

Steve Fleetwood (2001) 'Causal Laws, Functional Relations and Tendencies' *Review of Political Economy*, Vol. 13, No. 2, 201-220.

**Abstract** This paper draws upon critical realism to argue that the widespread use of functional relations and laws in economics is misconceived. This misconception stems from the inappropriate use of a deductivist mode of theorising; an empirical realist ontology; and a notion of causality as mere regularity or constant conjunction, all of which are associated with functional relations and laws. Not only does critical realism identify the cause of the misconception, it sustains an alternative causal/explanatory mode of theorising; a stratified ontology; notion of causality as powers; and an alternative notion of law as tendency. Marx's ideas on the tendencies to employment and unemployment are used as an *example* of economic theory consistent with these alternatives.

### 1. Introduction

The introductory chapter to Lipsey's *Positive Economics* contains the following comment:

The idea that *one thing depends on another* is one of the basic notions behind all science...When mathematicians wish to say that one thing depends on another, they say that one is a *function* of the other. Thus the gravitational attraction is a function of the mass of the two bodies concerned and the distance between them;...and the quantity of a product demanded is a function of the price of the product (1983; 18, first emphasis added).

The tools Lipsey highlights in this introductory text, particularly functional relations, remain central to much economic theory. Lipsey then identifies two of the most basic functional relations used in economic theory:

- (1)  $q = f(p)$
- (2)  $C = f(Y)$

While it is usual to refer to (1) as the law of demand, it is not usual to refer to (2) as the 'law of consumption'. Yet given the idea that 'one thing depends on another' these expressions appear to be on par. In fact, economists have many ways of expressing the notion that 'one thing depends on another'. Consider, for example, relationships between: labour supply and wages; factor inputs and produced outputs; output growth and productivity growth; the general price level and the money supply; inflation and wages; profits and wages; labour embodied and value, and so on.

My central thesis is that the use of functional relations and laws in economics is fundamentally misconceived. Section 2 of the paper sets out the nature of functional relations and laws. In section 3, critical realism is deployed to reveal that the source of this fundamental misconception lies with the choice of an inappropriate mode of theorising, before going on to develop an alternative mode of theorising which is

exemplified in section 4 by reference to Marx's theory of unemployment. The concluding section considers a typical counter argument to the critical realist critique .

Note that my argument targets functional relations and laws wherever they are used, that is, when used by Austrian, Institutional, Sraffian, Neoclassical, Post-Keynesian and (even) Marxist economists, and hence applies with equal force not only to orthodox economists, but also to many heterodox economists.

### 2.1 Functional relations and laws

Dennis (1995) highlights various logical problems surrounding economists' use of mathematical formalism and suggests that mathematical economics encompasses four dimensions:

- (i) The *ontological* dimension where real socio-economic activity takes place.
- (ii) The *epistemological* dimension where socio-economic reality is expressed conceptually.

This epistemological dimension divides into two further dimensions:

- (iii) The dimension of *economic theory*, in which:
  - socio-economic reality is expressed conceptually, and in natural language;
  - the 'economic content' of an economic model resides.
- (iv) The dimension of *mathematical formalism* in which:
  - statements are expressed in the non-natural language of mathematical formulae;
  - the 'mathematical content' of an economic model resides .

Note that whereas in (iii) socio-economic reality is expressed conceptually, in (iv) no such reality is expressed. As will become clear in a moment, before mathematical formalism can express any kind of reality, some 'extra-mathematical content' (*ibid*, p.182) must be imputed. While it might *appear* that the activity taking place in the dimension of economic theorising is being expressed in the dimension of mathematical formalism, this appearance is misleading.

As Boylan and O'Gorman (1995, 3, p.74-78) observe, economic theorising requires the drawing upon of an extensive stock of knowledge. When confronted by, say, the prevalence of women in the secondary labour market, the economist should apply his or her extensive knowledge of the causes and consequences of discrimination to the activity of economic theorising. In this way, economic theorising builds economic content into a model.

To engage in mathematical activity, by contrast, is merely to perform a set of logical operations on abstract variables. Such activity is purely formal and does not involve

any content. Extra-mathematical content, such as knowledge of socio-economic phenomena can, of course, be imputed to the relevant mathematical expression.<sup>1</sup> Any imputation that does occur, does so in a process of *translation* where expressions about socio-economic reality are translated from natural language to mathematical formulae. Let us consider what is involved here via a discussion of the functional relation.

A functional relation is a statement that belongs to the dimension of mathematical formalism. It is a way of describing a specific kind of relation between entities that have only a quantitative dimension - i.e. variables. A function maps the magnitudes taken by one variable ( $x$ ) or set of variables ( $x_1...x_n$ ) onto the magnitudes taken by another variable ( $y$ ) or set of variables ( $y_1...y_n$ ). Consider the following functional relation:

$$(3) Q = f(L).$$

In mathematics this expression is purely formal and (quite legitimately) need have no content. In economics, however, formalism without content leads to irrelevance. An expression like (3) becomes economically relevant only when extra-mathematical (i.e. economic) content is imputed to the mathematical expression. This might be done, for example, by taking  $L$  to denote the variable for the input of labour and  $Q$  to denote the variable for the output so that (3) becomes a production function. The imputation of economic content translates the purely formal expression into an economic one. The production function is meant to express something like the following:

(4) 'If the firm increases its input of labour, *then* the firm will increase (or decrease) its output in some systematic and predictable way, *ceteris paribus*.'

This process of translation has, however, allowed a presumption about causality to be smuggled into the mathematical expression. Expression (4), unlike (3) is a conditional or 'if-then' statement: it claims something will be the case on condition that something else obtains first; it implies causality. If expressions like (3) are to be economically relevant they must also imply causality. Without causality (3) would be economically irrelevant because the whole point of a production function is that a change in the input of labour *causes* a change in the output. Thus we arrive at the following conclusion: when used in economics, a functional relation either implies causality or it is irrelevant.<sup>2</sup> Before this is dismissed as trivially true, it is worth noting, as Cartwright (1989, p.149) does, that what one takes for granted and treats as unproblematic, often becomes problematic when it forms part of a controversial discussion – as is the case below. Stating the obvious, and doing so with clarity, will pay dividends.

Now, while causality has been smuggled into a functional relation, it is not the act of smuggling I wish to criticise,<sup>3</sup> but the particular notion of causality involved. The next section draws upon critical realism to argue that this particular notion of causality is misconceived.

### 3.0 Critical realism

A mode of theorising lies rooted in a dense web of methodological (i.e. epistemological, ontological and philosophical) presuppositions. If this rooting is consistent and non-contradictory, then the mode of theorising is endowed with intellectual support, justification, and is rendered intelligible. I call such a mode of theorising *consistently rooted* in its methodological presuppositions – and will be exemplified in the following section. Other modes of theorisation, however, are *inconsistently rooted* in the sense that the rooting involves inconsistencies and contradictions. Such is the case where an attempt is made to retain the deductivist mode of theorising in tandem with an interpretation of Humean laws along the lines of tendencies (see section 5).

