



# On Sraffa's Challenge to Causality in Economics

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## I FOREWORD

The opening of Sraffa's Archives<sup>1</sup> has given us the opportunity to unveil what lies behind his published works, offering clues to interpret them. Among the contributions found in Sraffa's unpublished papers are the arguments he developed over the years on the role of causality in economics.

In the last few years several scholars have tackled the issue which, however, remains to be untangled and fully understood. This more recent

<sup>1</sup>References to the Sraffa Papers, which are kept at Trinity College Library, Cambridge, and mostly available online, will be given hereafter following the catalogue classification. In a few cases, we completed Sraffa's abbreviations in order to make the text more readable.

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literature converges on the interpretation—suggested by Sraffa’s himself (see below)—that his entire research project is a struggle to escape from “mechanical”, i.e. causal theory, and to develop a “geometrical” representation of the economic system. While the geometrical theory refers to an instant in time and concerns logical relations, the mechanical theory refers to processes that happen in real time, in which causality is involved. The question remains open, however, as to the reasons *why* Sraffa embarked on such a project; they certainly are complex and possibly related to his beliefs that the requirements for causal explanations—like those met with in the natural sciences—are too stringent to be applicable in economics or because economic theory has often invoked causes that are of a metaphysical (and therefore ideological) nature. Some have stressed the similarity with Wittgenstein’s criticism of causality (Davis 2012; Arena 2015), others the influence of his early interest in quantum mechanics (Sinha 2016), physics, chemistry and philosophy of science (Kurz and Salvadori 2005, 2018), and yet others the influence of Gramsci (Ginzburg 2013; Davis 2021). Possibly many factors concur to fill out the background picture, which still needs to be fully discovered. In this paper, we review this recent literature to raise a few points that may lead to further discussion.

## 2 CHANGE AND DIFFERENCE

In the Preface to *Production of Commodities by Means of Commodities*, the reader is warned that the book: “is concerned exclusively with such properties of an economic system as do not depend on changes in the scale of production or in the proportions of ‘factors’”. In this respect the work is presented as an alternative to the “marginal approach” which “requires *attention to be focused on change*, for without change either in the scale of an industry or in the ‘proportions of the factors of productions’ there can be neither marginal product nor marginal cost” (Sraffa 1960: v, emphasis added).

In fact, in neoclassical economics change in the quantities produced (or consumed) is necessary to find the marginal cost (or utility) upon which supply-and-demand curves are built.

Krishna Bharadwaj was perhaps the first to expand upon Sraffa’s 1960 brief reference to the “requisite kind of change” (*ibidem*), by arguing that the role of change in supply-and-demand theories is to allow convergence towards equilibrium and it must therefore be conceived as following a

well-specified path.<sup>2</sup> Thus the direction of change required (i.e. the assumption that demand and supply are well-behaved functions) imposes “constraints which operate against an effective handling of problems of change” (Bharadwaj 1986: 3). On the contrary, changes observed in the real world are descriptions of events that may occur outside the strictures of the predictive relation between price and quantity described by supply-and-demand functions, which are necessary for the stability of equilibrium. She writes:

Thus, a statement about one position (at equilibrium) is tied up with a theory *specifying in exact terms* the behaviour of the system under ‘change’ away from that position, even though these variations may be considered ‘hypothetical’ or theoretically confined to the infinitesimally small (or to points ‘in the neighbourhood’). [...] The prices of production in the classical theory, in contrast, do not posit and therefore do not depend for their stipulation upon the postulate of actual or ‘potential’ change. (Bharadwaj 1986: 39)

And she adds that the classical system is more general in scope and versatile in dealing with historic-specific factors because

it does not commit itself through its theoretical structure to any rigid form and direction of change; [on the contrary, neoclassical theory] sought to explain a single observed situation in terms of potential changes—and as brought about by the balancing of marginal quantities operating through the principle of substitution. In order to be consistent with these explanations, the changes had to be in a direction and of the type postulated by theory. (ibid.: 63–64)

The question of how change is conceptualised in economics appeared quite early in the evolution of Sraffa’s thinking.<sup>3</sup> In winter 1927–28, while preparing for the lectures he was to give at Cambridge, he came to the

<sup>2</sup> See Marcuzzo (2014), from which the paragraph draws.

