

Pareto on the Cause of Value

Maurice Dobb's Partial Assessment

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1 Introduction

In his classic study of ideology and economic theory entitled *Theories of Value and Distribution since Adam Smith*, Maurice Dobb (1973) anticipates his discussion of Vilfredo Pareto with the comment that Pareto could be called a 'conscious apologist' of the 'existing system' (Dobb 1973, p.193). His examination of Pareto's contribution to economic theory is very critical of the great emphasis placed on interdependence. Dobb's fundamental concern is that Pareto failed to acknowledge the order of determinism associated with general equilibrium theory. This is dismissed as 'crudely one-sided' (Dobb 1973, p.210), largely because Dobb associates the order in which value is determined with the ideological basis of economic theories of value.

This brief article establishes the rationale for Pareto's views on causation and value theory by appraising Dobb's critical comments on this subject in *Theories of Value and Distribution since Adam Smith*. It demonstrates that Dobb's view does not recognise that Pareto's comments on causation were primarily presented to clarify the synthetic relationship between fact and theory, and not to conceal the order of determination associated with general equilibrium.

The paper is divided into a number of sections. Section 2 reviews Dobb's hypothesis that ideological factors are implicit in the causal form of economic theory, and outlines his concern with Pareto's emphasis on mutual interdependence. The appraisal of Dobb's interpretation of Pareto on the cause of value is contained in Sections 3 and 4. Section 3 demonstrates that Dobb's interpretation does not acknowledge Pareto's recognition that, in purely theoretical systems, some factors 'depend on' other factors. Section 4 demonstrates that Pareto's rejection of causation has more to do with his methodological treatment of the relationship between fact and theory than it does with the order of determination within theory. Section 5 considers ideology and economics once Pareto's *logico-experimental* methodology is adopted. In section 6 it is concluded that any references to Pareto's view on causation and equilibrium theory, particularly its ideological implications, cannot be undertaken without regard to his specific methodological approach to the social sciences.

2 Dobb's Thesis on the Cause of Value and Pareto

In *Theories of Value and Distribution since Adam Smith*, Dobb portrays theory as an explanation of processes and outcomes that reflect a particular relationship between what is explicitly (and/or implicitly) determined from what is initially taken as given. This relationship is largely a reflection of the theorists "vision of the economic system, and ... whatever socio-economic conditions shape and limit his mental picture of reality" (Dobb 1973, p.7). As a consequence, Dobb hypothesises that a 'causal form' is necessarily

associated with economic theory, and that consideration of this causal form facilitates identification of the ideological elements of theory.

Dobb's study of ideology and economic theory categorises different approaches to economic theory on the basis of common causal form and common consequent ideological implications. Within this analytical system, economic theory developed in the traditions associated with Jevons (and Marshall), Menger (and the Austrian school) and Walras (and the Lausanne School) are united under the generic title of the 'Jevonian revolution'. This is justified by Dobb because the approach to value theory associated with the 'Jevonian revolution' represents a significant break from the classical approach to value. Instead of starting from the proposition that labour determines value, an alternative view is developed where scarcity and consumer choice determine equilibrium values. No longer were economic processes considered in terms of the circumstances of production, social classes and class conflict, they were considered in an atomistic and static manner, where values were determined with respect to individual's consumer choices in isolation from the social context within which they occurred.

Dobb's consideration of Pareto stems from his goal of establishing that, for the purpose of analysing the ideology of economic theory, the general equilibrium approach associated with the University of Lausanne can be readily considered as part of 'Jevonian revolution'. To do this, he examined Pareto's main economic publications, the 1896-97 *Cours d'Économie Politique* (Pareto 1971a) and his 1909 *Manuel d'Économie Politique* (Pareto 1971b). He also noted that Pareto wrote a treatise on sociology (Dobb 1973 p.210), suggesting that he was aware of Pareto's 1916 *Trattato di Sociologia Generale* (translated into English under the title of *Mind and Society* (Pareto 1935)).

His analysis commences by noting that Pareto is usually taken to be the first to divorce the theory of demand from hedonism and utilitarianism by representing utility (ophelimity) as a purely ordinal measure of 'desiredness'¹ that cannot be used for the purposes of interpersonal comparisons (Dobb 1973, p.209). Aside from this and an emphasis on fixed coefficients of production², Pareto is acknowledged as doing "little more than translating the Walrasian system into a more accessible form" (Dobb 1973, pp.209-10).