### 3.1 The dominant mode of theorising in economics: deductivism

Lawson (1998) argues<sup>4</sup> that the dominant mode of economic theorising is the deductivist. Deductivism appears to be a particular variant<sup>5</sup> of the deductive-nomological (D-N), or covering law, model of explanation whereby to 'explain' something is to deduce a statement about that something from a set of initial conditions, assumptions, axioms, and a set of event regularities or constant conjunction of events.

Now, the deductivist mode of theorising gets what intellectual support and justification it does, by being consistently rooted in: a positivist philosophy of science; an empirical realist ontology of atomistic events; the notion of causality as mere regularity or constant conjunction, and the notion of law as Humean. This ensemble combines as follows.

- Although positivism prioritizes epistemology, an implicit ontology is concealed consisting of the objects of sense experience. Ontology is confined to knowledge about what is experienced<sup>6</sup> and is, therefore, of the *events* of sense experience. Because these objects are confined to experience the ontology is *empirical*; and because these objects are thought to exist independently of one's identification of them, it is *realist*; The ontology is, therefore, *empirical realist*.
- What are experienced are unique, atomistic events. These events cannot be other than atomistic, since any connection or relation between them is impervious to experience – otherwise the nature of the connections would require prior explanation, thus undermining the explanatory power of sense data. The ontology is not only of events, it is also of *atomistic* events.
- If *particular* knowledge of reality is gained through experiencing atomistic events, then *general*, including scientific, knowledge must be of the constant patterns, if any, that these events reveal. Scientific knowledge is, therefore, reliant upon the existence and ubiquity of constant patterns, regularities, or constant conjunctions, of events.
- In Humean fashion, causality is understood as mere event regularity or constancy, and a causal law may be styled, generally, as 'whenever event x, then

event y'.<sup>7</sup> Humean law drives the inferential machinery of the deductivist mode of theorising.

This 'constant conjunctions view', consistently links ontology and epistemology. The ontological presupposition is that causality is mere event regularity or constancy; and the epistemological presupposition is that scientific knowledge is generated from this event regularity. That is, if the external world is characterised by event regularity, then identifying these regularities is a consistent way to generate knowledge. Humean laws express this constant conjunctions view.

Functional relations (when used by economists), also express this constant conjunctions view. When causality is smuggled into the functional relation the formal relation is translated into a causal relation of the kind 'whenever event x then event y.' Hence, functional relations are the *alter ego* of Humean laws.

Now, whilst the constant conjunction approach derives what intellectual support and justification it does from positivism, its employment in economics is often extended way beyond any empirical level that most positivists would wish to sanction. Simply put, the constant conjunctions view often appears in purely algebraic or 'toy' models (Pencavel 1991, p. 84) which are not derived from, nor are tested against, sense experience. Allow me to elaborate.

Broadly speaking, there are two approaches to 'doing' economic theory. The first approach, econometric modelling, is clearly rooted in sense data and hence empiricism. The economist constructs a model which hypothesises a relationship between certain variables (i.e. a constant conjunction of events), then confronts the model with data. The model is deemed 'adequate' if the hypothesised relationship is consistent with the data.

In the second approach, 'toy' modelling, the economist constructs a purely algebraic model and makes no attempt to confront it with data. These models are often acknowledged by their advocates to be unrealistic, and are legitimised in various ways. For example, proof of the existence of equilibrium, under simplified conditions (allegedly) gives economists a reason to believe that they are 'on the right track' (Hausman 1992, pp. 100-101).<sup>8</sup>

Now, 'toy' models appear not to be rooted in empiricism; appear not to involve the events of sense experience; and appear not to involve constant conjunctions of events. This has led some to argue that whilst these models are not immune from criticism, they are immune from the particular criticism offered by critical realists which turns on a critique of constant conjunctions - see below.<sup>9</sup> This argument is, I think, incorrect. In 'toy' models, scientific knowledge is generated by constant conjunctions of events, but because the latter are implicitly built into the model as an *a priori* premise, they do not manifest themselves explicitly as in the case of the empirical relationships of econometric models. Thus one might conclude (incorrectly) that scientific knowledge is being generated by something other than constant conjunctions of events.

To explain how constant conjunctions of events are implicitly built into a 'toy' model as an *a priori* premise, consider the following example. In their classic paper on efficiency wage theory Shapiro & Stiglitz (1990: 48) attempt to predict when a worker will choose to shirk. They argue that a worker will choose to shirk iff the expected lifetime utility of an employed non-shirker ( $V^N_e$ ) exceeds that of an employed shirker ( $V^S_e$ ). There are four reasons why constant conjunctions of events are implicitly built into this model.

First, another way of expressing this situation is to write whenever event  $x$  ( $V^N_e \geq V^S_e$ ), then event  $y$  (shirking). True, Shapiro & Stiglitz did not arrive at this conclusion via sense experience, but the clear implication is that, under certain conditions, the hypothesised constant conjunctions of events would be observed. When used in economics, mathematical expressions either imply causality or are irrelevant. And the notion of causality employed here is one of mere event regularity or constancy.

Second, the whole analysis takes place at the level of events. If one event is observed or hypothesised, one can only seek its cause in terms of another observed or hypothesised event. One cannot make reference to unobservable powers or capacities - see section 3.2 below.

Third, there is a consistency between the ontological and epistemological views this model presupposes. The implication is that the socio-economic world is that kind of place where, under certain conditions, (i.e. whenever  $V^N_e \geq V^S_e$ ) shirking behaviour will follow. If the socio-economic world is characterised by constant conjunctions of events then building a model that expresses constancy is a consistent (if arguably incorrect) way to generate knowledge of this world.

Finally, the centrality of event constancy can be seen by considering how vacuous a model would be if event constancy were *not* present in statements couched in terms of events, as in the following statement: 'iff  $V^N_e$  exceeds  $V^S_e$ , the worker will, *on some occasions* choose to shirk, and *other occasions* choose not to shirk'. If constant conjunctions of events are *not* implicitly built into 'toy' models as an *a priori* premise, then nothing can be deduced from the antecedents. The model cannot even be used to give economists a reason to believe that they are "on the right track".

While constant conjunctions of events are implicit in toy models, they appear in one, or a combination, of the following guises.

- a) The constant conjunctions can be *explicit* and take the form of what most economists would refer to as a law (e.g.) the law of labour demand. Here, 'whenever wages rise, demand for labour falls'.
- b) The constant conjunctions can be *implicit* and concealed in the *axioms* (e.g.) that the firm is a rational maximiser. Here, 'whenever the firm initiates an action, something is maximised'.

- c) The constant conjunctions can be implicit and concealed in the *assumptions* (e.g.) that workers respond to higher wages by raising productivity. Here, 'whenever wages rise above some norm, productivity rises'.
- d) The constant conjunctions can be implicit and concealed in the *technical devices* (e.g.) the production function. Here, 'whenever a factor input is increased, output increases by a certain number of units'.
- e) The constant conjunctions can be implicit and concealed in the rules of a rational choice model. Here, 'whenever in situation *w*, opt for option *x* or *y*'. Whilst a little more complicated this is still based upon constant conjunctions of events because the rational agent is pre-programmed to choose option *x* in a certain situation, and in this situation will *always* choose *x* (See Cartwright (1995, pp. 286-289).