<sup>3</sup> See Sraffa’s comment in Summer 1927 “[...] the main stream of modern economic thought proceeds to analyse the ways in which change takes place, without being hindered by the fact that little is known of the ultimate causes of change” (D3/12/3/14). In fact, here Sraffa is making a distinction between the notions of ‘ultimate cause’ and ‘mechanical cause’. He is identifying the difference between the Classical and the Modern by associating the Classical with the notion of ‘ultimate cause’ and the Modern with the ‘mechanical cause’. We are indebted to the Editor of this volume for suggesting clarification of this distinction.

important conclusion that classical political economy and neoclassical economics rested on alternative theories of value and distribution; only the latter explains distribution and relative prices by means of the equilibrium of the two opposing sets of forces, demand for and supply of goods and factors of production; the classical political economy determines the distribution of the surplus, i.e. of product other than wages.

Another point that Sraffa made in this context was that in economics there is also the need to distinguish between situations in which change is necessary to construct the elements of the theory and those in which it is not required while analysis is conducted in terms of differences that co-exist in the same instant.

This led Sraffa to raise the related point of the distinction between “change” and “difference” in economic analysis. In one of the manuscripts of the period 1927–28, possibly where mention of the “Difference (simultaneous) versus Change (succession in time)” first occurs, Sraffa wrote:

The general confusion in all theories of value [...] must be explained by the failure to distinguish between two entirely distinct types of questions and the universal attempt of solving them both by one single theory.

The two questions are:

1. what determines the [difference in the?] values at which various commodities are exchanged in a given market on a given instant?
2. what determines the changes in the values of commodities at different times? (e.g. of one commodity).” (D3/ 12/ 7/115; emphasis in the original).

And he continues:

The first problem gives rise to a geometrical theory, the second to a mechanical one. The first is so much timeless that it cannot even be called statical. It does not represent an ideal stationary state in which it is assumed that no change takes place: but it represents a situation at one instant of time, that is to say something indistinguishable from a real state of things in such a short period of time that no visible movement takes place. Its object is, as it were, the photograph of a market place [...] Marshall’s theory of value, with its increasing and diminishing costs and marg[inal] utility, scissors, pillars

and forces, can only be understood as an attempt to solve the first question in terms of the second. (D3/12/7/117)

And in the same set of manuscripts, while working on his price equations, reflecting on the possibility of letting the reader assume constant returns to scale, Sraffa wrote:

[...] these equations cannot possibly answer as to how or why prices change. They only explain why, at a given moment (?), prices of different things bear to one another the proportions which they do. They explain variation (difference) between individual commodities at one time, not variations of one commodity at different times.

No system of equations, whether it considers variable returns or not, could tell this if time does not enter as a variable. (D3/12/7/85-6)

The same point, but related to the theory of distribution, is reiterated more than 30 years later in one of the many extant drafts of the Preface to *Production of Commodities*:

The fundamental difference is that the extensive (different qualities of land) is truly a purely timeless, or geometrical representation: all the different lands exist simultaneously/at one instant, they and their products can be ascertained, distinguished and measured at one instant, without changing anything in the present arrangements.

On the contrary, the intensive (successive doses of c[apital] and l[abour] on a piece of land) dim[inishing] ret[urns] do not exist at any one instant [...] We can only find these dim[inishing] ret[urns] by change, or movement: that is to say, we require *time*. (D3/12/13/23.2; emphasis in the original).<sup>4</sup>

In conclusion Sraffa's point is the distinction between two types of change, those which involve the passage of time and those which do not. See the annotation by Sraffa dated October 1929:

<sup>4</sup>In a contemporaneous manuscript dated 1–3 January 1958 and inscribed as “Margins and margins”, which he might have considered including in his book, Sraffa made the same point, returning to his earlier distinction between difference and change (D3/12/46/50). Finally, Sraffa reiterated the same point as late as 17 August 1965, when he was still trying to carry out his project for a comprehensive critique of marginal theory (D3/12/42/5). On these points, see Marcuzzo and Rosselli (2011).

