate risk takers in all decision making areas. Think of cliff divers and surfers as risk takers in physical areas and gamblers in financial matters.

As an example of prospect theory consider the following generic example: Some agent Alpha, say, has \$1,000 and is offered the following choices: 1) A) Alpha has a 50 per cent chance of winning \$1,000, and a 50 per cent chance of winning \$0. B) Alpha has a chance of winning \$500. 2) Alpha has \$2,000 and has A) a 50 per cent chance of losing \$1,000, and a 50 per cent chance of losing \$0. B) Alpha has a 100 per cent chance of losing \$500.

The logically consistent choices for both situations would be either A or B in both cases. But research has shown that majorities choose B) for question 1 and A) for question 2. Thus economic agents make choices based on how a single proposition is framed. This is indeed problematic for utility analysis given that two (2) separate indifference situations could arise for

basically the same choice situation. In this regard, prospect analysis has been of particular interest for those analysts who study the behaviour of agents who purchase and sell stock in the equity markets. The upshot of all this is the evident evolution of orthodox utility analysis dating from its marginalist foundations through the critique of Simon culminating in the paradigm shift of Kahneman and Tversky's prospect theory. The theoretical result we have today is what is known as Behavioural Economics. Its presumed forte is that its theories are founded on the actual behaviour of economic agents as opposed to the formal presentation of the homunculus 'rational economic man' with his decisions and choices determined a priori by the axioms of rational choice. It is the empirical refutation of the prescribed choices of ideal rational agents that serves as the foundations of behavioural economics. Prominent theorists in this regard are Colin Camerer et al (2004).

But it should be noted that the basis for the Kahneman-Tversky approach to choice-making was afforded by Maurice Allais's 1953 article that demonstrated that individual choices were often inconsistent with the predictions of expected utility theory. Allais's observations gave the lie to the independence axiom of agent choice theory. Note that the independence axiom merely states that if X is preferred to Y then that preference would still hold if some other choice item is included at equal probabilities for both X and Y.

The modalities of human thought are also borne out by examples afforded by Kahneman and Tversky within the context of what they call 'framing theory' according to which agents tend to prefer positive statements of the same proposition than negative. Thus agents tend to favour, for example, a statement that 'there is an 80% survival rate if some new drug (X) were taken' than if the same proposition were framed as 'there is a 20 per cent death rate if some new (X) drug were taken'.

Thus economics is at the stage where axiomatic neoclassical theory is being pressured by the behaviourist school to deal with the theoretical issues that arise when the formal theory is matched with the actual empirical choices made by individuals. But are we any closer to theory-practice illumination? The problem for microeconomics as neoclassical theory is that given the multiplicity of choices that individual agents could effect, what kind of theoretical structure would be appropriate for the theorist to construct so as to capture all possible kinds of choice-making? The answer is that none would be appropriate. Proof of this is that in areas such as finance theory where prospect theory has been applied the results have not been promising.

Rational expectations theory (John Muth 1961 and Robert Lucas 1987) widely applied to the world of finance economics has not saved the world from the huge paper losses of 2008. The same with the Efficient Market Hypothesis (Eugene Fama 1976) and Robert Shiller (2005) which, like the rational expectations theory, claims that agent market choices are effectively rational in the sense that they mirror the market. A Hegelian point being made here: what is real is rational and what is rational is real. So what should the theoretical future hold? Clearly, there is a palpable disconnect between the world of stock trading and the real economy. The fact that behavioural economics has not really answered the question of how to construct proper predictive and explanatory theories as replacements for the formal theories of neoclassical economics has pushed its advocates to explore the connections between economic decision-making and actual brain circuitry in the extension area of neuroeconomics. From a strictly scientific point of view, it is indeed useful to explore the reasons why individuals react more emotively to losses than to gains of equal amounts. Or the puzzling issue of why some agents become compulsive gamblers and spenders reflecting issues involving emotional health, and so on.

