Review of Political Economy,
Volume 16, Number 2, 179–206, April 2004

Sraffian Research Programmes and Unorthodox Economics

TONY ASPROMOURGOS
School of Economics & Political Science, University of Sydney, NSW, Australia

ABSTRACT *This paper provides an overview of the main currents in the development of the intellectual project inaugurated by Piero Sraffa's* Production of Commodities by Means of Commodities. *Five research programmes are detailed (together with some further extensions): the nature and significance of long-period equilibria; the Cambridge Growth Equation and the monetary determination of interest, as alternative theories of distribution; the Sraffa–Keynes synthesis; and the critique of marginalism. The paper also sketches the relations between the Sraffian project and other unorthodox strands in economics. Future prospects for orthodoxy and non-orthodoxy are canvassed. A substantial literature survey is included.*

Some day economics may become a science.
(attributed to J.M. Keynes, 1932: Rymes, 1989, p. 83)

1. Orthodoxy and Unorthodoxy

Political economy and, subsequently, economics have always had their critics. To the extent that William Petty is the founder of political economy, Jonathan Swift—who in his *Modest Proposal* (Swift, 1729) deliciously satirized Petty and the wider seventeenth-century English preoccupation with labour utilization—may be thought of as the first such critic.[1] Political economy and economics have also both commonly had their dissenters. This is a different thing: critics are those who attack from 'outside the frame' so to speak; while dissenters are those who attack from 'inside', in some sense. When Thomas Carlyle decried political economy as 'the' dismal science in 1849, he did not possess any conceptual and analytical economic framework alternative to that which he was opposing; but

Correspondence Address: Tony Aspromourgos, School of Economics & Political Science, University of Sydney, Sydney NSW 2006, Australia. Email: T.Aspromourgos@econ.usyd.edu.au

[1] Swift's satire is 'delicious' in more than one sense, since his main proposition is that the children of the poor be eaten by the rich.

ISSN 0953-8259 print/ISSN 1465-3982 online/04/020179-28 © 2004 Taylor & Francis Ltd
DOI: 10.1080/0953825042000183181

when Keynes attacked economics in 1936, he did purport to have an alternative economics (which, in a very bad joke, was said to have transformed the discipline into the gay science).[2] The former is merely a critic; the latter, a dissenter. In any case, certainly earlier political economy and, subsequently, modern economics have not always confronted alternatives to themselves. In fact, the sense in which classical political economy was ever an orthodoxy, except in retrospective 'Whig history', is problematic. That historiographical problem may be put aside here, in order to focus on modern economics, in the sense of the marginalist approach, which had its decisive advent in the 1870s, notwithstanding precursors, although it secured a genuinely dominant position only well after the Second World War. For the purposes here, the following defines economic orthodoxy: an approach to understanding economic society in which constrained optimization by autonomous individual agents facing substitution possibilities generates simultaneous demand and supply functions (or correspondences) for commodities and factors of production, such that market clearing under competitive conditions determines equilibrium quantities and relative prices, including prices of the factors of production. Marginalism is a reasonable nomenclature for this, reflecting the optimization conditions embodied in marginal equalities or inequalities.

A self-proclaimed alternative economics can hardly be regarded as 'non-orthodox'—or 'heterodox' if one prefers, or genuinely 'alternative'—unless it entails a rejection of at least some fundamental elements of this orthodox vision. Whatever alternatives to that approach to understanding economic society may earlier have existed, in the second half-century of its existence it confronted a series of rather robust challenges from a range of sources: Sraffa's precise interventions; the Keynesian revolution; an intellectually revitalized Marxian economics (intersecting with the Sraffian and Keynesian projects); Kalecki's synthesis of effective demand with Marxist elements and non-competitive pricing; and Institutionalism—the last, in a sense resisting from the very beginning of the marginalist tradition (in its earlier, 'Historical School' incarnation). Post-Keynesian Economics was a somewhat forced attempt to build a 'church' broad enough to find a place for many of these intellectual currents. My purpose here is to address the character and significance of 'the Sraffian project' within this range of alternative approaches to economics. My premise is that orthodoxy as defined above is radically inadequate for understanding economic society. The next section outlines the core propositions that those who are committed to Sraffa's approach would share and endorse. Section 3 sketches the relationship between these propositions and the other alternatives to orthodoxy, with a view to clarifying the extent of consensus and isolating outstanding differences of view. The final section considers the prospects for Sraffian and other alternatives, in relation to the current state of orthodox economics.

[2] On Carlyle—who, incidentally, explicitly contrasts 'gay' and dismal science—see Groenewegen (2001, esp. p. 77).

2. There is No Sraffian 'School'

It has been a commonplace to articulate orthodoxy and dissenters who contend against it, or against elements of it, in terms of a set of contending 'schools'. Consciously or otherwise, this is to borrow from the language of the history of philosophical disputation. Is this appropriate? In the history of philosophy context, the different philosophical schools present themselves, or are presented by others, as each providing generally quite comprehensive viewpoints on all major elements of the relevant domain or sub-domain of philosophical inquiry. Hence, for example, we have all-embracing systems of thought—'world views', as it is said—such as Platonism or Utilitarianism. Economic orthodoxy in some of its forms has certainly made claims to an analogous kind of comprehensiveness, within the domain of the explanation of economically relevant phenomena. The general equilibrium framework—which was the standard for orthodox high theory in the 1960s, when alternative approaches gained some victories—had such aspirations. And the claim by some, to have found in constrained individual optimization the kernel of the human psychology as such, takes aspirations to comprehensiveness to new heights of pretension (e.g. Wicksteed, 1914, pp. 1–9). Such aspiration to comprehensiveness may also be relevant to some of the alternatives to orthodoxy; but the Sraffian project offers no evidence of such aspirations or pretensions. I have used the term 'Sraffian project' advisedly, precisely because I do not think there is any such thing as a Sraffian School: even the term 'project' might give the impression of a more unitary, homogeneous and monolithic intellectual edifice than is the reality.

In relation to any intellectual claims to comprehensiveness, from orthodox or non-orthodox standpoints, the Sraffian project in a sense appears as having a more modest aim. Rather than offering a comprehensive alternative to orthodoxy, it posits a narrower set of solutions to certain fundamental problems in the history of economic theory—most notably, the relationship between distribution and 'equilibrium' (or more appropriately, 'normal')[3] prices in production systems subject to competition and choice among methods of production. The Sraffian resolution of this subject does not leave open *all* theoretical possibilities in other areas; but it does leave many issues open. It does not, for example, leave open the possibility of endorsing orthodox factor substitution mechanisms in long-period frameworks—nor any propositions for which those mechanisms are necessary. An example of the Sraffian project's 'openness' is the theory of distribution itself: given the available methods of production and the levels of gross outputs to be produced, exogenously fixing one distributive variable (e.g. the general rate of profit) allows determination of the technique of production which will be used, and commodity prices simultaneous with the remaining distributive variables. However, the determination of the 'exogenous' distributive variable remains open to a variety of possibilities (although only one can be sound for any particular time and place). This openness of the Sraffian project to a variety of possible theories, across a range of economic phenomena, is why

[3] For the origin of Sraffian use of this Marshallian terminology see Garegnani (1976, pp. 26n, 28–29; 1989, pp. 344n, 355–356).

I have used the plural *programmes* to refer to development of the Sraffian project.[4] Nevertheless, with regard to the theory of commodity outputs—also somewhat open from the core Sraffian standpoint—the overwhelming tendency of Sraffian economists has been to favour an 'effective demand' approach, even though this tendency is not a (strictly) logical consequence of fundamental Sraffian ideas.

Rather than a comprehensive theory of human and social economy then, what the Sraffian project augmented by effective demand stands upon is a small set of fundamental propositions, from which a *variety* of research programmes can proceed. It is, so to speak, a configuration of intellectual machinery available to inform wider and applied economic analyses. These propositions, which those committed to Sraffa or 'Italo-Cambridge' projects were seeking to sustain during the debates and controversies of the 1950s to the 1970s, would remain common ground for virtually all those engaging in economic analysis in light of Sraffa—although with the monetary propositions the most contentious. They can be stated as follows.

Income Distribution. Equilibrium (or the 'normal' position) of a competitive economy does not entail a unique, functional income distribution, or unique set of rates of return to the owners of inputs to production (labour, capital, scarce natural resources, entrepreneurship, risk-bearing). Demand (or marginal productivity) and supply approaches to determining 'factor prices' are found to be incoherent. On the contrary, within definite technological restrictions, the distribution of the net product—or more precisely, the social surplus—is open to determination by wider social forces.

Relative Commodity Prices. The fundamental determinants of normal relative commodity prices are the input–output ratios associated with methods in use for the production of commodities—together with one distributive variable (most usually, a rate of return), determined independently of technology and prices, although subject to technological restrictions—hence the notion of 'production prices'. Commodity demands only influence relative prices so understood, via their influence on either those production coefficients (input–output ratios) or on the independent distributive variable. Beyond this, the interaction of commodity demands and supplies only influence 'market' prices. Commodity supply functions of the orthodox kind, since dependent upon incoherent factor substitution mechanisms, are rejected.

Output Levels and Labour Employment. At least in modern capitalism, activity levels are determined by autonomous elements of commodity demands, together with 'multipliers' capturing induced elements of commodity demands—the latter in turn determined by income distribution, spending and saving propensities, and technology. (It follows that accumulation and growth are also understood in terms of growth in autonomous demands.) This entails

[4] Roncaglia (1991, esp. pp. 188, 198, 211) expresses a similar view—though developed in a rather different way, in terms of three distinct but largely compatible lines of inquiry: 'Ricardian' (Pasinetti), 'Marxian' (Garegnani) and 'Smithian' (P. Sylos Labini). Walsh (2000, esp. pp. 17, 19–20, 22) sees the minimalism of Sraffian economics as only a first phase of the revival of classical economics, with a need now to build a second, more expansive stage around Smithian themes (Pasinetti, 1981 and 1993 being the exemplars).

a rejection of the notion that competition can bring commodity demands endogenously into balance with commodity supplies, in such a manner as also to bring into balance derived demands for inputs and autonomous supplies of inputs (most notably labour). Involuntary labour unemployment is probable as a normal outcome of competitive (or indeed, non-competitive) capitalism. This may be read as implying, although it certainly does not entail, the desirability of active policy management of at least aggregate activity; but all policy issues are left aside here, just as history of thought issues are left aside (see note 7).