In view of Dobb's objectives, his main interest concerned Pareto's views on causation and the order of determination in the theory of general economic equilibrium. Dobb's discussion of general equilibrium theory emphasises that even systems of complex interacting variables have a causal form (Dobb 1973, p.10). In support of this, he notes that Léon Walras was aware of the causal form of his analysis (Dobb 1973, p.9, p.170 pp.203-04), though he does not suggest that Walras was aware of ideological aspects associated with the order of determination advocated. In contrast, in his 1906 *Manuale di Economia Politica* (Pareto 1974), and repeated in the 1909 French *Manuel*, Pareto was critical of Walras' position on the cause of value. Pareto consistently emphasised mutual dependence, and regarded consideration of cause and effect in timeless economic theory as inevitably misleading, arguing that "...any economist who looks for the cause of value shows thereby that he has understood nothing about the synthetic phenomenon of economic equilibrium" (Pareto 1971b p.177).

Dobb recognised that to some extent the difference between Walras and Pareto can be explained by varying levels of abstraction in their work. Nevertheless, irrespective of the level of abstraction, he dismisses Pareto's position (and proceeded to include general equilibrium as a part of the Jevonian revolution) because, when the

Walrasian system is given an economic interpretation - and a *fortiori* economic application - a determination of some factors by others necessarily emerges. This is, indeed, how the master himself [i.e. Walras] seems to have regarded it (Dobb 1973, p.210).

3 Dobb's Error of Interpretation: Pareto on the Causal Form

Dobb did not consider why Pareto was critical of Walras and emphasised interdependence. His approach is just portrayed as crudely 'one-sided'. Dobb's analysis interprets Pareto's emphasis on interdependence as a rejection of the view that value theory implies an order of determination. However, this is a misinterpretation. Pareto did not deny the implied order of determination in economic theories of value. He simply emphasised that it may be misleading to focus on the 'cause' of value because the implied order determination in value theory is necessarily partial, especially when the dynamics of economic phenomenon are reduced, with the aid of the mechanical analogy, to a static theoretical system.

Price or *value in exchange* is determined at the same time as economic equilibrium, and the latter arises from the opposition between tastes and obstacles. The person who looks at only one side and considers only tastes believes that they alone determine price and finds the *cause* of value in *utility* (ophelimity). The person who looks at the other side and considers only the obstacles believes that they alone are what determine price, and he finds the *cause* of price in the cost of production. And if among the obstacles he considers only labor, he finds the cause of value exclusively in labor. If in the system of conditions (equations) that we have seen determine equilibrium, we assume that all the conditions are satisfied with the exception of those which refer to labor, we can say that value (price) depends only on labor, and that theory will not be false, simply incomplete (Pareto 1971b, pp176-177).

As Pareto's investigations were general, he examined circumstances when prices could 'depend' on a range of factors. For example, he used general equilibrium theory to examine the economic implications of violating the conditions of free competition (type I economic phenomena of the *Manuale*). He also had a specific interest in monopoly (type II economic phenomena) and redistribution under socialism (type III economic phenomena). In relation to these phenomena, he employed deductive logic based on propositions to infer economic welfare consequences associated with various types of economic phenomena. For type II and III economic phenomena, price cannot be said to 'depend on' elementary ophelimity (marginal utility) because the presumption of equality between relative prices and relative elementary ophelimities is removed once theorists depart from type I economic phenomena.

Consequently, 'causal' explanations of price determination are not general (i.e. they don't relate to the full range of economic phenomena that general equilibrium can represent). Furthermore, Pareto acknowledged that some factors, such as income distribution, are initially given by the "historical and economic contingencies in which the society has evolved" (Pareto 1971b, p268). In this context, the emphasis on the interdependencies in the study of 'general' equilibrium is solidly grounded.

However, Pareto's concern with partial and potentially misleading consideration of the causal form, or the order of determination, of abstract propositions cannot be appreciated without reference to the relationship between fact and theory, as defined by Pareto's methodology. When this is considered, as it is in Section 4, it is clear that setting general equilibrium economics within Pareto's methodological context, as distinct from that of Walras, does not carry the ideological implications that Dobb associates with the economics of the 'Jevonian revolution'. Schumpeter hinted at this when he noted that while Pareto's *Cours d'Économie Politique* (Pareto 1971a) is "... a brilliant Walrasian treatise" (Schumpeter 1954, p860), Pareto's work: "floats in a sociology, philosophy and methodology that are not merely different but diametrically opposed to Walras' ideas" (Schumpeter 1954, p860).