But the fundamental question still arises: how to map the choice paths of individual agents as they pursue their economic activities. We have seen that in terms of actual empirical observations it is really not possible to establish a tested choice path for the generic agent. The works of Simon, Allais, Kahneman-Tversky bear this out. Economics in general concerns the choice paths of millions of human agents in their daily lives. Under uncontrolled conditions it is just not possible to map the choice paths of millions of individuals in real time. First, it has been established that utility is not measurable but it must also be recognised that utility functions are not stable and are constantly changing. Furthermore, it is unclear what variables should be included in any particular utility function. It could be the fact that an individual may be satiated after consuming some particular item but may not be satiated regarding the consumption of other items. And even so, some particular individual may never experience diminishing marginal utility for the consumption of some items. And again, the generic consumer would be puzzled that his or her choice path is described at its completion by 'bordered Hessians alternating in sign'.

Would it be cognitively more fruitful to treat economic decision making in holistic and macro terms in much the same way that the gas laws in physics are established? The behaviour of individual molecules

is of little moment in establishing such laws. Rather it is the behaviour of the gas as a whole that determines the gas laws. In the case of economics this would seem to have been the model until the advent of marginalism as advocated by Jevons, Menger, and Walras, and later extended by theorists such as Marshall, Edgeworth and Bowley.

Given the evident problematic concerning the neoclassical economic model founded on a defined postulate of rationality one solution has been to amplify agent decision-making by game theoretic models. But this does not solve the problem of unrealism given that the postulate of rationality is necessarily assumed so that formal decision-making solutions be worked out. The point is that each game-theoretic situation is unique in real terms and just cannot be shoe-horned into some ideal model.

Econometrics and Economics

Some theorists argue that the scientific credentials of economics are much boosted by its econometric exercises. Econometrics is defined as that branch of economics that is founded on seeking statistical correlations between quantitatively formulated data to determine whether they conform to the assumed laws of economics. The statistical tool of linear regression is the orthodox starting point. This approach seeks to establish correlations between sets of variables so as to determine whether the variables in question are causally related. In fact, econometric techniques are employed not only in economics but also in other social sciences such as sociology and history. But the mere fact of expressing economic phenomena in strict statistical terms would not be sufficient to render the discipline impervious from epistemological criticism (Edward Leamer 1983; Aris Spanos 1995). (See also Aris Spanos (with G.D. Mayo), (*Error and Inference: Recent Exchanges on Experimental Reasoning, Reliability, and the Objectivity and Rationality of Science* [2010])). There are the obvious problems with choosing the correct variables from a multiplicity of such. But, again, should all interactive variables be chosen? This has led to the problem of 'data mining' according to which the researcher just seeks out the data that could confirm the hypothesis in question; and issues of heteroskedasticity and multicollinearity which would seem to be unavoidable.

The major issue with econometrics in its quest for scientific status is that researched models cannot be replicated for the reason that the collected data is open-ended and always changing. This is not the case with the laboratory-bound natural and biological science research. Thus, when some researcher gathers data from which a hypothesis could be tested, replication by others for confirmation purposes would not be fully possible.

But apart from that problem econometrics has not replaced the nuanced ideas presented in microeconomics, monetary theory, and development economics which require much more than regression analysis. So the problems with economics as a purported scientific discipline remain. Economists have often been reproached for having what is called 'physics envy' on account of the way modeling in economics is conducted. This approach is problematic because according to physicist Lee Smolin (2013) neoclassical economic theory operates as if its theories were constructed in a timeless universe given its fixation on the concept of a timeless equilibrium. Smolin writes: 'How is it possible that influential economists have argued for decades from the premise of a single, unique equilibrium, when results in their own literature by prominent colleagues showed this to be incorrect? I believe the reason is the pull of the timeless over the timebound. For if there is only a single timeless equilibrium, the dynamics by which the market evolves over time is not of much interest' (Smolin 2013:259). According to Smolin, neoclassical economic theorists treat their discipline as being 'path-independent' when in actual fact the practice of economics is 'path-dependent' – that is dependent on events in time. Smolin writes: 'Neoclassical economics conceptualizes economics as path-independent. An efficient market is path-independent, as is a market with a single, stable equilibrium. In a path-independent system, it should be impossible to make money purely by trading, without producing anything of value. This sort of activity is called arbitrage, and basic financial theory holds that in an efficient market arbitrage is impossible, because everything is already priced in such a way that there are no inconsistencies.... Nonetheless, hedge funds and investment bankers have made fortunes trading currency markets. Their success should be impossible in an efficient market; but this does not seem to have bothered economic theorists' (Smolin 2013:260).