Monetary Phenomena and the 'Real' Economy. A rejection of the orthodox neutrality of the money doctrine does not *necessarily* follow from the above three sets of propositions; but it becomes a quite compelling possibility once income distribution is rendered indeterminate in the manner of the first set of propositions. That indeterminacy can be construed to mean that 'real forces' provide no 'anchor', so to speak, for the determination of yields in money markets. One Sraffian research programme—the Cambridge growth equation approach to distribution—in fact provides an alternative, non-orthodox way of determining distribution by real forces (the rate of accumulation; see Section 3). Sraffa (1960, p. 33) himself famously suggested the possibility of reversing the orthodox causation between profit rates and interest rates; and at this level of abstraction, that position coincides with Keynes's intention (e.g. Keynes, 1936, pp. 202–204; 1937, p. 250), however faulty his execution of the idea. Hence, similar to the issue of the theory of activity levels, although not a strictly logical consequence of fundamental Sraffian ideas, there is probably a strong tendency to favour non-neutrality of money among Sraffian economists, if not as widely as the endorsement of the Sraffa–Keynes synthesis implied by the third set of propositions above.[5] Analogously, the theory of inflation remains a fairly open issue, although most would endorse the notion of non-monetary shocks playing an important role in modern capitalism, in initiating inflations; so that, historically speaking, Sraffians would tend to side with the Banking School rather than the Currency School (Pivetti, 1991, pp. 38–39, 77, 80–81).

The variety of research programmes associated with these doctrines is further outlined below. It may be added here that the limited theoretical domain of the Sraffian project does not only leave it open to a range of alternative possibilities for specifying theory for determining other, to an extent separable, economic phenomena; it also makes the Sraffian project open to 'history' in a substantial sense. For example, the degree of freedom in the determination of commodity prices (one exogenous distributive variable) makes it possible for different 'closures' (determination of the exogenous variable) to be applied, at different times and places. To this extent, the limited domain of a Sraffian doctrine is a virtue not a defect—a welcome modesty of claims to definite and

[5] The conceptual distinction between real and monetary ('nominal') magnitudes of course remains valid—where the former refers to quantities measured in some physically existing entity which has its own natural dimension of measurement (weight of homogeneous silver, time length of homogeneous labour, and so on). What non-neutrality means is that equilibrium or normal values of real variables are not independent of 'nominal' magnitudes—where the latter refers to quantities measured in some conventional unit of account or standard of value (US$, GB£, and so on).

determinate general theoretical knowledge of the economically relevant world. This is well illustrated by a recent review:

> The realities of modern economic growth cannot be adequately captured by linear models allowing only for capital accumulation, labour force growth and technical progress. Natural resources and non-produced means of production make qualitative differences to the growth process. There are scarcities and scale effects even in the presence of constant-returns-to-scale methods of production. … Moreover, it quickly emerges that even very 'simple' models, with few produced commodities, few natural resources and unlimited supplies of labour can easily give rise to complicated dynamic paths, too complicated indeed to be analytically tractable. … [Once] the produced means of production include … a 'primary' commodity … produced … using also non-produced means of production … this single fact is … going to lead to analytical results significantly different from those of many familiar models. Prices and distribution now depend on which process has zero rent and the overall level of activity of the economy is now relevant even to, say, the wage-profit relationship. … There can be distributional conflict between employed and unemployed workers … rent can be non-monotonically related to the rate of profit … and the wage and profit rates can increase together (at the expense of rent). … The general theme [in relation to incomes and prices] is that of the complex forms of conflict among the different sources of income but general results are found to be hard to come by; even with simplifying assumptions, resort has to be taken to simulations and to complicated case-by-case statements of outcomes. … The effects of [technological] progress on prices and distribution can be minimal, or they can be rather drastic. (Steedman, 2001)

In truth, a fundamental defect of orthodox economic theory is that it has claimed far too much for our capacity to know the theoretical structure of the world—and this has definitely contributed to the disrepute of the discipline (too many smug economists). A more modest—but by virtue of that, hopefully more robust—economic theory is very much to be desired; and by corollary, also a greater reliance on historical studies and inductive methods. A better recognition of the limits and the frailty of our theoretical knowledge should be a conscious part of the 'temper' of economics practitioners, unorthodox or otherwise. Part of the purpose of non-orthodox economics should be not only to indict orthodoxy for various specific, faulty, substantive propositions, but also to repudiate it in general, for trying to say too much; for making larger claims to systematic knowledge than is possible in the domain of the human sciences. In many respects the Sraffian project deserved to be called 'neo-Classical economics', had not a bastard Pretender already stolen that name (Aspromourgos, 1986). By taking such a serious view of the limits to economic theory—the limits to what we can 'know'—perhaps Sraffa's project could instead have been called *neo-Socratic economics* (neo-'Classical' in another sense, one might say!)[6]

---

[6] For example, Plato's *Apology of Socrates* (21d), where Socrates is speaking of his thoughts after a conversation with a statesman:

> For my part, as I went away, I reasoned with regard to myself: 'I am wiser than this human being. For probably neither of us knows anything noble and good, but he supposes he knows something when he does not know, while I, just as I do not know, do not even

3. Sraffian Research Programmes and Other Unorthodoxies

Starting from the core propositions of the Sraffian project, what has the relatively small cohort of economists working in this framework been doing?[7] Some key literature in each of five Sraffian 'research programmes' is brought together in Table 1 (but limited, very largely, to English language literature):

(a) Much work has been done in the last 40 years in deepening the understanding of the theory of distribution and production prices itself. A vital point of departure is the interdependence between commodity costs of production and commodity prices in a long-period framework, which arises from the circular nature of production systems (literally, production of commodities by means of commodities). This interdependence is thrown into sharp relief by the distinction between basics and non-basics—itself a kind of distillation of the analytical essence of the classical distinction between necessities and luxuries. The dependence of the value of capital on distribution—and hence also the same dependence for capital–labour ratios and capital–output ratios at both the aggregate and sectoral levels—is another dimension of that circularity. Further research has concerned the complexities arising from various forms of joint production and natural resources, and other inquiry into deeper properties of such long-period price systems. Included in the latter has been the issue of the stability properties of such systems—the conditions under which market prices can be treated as convergent upon, or oscillating non-explosively around, normal prices.

Footnote continued

suppose that I do. I *am* likely to be a little bit wiser than he in this very thing: that whatever I do not know, I do not even suppose I know.' (West & West, 1984, p. 70)

On the other hand, it should not be lost sight of that the small set of Sraffian propositions stated above under four propositions amounts to a coherent framework for understanding the capitalist economy as such, even if not a comprehensive and unified grand theory in the traditional orthodox manner.

[7] We leave aside altogether here the intellectual history dimension of the Sraffian project. This has involved both a reconstruction of the nature and significance of classical and Marxian economics, as well as a critical reappraisal of the history of marginalist and wider modern economics. On this, Kurz & Salvadori (1998b), and further sources cited therein, contains a number of Sraffian contributions along these lines; but the literature on these matters is very large. Of course, Sraffa himself is now part of that intellectual history—and naturally, much attention also has been directed to interpreting his *historical* significance, context and intellectual relations with others such as Ricardo, Marx, Wittgenstein and Keynes. The relationship between classical economics and the Sraffian project is more complex than many think—certainly more complex than the appellation 'neo-Ricardian' might suggest. This nomenclature appears to have begun with Rowthorn (1974, p. 71)—*vide* Milgate (1987) and Rowthorn (1980, p. 8); but see as well the title of Parrinello (1970). Materials from Sraffa's archive likely will clarify his relationship with all the classical economists (including those before Smith, like Quesnay), and Marx.

[8] Given his key role in the development of the former, it is not surprising that Pasinetti (1988) has objected to the latter. Pasinetti (1990) is a somewhat different version of the same comment, and there is a response by Pivetti (1990). It may be added that there has been little interest in returning to the old classical closure, via exogenously fixing the real wage—though even if interest closure is accepted, it may be constrained by real wage behaviour (e.g. social limits to real wage variability), even in contemporary capitalism. Indexation of money wages would be the most obvious mechanism for possibly giving effect to real wage closure in modern capitalism.