4 Dobb's Error of Omission: The Relationship between Fact and Theory

In general terms, Dobb recognises that the relationship between fact and theory is important. However, he approaches the issue from one limited perspective, where theory has an 'economic application' or is given an 'economic interpretation'. He says nothing about how Pareto gave general equilibrium theory an economic interpretation (i.e. Pareto's treatment of the distinction between fact and theory), and nothing on why Pareto was concerned about Walras' economic interpretation of general equilibrium theory.

Pareto not only recognised that theory has an economic interpretation, he also considered when pure theory directly corresponded with fact, when it did not, and emphasised that a non-arbitrary synthesis of (pure and applied) theories was required to appreciate concrete phenomena. Pareto's critique of economists searching for 'the cause' of value is based on his perception that such economists failed to appreciate that economic equilibrium can only be appreciated as a "synthetic phenomenon" (Pareto 1971b, p.177). In recognition of the need for synthesis, Pareto argued that:

all economic phenomena express themselves in terms of *value*; but from that we [economists] have a right to conclude that in isolating the various elements in such phenomena we come upon a theory of value – but not that all other elements have to be squeezed into that theory (Pareto 1935, p.21).

In specific regard to Pareto's rejection of Walras' contention that *rareté* is the cause of value in exchange (Pareto 1974, p.174), Pareto was concerned that Walras did not properly consider the relationship between fact and theoretical hypothesis. As Dobb did not examine why Pareto expressed concern with Walras' views on causation, it is important to do so here.³

Pareto first made public his concern with Walras' discussion of the relationship between price and *rareté* in the *Manuale*. However, from his correspondence with Maffeo Pantaleoni it is evident that this concern dated back to his first exposure to Walrasian theory. In a letter written on 3 October 1891, Pareto indicated that:

One can cite many cases when the exchange value of goods depends on *other* variables that are independent of the nature of the individual and goods. I will give you some examples. The price of securities negotiated in the stock exchange often depend on dp/dt (p = prices, t = time). If, however, prices are proportional to the *raretés*, it still follows that they depend on other variables that are not only those determined solely by the nature of the individual and the goods.

I accept that pure economics does not take account of these cases, and only considers the exchange of goods whose final degree of utility depends solely on the nature of the individual and the goods. But, having taken this road, for me I ask that the definition of that final degree not be stretched; otherwise, one falls into the sophism of the average ambiguous term.

I have read Walras with great care, and it appears to me that he does not always take account of this (Pareto 1960a, p.66).

Pareto's unease was rooted in Walras' failure to identify the circumstances when the pure theory of free competition directly corresponds with the concrete economic phenomena, or the circumstances when it is necessary to introduce additional factors to appreciate the concrete phenomenon. Pareto himself tried to deal with this by integrating fact within economic theory where possible, as this clarifies the scope of pure economic theory, and also by his synthetic successive approximations approach to science.

The first indication of Pareto's intentions to integrate the 'fact of choice' within economic theory is evident in a letter of 28 December 1899 to Maffeo Pantaleoni. In that

letter he noted his concern that starting price analysis from the concept of marginal utility may reflect "the mania of always going beyond experience" (Pareto 1960b, p.288).⁴ To correct this, he wished to commence economic theory with "indifference curves which are a direct result of experience" (Pareto 1960b, p.288, Pareto's emphasis).⁵

In his 1900 articles, "Sunto di Alcuni Capitoli di un Nuovo Trattato di Economia Pura" parts one and two (Pareto 1982b; 1982c), Pareto formally developed his theoretical system based on the 'fact of choice'. In these studies, Pareto also demonstrated the equivalence between: (i) a purely axiomatic system of general economic equilibrium based on the proposition that ophelimity is a quantity, as outlined in the *Cours*, and (ii) his new equilibrium system based on experimentally determined choice (represented as ordinal indices of ophelimity).