Whilst the following two guises repeat the sentiment mentioned above, the points bear repetition and may benefit from a slightly different presentation.

f) The constant conjunctions can form part of a 'toy' model (e.g.)  $y = f(x)$ . Here the constant conjunctions of events that constitute this functional relation have been hypothesised and will not be tested against observed events. The implication, on pain of irrelevance, is that the constant conjunctions of events built into the model have a counterpart in the real world.

g) The constant conjunctions can form part of an econometric model (e.g.)  $y = a + bX + v$ . Here, the constant conjunctions of events that constitute this functional relation may have been spun out of the basic axioms, assumptions and theorems; may have been derived from the observation and recording of events; or may have been simply hypothesised. The difference between guises (f) and (g) is that in the latter, the alleged constancy will be tested against observed events.<sup>10</sup>

Now whilst constant conjunctions of events are clearly fundamental to deductivism, they are exceptionally rare phenomena. There appear to be very few spontaneously occurring systems wherein constant conjunctions of events occur in the natural world, and virtually none in the social world. That is not to deny the possibility that constant conjunctions may occur accidentally, or over some restricted spatio-temporal region, or be trivial. But virtually all of the constant conjunctions of interest to science (including economics) occur only in experimental situations. The point of experiment is to *close the system*<sup>11</sup> by creating a particular set of conditions that will isolate the one interesting mechanism. This mechanism is then allowed to operate unimpeded and the results, the constant conjunctions, recorded. For economists, constant conjunctions of events appear to be found only in the 'conceptual experiments' (Pencavel 1994, p.14) that constitute closed systems. A number of problematic and counterintuitive implications arise from this observation.

- a) Outside closed systems, where constant conjunctions of events are not usually found, one would have to conclude that there are no laws. This would be tantamount to saying that nothing governs the non-constant flux of events in open systems; science would, then, become a fruitless endeavor.
- b) It is often the case that conclusions derived from experimental situations (i.e. in closed systems) are successfully applied outside experimental situations (i.e. in open systems). Because of (a) above, this state of affairs would have no valid explanation.
- c) Deducing statements about the action of agents operating in a closed system, and transferring them to the action of agents in the open system, commits the fallacy called *ignoratio elenchi*. This entails assuming that one has demonstrated something to be true of X when the argument or evidence really applies to Y which is not the same as X in some respect (Gordon 1991, p. 108). What is 'not the same' is the existence and ubiquity of constant conjunctions of events.

While the deductive mode of theorising is wholly inappropriate for the analysis of open systems all is not lost.<sup>12</sup> Critical realism provides a viable alternative in the *causal/explanatory* mode of theorising. Illustrating this alternative means re-considering ontology.

### 3.2 *Ontology reconsidered*

Deductivism is fundamentally misconceived because it presupposes an ontology that is radically at odds with reality. Recognising this failure is the first step to taking corrective measures. As Figure (1) illustrates, deductivism's empirical realist ontology consists of two *fused* domains referred to as the empirical and the actual.

INSERT FIGURE 1 HERE

What *is*, is presumed co-existent with what is perceived - or what could, under certain conditions be perceived. For neoclassical economists for example, price *is* value, whereas for classical economists, price is the empirical manifestation of value. Causality as mere regularity or constancy means that if some event is perceived, one can only seek its cause in terms of another perceived event. There is nowhere else to seek a cause because any other domain in this ontological spectrum is ruled out.

Firmly rejecting constant conjunctions of events as most unlikely features of social reality and, thereby, abandoning this notion of causality as mere regularity the critical realist is free to seek the cause of an event elsewhere in the ontological spectrum. Attention turns away from the flux of events and towards the causal mechanisms that govern them. Rather than the ontology being restricted to the fused domains of the actual and empirical, the critical realist adds another domain, namely the (metaphoric) 'deep'. Figure (2) illustrates this stratified ontology.



INSERT FIGURE 2 HERE

### 3.3 *Switch from the deductive to the causal/explanatory mode of theorising*

Operating with a stratified ontology, the emphasis of investigation switches from the domains of the empirical and actual and the ensuing event patterns observed (or hypothesised) to the domain of the deep and the mechanisms that govern these events. Investigation switches from the consequences, that is, from the outcomes or results (in the form of events and their patterns) of some particular human action, to the conditions that make that action possible. Because of the openness of socio-economic systems, consequences cannot be induced, deduced or predicted. But the causal mechanisms that govern this action can be abducted or retroduced. Abduction or retroduction is a mode of inference where one starts from some phenomenon of interest, and postulates a mechanism that, if it existed, might causally account for that phenomenon.<sup>13</sup> Causal mechanisms are, thereby, uncovered, and their operation illuminated and explained. Illumination and explanation supplants prediction as the goals of economics and retroduction supplants deduction and induction as the mode of inference.

One can now understand the reason for calling the mode of reasoning 'causal/explanatory'. In this mode 'to explain a phenomena is to give information about its causal history' (Lipton 1993, p.33). The causal history of a phenomena is not couched in terms of the event(s) that happen to precede the phenomena, but in terms of the underlying causal mechanisms.

### 3.4 *Mechanisms, powers, structures, relations and tendencies*

This understanding of mechanisms can be elaborated upon. A mechanism, as a complex entity, possess an intrinsic structure (or combination of structures) which makes it the kind of thing it is and not another thing. The structure also endows the entity with powers, that is, dispositions, capacities and potentials do certain things, but not others. And powers may be possessed, exercised or actualised.

- ◆ A power is possessed by an entity in virtue of its intrinsic structure, and this power endures whether or not it is exercised or actualised and, therefore, endures irrespective of any causes it happens to generate. When a power (or any causal phenomena), endures in this sense, it can be said to act *transfactually*. An aeroplane, for example, has the power of flight even when it is sitting in a hangar.
- ◆ A power exercised is a power that has been triggered, and is generating an effect in an open system. Due to interference from the effects of other exercised powers, however, one can never know *a priori*, what the outcome of any particular power will be. The exercised power acts *transfactually*.
- ◆ A power actualised *is* an exercised power generating its effect in a closed system: the power is not deflected or counteracted by the effects of other exercised powers. The actualised power does not act *transfactually* but *factually* in the sense that the power generates its effect constantly.

With this understanding of powers, let us move on to the related issue of mechanisms. According to Lawson:

A *mechanism* is basically the way of acting or working of a structured thing... Mechanisms then exist as the causal powers of things. Structured things...possess causal powers which, when triggered or released, act as generative mechanisms to determine the actual phenomena of the world (1998, p. 21).

The key to understanding the critical realist conception of a mechanism (and eventually tendency) lies not with the notions of a power possessed or actualised, but with the notion of a power exercised. A possessed power is relatively uninteresting because it generates no effects. An actualised power is relatively uninteresting because it is only in special circumstances (in closed systems) that an exercised power is not interfered with and hence is actualised. A power exercised, however, is one that has been triggered, is generating effects, is acting transfactually, and, as will become clear in a moment, is generating tendencies. The term mechanism is a label one applies to the ensemble of structures, powers, and relations. Once a specific set of intrinsic structures combine to form an entity with a power, and this entity enters into appropriate relations with other entities, the power is triggered and becomes an exercised power, whereupon a tendency is generated.