Table 1. Key literature of the Sraffian project

(a) ***Theory of Distribution & Production Prices***			
Sraffa 1951	Baldone 1980	Duménil & Lévy 1985	Garegnani 1990b
Garegnani 1960	Manara 1980	Schefold 1985b	Salvadori & Steedman 1990
Sraffa 1960	Pasinetti 1980	Schefold 1985c	Woods 1990
Pasinetti 1965	Quadrio Curzio 1980	Bidard 1986	Bidard 1991
Quadrio Curzio 1967	Salvadori 1980	Franke 1986	Boggio 1992
Bharadwaj 1970	Schefold 1980a	Pasinetti 1986	Bellino 1993
Pasinetti 1973	Schefold 1980b	Quadrio Curzio 1986	Kurz & Salvadori 1994
Montani 1975	Steedman 1980	Salvadori 1986	Steedman 1994
Schefold 1976a	Varri 1980	Garegnani 1987	Kurz & Salvadori 1995
Schefold 1976b	Walsh & Gram 1980	Editorial Committee *et al.* 1988	Salvadori 1995
Schefold 1976c	Salvadori 1982	Levrini 1988	Abraham-Frois & Berrebi 1997
Pasinetti 1977	Steedman 1982	Salvadori 1988b	Piccioni 1997
Kurz 1978	D'Agata 1983	Salvadori & Steedman 1988	Quadrio Curzio & Pellizzari 1999
Roncaglia 1978	Parrinello 1983	Schefold 1988	Franke 2000
Schefold 1978a	Salvadori 1983	Steedman 1988b	Salvadori 2000
Schefold 1978b	Bidard 1984	Schefold 1989	Lager 2001
Schefold 1978c	D'Agata 1984	Steedman 1989	
Abraham-Frois & Berrebi 1979	Mainwaring 1984	Caminati & Petri 1990	
Lippi 1979	Steedman 1984		
	Boggio 1985		
(b) ***Alternative Closures I—Accumulation***			
Pasinetti 1962	Fazi & Salvadori 1981	Bidard & Franke 1987	Garegnani 1992
Laing 1969	Pasinetti 1983	Roncaglia 1988	Panico & Salvadori 1993
Pasinetti 1974	Fazi & Salvadori 1985	Salvadori 1988a	Kurz 1994
Pasinetti 1977	Franke 1985	Salvadori 1988c	
Abraham-Frois & Berrebi 1979	Vianello 1985	Baranzini 1991	
	Ciccone 1986	Salvadori 1991	

(c) ***Alternative Closures II—Interest***

Pivetti 1985
Franke 1988
Panico 1988
Pasinetti 1988
Pasinetti 1990
Pivetti 1990
Pivetti 1991
Panico 1993
Lavoie 1995
Panico 1997
Pivetti 2001
Stirati 2001

(d) ***Production Prices, Effective Demand & Long-Period Autonomous Demand***

Garegnani 1962
Garegnani 1964–65
Garegnani 1978–79
Milgate 1982
Eatwell 1983
Eatwell & Milgate 1983
Garegnani 1983
Kurz 1985
Kurz 1986
Garegnani 1988
White 1989
Kurz 1990a
Kurz 1995
Roncaglia 1995
Schefold 1995
Serrano 1995
Trezzini 1995
White 1996
Park 1997
Trezzini 1998
Park 2000
Cesaratto, Serrano & Stirati 2003

(e) ***Critique of Marginalism***

Garegnani 1960
Sraffa 1960
Garegnani 1966
Pasinetti 1966
Harcourt 1969
Pasinetti 1969
Garegnani 1970
Harcourt & Laing 1971
Harcourt 1972
Metcalfe & Steedman 1972
Garegnani 1976
Hagemann & Kurz 1976
Metcalfe & Steedman 1977
Pasinetti 1977
Petri 1978
Baldone 1984
Salvadori 1985
Garegnani 1990a
Kurz & Salvadori 1995
Schefold 1997a
Garegnani 2000
Schefold 2000
Gram 2001
Petri 2001

Table 1. *(continued)*

(f) ***Other Extensions***

Parrinello 1970 (international trade)
Clifton 1977 (industrial and corporate pricing)
Steedman 1977 (critique of Marxism)
Steedman 1979a (international trade)
Steedman 1979b (international trade)
Pasinetti 1981 (structural change)
Steedman and Metcalfe 1981 (international trade)
Gregory 1982 (economic development & anthropology)
Semmler 1984 (industrial and corporate pricing)
Schefold 1985a (environmental economics)
Steedman 1992 (critique of Kaleckian pricing)
Pasinetti 1993 (structural change)
Gehrke & Lager 1995 (environmental economics)
Hosoda 1996 (environmental economics)
Walsh 1996 (philosophy of economic approaches)
Giammanco 1998 (scarce resources & international trade)
Kurz & Salvadori 1998a (critique of endogenous growth theory)
Salvadori 1998 (critique of endogenous growth theory)
Kurz & Salvadori 1999 (critique of endogenous growth theory)
Steedman 1999 (international trade)
Hosoda 2000 (environmental economics)
Steedman *et al.* 2001 (exhaustible natural resources)

(b), (c) Two possible alternative 'closures' of the distribution system—via the accumulation rate or via the rate of interest—have also been systematically pursued, especially the former route. The essential basis of the former is that given the equilibrium equality between saving and investment, an equality can be postulated between the ratios of saving to the value of the capital stock, and investment to capital. If the latter ratio could be conceived of as an independently determined rate of accumulation, and the former decomposed into a distribution-weighted average of saving out of each functional income category, in a ratio to capital, then a causation from accumulation to distribution could be posited—the 'Cambridge Growth Equation' causation. On the other hand, the essential insight of the interest closure approach is that given the equalization of interest rates and profit rates (net of compensation for differential asset characteristics such as illiquidity and risk), if profit rates are free to vary in equilibrium, at least within limits, and interest can be independently determined in money markets—including, in the latter determination, central bank behaviour (monetary policy)—then a monetary determination of profit rates, and hence income distribution more widely, can be posited. The absence, so far, of a more considerable development of this latter programme is the most unfortunate omission from the Sraffian project as a whole—although further development of it properly should not amount to another theory of profit rate determination, different from the Cambridge Growth Equation, but similarly mechanical and indifferent to the role of wider social forces. It offers a firm analytical foundation for non-neutrality of money, and a coherent framework for money endogeneity (thereby opening up a definite analytical connection with Post-Keynesian economics; *vide* Rochon & Vernengo, 2001)—both notions widely attractive in non-orthodox circles. So long as only one degree of freedom is available for determining distribution, both of these approaches cannot be sound. A kind of synthesis, precisely via opening up an additional degree of freedom, has been suggested by Panico (1993, 1997).

(d) The possibility of a synthesis of Sraffian distribution and pricing determination and Keynesian employment and outputs determination began with Garegnani (1978–79, though written much earlier, with a version available in Italian in 1964–65, in turn derivative from the theoretical part of Garegnani, 1962; *vide* the note by Garegnani at Eatwell & Milgate, 1983, p. 21n). In the first instance, developments along this line involved the issue of whether Keynes's (and Kalecki's) effective demand approach to output could be embedded within a price-theoretic framework along classical-Sraffian lines. Demonstrating this *compatibility* has been a research programme in its own right—although logical compatibility of course is not proof of the soundness or sense of such a synthesis. Within the broad framework of this synthesis, one particular issue has more recently come into focus: essential to the effective demand approach to determining aggregate activity levels is the supposition of an element of demand which is at least partly autonomous with respect to supply, in the equilibration of output levels.[9] But what meaning can then be attached to any such idea of an autonomous demand, in the *long-period*

[9] Commonly, an autonomous investment demand has filled this role; but investment may not be the most plausible candidate for such autonomy in a long-period setting. It may be added here that the existence of a demand element that is not strictly constrained by (current) income points to the presupposition of a certain kind of 'elastic' financial system, for effective demand theories of output to make sense, in both short-period and long-period frameworks.

framework, which is the conceptual setting of Sraffian pricing theory? Does long-period autonomous demand make any sense? Showing that it does is an emerging sub-programme of the Sraffa-Keynes synthesis (Serrano, 1995; Trezzini, 1995, 1998; Park, 1997, 2000; Cesaratto *et al*., 2003).

Two final aspects of the Sraffian project may be noted:

(e) The critique of marginalism, which was fundamental to Sraffa's original intention (hence the subtitle of his little book, and also the earlier, narrower critique of Sraffa, 1925, 1926), remains of ongoing importance. Not least, this is precisely because the critique centred upon capital theory has not yet convinced a majority of the profession to abandon the orthodox approach. In addition, a view emerged among the orthodox that the Sraffian critique of orthodox capital-theoretic analysis was entirely valid, but only for a subset of orthodox approaches (e.g. Hahn, 1982). In particular, it has been proposed that intertemporal and temporary general equilibrium approaches with disaggregated capital endowments are immune to the Sraffian class of criticisms. This latter issue has not yet been clearly resolved. Key proponents of the Sraffian project have not conceded the point (e.g. Schefold, 1997a, 2000; Garegnani, 2000); but the significance of the capital critique for those classes of general equilibrium models is yet to receive the analytically transparent resolution of the earlier capital-theoretic debates.

(f) Finally, some other extensions of the Sraffian project may be noted—significant but not involving a substantial body of literature, to date. In many respects these also share in the critique dimension; e.g. capital theory in its application to the theory of international trade.

In addition to the literature noted in Table 1, other significant works that do not easily fall within one or other of these programmes include: Dobb (1973); *Political Economy: Studies in the Surplus Approach* (which was published as a series from 1985 to 1990: 6 volumes and 11 distinct numbers, in 1650 pages); some entries in Eatwell *et al.* (1987); the Piero Sraffa Memorial Issue in the *Cambridge Journal of Economics* (1988, vol. 12, no. 1); Steedman (1988a—which also reprints a number of the early reviews of Sraffa, 1960); Kurz (1990b); Potier (1991); Roncaglia (1991); Baranzini & Harcourt (1993); Schefold (1997b); the Special Issue to Commemorate the Centenary of the Birth of Piero Sraffa in the *Review of Political Economy* (1998, vol. 10, no. 4); some entries in Kurz & Salvadori (1998b); Roncaglia (2000); and Cozzi & Marchionatti (2001). It may be emphasized that the literature in Table 1 is not intended by any means as a comprehensive literature survey; it is a statement of key literature in the fields.[10] A quite comprehensive bibliography of Sraffa's own publications can be found in Roncaglia (1978, pp. 151–153). In addition, an edition of selected manuscripts from Sraffa's archive is in preparation—projected at approximately 2000 pages, under the general editorship of H. D. Kurz, by Cambridge University Press. It may be added that the prominent role, in particular, of the *Cambridge Journal of Economics*, *Contributions to Political Economy*, the *Manchester School* and *Metroeconomica* as vehicles for the public communication and preservation of this body of research is very evident—al-

[10] References are organized chronologically and alphabetically. Roncaglia (1978, pp. 154–171) provides a more extensive bibliography, to 1976.

though in the case of *Contributions*, more inclined to publication of Sraffian historical scholarship, so not so evident in the bibliography here. The *Journal of Post Keynesian Economics*, on the other hand, contains very little that could reasonably be called Sraffian.