[The following] notion of time is important: it really substitutes ‘instantaneous photographs’ as opposed to ordinary time. It is only a part of ordinary time, it has only some of its connotations: it includes events, also different events, but no change of events. It enables us to compare two simultaneous, but not instantaneous, events—just as if they were ‘things’.  
(D3/12/13/1.3 emphasis added)

In a different context, in the Introduction to Ricardo’s *Principles*, we find Sraffa explicitly referring to “the two points of view of difference and of change” (Sraffa 1951: xlix) to distinguish between real and apparent change. The distinction lies behind the question of how to measure “the magnitude of aggregate of commodities” in order to study the distribution of surplus: there *seems* to be a change in the quantity of output to be distributed whenever there is a change in its value due to a change either in wages or in profits. However, this is an *apparent* change,<sup>5</sup> since the conditions of production of the commodities and the quantities produced remain the same. It is the kind of change studied in *Production of Commodities* when analysing the effects on prices of a change in distribution, not to be confused with the effects deriving from the introduction of the time factor.

### 3 DETERMINISM

“Real” changes imply a process which occurs in time. Under what circumstances can we consider the effect of a change that implies comparison of the same object at two different instants, equivalent to the observation of two distinct objects at the same time? There are two possibilities and Sraffa seems to have considered both. The first is that we assume that the time interval is so short that the assumption of *ceteris paribus* holds because of lack of time for modifications of the existing situation other than that in

<sup>5</sup> Finally, the distinction between difference and change is employed by Sraffa to distinguish two different aspects of the effects on the relative value of two commodities of different proportions or durabilities of capital employed in their production. Sraffa writes: “[the first aspect] is that of occasioning a *difference* in the relative values of two commodities which are produced by equal quantities of labour. Second, that of the effect which a rise of wages has in producing a *change* in their relative value” (Sraffa 1951: xlvii). This testifies to the importance Sraffa attached to the distinction between change and difference in economics.

the independent variable.<sup>6</sup> The second is that once the initial position is known, any other position is known with absolute certainty, in the same way in which, studying the motion of a physical body, the knowledge of its initial position and of the forces applied to it allows us to determine any successive position. As Sraffa wonders, discussing marginal productivity “are the potential, hypothetical returns which would be obtained by additional doses *part of the existing situation?* (D3/12/49.5 recto; emphasis added).

To appreciate the relevance of this question fully, let us recall that in 1929 Sraffa had written that solely to be included in the “data” of the theory were “things that actually happen”. Marginal magnitudes would appear to be excluded from this condition by definition, being called into existence by thought experiments. But now Sraffa seems to be considering the possibility that marginal magnitudes might be conceived as “part of the existing situation” as if they were “things that actually happen”.<sup>7</sup> The question Sraffa poses is, then, a crucial one. For if the answer were to be affirmative, then marginal magnitudes could after all be taken as a basis for economic theory to determine price and distribution. We hear in this question an echo of Sraffa’s reflections on the developments in physics in the early decades of the twentieth century that challenged the determinism of Newtonian mechanics, which had been the source of inspiration for Marshall. We find in his notes several passages copied from an essay of 1931 by Erwin Schroedinger with the title “Indeterminism in Physics”. In one of these passages Sraffa summarises the “so-called problem of causality” in physics (D1/91/66 recto), quoting from Schroedinger: “Given any physical system, is it possible, at any rate in theory, to make an exact prediction of its future behaviour, provided that its nature and condition at *one* given point of time are exactly known?” And Sraffa seems interested in the conclusions that identical initial conditions do not lead to identical results, according to the most recent experiments in physics of his time.

<sup>6</sup> Referring to Russell’s interpretation of differential calculus in physics, Sraffa seems to be thinking of differential calculus as a model because it considers “time in which effects follow causes, but so closely that there is no room either for dispersion or for entering of foreign influences: it does this by differentiation (making time so short as actually to leave no room for change in circumstances: the cause and effect are perfectly contiguous—nothing happens in between” (quoted in Martins 2013: 44).