Interestingly, by integrating the 'fact of choice' within Pareto's system of economic theory, the direction of inference is reversed, with the theorist working back to ophelimity, if it exists (Pareto 1971b, p.391). That is, indices of ophelimity are 'inferred' from experimentally determined data. Given, that this theoretical system determines an equivalent equilibrium point to that determined using a theoretical system where ophelimity is assumed to exist, the direction of causation in theoretical systems has limited significance.

When Pareto finally made public his concern with Walras' approach to theory in the *Manuale*, he expressed the view that neglect of the synthetic nature of theory seems to result in an interpretation that fact (price) is subordinate to an hypothesis (*areté* is the cause of price). Pareto regarded this as untenable, a point which he reiterated in the *Trattato*:

In pure economics my hypothesis of "ophelimity" remains experimental so long as inferences from it are held subject to verification on the facts. Were that subordination to cease, the hypothesis would no longer be called experimental. Walras did not think of "exchange value" in any such manner (Pareto 1935, p.29).

In this regard, Pareto found it necessary to relate fact with general theory when the conditions of free competition did not hold. Pareto accepted that the theory of equilibrium under free competition is very closely related to fact when conduct is constant and repeated (Pareto 1982a, pp.378-379). However, what happens when, as is often the case, choice is not constant or repeated? To account for this circumstance, Pareto advocated a synthesis of economics (both pure and applied) with general sociology.

Aspects that demonstrated stability could be considered with the aid of the theory of general economic equilibrium. In contrast, less stable economic conduct, can all be considered using general sociology. In this regard, Pareto contended that when logical inference based on hypothetical proposition about the conduct of individuals leads to a false determinism, other influences on individuals' 'non-logical' (but generally not illogical) conduct need to be considered. Pareto analyses these non-logical influences on economic conduct in reference to observable criteria that contribute to the destabilising of individual's conduct. These include class conflict, conflict over the distribution of income, circulation of political elites, and spoliation (appropriation of others property by public and/or private arrangements). Within this context, Pareto assigns considerable importance to control of capital and the distribution of wealth – which is central to the vision of many classical political economists.

This serves to clarify why Pareto considered that no single causal chain in theory explains the concrete phenomenon, and that in order to reduce the influence of ideology on theory, any pretence that one has achieved a causal chain that really explains the concrete fact should not be made. In this regard, Pareto was clearly frustrated with some

of his contemporaries (i.e. the second generation of Jevonian revolutionaries), as evidenced by his observation that economists:

try obstinately to get from their science alone the materials they know are needed for a closer approximation to fact; whereas they should resort to other sciences and go into them thoroughly – not just incidentally – for their bearings on an economic problem. (Pareto 1935, p.1412; cited in Tarascio 1983 pp.119-120)

The importance of Pareto's sociology to the study of the economic conduct is now well documented, mainly through the work of Schumpeter (1949), Allais (1968) and Tarascio (1968, 1969, 1973, 1993), and in a range of works reproduced in Wood and McLure (1999). To illustrate the importance of synthesising economics and sociology in Pareto's study of economic phenomena, it is useful to consider the issue of free trade. The *Manuale* stresses the formal validity of the theory of general equilibrium versions of the theory of comparative costs, but also emphasises that it is not the end of the question from a policy perspective (Pareto 1971c, p14). In the *Trattato* he clarified why.

A forward step along the scientific path was taken when the theories of mathematical economics supplied a proof that, in general, the direct effect of protection is a destruction of wealth. ... But before such a proposition can be taken for granted, the indirect economic effects and the social effects of protection have to be known. ... we find that protection transfers a certain amount of wealth from a part, *A*, of the population to a part *B*, through the destruction of a certain amount of wealth, *q*, the amount representing the costs of the operation. If, as a result of this new distribution of wealth, the production of wealth ... increases by a quantity greater than *q*, the operation is economically beneficial. Th[is] latter case is not barred *a priori* ... (Pareto 1935, pp.1545-46).

The main reason for the above conclusion on protection is that the redistribution of wealth generated through protection may give capital to a new elite who makes better use of it. To analyse this effect, and long term economic growth generally, Pareto developed his theory of *speculators* and *rentiers* (Pareto 1935, p1644). From the perspective of implied ideology, it is important that this theory is set against a context of elites and group struggle to acquire income and wealth by either producing it or despoiling the wealth of others (by means of public or private conduct).