How does all this sit with other non-orthodox approaches at the beginning of the 21st century? Three fairly distinct approaches were listed in the opening section: Post-Keynesianism, Marxism and Institutionalism.[11] On the first of the four sets of Sraffian fundamental propositions outlined in the previous section, Marxism would be in agreement, perhaps also Post-Keynesianism (although without really having any coherent theory of distribution), and the Kaleckian approach would be obliged to treat distribution as being as determinate and coherent as its mark-ups. On the second set of propositions, concerning relative prices, there would be a degree of affinity with Post-Keynesian economics—to the extent that it tends to treat equilibrium prices in terms of costs plus profit margins (rather than demand and supply). But it offers no coherent theory of costs—and little about profit margins either. The use of marked-up prices as an ad hoc device may be quite harmless for some limited purposes—so long as such mark-ups are not treated as given when their deeper underlying determinants change (e.g. a permanent change in interest rates or minimum real wages with no change in mark-ups would be senseless). Marxist approaches to some extent have endorsed Sraffa prices as a coherent statement of Marxian prices of production. At the end of the day, for a framework of capitalist production and exchange, with or without free competition (unrestricted capital mobility, together with profit maximization), it is impossible to write an equilibrium or normal price equation—or *any magnitude which itself depends upon such prices* (e.g. a sectoral capital–labour ratio or a real wage)—without the foundation of long-period distribution and value theory, which is at the heart of the Sraffian project. In particular, positing the notion of non-competitive pricing is to conceptualize a *departure* from competitive pricing, and therefore can only be understood in relation to a robust theory of long-period competitive prices (cf. Sylos-Labini, 1984, pp. 141–143; original published 1971).

On the third set of propositions, there would be very wide agreement among unorthodox approaches that effective demand is central to explaining activity and growth in mature capitalism; that demand-constrained activity levels are common or the norm. But it is one thing to endorse in common the effective demand approach to explaining activity levels; it is quite another to agree that the principle of effective demand should be articulated in a framework of long-period prices and distribution. Post-Keynesians in particular have disputed the appropriateness of conceptualizations along such lines, regarding long-period

[11] This is on the supposition that the Keynesian revolution and Kaleckian economics can be collapsed into Post-Keynesianism. Whether or not Sraffian economics should also be subsumed under the rubric of Post-Keynesian economics is a semantic question of not much importance from the viewpoint of substantive beliefs. In a recent defence of the coherence of Post-Keynesianism Arestis *et al.* (1999, pp. 544–546) are equivocal on this question, although ultimately choosing to exclude Sraffianism. A perusal of the Post-Keynesian literature of recent decades would also reveal some ambivalence on this. From the other (Sraffian) side, perhaps ‘Post-Keynesianism’ has been something of an occasional flag of convenience.

frameworks as such, as inappropriate for treating effective demand.[12] The Kaleckian element of Post-Keynesianism has naturally preferred mark-up prices to long-period prices—without seeing any need to explain mark-ups in relation to competitive prices, as embodying a deviation of prices from the latter, in the presence of restrictions to free competition. In an earlier comparison of Sraffian and Post-Keynesian views Lavoie (1992, pp. 61–68) sees more common ground—including a compatibility of short-period and long-period methods (quite rightly), as well as on value, money and output—although his discussion of production prices versus mark-up prices is compromised by the subsequent analysis of Steedman (1992), which demolishes the traditional partial equilibrium, Kaleckian approach to mark-ups (vertically integrated or otherwise), and the aggregate analyses which derive from that approach. In his useful commentary on Steedman (1992), Mainwaring (1992) also endorses the compatibility of short-term and long-period analyses—in particular, presenting a simple formal synthesis of short-run mark-up prices and long-period Sraffa prices. Marxian approaches, to the extent that production prices are still embraced by them, are more open to the combination of long-period prices and the principle of effective demand.

Finally, with regard to the monetary propositions under the fourth proposition in Section 2 above, there is first of all some tension within the Sraffian project itself: as indicated in Section 2, to the extent that in the Cambridge Growth Equation causation of the second of the five programmes listed in Table 1, the rate of capital accumulation is conceived of as determined independently of monetary phenomena, then a certain kind of neutrality of money would arise—although to be sure, different from that associated with marginalist orthodoxy. It would be akin to Ricardian neutrality, except that rates of interest in the monetary sphere would be governed by profit rates in production via prior determination of the accumulation rate rather than via prior determination of the real wage. The following minimal observation may be added. The independence of the rate of accumulation from the general rate of profit—a necessary condition for the Cambridge Growth Equation causation—could *only* occur under conditions of steady growth. With steady growth, the numerator of the rate of accumulation (net investment), and the denominator of the rate of accumulation (the capital stock), are collections of commodities in identical proportions, so that the accumulation rate is a pure number independent of relative prices—a

[12] Asimakopulos was perhaps the champion of this view—although Joan Robinson had started the 'Post-Keynesian' rejection of long-period theory. See the exchange between her (Robinson, 1979) and Garegnani (1979; also Garegnani, 1976, pp. 42–44; 1989). The memorial volume for Asimakopulos deals extensively with the issue (Harcourt *et al.*, 1995). Incidentally, once the notion of long-period equilibrium is abandoned, it becomes meaningless to ask of Post-Keynesians whether they endorse that effective demand explains activity levels in both the short period and the long period. (It thereby also becomes impossible to accept substantial parts of Keynes's intentions in the *General Theory*—articulated as they are, in long-period terms.) Then, the persistence of demand-constrained activity levels can be articulated only in terms of short-period equilibria which are more or less continually prone to destabilization. But what the *sequence* of such constrained (i.e. less than full, long-period) equilibria might be supposed to look like, has never been well-explained. Nor is it clear how the so-called Post-Keynesian growth theory fits into this anti-long-period stance.

ratio of two quantities of the same composite commodity. To that extent, steady growth amounts to a system in which just one, albeit composite, commodity is produced. In non-steady conditions, with the commodity composition of net investment different from the commodity composition of the capital stock, the rate of accumulation cannot be written down without recourse to prices—and hence cannot be written down without recourse to a general rate of profit embedded in prices (Vianello, 1985, pp. 86–87; Ciccone, 1986, pp. 20–21). It may be emphasized that this means the Cambridge Growth Equation causation could *never* apply outside the abstract and highly restrictive conditions of steady state growth: steady growth (or equivalently, a one-commodity world) is not merely a simple, 'first approximation' framework within which to articulate the theory; it is the *only* situation in which the causation could be proposed. It is an obvious irony that the 'Cambridge' growth theory should fall victim to the same formal difficulty as orthodox capital theory.

Putting aside this 'family dispute', which the present writer would resolve *against* the Cambridge Growth Equation causation, endogenous money now appears to be capable of commanding a consensus across Sraffian and Post-Keynesian positions—although as Pivetti (2001, pp. 104–106) has indicated, it can be rendered consistent with orthodox economics as well. The question that remains is the determination of the interest rate set by the monetary authorities, at which they accommodate monetary demands: are the authorities free (within constraints) to choose this rate; or is the rate instead imposed upon them, by other forces—and are those other forces, if they exist, 'real' forces in the traditional sense? The orthodox answer is clear; the Post-Keynesian view, less so (see also Lavoie, 1995, pp. 473, 474). A singular Post-Keynesian view perhaps does not exist. To the extent that the Cambridge Growth Equation approach is endorsed as a 'Post-Keynesian theory of distribution and growth', such Post-Keynesians end up also with a form of money neutrality, in which central banks (and money markets) could exercise no influence on interest rates, except temporarily—and hence no influence on profit rates and distribution more widely.[13] It could be thought that another line of divergence between Post-Keynesians and a Sraffian interest rate closure might turn upon the significance of liquidity preference for monetary approaches to interest. However, it seems doubtful that this is a matter of fundamental theoretical importance: it would merely involve the question of how best to theorize the term and risk structure of interest rates, along with other aspects of the rate structure (wholesale versus retail rates, borrowing versus lending rates, and so on)—not unimportant matters, but of second-order theoretical significance really. As Pivetti (1988, p. 282) allows, liquidity preference as expressed in money market sentiment also *may* constrain the choices open to monetary authorities, in the particular money market in which they conduct policy.

Nothing has been said so far about Institutionalism. How does it relate to the Sraffian propositions and programmes? In fact, Institutionalism exhibits no

[13] It may be noted that the separability of the first programme in Table 1, from the second and third, is evident enough from the fact that the former has been able to proceed without needing to decide the latter issue.

core *theoretical* propositions or beliefs at all: if it is a thing of any clear substance, it is much more a methodological *temper* than a doctrinal standpoint. There is no Institutionalist theory concerning distribution, value, activity levels, or money—although its scepticism concerning the optimality or desirability of unregulated market forces might incline a general doubt among adherents, concerning the efficacy of capitalism for generating adequate employment (and hence perhaps a tendency towards Keynesianism). But in its (i) lack of confidence in capitalist outcomes, (ii) interest in institutionalized power, (iii) pragmatic and problem-oriented approach to practising economics (and associated aversion to 'high theory'), and (iv) opposition to methodological individualism (as at least not sufficient to understanding social economy), Institutionalism makes no necessary or inevitable break with marginalism.[14] The first three of these attitudes are not incompatible with orthodox marginalist beliefs. The last is important and a point of common ground with non-orthodox positions; but by itself, this methodological disposition connotes no definite, substantive propositions about how the economy actually operates. From this vantage-point, Institutionalism can be read as a kind of cautionary tale for keeping theoretical economics of all kinds 'in their place' so to speak, a countervailing force to any outbreak or ascendancy of 'the [so called] Ricardian Vice' (Schumpeter, 1954, p. 473). To that extent, Institutionalism is compatible, and incompatible, with the Sraffian project—'it just depends'. The lack of doctrinal substance means that some Institutionalists may sympathize with that project, and some may not. Nevertheless, the attitude to theory associated with Garegnani (1984, pp. 296–299; or more expansively, 1987, pp. 561–563,[15] and

[14] Similar judgement can be applied to elements of 'evolutionary economics', while other parts of that project may end up offering something more substantial.