When, therefore, one writes that *a mechanism has a tendency to x*, one is, in reality, referring to the ensemble of structures, powers and relations: it is, strictly speaking, the ensemble that has a tendency to x. Once understood, however, there is no harm in shortening the phrase by omitting reference to structures, powers and relations. In the same vein, when one writes that *a tendency is the typical way of acting of a mechanism*, the tendency is, strictly speaking, the typical way of acting of the ensemble of structures, powers and relations. Again, once understood, there is no harm in shortening the phrase.

Now, to write that a mechanism has a tendency to x, does not mean that it will x. In an open system, mechanisms do not exist in isolation from one other, rather there are a multiplicity of mechanisms, each with their own tendencies and these tendencies converge in some space-time location. The actual outcome of this confluence of tendencies is impossible to predict *a priori*.

A tendency then, metaphorically speaking, is akin to a force: it drives, propels, pushes, thrusts, asserts pressure and so on. A tendency relates not to any outcome or result of some acting force, such as a regularity or pattern in the resulting flux of events. Rather, a tendency refers to the force itself.<sup>14</sup> The relation between mechanism and tendency might be characterised as follows.

- ◆ The mechanism does not always bring about certain effects, but it *always* tends to. Hence it acts transfactually.

- ◆ Mechanisms, continue to causally govern the flux of events, irrespective of the conditions under which they are said to operate. One does not say of a transfactually acting mechanism that it would bring about certain events *if* certain conditions prevail, or *ceteris paribus*. Rather, the mechanism tends to bring about certain events, period.
- ◆ Mechanisms continue to causally govern the flux of events irrespective of any events that ensue. A transfactually acting mechanism does not depend for its action upon the patterns of events that it governs: it continues to govern, whether the ensuing events are constantly or non-constantly conjoined.

In sum, then, critical realism is not only critique: it offers an alternative ontology, conception of causality, conception of law as tendency and mode of theorising. There are not many actual examples of this alternative approach, although the work of Marx is a case in point, which I use to exemplify the point.<sup>15</sup>

#### *4. Marx, Tendencies, and Unemployment*

It is well known that Marx conceives of laws in terms of tendencies. He suggests, for example, that the tendency for profit rates to equalise be 'viewed as a tendency like all other economic laws (1984, p. 175). Unfortunately, as the following comment from MacBride illustrates, neither Marx, nor subsequent Marxists have elaborated an unambiguous conception of 'tendency'. 'The failure to say very much about the meaning of the term 'law' as he uses it [i.e. as tendency, SF] is one of the most gaping lacunae in Marx's all too brief discussions of methodology' (1977, p. 59, see also pp.123-6).

The following section re-visits Marx's notion of tendency, establishing it on a more secure methodological footing by augmenting it with critical realist ideas. It takes Marx's views on employment and unemployment and renders them more systematic, explicit, and unambiguous by applying the categories and language of critical realism.<sup>16</sup> After re-describing the general categories of structures, powers and relations (section 3 above) to suit this specific context, two new categories are added, namely *positions* and *practices*. This ensemble will be shown to constitute a mechanism and this mechanism will be shown to be responsible for generating the *tendencies* that influence the actual levels of employment and unemployment.

#### *Structures*

The term 'structures' has a dual, and therefore slightly complex meaning in social science deriving from the fact that human beings not only inhabit a world of extrinsic social structures which they draw upon and reproduce, but are themselves constituted by intrinsic physiological and cognitive structures. Both kinds of structure are necessary for human society to exist.

The term 'intrinsic structures' includes the physiological and cognitive structures possessed by human beings that make them the kind of social animal they are. Once brought into existence and suitably combined, they activate the powers human labourers have for physical effort, and conscious, imaginative, and creative thought.

The term 'social structures' includes the rules that workers draw upon in order to carry out the practices associated with the position of worker. These rules involve rules of custom and practice, tacit rules agreed upon by work colleagues, official rules sanctioned by management, legal rules that prevent stealing from the employer and so on.

#### *Powers*

The term 'powers' includes what Marx (1973, p.354) calls the animating and preserving forces or powers of human labour. As an 'animating force' it creates new value; as a 'preserving force' it preserves the value already embodied in physical capital. Humans possess this power in virtue of the physiological and cognitive structures.

#### *Relations*

The term 'relations' includes the dense web of relations relevant to the production/valorisation process. For simplicity, I concentrate only upon one specific relation, that between worker and capitalist. It is important to note here that the relations are not named individuals but positions. Named individuals can be replaced, but the position of capitalist and worker remain. These positions carry with them certain practices. The position of worker, for example, carries with it practices in the form of obligations, duties and rights such as not being late for, or absent from, work without good cause; performing a set of agreed tasks; receiving a wage and so on.

#### *Mechanisms*

Upon entering into a relation with the capitalist, the worker adopts a position and a set of practices, each of which are carried out by drawing upon the social structures of the workplace. These practices are carried out in what is referred to as the production/valorisation process. At this space-time location, the (activated) powers possessed by labour are triggered and become actualised powers. And because of the special relation between worker and capitalist, surplus value accrues to the latter. This process, a process involving intrinsic structures, powers, relations, social structures, positions and practices, constitutes the mechanism that creates surplus value.

#### *Tendencies*

The mechanism that creates surplus value consists, in fact, of a multiplicity of sub-mechanisms, although two sub-mechanisms are of interest here. One is responsible for raising the *rate* of surplus value, the other for raising the *mass* of surplus value.<sup>17</sup> These two sub-mechanisms generate two very different tendencies.

- (i) The drive to increase the *rate* of surplus value, sets in motion sub-mechanisms associated with the introduction of machinery embodying new technology. These sub-mechanisms, in turn, generate a tendency to increase technological unemployment.
- (ii) The drive to increase the *mass* of surplus value, sets in motion sub-mechanisms involving the multiplication of job positions. These sub-

mechanisms, in turn, generate a tendency to increase accumulation employment.

These sub-mechanisms act transfactually, generating two opposing tendencies: a tendency to increase (technological) *unemployment*, and a tendency to increase (accumulation) *employment*. Note, however, the following (re-stated from section 3.4):

- ◆ The sub-mechanisms that tend to increase accumulation employment, for instance, do not always bring about increased employment but they always tend to.
- ◆ The sub-mechanisms that tend to increase technological unemployment, for instance, do not operate counterfactually. That is, they do not tend to do so only if certain closure conditions prevail, or *ceteris paribus*. Rather, the mechanisms tend to increase technological unemployment, period.
- ◆ The sub-mechanisms that tend to increase technological unemployment, for instance, do not depend upon the resulting event patterns. These mechanisms always acts tendentially whether or not the action of any particular mechanism is constantly conjoined with a particular level of unemployment.

The actual level of unemployment will, of course, depend upon which of these opposing tendencies<sup>18</sup> is the more forceful. And this cannot be known *a priori*.

##### *5. Conclusion: Misinterpretations of Humean Law as Tendency*

In conclusion, I want to consider a typical response from mainstream economists to the kind of critique of deductivism and Humean laws (and their *alter ego* functional relations) elaborated above. The response goes like this.<sup>19</sup> 'While economists do use something like the deductive mode of theorising, and with it Humean laws, most competent economists do not claim that such laws in the social world are as stable or strong as those (allegedly) existing in the natural world. This does not entail the abandonment of deductivism, or Humean law in social science but does entail the use of an alternative interpretation of Humean law, styled perhaps as: 'whenever event x, then event y *tends* to follow'. For example, whenever wage rates rise, employment does not always fall, but it often does, that is, it *tends* to fall. If the deductivist mode of theorising can be used in tandem with an interpretation of Humean laws along the lines of tendencies, then critical realists are suddenly without an opponent.'