In recognition of the multiple influences on economic phenomena, Pareto de-emphasised causation in economic theory and abandoned use of the term value in favour of the term 'price'. Value had come to be associated with the direct causation of prices, a proposition that Pareto regarded as beyond the scientific limits of pure economic theory. His consistent view was that theories must complement each other to appreciate the concrete economic phenomena. As this does not support a single direction of causation, his emphasis was placed on interdependence (not only between the elements of general equilibrium theory, but between elements emphasised in economic and social theories). Pareto had also observed the tendency to employ value theory for ideological expression. He also notes that the notion of value had become associated with complex human feelings (Pareto 1953a, p.187).

Metaphysically, people have used an entity called value taken as a constant cause of price variation. This ... manner of reasoning easily leads astray, since it deprives [price] averages of the status they have scientifically and gives them another that is altogether imaginary. This statement, however, implies no criticism of early economists for using the term "value". But it was a notable step in advance when "exchange value" came to be distinguished from "utility value". Further progress derived the far more exact concept of "final utility"

from the concept of "utility value"; and going on in that fashion, general theories of economic equilibrium were finally attained. There is nothing unusual about such a course. It is the course the natural sciences have all followed (Pareto 1935, p.54).

However, when the term 'value' was used out of historical context in a way that implied a direction of causation, Pareto was scathing in his criticism. For example, in the *Manuale*, he noted that in "...a recently published book, it is said that 'price is the concrete manifestation of value.' We have had the incarnations of Buddha, here we have the incarnations of *value*" (Pareto 1971b p.177).

5 Fact, Theory and Ideology

Two important consequences for the study of ideology emerge from Pareto's de-emphasis of the implied order of determinism in theory and his strong emphasis on the relationship between fact and theory. First, any analysis that primarily associates ideology with the order of theoretical causation cannot establish the ideological implications of Paretian theory. In relation to Dobb's thesis on ideology, it follows that when general equilibrium economics is considered in the context of Pareto's methodology, it cannot be considered under the generic banner of the 'Jevonian revolution' (at least not without being heavily qualified). Second, Pareto's own theory of ideology emerges, where the key factor is not causation, but the relationship between the 'subjective' and the 'objective', and the stability of utility associated with that relationship.

The fundamentals of Pareto's study of ideology were evident in the 1901 and 1902 *Les Systèmes Socialistes* (Pareto 1974b), especially the importance of his distinction between the objective (concrete phenomena) and the subjective (or that which our 'spirit perceives'). In this regard, Pareto recognised how difficult it is to make this distinction, but insisted that it be made.

Our ignorance of facts, our passions, our prejudices, the ideas in vogue in the society in which we live, events that strike us forcefully and a thousand other circumstances that veil the truth and impede an exact impression of the objective phenomenon prevent our impressions from being an exact copy of the objective phenomenon which gave rise to them (Pareto 1974b, pp.137-38).⁶

In the *Manuale*, Pareto further investigated the relationship between the subjective and the objective aspects of theory⁷ to expose its ideological influences. This approach is taken to its greatest level in the *Trattato*, when Pareto formalises the distinction between the 'objective aspect', the 'subjective aspect' and the 'aspect of utility'. The importance of these three aspects is emphasised by Joseph Lopreato in his "Notes on the Work of Vilfredo Pareto":

Early in the *Treatise* (section 13) he [Pareto] states that a social fact may be viewed from three aspects: the *subjective* aspect, the *objective* aspect and the aspect of *utility*. The *Treatise* never lets up on the application of this classification (Lopreato 1973, p.456).

The objective aspect of theory defines the relationship between the subject being studied and scientific evidence. If the subject considered is observable, it is an experimental matter. If it is not observable it is a non-experimental matter. Within this context, Pareto refers to the exclusive utilisation of a logical nexus between the elements of the observed subject matter to determine general principles as the *logico-experimental* approach to science.

The subjective aspect involves identification of elements that are associated with the objective phenomenon, but are perceived subjectively by people. This involves

consideration of why people make subjective assertions (which may be simply stated, or disguised in complex pseudo-logical reasoning) and why others assent to them. While subjectivity *per se* is non-experimental (because it cannot be observed), manifestations of subjective influences are observable, such as in written documents.

However, Pareto's distinction between the objective and subjective aspects of the logico-experimental approach is not absolute, as it is relative to the current state of knowledge.