<sup>7</sup> We interpret the existing situation as also including alternative techniques as long as they are comparable because, even if not used, they “exist” at the same time. We are grateful to the Editor of this volume for raising this point.

But under precisely what conditions would any future development be included into the initial condition?<sup>8</sup> To answer this question, in what might be a draft of the Preface to *Production of Commodities*, Sraffa makes reference to a passage in Wicksteed's *Alphabet of Economic Science* on the existence of a labour supply curve. Wicksteed's passage runs as follows:

But even if he [the labourer] cannot tell what amount of work he will be willing to do under the varying circumstances, obviously *there is* a given amount which, as a matter of fact, he would be willing to do under any given circumstances. Thus the curve *really exists* whether he is able to trace it or not. (Wicksteed 1888: 55)

Variation in the labour supply “under varying circumstances” is clearly a process of change. The point is, can the effects of this change be included within the “existing situation”? “Wicksteed”, Sraffa observes, “with great and indeed reckless consistency, thinks that they do.” (D3/12/49.5 recto). In fact, according to Wicksteed such change appears to be determined in its entirety by the initial position as if it were known a priori. To this Sraffa replies:<sup>9</sup> “Wicksteed considers that the path to be followed when one of the quantities is changed is prescribed a priori like the rails prescribe the path of a tramcar”. (D3/12/46.43b recto). And yet again, in another draft:

This sounds like a declaration of faith in universal determinism (‘not a bus, not a bus, but a tram’): however Wicksteed considers that when one of the quantities is changed, the dependent variable will follow a path which is prescribed a priori although no rails or other circumstances capable of directing its motion are visible. But of course, saying that it will follow ‘one’ path at a time does not prove that it will follow one particular prescribed path rather than another. (D3/12/46.43b recto)

<sup>8</sup>The following paragraphs draw on Rosselli and Trabucchi (2019).

<sup>9</sup>For the vivid contrast of the image of a tram vs. that of a bus, we have preferred to quote this version, which Sraffa crossed out, to the one he kept in the manuscript which runs as follows:

This is nothing less than a declaration of faith in universal determinism, for nothing less can support the belief in the actual existence of a prescribed path which must inevitably be followed, whether by the consumer or by the producer, such as is described by the demand- and supply-curves: for no observation, however minute, of the existing situation (in our case, of the existing methods of production) can bring out the path along which they must move in any given circumstances. (D3/12/46.43b recto)



In the light of the distinction between difference and change we can appreciate the sense of Sraffa's forthright reference to a "faith in universal determinism" as the only conceivable foundation for the "marginist" method (as Sraffa used to call it). Variations in the labour supply "under varying circumstances"—and the same obviously applies to variations in the cost of production of a commodity attending variations in the quantity produced or, again, to variations in output due to variations in the proportions in which different means of production are used—are all processes of change. As such they should be open to a wide range of outcomes. However, this would preclude them from serving as a basis for an explanation of value and distribution. Or, as Sraffa notes analysing the change in output as a result of the increase in the use of a factor of production: "The 'change' or historical method would in practice involve trial and error but the theory assumes that 'the best' or at any rate prescribed method is known a priori" (D3/12/49.6 recto).

Thus the only way to support the marginist method would appear to lie in postulating a certain determinism: in the form, for example, of a marked degree of regularity in the relation between cost and quantity produced—which, we may note, is precisely what would happen if the product obtained with  $n$  units of a factor and the product obtained with  $n + 1$  units were two *different* magnitudes existing side by side.

In fact, Sraffa speaks of faith in such regularity, because no actual experience can confirm it. Here it is worth noting that the role of the experiments that should lead to definition of the marginal magnitudes is, in fact, completely different from the part experiments normally have to play in the physical sciences. Unlike physics, experiments for marginalist theory do not consist in application of the conceptual tools of the theory to investigate certain properties of the economic systems under study. Rather, the very creation of these tools is made to depend upon one and only one possible result of the experiments. If the experiments were to yield different outcomes, we would not be dealing with a different theory, i.e. a theory yielding different results, for there would no longer be any theory from which results could be derived.