While responses like this appear plausible, I will argue they are fundamentally misconceived. My argument begins with Lawson's (1997)<sup>20</sup> identification of several commonly held attempts to interpret Humean laws along the lines of tendencies – henceforth 'Humean law/tendency'.

1. A Humean law/tendency can be interpreted as a trend such as: wages tend to rise over time or profits tend to fall over time.<sup>21</sup> One might style this as 'Whenever event x (passage of time), then event y'.

2. A Humean law/tendency can be interpreted as a high relative frequency of a given sub-set of a class of possible events, such as: output growth tends to induce productivity growth; or as aggregate demand increases the level of output and employment tends to increase.<sup>22</sup> One might style this as: 'whenever event x, then with some probability, event y'; or, as suggested above: 'whenever event x, then event y *tends* to follow'.
3. A Humean law/tendency can be interpreted as a counterfactual claim about what would come about under certain closure conditions such as: if wages rise above a certain level, efficiency will increase *ceteris paribus*.<sup>23</sup> One might style this as 'Whenever event x, then event y under conditions z'.
4. A Humean law/tendency can be interpreted as a constant conjunction of events that holds with some ill-defined regularity: a kind of loosely operating Humean law.<sup>24</sup> One might style this as 'Whenever event x, then most of the time event y'.

Note immediately these four mainstream attempts to interpret Humean law as tendency all identify a tendency with the *outcome* or *result* of some acting force such as a regularity or pattern in the resulting flux of events; they do not identify a tendency with the *force itself* - which is how critical realists conceive of a tendency.

Now, recall section 3.0 and the suggestion that a mode of theorising is consistently (or inconsistently) rooted in a dense web of methodological presuppositions which endow (or fail to endow it) it with intellectual support, justification, and render it intelligible. The following flow chart (Figure 3) might illuminate the notion of consistent rooting in both deductive and causal/explanatory modes of reasoning.

INSERT FIGURE 3 HERE

Should any attempt be made to retain the deductivist mode of theorising in tandem with an interpretation of Humean laws along the lines of tendencies, the deductivist mode would end up being inconsistently rooted in the web of methodological presuppositions associated with the causal/explanatory mode. I will briefly state the arguments and then elaborate upon them in more depth.

The deductive mode of theorising is consistent with the use of Humean law (or its *alter ego*, functional relations) but inconsistent with the use of tendency. Humean law is consistent with the notion of causality as mere event regularity or constancy but inconsistent with the notion of causality as power. Causality as mere event regularity is consistent with an ontology confined to atomistic events of sense experience but inconsistent with a stratified ontology of structures, mechanisms, relations and powers.

First, the deductive mode of theorising is consistent with the use of Humean law. Deductivism attempts to 'explain' something by deducing a statement about that something from a set of initial conditions, assumptions, axioms and, of crucial

importance here, event regularities or constancy. Humean law supplies the requisite event regularities or constancy that drives the inferential machinery of the deductivist mode of theorising. The deductive mode of theorising is, however, inconsistent with the use of law as tendency, essentially, because tendencies and event regularities are metaphysically different phenomena: event regularity refers to the *outcome* or *result* of some acting force whereas a tendency refers to the *force itself*. Moreover, as a force, a tendency is transfactual. It can be acting yet generate no events at all, or it can be acting yet generate no event regularities. Yet without event regularity (deterministic or stochastic, see note 9) it cannot be used to drive the inferential machinery of the deductivist mode of theorising.

Second, Humean law is consistent with the notion of causality as mere event regularity or constancy, and an ontology confined to atomistic events of sense experience, but inconsistent with the notion of causality as power and a stratified ontology. According to Hume:

When I cast my eye on the *known qualities* of objects, I immediately discover that the relation of cause and effect depends not in the least on *them*. When I consider their *relations*, I can find none but those of contiguity and succession (1978, p.77).

We have no other notion of cause and effect, but that of certain objects, which have been *always conjoin'd* together...We cannot penetrate into the reason for the conjunction (*ibid*, p.93)

The distinction, which we often make betwixt *power* and the *exercise* of it, is equally without foundation (*ibid*, p.171).

Before one objects that things have moved on since Hume, listen to a contemporary mainstream economist:

I am a Humean in that I believe we cannot perceive necessary connections in reality. All we can do is set up a theoretical model in which we define the word 'causality' precisely as economists do with the  $y=f(x)$ . What they mean by that in their theory is that if we change  $x$  [then]  $y$  will change. And the way  $y$  will change is mapped by  $f$ , so we have a causal theory (Leamer, in Hendry *et al* 1990, p 187).

Once causality is based upon, and exhausted by, constant conjunctions of events the consistent (as opposed to the inconsistent) deductivist really has no option but to reject the notion of powers. According to Meikle, for the deductivist:

There is no distinction to be drawn between a capacity and its exercise...To say that something can do something - that is, that it has a capacity to do it - is just to say that it does do it (1995, p. 114).

If an entity generates some event in sense experience then the entity can be treated as causal: if it does not, it cannot. The empirical realist's preoccupation with sense experience, denies any 'space', as it were, between a power and the events it causes – or in the case of 'toy' models, the events it would cause under certain conditions. And yet it is only in virtue of this 'space' that the notion of power, and hence tendency, is intelligible at all. Recall from section 3.4 that a power exercised is a power generating an effect in an open system. There is a 'space' between the power and its effects because the effects of the power are being deflected or counteracted by other exercised powers operating at the level of the 'deep'. This 'space' renders the transfactual nature of a tendency intelligible. A tendency, then, is consistently rooted in a notion of causality as powers and a stratified ontology. A power actualised, by contrast, is an exercised power generating its effect in a closed system. There is no 'space' between the power and its effects because the power is not deflected or counteracted. Without this 'space' the interpreted Humean law/tendency is not a transfactually acting force, but a regular, or at any rate, semi-regular outcome. Any apparent 'depth' to the ontology is superfluous because in a closed system, a power is reduced to an actuality and the 'deep' is reduced to the actual and empirical (cf. Lawson 1999, pp.223-235). Whilst the lack of 'space' renders the transfactual nature of tendency unintelligible, the very regularity or constancy that this lack of 'space' creates, by contrast, renders the Humean conception of law perfectly intelligible.

Finally, causality as mere event regularity, is consistent with an ontology confined to atomistic events of experience, but inconsistent with a stratified ontology including powers. If one's ontology is confined to the atomistic events of sense experience, then causality cannot be conceived of in terms of anything other than regularity between these events: one must seek the cause of event y in terms of some prior event like x. If one's ontology includes powers, then causality cannot be conceived of as event regularity because these powers give rise to transfactually acting tendencies which do not, typically, manifest themselves as event regularities. If one has an ontology of powers, not only is causality as regularity inconsistent with it, it is also superfluous.