But the opposite holds as in the cases of the great losses incurred by the hedge fund Long-Term Capital Management in 1998. This hedge-fund was noted for its heavy reliance on quantitative methods with Nobel Prize winners, Myron Scholes and Robert Merton on its board of directors. The same principle holds regarding the world economic crisis of 2008. As Smolin puts it: 'In the thinking of the economic gurus who won the day for deregulation, the role of human agency was neglected, in deference to an imagined mythical timeless state of nature. This was the profound conceptual mistake that opened the way for the errors of policy that led to the recent economic crisis and recession' (Smolin 2013:259-260). Smolin finally states tellingly that 'To do real economics, without

mythological elements, we need a theoretical framework in which time is real and the future is not specifiable in advance in principle' (Smolin 2013:263). The point is that neoclassical economics as it is structured, even when buttressed with econometrics does not, at its foundational levels, offer an accurate scientific analysis of the economy.

Political Economy Revisited

The classical economists such as Ricardo, Say, Malthus, and others all wrote about the economy as an ongoing dynamic between labour, rent, and capital. And this was the essential point later taken up by Marx in favour of labour. We recall, of course, that an important cornerstone of classical economics was the labour theory of value. The logical implication of this ongoing dynamic was amply pointed out by Marx in his copious writings. The classical labour theory of value leads directly Marx's theory of surplus value, which on its formalisation has ever since been a topic of great controversy. It was at this point that there was a gestalt switch among the theorists of economics to focus more on the decision-making of individuals. This was the point at which theorising efforts of the marginalists were bent on arguing that economic behaviour was at base individualist and subject to strictly axiomatic representation.

But this approach was strictly evasive because of the constantly interactive nature of economic behaviour within society as a whole. The most important features of the economy as a whole are to be understood macroscopically. It is for this reason that the most important works written in economics are those that deal with the economy as a whole. Think of the works of the classical political economists including those of J.S. Mill and J.B. Say. Even the marginalist, Walras, sought to understand the economy as the interactive choices of all agents in the social economy. This explains Walras's attempt to map the economy as a whole with his general equilibrium theory. On this issue we can think analogically with regard to gas theory laws. According to gas theory, the behaviour of individual molecules is of little import given the greater importance of variables such as pressure, temperature, and volume. The equation for the Ideal Gas Law is $PV = nRt$ where n refers to the number of moles of molecules all taken together. Analogically, the understanding of the dynamics of an economy derives not from analysing the paths of single molecules but of understanding the behaviour of the gas as a collection of gas molecules subject to the variables mentioned above.

Viewed macroscopically the most important aspects of an economy are general prices, employment levels, inflation rates, governmental fiscal

and monetary policies, and at a more analytical level the relationship between capital and labour. The choices made by some idealised consumer are of minimal significance. In this regard, economics becomes a more comprehensive discipline as political economy than as economics as a positive science. Works such as *The Political Economy of Growth* (Paul Baran 1957), *The Development of Underdevelopment* (Andre Gunder Frank 1966), *The Modern World System* (Immanuel Wallerstein 1974, et seq.), etc., are much more illuminating for the understanding of the dynamics of economics than otherwise. In sum the macroscopic thrust of Marx's *Capital* and J.M. Keynes's *The General Theory of Employment, Interest and Money* are more meaningful for understanding economics than, say, Debreu's *Theory of Value: An Axiomatic Analysis of Economic Equilibrium*.

There are others who would argue that the microeconomic aspects of the economic landscape should be taken into consideration as in the case of understanding the modalities for optimisation in the case of firms. Of course, such can be done on a case by case analysis. The techniques of linear and non-linear programming have been applied in such situations and have been quite effective. One might even apply the same techniques to individual agent decision-making, treating the agent as an optimiser according to set production outputs. Appeal to such techniques would be more reliable than the orthodox approaches now taken according to traditional microeconomic approaches based on equality constraints. The goal here, it must be admitted, is to offer realistic analyses rather than ideal-type abstractions.