[15] Some quotations will illustrate the point. (For a critical, Sraffian, view of this methodological temper see Roncaglia, 1991, pp. 210–211; 2000, pp. 95–97, 100–105.) Discussing the analytical separability of the classical 'core' analysis (determination of the surplus and its distribution), from the wider set of economic phenomena and interactions:

> This separate study was the natural result of what was seen as the multiplicity of these [latter] influences and their variability according to circumstances. In fact this multiplicity and variability prevented the generalizations about them from assuming the form of quantitative relations of known general properties….
>
> …
>
> We may note how this more limited scope which the theory of value has in the classical theories [relative to marginalist theory] gives them the greater flexibility which seems required by a discipline like economics.
>
> …
>
> The above limitation of the theory of value in the classical authors appears to have been the result of an instinctive methodological adaptation to the requirements of economics, where, because of the impossibility of experiment and of the complexity and variability of the material, 'the function of analysis and deduction … is not to forge a few long chains of reasoning, but to forge rightly many short chains' [quoting Marshall]….
>
> In fact the flexibility resulting from the classical reasoning 'by stages' and the recognition it implies of the multiplicity and variability of the relations examined outside the 'core', appear to be a more or less conscious recognition of the role which broader social, institutional and political factors, in a word historical factors, play in economic phenomena, particularly in the spheres of distribution, accumulation and technical

alluded to in the final paragraph of Section 2 above), concerning the *limits* of general theory, surely has kinship with the Institutionalist methodological temper. However, perhaps at the end of the day many Institutionalists are saying no more than that orthodox theory should be utilized with care and with an appreciation of the concrete institutional circumstances of each particular application. This is a good temper to encourage; but it is not an alternative economics; and a bad theory well or seductively applied might simply make that bad theory spuriously more attractive (e.g., Marshall).

4. Orthodoxy and the Prospects for Non-Orthodoxy

The current tendencies in economics, for example, the new preoccupations with game-theoretic models of immense, ad hoc variety, might give the impression that research endeavours around production, choice of technique, capital theory, and so on—and, in particular, the use of these analyses for the critique of the traditional, orthodox core beliefs stated in the opening paragraph above—show the Sraffians to be 'still fighting the last war', so to speak. Orthodoxy has moved on, it might be said. In a quite significant sense the mainstream *has* taken on a definite postmodern tinge. Consider these difficult questions. What has become of the 'target', the object of Sraffian criticism, since (say) the 1966 *Quarterly Journal of Economics* symposium on capital theory or the 1985 conference marking 25 years since *Production of Commodities by Means of Commodities* (Bharadwaj & Schefold, 1990)? Is general equilibrium theory still the theoretic hard core of orthodoxy, of the discipline's central beliefs? What *is* orthodox belief now? Is the repositioning of the doing of 'normal (economic) science' around game theory a fundamental shift of orthodoxy, in terms of the *substance* of its beliefs? Or is it a mere reworking of the *same* fundamental beliefs in different analytical clothing—and perhaps with those core beliefs, as a result, now more submerged (and therefore more dangerous)? I am inclined to affirm the latter. Those who would be happy to characterize the critical dimension of the Sraffian project as a case of old soldiers still fighting the last war are wrong; but something significant *has* happened to orthodoxy in the last two decades. It may be just infection by postmodern nihilism, but it is no less a problem for that: it is hard to engage with an opponent who holds the same fundamental beliefs as he did 20 or 30 years ago, but no longer really *cares* about those beliefs, or about the relation of those beliefs to the actual world (and it should not be forgotten that the widespread acquiescence in those beliefs powerfully contributes to shaping the character of that actual world, which we all have to share with orthodox economists). The recent symposium on 'the progress of heterodox economics' (Coats *et al.*, 2000) has a recurring theme that is not without substance: orthodoxy has become more diffuse, more fragmented, more ad hoc, more detached, and less coherent. This is a postmodern temper—and is

Footnote continued

> change. The absence of this recognition from later economic theory has often been lamented. (Garegnani, 1987, pp. 562–563)

See also the comments on Sraffa, classical economics and the Historical School by Schefold (1997b, pp. 13–14, 389–391).

illustrative that postmodernism easily can have a reactionary or conservative character and function, if it so chooses.[16]

Certainly the orthodox target has become more elusive in some respects. But this does appear to be largely a submergence of the same traditional belief system: the old orthodox verities remain bedrock convictions very widely endorsed. They have not been abandoned; the entertaining of debate around them has been abandoned. The persistence of entirely traditional orthodox views can be seen in one particular— entirely representative, although perhaps particularly blunt—recent elementary textbook, by a distinguished member of the profession (Blanchard, 1997). In an epilogue (entitled 'The Core') which appears at the end of the text proper, the author notes five basics sets of propositions about which there is apparently no disagreement in macroeconomics. All (legitimate?) disagreements are understood to occur *within* the framework of these principles, these disagreements pertaining to just two issues: 'the length of the "short run" ' and 'the role of policy'. For those familiar with conventional macroeconomics these five principles may be described as 'the usual suspects':

(i) 'In the short run, shifts in aggregate demand affect output.'
(ii) 'Expectations play a major role in determining the behavior of the economy. How people … respond to … policy determines … the economy's response to the [policy] change.'
(iii) 'In the long run, output returns to its natural level … [which] depends on the natural rate of unemployment … the size of the labor force … the capital stock, and … the state of technology.'
(iv) 'Monetary policy affects output in the short run and medium run, but not in the long run …[:] money growth eventually translates one for one into … inflation.'
(v) 'Fiscal policy has … short- and long-run effects on output … [but higher] deficits are likely to increase activity in the short run … [and] decrease capital accumulation and output in the long run.' (Blanchard, 1997, pp. 620–621)

It might almost be welcome to be able to believe that Blanchard's five principles are merely intended as useful half-truths for beginners; but this is not so. On the basis of the fundamental Sraffian propositions enunciated in Section 2 above, only the first two of these could be endorsed—and the second is in fact little more than an empty formalism, if not a tautology (given that 'people' make up 'the economy'). The latter three would be rejected;[17] and those three

[16] I mean, here, reactionary or conservative in the intellectual sense—though relativism is by no means intrinsically or naturally progressive *politically*, either. On the postmodernism of contemporary orthodoxy, see Dow's contribution in Coats *et al.* (2000, p. 159). The contributors to this symposium, incidentally, are inclined to see the defining characteristic of orthodoxy as formal or methodological—whereas my definition in Section 1 above is more substantive, or doctrinal.

[17] The possible exception to this is Blanchard's fourth proposition—if the Cambridge Growth Equation causation is endorsed, and conceived of as a kind of non-marginalist form of neutrality. However, such a view would not entail full labour employment, any more than did Ricardian neutrality of money. It may be noted in addition, notwithstanding Blanchard, that the long-run element of the fifth proposition in fact really does not command even an *orthodox* consensus, not even when expressed merely as a likelihood. For a valuable critical analysis of the various orthodox routes via which fiscal contraction may be supposed capable of expanding equilibrium short-run or long-run aggregate output see Barba (2001).

propositions, and the rejection of them, hinge upon the same singular issue: the question of whether there exists some 'natural' tendency for a market economy to converge upon a market-clearing outcome in which involuntary or demand-deficient unemployment is impossible (Aspromourgos, 2001, pp. 15–16). The error in this and the related three Blanchard principles derives, of course, from faulty underlying microeconomic and general equilibrium theoretical structures.

In 1966, if not 1985, a reasonable person not prone to excessive optimism would have expected the state of economics to be better in 2000 than it turned out to be; that is to say, with the mainstream *less* in thrall to marginalism than previously, not *more* acquiescent. The actual outcome is definitely a failure of some kind. To whom should the failure be attributed: the Sraffians, the other non-orthodox, and/or the orthodox? Errors occurred in the Sraffian camp. But it may be said with regard to the Sraffian project as whole, that much of its fundamental programmes has successfully proceeded and developed, from the point of departure provided by Sraffa's 1960 'prelude'. This is not to say that nothing remains to be done in relation to the fundamental Sraffian propositions listed in Section 2 above—and one of course would be glad to see progress accelerated via more intellectual workers in the field. Intellectual problems remain with regard to joint production, including scarce natural renewable and non-renewable (exhaustible) resources; the stability properties of long-period prices; autonomous demand and accumulation in the long period and long run; a more formal expression of the notion of the interest rate as a conventional phenomenon in the Sraffa–Keynes framework with non-neutrality; the critique of general equilibrium theory; and no doubt other matters. But allowing that, one may say that 'the decks are cleared' for a rational and objectively based political economy to go forward, on well-laid analytical foundations contributed by the Sraffian project and research programmes—foundations that will endure in theoretical significance for as long as does competition among capitals. Whether the profession—in its dominant orthodox element, or in its other unorthodox elements—pursues this offered lead is the intellectual responsibility of those who make up those several elements. Still, it could be concluded that the current hegemony of marginalism is unlikely to persist indefinitely; in the end, it is too humanly unsatisfying an account of us, and how we live. Or is it always to be that an intellectual discipline so intimately involved with material interests inevitably will be marred by false consciousness? One might point to Ricardo as evidence for the possibility of non-mystifying economics. Or was a David Ricardo only possible in a time *before* economic analysis became an institutionalized element of the structure of social governance? In any case, real success will not be a willingness of the marginalist camp to give more professional space to the unorthodox in general or Sraffians in particular; it will be, in particular, when Sraffian propositions are no longer Sraffian propositions, but 'just' generally accepted propositions of economic science as such.