In short, any attempt to retain the deductivist mode of theorising in tandem with an interpretation of Humean laws along the lines of tendencies, would result in this mode being inconsistently rooted and hence misconceived.<sup>25</sup> I will end with an example of the kind of incoherence that can stem from this attempt.

Layard *et al* (1992, p.13) write: 'Wages [ $w$ ] are set as a mark-up on expected prices [ $p^e$ ], with the mark-up *tending to* rise as...unemployment [ $u$ ] falls' (emphasis added). Hence:

$$(5) \quad w - p^e = \gamma_0 - \gamma_1 u$$

Now, attempting to combine the sentiment about tendencies in the quotation with the mathematics of equation (5), would mean writing something like:

$$(5') \quad w - p^e \text{ tends to} = \gamma_0 - \gamma_1 u$$

which is as incoherent as writing something like:

$$(6) \quad 2 + 2 \text{ tends to} = 4^{26}$$



The choice, then, is simple. One can abandon the deductivist mode of theorisation in favour of its causal explanatory counterpart, and retain the notions of tendency, power and the stratified ontology. Or one can retain the deductivist mode theorisation and abandon the notions of tendency, power and the stratified ontology. One cannot, on pain of inconsistency however, retain the deductivist mode of theorisation while attempting to 'pick and mix' between: law as Humean law (and its *alter ego*, the functional relation) and law as tendency; causality as regularity and causality as power; and atomistic ontology and stratified ontology.

## Endnotes

<sup>1</sup> Many mainstream economists start not from social reality, but from formal techniques. The resulting laws and theorems are not, therefore, social but technical, or even natural.

<sup>2</sup> It is possible to counter-argue that not only is correlation relevant in economics, it can also be expressed as a functional relation, in which case we have a functional relation that does not imply causality and is relevant. My response is that although correlation is used extensively in economics it is irrelevant unless causality is imputed to it.

3. Two problems that do arise are: (i) Causality is smuggled into a functional relation in the process of translation, when a functional relation, being purely formal, implies no causality whatsoever. (ii) 'Functionality is not conditionality' Dennis (1995, p.187). Functional relations are statements that map one set of variables onto another set of variables, they are not statements that map one set of activities (employing  $y$  units of labour) onto another set of activities (producing  $x$  units of output). Given all the smuggling that appears to accompany the translation from natural language to mathematical formulae, the view commonly held by many economists, that mathematics is 'just another language' is cast into doubt.

<sup>4</sup> In Fleetwood (1999) I add weight to Lawson's claim by showing that within mainstream economics of trade unions the deductivist method is dominant.

5. The difference between deductivism and the DN or covering law model is that in the former, the constant conjunctions do the work of, yet do not always manifest themselves as, a covering law. I will elaborate upon this below. Furthermore, whilst the early empiricists, unlike the later logical empiricists, who proposed the D-N model, were unconcerned with explanation, the thread that links both sets of thinkers, is their commitment to causality as regularity and hence to closed systems – although this

term is contemporary. I wish to thank an anonymous referee for reminding me of the different versions of 'empiricism'.

<sup>6</sup> Notice the transposition of ontology into epistemology, a move Bhaskar (1978, p. 36) refers to as the "epistemic fallacy". Realists do not argue that positivists are committed to the claim that events in sense experience are all that exist. Realists do argue that positivists transpose questions of ontology into questions of epistemology so that in effect, they are committed to the claim that all that exists vis-à-vis scientific enquiry are events in sense experience – i.e. they cannot countenance unobservable entities such as powers and capacities. I wish to thank the anonymous referee for drawing my attention to this point.

7. For Hume's work on causality see Hume (1888, 1978, pp.73-94; 155-172;) and for a critical discussion see Bhaskar (1978, chapters 1,2 & appendix); Meikle (1985, especially chapters 1 and 7); and Cartwright (1995).

<sup>8</sup> While these two approaches have differences (e.g. some confront their models with data and others do not) and similarities (e.g. econometricians often base their model specification on a 'toy' model) it is the underlying similarity vis-à-vis their acceptance of event regularity or constancy that is under scrutiny here.

<sup>9</sup> Parsons (1996, p.421) and Hands (1999, pp.174-178) make arguments similar to this and Lawson (1999) replies.

<sup>10</sup> Hausman (1992, p.81) appears to recognise these different guises, noting that economists 'prefer to think of these 'laws' as behaviour postulates'. Even the 'pure theorist' Hahn writes: 'I do not wish to deny that there are empirical regularities of economic behaviour awaiting discovery. But I claim that these will be, as it were, much deeper down...and much closer to the form in which axioms are postulated'

(Hahn, 1984 p. 332). Hahn's idea that regularities are 'much deeper down' resonates with my idea that constant conjunctions of events are implicitly built into toy models.

11. In a closed system, events are constantly conjoined in the sense that for every event  $y$ , there exists a set of events  $x_1, x_2, \dots, x_n$ , such that  $y$  and  $x_1, x_2, \dots, x_n$  are regularly conjoined. In its econometric guise a stochastic error term added and the deterministically closed system is transposed to a stochastically closed system. Here  $y$  and  $x_1, x_2, \dots, x_n$  are regularly conjoined under some well behaved probabilistic function. This specification presupposes the existence of a stable relationship between a set of conditions  $x_1, x_2, \dots, x_n$  and the average or expected value of  $y$ . If, however, the economic phenomena (structures, mechanisms and powers) that causally govern the flux of events evolve, then the presupposed relationship might become unstable and the model specification would no longer reflect the previous relationship between the variables. The stochastic event regularity would no longer hold. (cf. Lawson 1998, chapter 7). If, for example, following a change in trade union behavior that generates upward pressure on wage rates, firms respond not by laying off workers, but by introducing more flexible working practices, then any stable relationship that (allegedly) held previously between wages and unemployment may become unstable.

<sup>12</sup>Although the argument has been developed from the practice of natural science, it is applicable to social science in general, and mainstream economics in particular, for two reasons. First, mainstream economists readily admit to using (what they assume to be) the method of natural science. Second, and more importantly, if human agency is real, then (a) human agents could always have acted otherwise, and (b) human action must make a difference to the social world. If, minimally, (a) and (b) are accepted, the social world cannot be a closed system and any attempt to model it 'as if' it was leads to the kind of problematic and counterintuitive implications just noted.

13. Abduction or retroduction consists 'in the movement, on the basis of analogy and metaphor amongst other things, from a conception of some phenomenon of interest to

a conception of some totally different type of thing, mechanism, structure or condition that, at least in part, is responsible for the given phenomenon. If deduction is illustrated by the move from the *general* claim that 'all ravens are black' to the *particular* inference that the next one seen will be black, and induction by the move from the *particular* observation of numerous black ravens to the *general* claim that 'all ravens are black', retroductive or abductive reasoning is indicated by a move from the observation of numerous black ravens to a theory of a mechanism intrinsic...to ravens which disposes them to be black' (Lawson 1998, p. 24).

<sup>14</sup> Readers harbouring the suspicion that most competent economists would use the term 'tendency' in the way critical realists advocate, and that I am attacking straw man, are advised to reserve judgement until section 5.