This criticism of "marginism" (again, Sraffa's wording), focussed on the regularity of the outcome of changes that must be assumed in order to build supply-and-demand curves, has more general implications for the study of causal relations in economics.

## 4 CONTINUITY AND STRUCTURAL CHANGE

Let us now look at the other possibility that we can take into account to consider the effect of a change, which implies comparison of the same object at two different instants, equivalent to the observation of two distinct objects at the same time. Could we consider variations so small that the assumption that nothing else changes is plausible? Sraffa seems to argue that in economics it is not possible to resort to infinitesimal calculus. First, variations are highly unlikely to come about in a continuous manner but rather occur in discrete form. Moreover, change hardly ever takes the form of variations in magnitudes that leave the overall structure unchanged.

On various occasions over the years Sraffa objected to Marshall's case of an "alert" railway manager who deals with the increasing number of passengers by altering the composition and size of carriages in a train, "constantly weighing the net product in saving of time and of annoyance to passengers, that will accrue from the aid of a second guard on an important train and considering whether it will be worth its costs" (Marshall 1920: 427).

On 29 March 1963, Sraffa again wrote:

This suggests that his [the alert manager's] main task is to sack a porter here, add a coach to a train there, or shorten a platform elsewhere. The idea is that the process of change can be reduced to a continuous process, like shortening platforms: 'a penny is the basis of a million', and so a process of shortening, adding [,] sacking in detail is the route from one position to another. In Marshall's view the 'alert' Dr. B.... never needs to take bird's eye view of his enterprise. (D3/12/42.12)

This awareness that in economics changes in one variable affect the whole structure connects with Sraffa's repeated observation that the marginal productivity is always measured in the case of two factors, which is the only case in which changing the quantity of one factor and changing the proportions in which factors combine amount to the same thing. However, when we have more than two factors, can we still maintain that the proportion between the unchanged factors remains constant in the presence of a change in the quantity of one factor?

We have several passages showing that Sraffa was critical of the assumption that one could deal with change in real time as if the *ceteris paribus* assumption held.

M[arshall] is constantly on the defensive against objections to continuity based on facts [...] This is not the basis on which this [my argument] is based. That can be granted in detail, wherever it is possible. It is against the logical possibility of the type of continuity assumed. That type is only possible with two factors. (D3/12/42.12)

And again:

Where marginism goes astray is in (falsely) assuming [...] that it has general applicability whereas in fact it only applies exceptionally (in cases where partial change is feasible, there is independence, the whole is not affected). (D3/12/42.9)

However, even if supply-and-demand functions (for goods and factors) were continuous so that marginal calculus were applicable, there would still be one obstacle to adopting the methods of mechanics in economic analysis. Sraffa wrote:

[...] in mechanics if the experiment is repeated in similar circumstances (say, on the elasticity of a metal) the same results will be obtained. But with supply and demand, even if the external circumstances were the same, the result would be different because man learns from experience, or at any rate is changed by it, forms and transforms habits, etc. (D3/12/42/11recto)

In conclusion, differential calculus and demand and supply functions are not tools applicable to economic analysis borrowing the method of classical physics—i.e. mechanical causality does not work in economics. Does this mean that Sraffa gave up the possibility of establishing causal relationships to explain change in economics? In the next section we look at what the literature had to say on the matter.