Acknowledgements

This is a revised version of an address given at the University of Athens in March 2002. The author is indebted to participants there, as well as

P. Garegnani, C. Gehrke, H. D. Kurz, S. Parrinello, A. Roncaglia, B. Schefold, G. K. White, participants in a seminar at the Centro Sraffa, Università di Roma Tre and two referees, for comments. More than usually, it must be emphasized that this does not implicate any of them in the argument or final product.

References

Abraham-Frois, G. & Berrebi, E. (1979) *Theory of Value, Prices and Accumulation: a Mathematical Integration of Marx, von Neumann and Sraffa* (Cambridge: Cambridge University Press; French edn 1976).

Abraham-Frois, G. & Berrebi, E. (1997) *Prices, Profits and Rhythms of Accumulation* (Cambridge: Cambridge University Press; revised from French edn 1987).

Arestis, P., Dunn, S. P. & Sawyer, M. (1999) Post Keynesian economics and its critics, *Journal of Post Keynesian Economics,* 21, pp. 527–549.

Aspromourgos, T. (1986) On the origins of the term 'neoclassical', *Cambridge Journal of Economics,* 10, pp. 265–270.

Aspromourgos, T. (2001) Is labour cheapening a means to reducing involuntary (labour) unemployment, *History of Economics Review*, 34, pp. 7–18.

Baldone, S. (1980) Fixed capital in Sraffa's theoretical scheme, in: L. L. Pasinetti (Ed.) *Essays on the Theory of Joint Production* (London: Macmillan; Italian version 1974).

Baldone, S. (1984) From surrogate to pseudo production functions, *Cambridge Journal of Economics,* 8, pp. 271–288 (reprinted in Steedman, 1988a).

Baranzini, M. (1991) *A Theory of Wealth Distribution and Accumulation* (Oxford: Clarendon).

Baranzini, M. & Harcourt, G. C. (Eds) (1993) *The Dynamics of the Wealth of Nations: Growth, Distribution and Structural Change. Essays in Honour of Luigi Pasinetti* (New York: St Martin's Press).

Barba, A. (2001) Rethinking expansionary fiscal retrenchments, *Contributions to Political Economy,* 20, pp. 57–86.

Bellino, E. (1993) Continuous switching of techniques in linear production models, *The Manchester School,* 61, pp. 185–201.

Bharadwaj, K. (1970) On the maximum number of switches between two production systems, *Schweizerische Zeitschrift für Volkswirtschaft und Statistik,* 106, pp. 409–429 (reprinted in Steedman, 1988a).

Bharadwaj, K. & Schefold, B. (Eds) (1990) *Essays on Piero Sraffa: Critical Perspectives on the Revival of Classical Theory* (London: Unwin Hyman).

Bidard, C. (Ed.) (1984) *La Production Jointe: Nouveaux Débats* (Paris: Economica).

Bidard, C. (1986) The maximum rate of profits in joint production, *Metroeconomica,* 38, pp. 53–66.

Bidard, C. (1991) *Prix, Reproduction, Rareté* (Paris: Dunod).

Bidard, C. & Franke, R. (1987) On the existence of long-term equilibria in the two-class Pasinetti-Morishima model, *Ricerche Economiche,* 41, pp. 3–21 (reprinted in Panico & Salvadori, 1993).

Blanchard, O. J. (1997) *Macroeconomics* (New Jersey: Prentice Hall).

Boggio, L. (1985) On the stability of production prices, *Metroeconomica,* 37, pp. 241–267.

Boggio, L. (1992) Production prices and dynamic stability: results and open questions, *The Manchester School,* 60, pp. 264–294.

Caminati, M. & Petri, F. (Eds) (1990) *Convergence to Long-Period Positions: Proceedings of a Workshop, Political Economy: Studies in the Surplus Approach*, 6, pp. 5–359 (with contributions by M. Caminati, L. Boggio, P. Flaschel, B. Schefold, W. Semmler, G. Duménil & D. Lévy, P. Garegnani and others).

Cesaratto, S., Serrano, F. & Stirati, A. (2003) Technical change, effective demand and employment, *Review of Political Economy,* 15, pp. 33–52.

Ciccone, R. (1986) Accumulation and capacity utilization: some critical considerations on Joan Robinson's theory of distribution, *Political Economy: Studies in the Surplus Approach,* 2, pp. 17–36 (reprinted in Bharadwaj & Schefold, 1990).

Clifton, J. A. (1977) Competition and the evolution of the capitalist mode of production, *Cambridge Journal of Economics,* 1, pp. 137–151.

Coats, A. W. et al. (2000) Roundtable: the progress of heterodox economics, *Journal of the History of Economic Thought,* 22, pp. 145–190 (with contributions by R. E. Backhouse, S. C. Dow and others).

Cozzi, T. & Marchionatti, R. (Eds) (2001) *Piero Sraffa's Political Economy: a Centenary Estimate* (London: Routledge).

D'Agata, A. (1983) The existence and unicity of cost-minimizing systems in intensive rent theory, *Metroeconomica,* 35, pp. 147–158.

D'Agata, A. (1984) Molteplicità di merci agricole e rendita differenziale estensiva, *Ricerche Economiche,* 38, pp. 78–94.

Dobb, M. H. (1973) *Theories of Value and Distribution Since Adam Smith: Ideology and Economic Theory* (Cambridge: Cambridge University Press).

Duménil, G. & Lévy, D. (1985) The classicals and the neoclassicals: a rejoinder to Frank Hahn, *Cambridge Journal of Economics,* 9, pp. 327–345.

Eatwell, J. (1983) The long-period theory of employment, *Cambridge Journal of Economics,* 7, pp. 269–285.

Eatwell, J. & Milgate, M. (Eds) (1983) *Keynes's Economics and the Theory of Value and Distribution* (London: Duckworth).

Eatwell, J., Milgate, M. & Newman, P. (Eds) (1987) *The New Palgrave: a Dictionary of Economics*, 4 vols (London: Macmillan).

Editorial Committee *et al.* (1988) Four questions on joint production, *Political Economy: Studies in the Surplus Approach,* 4, pp. 176–250 (with contributions by S. Baldone, G. Duménil & D. Lévy, M. Lippi, N. Salvadori, I. Steedman, B. Schefold & P. Varri).

Fazi, E. & Salvadori, N. (1981) The existence of a two-class economy in the Kaldor model of growth and distribution, *Kyklos,* 34, pp. 582–591 (reprinted in Panico & Salvadori, 1993).

Fazi, E. & Salvadori, N. (1985) The existence of a two-class economy in a general Cambridge model of growth and distribution, *Cambridge Journal of Economics,* 9, pp. 155–164 (reprinted in Panico & Salvadori, 1993).

Franke, R. (1985) On the upper- and lower-bounds of workers' propensity to save in a two-class Pasinetti economy, *Australian Economic Papers,* 24, pp. 271–277 (reprinted in Panico & Salvadori, 1993).

Franke, R. (1986) Some problems concerning the notion of cost-minimizing systems in the framework of joint production, *The Manchester School,* 54, pp. 298–307 (reprinted in Steedman, 1988 and in Salvadori & Steedman, 1990).

Franke, R. (1988) Integrating the financing of production and a rate of interest into production price models, *Cambridge Journal of Economics,* 12, pp. 257–272.

Franke, R. (2000) Optimal utilization of capital and a financial sector in a classical gravitation process, *Metroeconomica,* 51, pp. 40–66.

Garegnani, P. (1960) *Il Capitale nelle Teorie della Distribuzione* (Milano, Giuffrè).

Garegnani, P. (1962) *Il Problema della Domanda Effettiva nello Sviluppo Economico Italiano* (Roma: Associazione per lo Sviluppo dell'industria nel Mezzogiorno [SVIMEZ]).

Garegnani, P. (1964–65) Note su consumi, investimenti e domanda effettiva, *Economia Internazionale,* 17 & 18, pp. 591–631 & pp. 575–617.

Garegnani, P. (1966) Switching of techniques, *Quarterly Journal of Economics,* 80, pp. 554–567 (reprinted in Steedman, 1988a).

Garegnani, P. (1970) Heterogeneous capital, the production function and the theory of distribution, *Review of Economic Studies,* 37, pp. 407–436 (reprinted in E. K. Hunt & J.G. Schwartz (Eds) (1972) *A Critique of Economic Theory* (Harmondsworth, UK: Penguin); and in Steedman, 1988a).

Garegnani, P. (1976) On a change in the notion of equilibrium in recent work on value and distribution: a comment on Samuelson, in: M. Brown, K. Sato & P. Zarembka (Eds) *Essays in Modern Capital Theory* (Amsterdam: North-Holland) (reprinted in Eatwell & Milgate, 1983).