15. Other examples would be Hayek (*cf.* Hayek 1960, 1983; Fleetwood 1995). It would appear that much of the work on Segmented Labour Markets is also consistent with critical realism (*cf.* Peck 1996: chapter 3 and Rubery and Wilkinson 1994, especially Rubery 1994).

<sup>16</sup> This approach is not welcomed by all. Some find critical realism and Marxism at odds (Magill, 1994; Roberts, 1999); others find the notion of tendency versus event regularity misleading (Ruben 1979 especially p. 207).

17. For an elaboration of this, see Rosdolsky (1977: 248-9).

18. The actual level of unemployment will, of course, depend upon many more tendencies, but these belong with a different level of analytical abstraction. The tendencies I elaborate upon here are merely the most essential.

<sup>19</sup> It is difficult to prove the existence of this response via textual exegesis because most economists never comment upon what they mean by laws and/or tendencies.

My reasons for crafting this response are three-fold. First, I have often heard it at conferences and workshops. Second, it is often implied in mainstream models and I offer a few examples where the term 'tendency' is used but the deductivist mode of theorising is retained. Thirdly, one referee of this paper made comments similar to it.

<sup>20</sup> Hausman (1992, section 8.1 and 1995) also provides a useful discussion of tendencies.

<sup>21</sup> After citing statistics (table 2.3) showing the concentration of capital over the course of approximately 70 years, Green & Sutcliffe note: 'Most studies...have shown a marked tendency for increasing concentration' (1987, p. 29).

<sup>22</sup> Discussing the size of the effect that unemployment on wage bargaining, Layard *et al* make use of the function  $\varphi = \varphi(u, z_s)$  which 'captures the probability that an individual losing his job is unable to find work in a given period. The  $z_s$  variables *tend* to reduce this probability, making it easier to find work at given levels of unemployment' (p. 992; p. 200, emphasis added. See also p.203 equation (24).

<sup>23</sup> For example, 'firms with a large share of the product market *tend* to be more profitable. Other things being equal, larger firms are more likely to have a higher market share and, hence, tend to be more profitable' (Layard *et al* 1992, p.191. Emphasis added).

<sup>24</sup> For example, Pencavel (1994, p. 46) writes: 'Reductions of hours of work have *tended* to be pursued by unions in firms and industries experiencing contractions in employment'. According to MacBride, for Marx, 'laws [i.e. tendencies] are, presumably, nothing but high level generalizations concerning a wide range of phenomena' (1977, p.59, see also pp.123-126).

<sup>25</sup> An example of just how difficult it is to get a clear understanding of tendency is Piet-Hein van Eeghen's excellent (1996) paper. In places he interprets tendencies in an empirical realist fashion, writing variously about 'a kind of regularity'; as 'expressing the predominant response to a certain stimulus'; a 'predominant outcome'; 'formulated as patterns'; and 'a distinctive kind of causal regularity. Yet in other places he rejects laws 'defined as causal regularities' and interprets tendencies in a critical realist manner, writing variously about 'tendency analysis focuses its attention on a certain kind of behaviour, behind which a certain motive can be said to apply; 'when one mechanism predominates, some rough regularity will be observable'; 'tendencies, by virtue of their pattern-nature, must be explained in terms of social *institutions*'; and 'institutions and actions can be causally related to each other by virtue of their natures'. To be fair, I suspect van Eegham is trying to connect rough and ready patterns of events to the underlying causal mechanisms that govern them. But his slippage between the two interpretations shows just how difficult it is to shake off residues of the constant conjunctions view.

<sup>26</sup> Adding a stochastic error term to the right hand side of (5) transforming it into a stochastically closed system, does not avoid this critique - see note 9.

## References

- Bhaskar R. (1978) *A Realist Theory of Science*, (Brighton, Harvester Wheatsheaf).
- Boylan T. O'Gorman P. (1995) *Beyond Rhetoric and Realism in Economics*, (London, Routledge).
- Cartwright N. (1995) 'Ceteris Paribus Laws and Socio Economic Machines', *The Monist*, Vol. 78, No. 3 pp. 276-294.
- Cartwright N. (1989) *Nature's Capacities and their Measurement* (Oxford, Clarendon Press).
- Dennis K. (1995) 'A Logical Critique of Mathematical Formalism in Economics', *Journal of Economic Methodology*, Vol. 2, No. 2, pp.181-199
- Eegham van P. (1996) 'Towards a Methodology of Tendencies', *Journal of Economic Methodology* 3:2, pp.261-284.
- Fleetwood S. (1995) *Hayek's Political Economy: the socio-economics of Order*, (London, Routledge).
- (1999) 'The Inadequacy of Mainstream Theories of Trade Union Behaviour', *LABOUR* 10(2), pp.445-480.
- Green F. Sutcliffe B. (1987) *The Profit System: The Economics Of Capitalism*, (Harmondsworth Penguin).
- Gordon S. (1991) *The History and Philosophy of Social Science*, (London, Routledge).
- Hahn F. (1984) *Equilibrium and Macroeconomics*, (Oxford, Basil Blackwell).
- Hands W. (1997) 'Empirical Realism as Meta-Method: Tony Lawson on Neoclassical Economics' in Fleetwood S. (ed) *Critical Realism in Economics: Development and Debate*, (London, Routledge).
- Hausman D. (1992) *The Inexact and Separate Science of Economics*, (Cambridge, Cambridge University Press).
- Hausman D. (1995) 'The Composition of Economic Causes' *The Monist*, Vol. 78, No. 3, pp.295-307.
- Hayek F. (1960) *The Constitution of Liberty*, (London, Routledge).
- (1983) *Rules and Order, in Law Legislation and Liberty*, (London, Routledge and Keegan Paul).



Hendry *et al* (1990) 'The ET Dialogue; A Conversation on Econometric Methodology', *Econometric Theory* 6, pp.171-261.

Hume D. (1888; 1978) *A Treatise of Human Nature*, (Oxford, Clarendon Press).

Lawson T. (1997) 'Tendencies', Davis J. Hands W. Maki U. *Handbook of Methodology*, (Aldershot, Elgar).

----(1998) *Economics and Reality*, (London, Routledge).

----(1999) 'Critical Issues in Economics as Realist Social Theory', in Fleetwood S. (ed) *Critical Realism in Economics: Development and Debate*, (London, Routledge).

Layard R. *et al* (1992) *Unemployment: Macroeconomic Performance and the Labour Market*, (Oxford, Oxford University Press).

Lipsey R. (1981) *An Introduction to Positive Economics*, ( London, Wiedenfeld and Nicholson).

Lipton P. (1993) *Inference To The Best Explanation*, (London, Routledge).

McBride W. (1997) *The Philosophy of Marx*, (London, Hutchinson).

Marx K. (1973) *Grundrisse*, (Harmondsworth, Penguin).

Meikle S. (1985) *Essentialism in the Thought of Karl Marx*, (Gloucester, Duckworth).

---- (1995) *Aristotle's Economic Thought*, (Oxford, Clarendon Press).

Parsons S. (1996) 'Post Keynesianism, Realism and Keynes' General Theory,' *Journal of Post Keynesian Economics* vol. 18, No.3, pp. 418-411).

Peck J. (1996) *Work Place: The Social Regulation Of Labour Markets*, (New York, The Guildford Press).

Pencavel J. (1991) 'Prospects for Economics' *Economic Journal* 101, pp.81-87.