We must not be misled by the names we give to the two classes [objective knowledge and subjective knowledge]. In reality both are subjective, for all knowledge is subjective. They are distinguished not so much by any difference in nature as in view of the greater or lesser fund of factual knowledge that we ourselves have (Pareto 1935, pp.76-77).

The objective and the subjective aspects of Pareto's logico-experimental approach are initially considered in relation to social doctrines and theories, from which the rapport between the subjective and the objective is developed. Verification of this relationship is then sought in history. As Bobbio (1964, p189) noted, this means that non-logico-experimental theories of conduct in society are the datum of Pareto's social research that identify the ideological forces operating in society.

[T]he inductive method is the method which, by analysing non-logico-experimental theories, discovers the forces operating in society ... ; the deductive method is the method which, once it has established the nature of these forces and suggested their classification, turns to the study of history in order to verify their validity. Thus the study of history, which in traditional political science comes first, is last in this case, in consequence of the fact that the primary sources of research are not historical narratives, but the so called non-logico-experimental theories (Bobbio 1964, p.189).

The final aspect, that of utility, concerns the advantage or disadvantage from subjective assertions and the consequent conduct that such assertions inspire. Utility is considered in relation to the person (or the persons) making the assertion, the people assenting to it and for the collective as an entity. The subjective aspect is solely concerned with the existence of non-logical influences on human conduct. The aspect of utility concerns the individual and collective benefits or costs resulting from objective acts inspired by subjective influences. The focus on utility in general sociology, and ophelimity in economics (a sub-class of utility) also facilitates a ready synthesis of economics and sociology.

Within this context, the importance of ideology in Pareto's analytical system is great. Pareto's observations suggest that most human conduct is non-logical, and that direct correlation between the objective fact and utility should be rejected because of the importance of non-logical factors. An absurd theory that does not correspond with social facts may be socially beneficial (Pareto 1935, p.38).

This framework for the study of ideology has ready application to economic theory. Economic theory became Pareto's first approximation to the economic phenomenon when the subjective purpose of an individual's conduct and its objective end were the same, or were in a constant and stable relationship. This ensured that ophelimity for the set of possible outcomes could be defined in commodity space as a stable and path-independent field or matrix (see McLure 1999). In such a circumstance, which is a prerequisite for 'logical' conduct (where the expected index of ophelimity from a desired end is realised once the end is attained), the dynamic processes of price determination can be specified in a system of timeless (or static) equations.

In contrast, the relationship between utility – as distinct from ophelimity – and objective social fact is not stable and unique (either for the individual and the collective).

This is a consequence of the subjective purpose of economic or social conduct not being the same as its objective intent, such as when the subjective purpose of conduct extends beyond the satisfaction of a simple taste. Consequently, Pareto's notion of utility (something useful - ophelimity adjusted for sentiment related to economic and social circumstances) is dependent on the historical processes or path taken to achieve an outcome. That is, the utility field is path-dependent since utility realised from desired ends depends on the path taken over time to realise these ends, and there is no strong basis for expected utility to equate with realised utility.⁸ In this circumstance, logical inference based a hypothetical premise about individual conduct simply rationalises a theoretical outcome without due regard to experimental observation that suggests such an outcome would not be achieved and/or sustained.

Within Pareto's methodology, economic phenomena are investigated 'synthetically' to recognise interaction between 'logical' conduct (where expected benefits from conduct are realised) and 'non-logical' conduct (where expected benefits from conduct may not be realised). In this context, the subjective aspect of economic theory takes on an ideological dimension when observation of objective phenomena suggest that individuals' utility fields are unstable, but they are treated as if they were stable and/or homogeneous across all members of the collective.

The social contexts that dominant classical value theory – class, class conflict and the struggles over the distribution of income and wealth – are all treated within Pareto's general sociological framework, where the relationship between utility and the objective economic phenomenon is unstable. In view of this, Dobb's failure to consider the *Trattato* is a serious omission, and given his inclusion of the sociological context of the work of classical economists (notably Marx), it is slightly perplexing.⁹

6 Conclusion

If an economist is defined, as Dobb does, as a person who gives theory an economic application, then the views of Pareto the economist on causation in economic theory must be assessed in relation to his methodology, economics and sociology. When general equilibrium theory is placed within the context of Pareto's methodology of science (in contrast to Walras' methodology), it does not display the ideological influences that Dobb attributes to developments of the 'Jevonian revolution'.