## 5 INTERPRETING MECHANICAL VS. GEOMETRICAL CAUSALITY

On Sraffa's challenge to the notion of mechanical causality in economics there have recently appeared a fair number of interesting contributions which, although not differing greatly, nevertheless highlight different aspects of the matter. In common they offer a defence of Sraffa's theory against the criticism of lacking generality (for example, valid only by

assuming constant returns to scale) or of being narrow in scope (for example, it allegedly describes an equilibrium situation without specifying how the system reaches it). Moreover, investigation into Sraffa's research project has brought to light the fact that his theory of prices and distribution is not subject to the limitations that constrain the marginalist approach which determines prices through the balancing of the forces of supply and demand. This is the view that Sraffa expressed at the beginning of his work on *Production of Commodities* in the famous parable of the "Man from the moon" (D3/12/7.87) and reiterated in 1942:

The problem is that of ascertaining the conditions of equilibrium of a system of prices and the rate of profits, independently of the study of the forces which may bring about such a state of equilibrium. Since the solution of the second problem carries with it a solution of the first, that is the course usually adopted in modern theory. The first problem however is susceptible of a more general treatment, independent of the particular forces assumed for the second; and in view of the unsatisfactory character of the latter, there is advantage in maintaining its independence. (D3/12/15.2)

Ginzburg (2013) provides an interesting interpretation of this point, highlighting the distinction between causal representations, which answer the question "why" and non-causal representations which answer the question "how".

The distinction is between representations which investigate the causes of phenomena (and are therefore presumably able to predict them) and merely descriptive representations, like "snapshots",<sup>10</sup> which capture the system as it actually is at a given instant in time. Ginzburg claims that this "metaphor, if taken literally as a photograph of a real economic system, is misleading. It can be considered a snapshot only in the sense that all the phenomena taken into account relate to the same period" (Ginzburg 2013: 113). Ginzburg argues that non-causal representations are not realistic descriptions of a situation, but require a mode of abstraction: for example, the methods of production under consideration are those prevailing in the system and not those actually adopted under specific circumstances. Non-causal representations capture meaningful features of the

<sup>10</sup>The first to employ the "snapshot" metaphor was Roncaglia in his 1975 Italian book, translated into English as Roncaglia (1978). For a more recent restatement of his interpretation of Sraffa's approach, see Roncaglia (2009). On the evidence of Sraffa's reference to the snapshot, see Kurz and Salvadori (2018).

object of analysis and the properties of the structure without the need to bring in specifications of their developments over time, which remain open to a variety of possibilities.

The idea that equilibrium prices can be defined independently of the forces which guarantee that equilibrium is reached does not imply that equilibrium is independent of other factors which call for a different kind of analysis. The argument that social analysis, and economic theory in particular, must address questions which require different levels of abstraction and generality had been put forward by Garegnani in several contributions (1984, 1990a, b) as well as various other scholars who adopted his approach.

This view—which is known as the “core” interpretation of Sraffa’s theory—has found support in a number of studies by Kurz and Salvadori (2004, 2005, 2018). In particular, they have introduced two elements which clarify Sraffa’s research project through a careful reconstruction of the complex work underlying the final text of *Production of Commodities*. The first element is the influence on Sraffa of his perusal of a great many books on the natural sciences and how this led to a search for “objectivism” which, at an early stage<sup>11</sup> consisted in an attempt to construct a theory of exchange values whose elements would be measurable quantities, thus excluding any reference to motivations. The economic system could then be represented as production of commodities by commodities, since any output would be the result of the destruction of all the inputs used up in its production.

The second element highlighted by Kurz and Salvadori and, with his alternative interpretation, by Sinha (2016)—and recently by Davis (2020)—is Sraffa’s important note on “Surplus Product” written in August 1931. It marks the abandonment of the “natural science point of view” which links one effect to one cause.

Sraffa realised that the distinction between surplus and necessities brought him up against an apparently insoluble dilemma: either all the

<sup>11</sup>Sraffa had endorsed Francis Bacon’s principle of “efficient causes” as against “final causes”. He wrote in the December 1927–December 1928 period: “Efficient causes’ are facts of the past that act on the present: ‘final causes’ are facts of the future that act on the present. The existence of the latter is at best dubious and they are better called ‘illusions’. The classical P[olitical] E[conomy] dealt only with the first sort of causes, i.e. of ‘material things’ that have existed in the past. Modern economics deals with the second class, i.e. hopes for the future, such as utility, abstinence, disutility, etc.; these things, it must be noticed, refer only to the foreseeing of future acts.” (D3/12/10/ 61.1recto).

surplus is necessities, i.e. all that is produced is necessary for the reiteration of the production and the surplus vanishes, or the components of the surplus, like profits and rents, must be represented as inducements and then the distinction between objective and subjective disappears. This led Sraffa to conclude that “The surplus may be the effect of the outside causes; and the effects of the distribution of the surplus may lie outside.” (D3/12/7/161.5recto).