In this regard, it should be recognised that notions such as equilibrium states of the economy according to which microeconomic and macroeconomic solutions are established do not really exist. There are no equilibrium states of the economy given that there is constant motion among its constituent parts. Proof of this derives from the fact that the world economic recession of 2008 was not predicted by most of the 'efficient market' theorists who argue that the behaviour of financial markets reflect the correct choices of the decision makers operating therein. From John Muth to Eugene Fama the attempts to establish some kind of structured decision-making rationality for agents in the market have failed for the most part. Proof of this is the fact that the world economic recession of 2008 was not predicted by most economists.

On account of all these observations it is incumbent on theorists of economics to seek to establish novel paradigms that would better explain economic decision-making. In this sense a more comprehensive

approach is required. This would mean approaching economics not as a narrow, ideal-type discipline whose actors are imbued with an unrealistic rationality which leads to equally unrealistic results, but as a comprehensive discipline constructed along the lines of traditional political economy. When this approach is assumed it becomes clear economic decision-making by individuals in whatever guise is a complex matter determined by political, sociological, and historical variables. In the final analysis, the decision-making map for the whole dynamic is determined by an ongoing conflict between labour and capital. This recognition would not be grasped were economics reduced to the analysis of neoclassical economics.

The present economic structure of the world requires investigation given the huge economic imbalances that exist between individuals and nations. It is a matter of great concern when the collective wealth of a mere eighty five individuals is on par with the wealth of approximately 50 per cent of living humans, that is, some 3.5 billion persons. The same could be said for the income disparities that exist for a number of non-industrialised nations especially those of Africa. Neoclassical economics is just not equipped with the appropriate tools to analyse this phenomenon given its dogmatic mantra that all factors of production are rewarded in the production process with the values of their marginal products. Given the original meaning of ‘economics’ – derived from the Greek term ‘*oikonomos*’ meaning ‘care of the household’ – the present structure of the world’s economic arrangements needs analyses of existing socio-historical and political structures, and the political behaviours of governments and corporations. There must be explanatory focus on the role that the Bretton Woods institutions exercise such influence on the world’s economies, the fact that there exists both a world’s reserve currency and convertible currencies, the fact that the exchange values of currencies are so disparate, the fact that neoliberal market economics strongly endorses the free flow of capital but not the free flow of labour, and so on. Answers to these economic questions cannot be answered by neoclassical economics in any meaningful way. What this means is that contemporary students of economics should recognise that there are more meaningful paradigms of economic behaviour than neoclassical economics and that questions concerning economic structures could be more realistically answered within a framework of political economy.

In the particular case of Africa the dominant paradigm in its theoretical guise is neoclassical economics which translates into the practice of neoliberalism as advised by the dominant international lending agencies

such as the IMF and the World Bank. The results are that the majority of nations on the lowest tier of the UNDP's Human Development Index are on the African continent. This situation can be reversed only by a rethinking of orthodox economic theory in favour of political economy. In this regard, theories such as dependency theory, critical Marxism, world systems theory should be dusted off and brought to the forefront of critical economic analysis. Africa's universities and social science research centres have a crucial role to play in this regard.

Conclusion

This article derives from the fact that contemporary economics, dominated as it is by neoclassical economics and its empirical practice, neoliberalism, has failed to offer genuinely scientific explanations of economic phenomena. In order to solve this issue a paradigm shift has been proposed. This new direction entails a return to the more comprehensive analysis of economic behaviour in terms of its past as political economy. In this context, economic behaviour was understood as human decision-making structured comprehensively as it was on the other social sciences of politics, sociology, and history. This novel approach was recommended after it was demonstrated that economics (with microeconomic foundations) could not sustain itself empirically based as it is on the assumption of rational agent behaviour. The research findings of Kahneman and Tversky clearly confirmed this fact. It is for this reason that behavioural economics and neuroeconomics have become increasingly popular. But even this approach would not be adequate given that human behaviour is so complex that any theory proposing to explain and predict some aspects of behaviour could be easily refuted by falsifying instances. The modelling of economics as a species of engineering or physics has not yielded the expected results. The failures of neoclassical economics are obvious given that any social science claiming to be 'scientific' must be able to offer not only realistic descriptions of reality but also to explain existing phenomena and to offer accurate forecasts.