Garegnani, P. (1978–79) Notes on consumption, investment and effective demand, *Cambridge Journal of Economics,* 2 & 3, pp. 335–353 & pp. 63–82 (reprinted in Eatwell & Milgate, 1983).
Garegnani, P. (1979) Notes on consumption, investment and effective demand: a reply to Joan Robinson, *Cambridge Journal of Economics,* 3, pp. 181–187 (reprinted in Eatwell & Milgate, 1983).
Garegnani, P. (1983) Two routes to effective demand: comment on Kregel, in: J. Kregel (Ed.) *Distribution, Effective Demand and International Economic Relations* (London: Macmillan).
Garegnani, P. (1984) Value and distribution in the classical economists and Marx, *Oxford Economic Papers,* 36, pp. 291–325.
Garegnani, P. (1987) Surplus approach to value and distribution, in: J. Eatwell, M. Milgate & P. Newman (Eds) *The New Palgrave: a Dictionary of Economics*, Vol. 4 (London: Macmillan).
Garegnani, P. (1988) Capital and effective demand, in: A. Barrère (Ed) *The Foundations of Keynesian Analysis* (London: Macmillan).
Garegnani, P. (1989) Some notes on capital, expectations and the analysis of changes, in: G. R. Feiwel (Ed) *Joan Robinson and Modern Economic Theory* (London: Macmillan).
Garegnani, P. (1990a) Quantity of capital, in: J. Eatwell, M. Milgate & P. Newman (Eds) *The New Palgrave: Capital Theory* (London: Macmillan).
Garegnani, P. (1990b) Sraffa: classical versus marginalist analysis, in: K. Bharadwaj & B., Schefold (Eds) *Essays on Piero Sraffa: Critical Perspectives on the Revival of Classical Theory* (London: Unwin Hyman).
Garegnani, P. (1992) Some notes for an analysis of accumulation, in: J. Halevi, D. Laibman & E. J. Nell (Eds) *Beyond the Steady State: a Revival of Growth Theory* (New York: St Martin's Press).
Garegnani, P. (2000) Savings, investment and capital in a system of general intertemporal equilibrium (with a mathematical note by M. Tucci), in: H. D. Kurz (Ed.) *Critical Essays on Piero Sraffa's Legacy in Economics* (Cambridge: Cambridge University Press).
Gehrke, C. & Lager, C. (1995) Environmental taxes, relative prices and choice of technique in a linear model of production, *Metroeconomica,* 46, pp. 127–145.
Giammanco, M. D. (1998) Scarcity of resources in a Sraffian framework of international trade, *Metroeconomica,* 49, pp. 300–318.
Gram, H. (2001) Critical comments on André Burgstaller's *Property and Prices: Toward a Unified Theory of Value*, *Metroeconomica,* 52, pp. 149–161.
Gregory, C. A. (1982) *Gifts and Commodities* (London: Academic Press).
Groenewegen, P. D. (2001) Thomas Carlyle, 'the dismal science', and the contemporary political economy of slavery, *History of Economics Review*, 34, pp. 74–94.
Hagemann, H. & Kurz, H. D. (1976) The return of the same truncation period and reswitching of techniques in neo-Austrian and more general models, *Kyklos,* 29, pp. 678–708 (reprinted in Steedman, 1988a).
Hahn, F. (1982) The neo-Ricardians, *Cambridge Journal of Economics,* 6, pp. 353–374.
Harcourt, G. C. (1969) Some Cambridge controversies in the theory of capital, *Journal of Economic Literature,* 7, pp. 369–405.
Harcourt, G. C. (1972) *Some Cambridge Controversies in the Theory of Capital* (Cambridge: Cambridge University Press).
Harcourt, G. C. & Laing, N. F. (Eds) (1971) *Capital and Growth: Selected Readings* (Harmondsworth: Penguin).
Harcourt, G. C., Roncaglia, A. & Rowley, R. (Eds) (1995) *Income and Employment in Theory and Practice: Essays in Memory of Athanasios Asimakopulos* (London: Macmillan).
Hosoda, E. (1996) An environmental restriction and income distribution in a capitalist economy, *Metroeconomica,* 47, pp. 236–265.
Hosoda, E. (2000) Material cycle, waste disposal and recycling in a Leontief-Sraffa-von Neumann economy, *Journal of Material Cycles and Waste Management,* 2, pp. 1–9.
Hunt, E. K. & Schwartz, J. G. (Eds) (1972) *A Critique of Economic Theory* (Harmondsworth: Penguin).
Keynes, J.M. (1936) *The General Theory of Employment, Interest and Money* (London: Macmillan).

Keynes, J.M. (1937) Alternative theories of the rate of interest, *Economic Journal,* 47, pp. 241–252.

Kurz, H. D. (1978) Rent theory in a multisectoral model, *Oxford Economic Papers,* 30, pp. 16–37 (reprinted in Steedman, 1988a; and in Kurz, 1990b).

Kurz, H. D. (1985) Effective demand in a 'classical' model of value and distribution: the multiplier in a Sraffian framework, *The Manchester School,* 53, pp. 121–137 (reprinted in Kurz, 1990b).

Kurz, H. D. (1986) 'Normal' positions and capital utilization, *Political Economy: studies in the surplus approach,* 2, pp. 37–54 (reprinted in Kurz, 1990b).

Kurz, H. D. (1990a) Accumulation, distribution and the 'Keynesian hypothesis', in: K. Bharadwaj & B. Schefold (Eds) (1990) *Essays on Piero Sraffa: critical perspectives on the revival of classical theory* (London: Unwin Hyman).

Kurz, H. D. (1990b) *Capital, Distribution and Effective Demand: Studies in the 'Classical' Approach to Economic Theory* (Cambridge, UK: Polity).

Kurz, H. D. (1994) Growth and distribution, *Review of Political Economy,* 6, pp. 393–420.

Kurz, H. D. (1995) The Keynesian project: Tom Asimakopulos and 'the other point of view', in: G. C. Harcourt, A. Roncaglia & R. Rowley (Eds) *Income and Employment in Theory and Practice: Essays in Memory of Athanasios Asimakopulos* (London: Macmillan).

Kurz, H. D. & Salvadori, N. (1994) Choice of technique in a model with fixed capital, *European Journal of Political Economy,* 10, pp. 545–569.

Kurz, H. D. & Salvadori, N. (1995) *Theory of Production: a Long-Period Analysis* (Cambridge: Cambridge University Press).

Kurz, H. D. & Salvadori, N. (1998a) 'Endogenous' growth models and the 'classical' tradition, in: H. D. Kurz & N. Salvadori (Eds) *Understanding 'Classical' Economics: Studies in Long-Period Theory* (London: Routledge).

Kurz, H. D. & Salvadori, N. (Eds) (1998b) *The Elgar Companion to Classical Economics*, 2 vols (Cheltenham, UK: Elgar).

Kurz, H. D. & Salvadori, N. (1999) Theories of 'endogenous' growth in historical perspective, in: M. R. Sertel (Ed) *Contemporary Economic Issues: Proceedings of the Eleventh World Congress of the International Economic Association, Tunis*, Vol. 4 (*Economic Behaviour and Design*), (London: Macmillan).

Lager, C. (2001) Joint production with 'restricted free disposal', *Metroeconomica,* 52, pp. 49–78.

Laing, N. F. (1969) Two notes on Pasinetti's theorem, *Economic Record,* 45, pp. 373–385.

Lavoie, M. (1992) Towards a new research programme for Post-Keynesianism and neo-Ricardianism, *Review of Political Economy,* 4, pp. 37–78.

Lavoie, M. (1995) Interest rates in Post-Keynesian models of growth and distribution, *Metroeconomica,* 46, pp. 146–177.

Levrini, E. (1988) Joint production: review of some studies on Sraffa's system, *Political Economy: Studies in the Surplus Approach,* 4, pp. 159–175.

Lippi, M. (1979) *I Prezzi di Produzione: un Saggio sulla Teoria di Sraffa* (Bologna: Il Mulino).

Mainwaring, L. (1984) *Value and Distribution in Capitalist Economies: an Introduction to Sraffian Economics* (Cambridge: Cambridge University Press).

Mainwaring, L. (1992) Steedman's critique: a tentative response from a tentative Kaleckian, *Review of Political Economy,* 4, pp. 171–177.

Manara, C. F. (1980) Sraffa's model for the joint production of commodities by means of commodities, in: L. L. Pasinetti (Ed) *Essays on the Theory of Joint Production* (London: Macmillan; Italian version 1968).

Metcalfe, J. S. & Steedman, I. (1972) Reswitching and primary input use, *Economic Journal,* 82, pp. 140–157 (reprinted in Steedman, 1979a; and in Steedman, 1988a).

Metcalfe, J. S. & Steedman, I. (1977) Reswitching, primary inputs and the Heckscher-Ohlin-Samuelson theory of trade, *Journal of International Economics,* 7, pp. 201–208 (reprinted in Steedman, 1979a).

Milgate, M. (1982) *Capital and Employment: a Study of Keynes's Economics* (London: Academic Press).

Milgate, M. (1987) Neo-Ricardianism, in: J. Eatwell, M. Milgate & P. Newman (Eds) *The New Palgrave: a Dictionary of Economics*, Vol. 3 (London: Macmillan).