In the search for the influences which might have led Sraffa along the path to abandoning the notion of mechanical causality in economics, it has been argued in the literature that the exchanges between Sraffa and Wittgenstein from 1929 to 1946 provide evidence that Sraffa had an influence on the preparation of Wittgenstein’s *Philosophical Investigations* and in turn Wittgenstein had an influence on Sraffa’s *Production of Commodities*. Arena (2015) in particular has argued that the letters between them show that both Sraffa and Wittgenstein criticised various notions of causality, and specifically, the notion of mechanical causality.

Wittgenstein abandoned the idea that there is only one type of causality that we could discover by observation and experiments, interpreting “causality as one grammar rule amongst others” (Arena 2015: 1097). He also criticises the notion of causes based on individual motivations,

such as beliefs, intentions or desires, arguing that if agent motivations do exist, they do not necessarily produce and therefore explain their actions: motivations (even social ones) are not causes. (ibid.)

Accordingly, Arena finds a clear parallelism with what Sraffa had been arguing since his early period:

Economists who do not take this objective test as the standard of what is the cause of an event, are always driven back to trace the ‘ultimate causes, causae causantes, etc.’ to the wants, desires, aversions, decisions, volitions and intentions (or inducements and rewards) of individuals. In fact, if we do not use an objective standard and rely simply upon an unconscious ‘feeling that this must be the real cause’ ... we are bound to base the conclusions on our own individual experience, from which it appears that we do what we want, or what we like, etc., and this seems the only convincing final conclusion”. (D 1/9/6, pre-1928<sup>12</sup>)

<sup>12</sup>According to Nerio Naldi in a private communication, the papers in D1/9—in the catalogue dated pre-1928—in fact belong to the 1928–1931 period, as revealed by the annotation “next lecture” on one sheet.

Wittgenstein introduced a new type of representation, that can be defined as *surveyable* or *perspicuous representation*, which aims at bringing out “mutual links and connections in the data and corresponds to the synthesis or the synopsis of the grammatical rules of a form of life, but without making any assumptions about their evolution over time” (Arena 2015: 1099).

So Arena also agrees that Sraffa must have come to the conclusion that a “snapshot” was best suited to escape from causality in providing a representation of the economic system.

Davis (2012) also re-assessed the nature of the influence on and by Wittgenstein, but in Davis (2020) he adds a further element to the present discussion, i.e. the distinction between closed and open systems. A “closed system” is isolated from the environment and is subject to principles which are invariant relative to it; on the contrary the functioning of an open system is influenced by the environment.

Davis argues that Sraffa confined the objectivist, sufficient cause principle to the field of commodity prices, but also supposed that this “closed system” was operated upon as a whole by causes that lay outside of it. Davis contends that Sraffa both maintained and modified his objectivism by allowing for different types of causal factors associated respectively with production and distribution. In conclusion, Sraffa is said to allow for two types of causal forces, one associated with the natural world, the other with the social world, and these two types of causal forces are assumed to be interacting “in a complex manner” (Davis 2012: 9).

The distinction between an open and a closed system seems to find corroboration in the following passage dating to August 1931:

Thus there must be a leak at one end or the other: the ‘closed system’ is in communication with the world.