The neoclassical economics paradigm has become so dominant in these contemporary times of globalisation that its pedagogic instruction in Africa's universities is now the norm. But its practice as economic neoliberalism has spelled doom for Africa with the frequent IMF and World Bank ministrations of Procrustean 'structural adjustment' programmes. Capital continues its centrifugal flight from Africa even as its governments are advised to practice 'open markets' and to offer

‘investor friendly’ economies. The result is just as in the ‘old days’: Africa exports cheap raw materials and imports relatively expensive finished value-added products – especially from China, a growing economic superpower. It is evident, therefore, that alternative and modified theories not so popular in the technologically developed West, must be revisited for their viability in Africa’s mostly tiny and unviable economies. Political economic analyses must be an integral part of new solutions in the forms of regional integration, viable currencies and effective monetary reforms. There is no need to reinvent the wheel, thus the current model of the European Union with its single currency, freedom of movement, and coordinated infrastructures, and so on, is a viable way forward with the appropriate modifications.

But one should be aware that though the end goal should be a political and economic Africa structured along the lines as recommended Kwame Nkrumah and C.A. Diop, the necessary infrastructure to effect this is not in place. To emphasise again: there is much need for more think tanks, research universities, publishing houses, journals, and bookshops, all existing within the context of a modernising social matrix. In other words, for Africa to develop intellectual cultures, it must necessarily develop *pari passu*. Ideas from all parts of the globe should be made available instantaneously and studied. But that is not what obtains at the moment. How many bookshops or university students in the area of economics have access to texts such as *How Rich Nations Got Rich and Why Poor Nations Stay Poor* authored by Eric Reinert (2007)? Ideally, the very recent text, *Capital in the 21st Century* (Thomas Piketty, 2014) should be available at university libraries at the same time it is available elsewhere. There should be ongoing debates in African universities as whether this text is just another instance of ‘old wine in new bottles’ with weak recommendations or otherwise. After all, the global economic crisis of 2008 did affect Africa maximally.

References

- Allais, M., 1953, ‘Le comportement de l’homme rationnel devant le risque, critique des postulats et axiomes de l’ecole americaine’, *Econometrica*, 29(3), 315-335.
- Arrow, K. and Debreu, G., 1954, ‘The Existence of an Equilibrium for a Competitive Economy’, *Econometrica*, 22, 265-290.
- Baran, P., 1957, *The Political Economy of Growth*, New York: Monthly Review Press.