Dobb's main error is one of omission. Instead of explaining Pareto's views on causation in reference to the way that Pareto gave general equilibrium theory an economic application (as defined by his synthetic logico-experimental methodology), he prematurely rejected Pareto's views as crude, and incorrectly dismissed his work as the product of an apologist for the existing system.

Studies of the ideological implications of the 'Jevonian revolution' that introduce Pareto's comments on determinism and theory will invariably misrepresent these comments if Pareto's multi-disciplinary methodology is not differentiated from that of other economists.

Notes

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1 Pareto referred to utility in this context as ophelimity, though it is restricted to the circumstance where the utility/ophelimity field in commodity space is stable and enduring.

2 Pareto was in fact the first to introduce variable coefficients of production in his pioneering 1894 article "Il Massimo di Utilità dato della Libera Concorrenza" (Pareto 1982a). The originality of this article for production theory is discussed in (Chipman 1976, p.90). However, as Schultz has shown in some detail, in his 1897 and 1898 *Cours d'Economie Politique* (Pareto 1971a) and his 1906 *Manuale di Economia Politica* (Pareto 1974b), Pareto was concerned about the accuracy of marginal productivity theory when based on a first degree homogeneous production function (Schultz 1929, p.521). This reflects Pareto's contention that some coefficients of production are determined exclusively by technical considerations in response to the level of output (fixed production coefficients), whereas others are determined by economic considerations when inputs can be substituted (variable production coefficients).

3 The relationship between Pareto and Walras was complex. After a respectful and courteous rapport was established from their first meeting in 1891, a considerable animosity developed after Pareto moved to Lausanne in 1893 to succeed Walras in the chair of Political Economy. Pareto made no secret of the fact that he entirely disagreed with the premise of Walras' social economics (Pareto 1897, p.491) and in private correspondence he asserted that it was simply foolishness (Pareto 1960c, p.138). Pareto eventually confided in a letter to Guido Sensini that he and Walras had 'become enemies' because he was 'unwilling to follow him [Walras] on his metaphysical fantasies' (Pareto, cited in Schneider 1961, p.261). However, Pareto never ceased acknowledging the importance of Walras' contribution to the study of the pure theory of free competition, even when their relationship had deteriorated considerably. This is why Pareto made the following comment at the silver jubilee celebration of his association with the University of Lausanne in 1917:

It is with profound emotion that I accept the testimonies of goodwill with which you have wished to honour me. However, I would like to offer them, at least in part, to my predecessor Walras... (Pareto 1980, p.687).

4 Translation from Schneider (1961, p.290).

5 Translation from Schneider (1961, p.290).

6 Translation from Finer (1966, p.124)

7 See Gross and Tarascio (1998).

8 Mirowski (1989) also failed to appreciate that Pareto's study of utility and non-logical conduct was a notable investigation into path dependence which derived from the mechanical analogy (see McLure 1999).

9 If Dobb had examined Pareto's methodology and sociology, not only would his study of ideology in *Theories of Value and Distribution since Adam Smith* been given greater depth, but his *Welfare Economics and the Economics of Socialism* (Dobb 1970) could also have been considerably enhanced. In the latter work, Dobb recognised Pareto for his analysis of economic maximisation (i.e. work related to the Pareto optimum), but treated the matter superficially. There is no discussion of Pareto's distinction between the mathematical and economic expressions of the first theorem of welfare economics, or of the 'surplus' approach to economic welfare pioneered by Pareto, and subsequently developed by Allais after 1924, as reviewed, in English, in Allais (1975). More fundamentally, there is no acknowledgement of Pareto's pioneering economic analysis of socialism, or any indication that Pareto found that "pure economics does not give us a truly decisive criterion for choosing between the organisation of society based on private property or socialist organisation" (Pareto 1971b, p.269). Had this been considered, it would have been difficult to present Pareto as a 'conscious apologist' for the existing system. Furthermore, Dobb does not mention, in either *Theories of Value and Distribution since Adam Smith* or his *Welfare Economics and the Economics of Socialism*, Pareto's sociological study of welfare maximisation and redistribution, which goes outside the constraints of Pareto's criteria for economic maximisation (as discussed in Tarascio 1968 and McLure 1997), even though redistribution was a major issue in Dobb's analysis of welfare, socialism and ideology.

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