When we have defined our ‘economic field’, there are still outside causes which operate in it; and its effects go beyond the boundary. This must happen in any concrete case. (D3/12/7/161.5recto)

Sinha (2016) places at the centre of his interpretation Sraffa’s insistence on the difference between two types of explanations, meant to answer two types of questions:

why ‘x’ has increased in price from \$2 to \$3 [...] why ‘x’ is sold at \$3. The first question needs an answer in terms of a discovery of a cause that explains the change... the second question [...] requires an answer in terms of a relation (a logical relation), that is, why ‘x’ must relate to \$ or other commodities ‘y’, ‘z’ and so on in a precise quantitative association at one moment. The first case is mechanical in nature whereas the second is geometrical. In the second case, the problem of causation does not arise because time is absent from the problem—hence the explanation must be a description of what exists”. (Sinha 2016: xii)

Sinha has clarified the core point of the discussion on the nature of Sraffa’s objections to the notion of causality in economics, or at least the notion of causality borrowed from classical mechanics, namely the nexus time-change-cause. Observed phenomena could be traced back to a given cause only if we could observe the “forces” that produced that effect, but this presupposes going back in time to produce a change in the existing situation. This, however, does not mean that we cannot study situations following a change, for instance in a given variable (wage or profit), although we can only do so as long as these changes have no time dimension, and are merely a logical derivation.

## 6 THE BOUNDARIES OF THE “ECONOMIC FIELD”

As in the case of objectivism, which has been interpreted as if Sraffa were a crude positivist, unable to see the importance of subjective magnitudes, like expectations, which although unobservable play an important role in economics, his rejection of mechanical causality should not be interpreted in a restrictive way. Obviously, Sraffa set out to understand economic reality and therefore how economic phenomena could best be explained; his concern seems to have been primarily to avoid the employment of tools or concepts that appeared from the outset to be of limited generality or dubious existence (utility), or indeed ideologically vitiated (abstinence). The pursuit of a scientific method to apply to economics required the utmost care and attention to avoid metaphysics, ideology and ad hoc assumptions.

The way Sraffa went about it was a very drastic delimitation of the “economic field”, as he called it, leaving out “causes” from the investigation. It is argued by many interpreters, as we have seen, that Sraffa makes a distinction between the “economic field”—the plane to which only a geometrical theory can be applied, i.e. satisfying the criterion of using only



logical and timeless relationships, without dealing with “ultimate causes”—and the outside realm of circumstances and historically given context, as was clear to him from the very beginning of his research programme:

Clearly, we must reduce all the data to things that actually happen, excluding inexistent possibilities. Only such things are measurable, and can enter the theory as ‘knowns’, or ‘constants’; and, in reality, only really happening things can be real causes and determine effects. (D3/ 12/ 13/ 1.2)

What this implies is that institutions, technology, social norms and levels of activity cannot be approached with the same level of abstraction as within the “economic field”. However, this leaves open the question of the nature of the relationships prevailing outside. The question arises if we can take them as causal forces even though we cannot represent them in a functional deterministic form.

Any attempt to assess how Sraffa would have answered this question takes us onto slippery ground, because direct evidence is lacking. Seeking out Sraffa’s motivations and objectives—e.g. demolition of the marginal productivity theory, rehabilitation of classical political economy—and/or searching for influences by the contemporary scientific discussion (quantum physics) or personal interactions with particular individuals (Wittgenstein, Gramsci) may well prove illuminating, but hardly conclusive on this point.

What is clear is that we are left with alternative options to continue Sraffa’s research programme and accept his legacy. We could attempt to expand the “economic field” beyond the boundaries marked by Sraffa, introducing further relationships of the wage-profit type, namely those that have the property of bringing in an “if and only if” clause. Another approach could be to enlarge the realm of the “economic field”, applying price equations to problems that imply changes, for instance, in the quantities produced, but introducing assumptions (such as constant returns to scale) that restrict the level of generality Sraffa aimed at.

In any case, we have to continue looking into the causes at work outside the economic field and build a bridge between the core and the outside world. This might lead us to accept that the level of abstraction and therefore of generality will be lower, gaining in relevance what is lost in rigour.

Only by keeping the uses we can make of Sraffa’s system of equations separate from the reasons which may have led Sraffa to travel the road of

the geometrical representation and, above all, of what is really meant by it, can we make any further headway, without being bogged down by disputes on Sraffa's motivations or being unfaithful to his text.

What we are left with is a powerful warning against invoking spurious causes to explain economic phenomena; we are also left with means to prevent us from mistaking changes for differences and above all a fence against false claims of rigour and generality.

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