---- (1994) *Labour Markets Under Trade Unionism*, (Oxford, Basil Blackwell).

Roberts J. (1999) 'Marxism and Critical Realism', *Capital & Class* No. 68, pp.21-49.

Rosdolsky R. (1977) *The Making of Marx's Capital*, Vol 1, (London, Pluto).

Roy S. (1991) *Philosophy of Economics*, (London, Routledge).

Ruben D-H. (1979) *Marxism and Materialism*, (Sussex, Harvester).

Rubery J. (1994) 'Internal and External Labour Markets: Towards an Integrated Analysis', in Rubery J. Wilkinson F. *Op cit*.

Rubery J. Wilkinson F. (1994) *Employer Strategy and the Labour Market*, (Oxford, Oxford University Press).

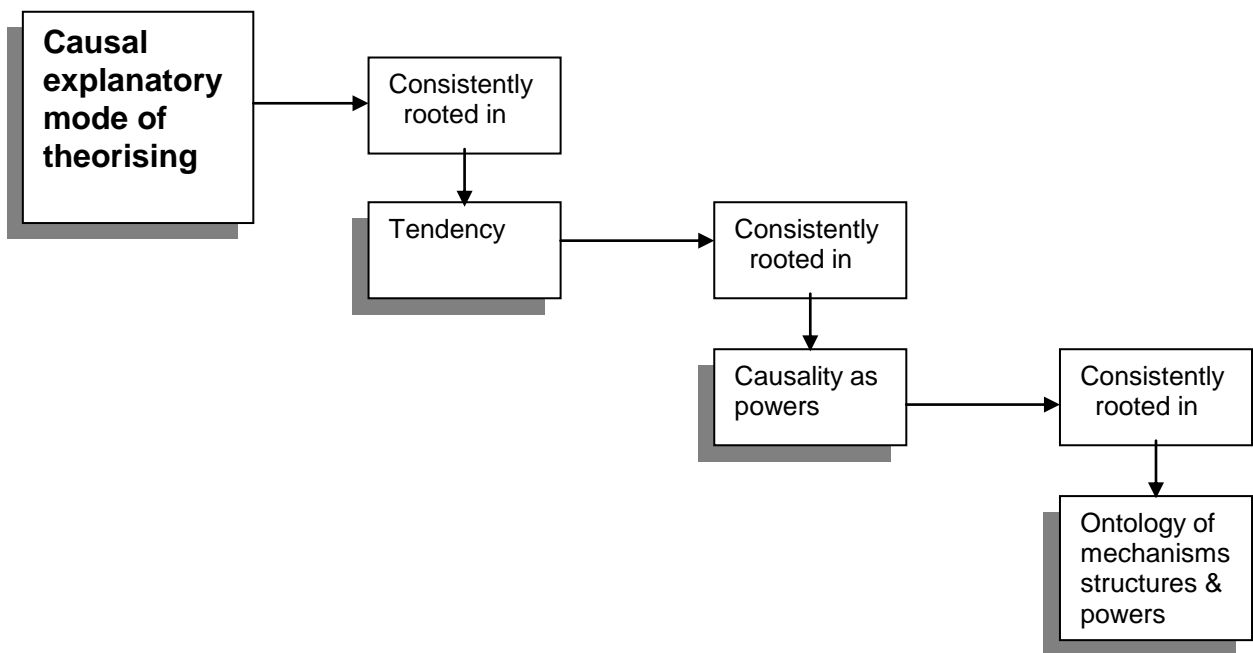
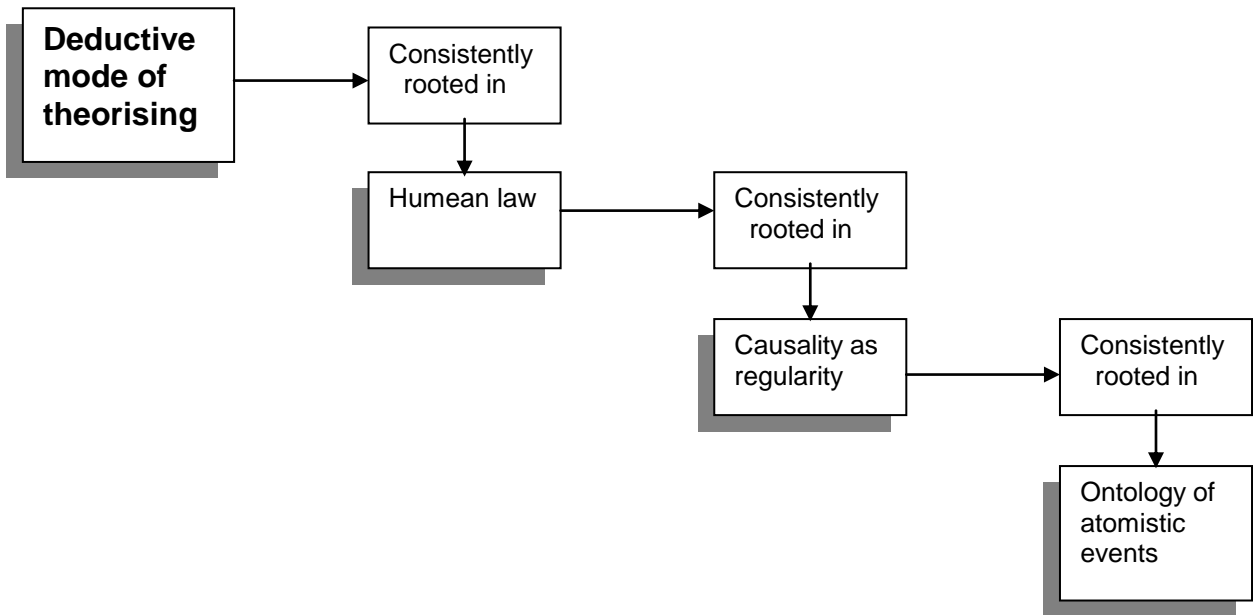
Sahapiro C. Stiglitz J. (1990) 'Equilibrium Unemployment as a Worker Discipline Device', in Akerlof A. Yellen J, *Efficiency Wage Models of the Labour Market*, (Cambridge, Cambridge University Press).

<b>Domain</b>	<b>Entity</b>
Empirical	Experiences, perceptions
Actual	Events and actions

*(Figure 1. An empirical realist, 'flat', ontology)*

<b>Domain</b>	<b>Entity</b>
Empirical	Experiences, perceptions
Actual	Events and actions
'Deep'	Structures, mechanisms, rules, powers, relations

*(Figure 2. A stratified ontology)*



(Figure 3)

## Causal Laws, Functional Relations and Tendencies

### **Steve Fleetwood**

Steve Fleetwood teaches Employment Relations in the Management School, Lancaster University. He is author of *Hayek's Political Economy: the socio-economics of order*, Routledge, 1995 and editor of *Critical Realism in Economics: development and debate*, Routledge 1999.

Department of Behaviour in Organisations  
Management School  
Lancaster University  
Lancaster LA1 4YX  
tel: 01524 594040  
fax: 01524 594060  
e-mail [s.fleetwood@lancaster.ac.uk](mailto:s.fleetwood@lancaster.ac.uk)