- Blaug, M., 1996, *Economic Theory in Retrospect*, Cambridge: Cambridge University Press.
- Camerer, C., Lowenstein, G., Rabin, R.,(eds.), 2004, *Advances in Behavioral Economics*, New York: Princeton University Press.
- Camerer, C., Lowenstein, Drazen, P., 'Neuroeconomics: How Neuroeconomics Can Inform Economics', *Journal of Economic Literature*, 43, 9-64.
- Debreu, G., 1959, *The Theory of Value: An Axiomatic Analysis of Economic Equilibrium*, New York: Wiley.
- Fama, E., 1976, *Foundations of Finance*, New York: Basic Books.
- Fechner, G.T., 1860, 1966, *Elements of Psychophysics*, Vol 1., New York: Holt, Rinehart and Winston.
- Frank, A. Gunder, 1966, *The Development of Underdevelopment*, New York: Monthly Review Press
- Friedman, M., 1953, 'The Methodology of Positive Economics', in *Essays in Positive Economics*, Chicago: Chicago University Press, pp. 3-43.
- Gloria-Palermo, S., 1999, *The Evolution of Austrian Economics: From Menger to Lachmann*, London: Routledge.
- Hicks, J.R. and Allen, R.D.G., 1934, 'A Reconsideration of the Theory of Value', *Economica*, 1(2), 196-219.
- Hicks, J., 1939, *Value and Capital: An Inquiry into Some Fundamental Problems of Economic Theory*, Oxford: Clarendon Press.
- Houthakker, H., 1950, 'Revealed Preference and the Utility Function', *Economica*, 17(66), 159-174.
- Jevons, W.S, 2012(1862), *The Progress of the Mathematical Theory of Political Economy*, Charleston, S.C.: Nabu Press.
- Jevons, W.S., 1981(1870), *The Theory of Political Economy*, London: Macmillan.
- Kahneman, D. and Tversky, A., 1979, 'Prospect Theory: An Analysis of Decisions Under Risk', *Econometrica*, 47, 263-291.
- Kahneman, D. and Tversky, A., eds, 2000, *Choices, Values, and Frames*, Cambridge: Cambridge University Press.
- Keynes, J. M., 1936, *The General Theory of Employment, Interest and Money*, London: Macmillan.
- Keynes, J.N., 1890, *The Scope and Method of Political Economy*, Kitchener, London: Macmillan.
- Leamer, E., 1983, 'Let's Take the Con out of Econometrics', *American Economic Review*, 73(1), 31-43.
- Lucas, R., 1972, 'Expectations and the Neutrality of Money', *Journal of Economic Theory*, 4(2), 103-124.
- Malinowski, B., 1922, *Argonauts in the Western Pacific: An account of Native Enterprise and Adventure in the Archipelago of Melanesian New Guinea*, London: Routledge and Kegan Paul.
- Menger, K., 1981(1870), *Principles of Economics*, New York: New York University Press.

- Muth, J., 1961, 'Rational Expectations and the Theory of Price Movements', *Econometrica*, 29(3), 315-335.
- Polanyi, K., 1957(1944), *The Great Transformation*, Boston, MA: Beacon Press.
- Reinert, E., 2007, *How Rich Nations Got Rich and Why Poor Nations Stay Poor*.
- Robbins, L., 1935(1932), *An Essay on the Nature and Significance of Economic Science*, London: Macmillan
- Samuelson, P.A., 1938a, 'A Note on the Pure Theory of Consumer's Behaviour', *Economica*, 5, 61-71.
- Samuelson, P.A., 1938b, 'A Note on the Pure Theory of Consumer's Behaviour', *Economica*, 5, 353-354.
- Samuelson, P.A., 1948, 'Consumption Theory in Terms of Revealed Preference', *Economica*, 15, 243-253.
- Shiller, R., 2005, *Irrational Exuberance*, 2nd Edition, Princeton NJ: Princeton University Press.
- Simon, H., 1972, 'Theories of Bounded Rationality', in *Decision and Organization*, C.B. Macguire and R. Radner, eds, Amsterdam: North Holland, 161-176.
- Simon, H., 1976, 'From Substantive to Procedural Rationality', in *Method and Appraisal in Economics*, S.J. Latsis, ed., Cambridge: Cambridge University Press.
- Smolin, L., 2013, *From the Crisis in Physics to the Future of the Universe*, New York: Houghton Mifflin Harcourt.
- Spanos, A., 1995, 'On the Testing of Econometrics: Modeling with non-Experimental Data', *Journal of Econometrics*, 67, 189-226.
- Spanos, A., (with G.D. Mayo), 2010, *Error and Inference: Recent Exchanges on Experimental Reasoning, Reliability, and the Objectivity and Rationality in Science*, Cambridge: Cambridge University Press.
- Varian, H., 2005, 'Revealed Preference', in M. Szenberg, L. Ramrattand and A.A. Gottesman, eds., *Samuelsonian Economics in the 21st Century*, Oxford: Oxford University Press, 99-115.
- Wallerstein, I., 1974, *et seq.*, *The Modern World System*, New York: Academic Press.
- Wong, S. 1978, *The Foundations of Samuelson's Revealed Preference Theory*, London: Routledge and Kegan Paul.