Montani, G. (1975) Scarce natural resources and income distribution, *Metroeconomica,* 27, pp. 68–101 (reprinted in Steedman, 1988a).
Panico, C. (1988) *Interest and Profit in the Theories of Value and Distribution* (London: Macmillan).
Panico, C. (1993) Two alternative approaches to financial model building, *Metroeconomica,* 44, pp. 93–133.
Panico, C. (1997) Government deficits in Post-Keynesian theories of growth and distribution, *Contributions to Political Economy,* 16, pp. 61–86.
Panico, C. & Salvadori, N. (Eds) (1993) *Post Keynesian Theory of Growth and Distribution* (Aldershot: Elgar).
Park, M.-S. (1997) Accumulation, capacity utilisation and distribution, *Contributions to Political Economy,* 16, pp. 87–101.
Park, M.-S. (2000) Autonomous demand and the warranted rate of growth, *Contributions to Political Economy,* 19, pp. 1–18.
Parrinello, S. (1970) Introduzione ad una teoria neoricardiana del commercio internazionale, *Studi Economici,* 25, pp. 267–321.
Parrinello, S. (1983) Exhaustible natural resources and the classical method of long-period equilibrium, in: J. Kregel (Ed.) *Distribution, Effective Demand and International Economic Relations* (London: Macmillan).
Pasinetti, L. L. (1962) Rate of profit and income distribution in relation to the rate of economic growth, *Review of Economic Studies,* 29, pp. 267–279 (reprinted in Panico & Salvadori, 1993).
Pasinetti, L. L. (1965) A new theoretical approach to the problems of economic growth, *Pontificiae Academiae Scientiarum Scripta Varia*, 28, pp. 571–696; reprinted in *The Econometric Approach to Development Planning* (Amsterdam: North-Holland, 1965).
Pasinetti, L. L. (1966) Changes in the rate of profit and switches of techniques, *Quarterly Journal of Economics,* 80, pp. 503–517 (reprinted in Steedman, 1988a).
Pasinetti, L. L. (1969) Switches of technique and the 'rate of return' in capital theory, *Economic Journal,* 79, pp. 508–531 (reprinted in Steedman, 1988a; and partly in Harcourt & Laing, 1971).
Pasinetti, L. L. (1973) The notion of vertical integration in economic analysis, *Metroeconomica,* 25, pp. 1–29 (reprinted in Pasinetti, 1980; and in Steedman, 1988a).
Pasinetti, L. L. (1974) *Growth and Distribution: Essays in Economic Theory* (Cambridge: Cambridge University Press).
Pasinetti, L. L. (1977) *Lectures on the Theory of Production* (New York: Columbia University Press; Italian edn 1975).
Pasinetti, L. L. (Ed.) (1980) *Essays on the Theory of Joint Production* (London: Macmillan; Italian edn 1977).
Pasinetti, L. L. (1981) *Structural Change and Economic Growth: a Theoretical Essay on the Dynamics of the Wealth of Nations* (Cambridge: Cambridge University Press).
Pasinetti, L. L. (1983) Conditions of existence of a two class economy in the Kaldor and more general models of growth and distribution, *Kyklos,* 36, pp. 91–101 (reprinted in Panico & Salvadori, 1993).
Pasinetti, L. L. (1986) Sraffa's circular process and the concept of vertical integration, *Political Economy: Studies in the Surplus Approach,* 2, pp. 3–16 (reprinted in Bharadwaj & Schefold, 1990).
Pasinetti, L. L. (1988) Sraffa on income distribution, *Cambridge Journal of Economics,* 12, pp. 135–138.
Pasinetti, L. L. (1990) Comment [on Pivetti (1985)], in: K. Bharadwaj & B. Schefold (Eds) *Essays on Piero Sraffa: Critical Perspectives on the Revival of Classical Theory* (London: Unwin Hyman).
Pasinetti, L. L. (1993) *Structural Economic Dynamics: a Theory of the Economic Consequences of Human Learning* (Cambridge: Cambridge University Press).
Petri, F. (1978) The difference between long-period and short-period general equilibrium and the capital theory controversy, *Australian Economic Papers,* 17, pp. 246–260.

Petri, F. (2001) Burgstaller on the common core of classical and Walrasian economics, *Metroeconomica,* 52, pp. 162–180.
Piccioni, M. (1997) Joint production and gravitation, *Contributions to Political Economy,* 16, pp. 103–118.
Pivetti, M. (1985) On the monetary explanation of distribution, *Political Economy: Studies in the Surplus Approach,* 1 (no. 2), pp. 73–103 (reprinted in Bharadwaj & Schefold, 1990).
Pivetti, M. (1988) On the monetary explanation of distribution: a rejoinder to Nell and Wray, *Political Economy: Studies in the Surplus Approach,* 4, pp. 275–283.
Pivetti, M. (1990) Reply [to Pasinetti (1990)], in: K. Bharadwaj & B. Schefold (Eds) *Essays on Piero Sraffa: Critical Perspectives on the Revival of Classical Theory* (London: Unwin Hyman).
Pivetti, M. (1991) *An Essay on Money and Distribution* (New York: St Martin's Press).
Pivetti, M. (2001) Money endogeneity and monetary non-neutrality: a Sraffian perspective, in: L.-P. Rochon & M. Vernengo (Eds) *Credit, Interest Rates and the Open Economy: Essays on Horizontalism* (Cheltenham, UK: Elgar).
Potier, J.-P. (1991) *Piero Sraffa – Unorthodox Economist (1898–1983): a Biographical Essay* (London: Routledge; French edn 1987).
Quadrio Curzio, A. (1967) *Rendita e Distribuzione in un Modello Economico Plurisettoriale* (Milano: Giuffrè).
Quadrio Curzio, A. (1980) Rent, income distribution, and orders of efficiency and rentability, in: L. L. Pasinetti (Ed.) *Essays on the Theory of Joint Production* (London: Macmillan; Italian version, 1977).
Quadrio Curzio, A. (1986) Technological scarcity: an essay on production and structural change, in: M. Baranzini & R. Scazzieri (Eds) *Foundations of Economics: Structures of Inquiry and Economic Theory* (Oxford, Blackwell).
Quadrio Curzio, A. & Pellizzari, F. (1999) *Rent, Resources, Technologies* (Berlin: Springer-Verlag; Italian edn 1996).
Robinson, J. (1979) Garegnani on effective demand, *Cambridge Journal of Economics,* 3, pp. 179–180 (reprinted in Eatwell & Milgate, 1983).
Rochon, L.-P. & Vernengo, M. (Eds) (2001) *Credit, Interest Rates and the Open Economy: Essays on Horizontalism* (Cheltenham: Elgar).
Roncaglia, A. (1978) *Sraffa and the Theory of Prices* (New York: Wiley; Italian edn 1975).
Roncaglia, A. (1988) The neo-Ricardian approach and the distribution of income, in: A. Asimakopulos (Ed.) *Theories of Income Distribution* (Boston: Kluwer).
Roncaglia, A. (1991) The Sraffian schools, *Review of Political Economy,* 3, pp. 187–219; reprinted and revised in: A. Roncaglia, *Piero Sraffa: His Life, Thought and Cultural Heritage* (London: Routledge, 2000).
Roncaglia, A. (1995) On the compatibility between Keynes's and Sraffa's viewpoints on output levels, in: G. C. Harcourt, A. Roncaglia & R. Rowley (Eds) *Income and Employment in Theory and Practice: Essays in Memory of Athanasios Asimakopulos* (London: Macmillan).
Roncaglia, A. (2000) *Piero Sraffa: His Life, Thought and Cultural Heritage* (London: Routledge).
Rowthorn, B. (1974) Neo-classicism, neo-Ricardianism and Marxism, *New Left Review*, 86, pp. 63–87 (reprinted in Rowthorn, 1980).
Rowthorn, B. (1980) *Capitalism, Conflict and Inflation: Essays in Political Economy* (London: Lawrence & Wishart).
Rymes, T. K. (1989) *Keynes's Lectures, 1932–35. Notes of a Representative Student: a Synthesis of Lecture Notes Taken by Students at Keynes's Lectures in the 1930s Leading Up to the Publication of* The General Theory (London: Macmillan).
Salvadori, N. (1980) On a generalized von Neumann model, *Metroeconomica,* 32, pp. 51–62.
Salvadori, N. (1982) Existence of cost-minimizing systems within the Sraffa framework, *Zeitschrift für Nationalökonomie,* 42, pp. 281–298 (reprinted in Steedman, 1988a).
Salvadori, N. (1983) On a new variety of rent, *Metroeconomica,* 35, pp. 73–85.
Salvadori, N. (1985) Switching in methods of production and joint production, *The Manchester School,* 53, pp. 156–178 (reprinted in Steedman, 1988a).
Salvadori, N. (1986) Land and choice of techniques within the Sraffa framework, *Australian Economic Papers,* 25, pp. 94–105.

Salvadori, N. (1988a) Fixed capital within a von Neumann–Morishima model of growth and distribution, *International Economic Review,* 29, pp. 341–351 (reprinted in Panico & Salvadori, 1993).
Salvadori, N. (1988b) Fixed capital within the Sraffa framework, *Zeitschrift für Nationalökonomie,* 48, pp. 1–17 (reprinted in Salvadori & Steedman, 1990).
Salvadori, N. (1988c) The existence of a two-class economy in a general Cambridge model of growth and distribution: an addendum, *Cambridge Journal of Economics,* 12, pp. 273–278.
Salvadori, N. (1991) Post-Keynesian theory of distribution in the long run, in: E. J. Nell & W. Semmler (Eds) *Nicholas Kaldor and Mainstream Economics: Confrontation or Convergence*? (New York: St. Martin's Press).
Salvadori, N. (1995) 'Demand' in *Production of Commodities by Mean of Commodities*, in: G. C. Harcourt, A. Roncaglia & R. Rowley (Eds) *Income and Employment in Theory and Practice: Essays in Memory of Athanasios Asimakopulos* (London: Macmillan).
Salvadori, N. (1998) A linear multisector model of 'endogenous' growth and the problem of capital, *Metroeconomica,* 49, pp. 319–335.
Salvadori, N. (2000) Sraffa on demand: a textual analysis, in: H. D. Kurz (Ed.) *Critical Essays on Piero Sraffa's Legacy in Economics* (Cambridge: Cambridge University Press).
Salvadori, N. & Steedman, I. (1988) Joint production analysis in a Sraffian framework, *Bulletin of Economic Research,* 40, pp. 165–195 (reprinted in Salvadori & Steedman, 1990).
Salvadori, N. & Steedman, I. (Eds) (1990) *Joint Production of Commodities* (Aldershot: Elgar).
Schefold, B. (1976a) Different forms of technical progress, *Economic Journal,* 86, pp. 806–819 (reprinted in Schefold, 1997b).
Schefold, B. (1976b) Reduction to dated quantities of labour, roundabout processes, and switches of techniques in fixed capital systems, *Metroeconomica,* 28, pp. 1–15 (reprinted in Steedman, 1988a; and in Schefold, 1997b).
Schefold, B. (1976c) Relative prices as a function of the rate of profit: a mathematical note, *Zeitschrift für Nationalökonomie,* 36, pp. 21–48 (reprinted in Steedman, 1988a; and in Schefold, 1997b).
Schefold, B. (1978a) Fixed capital as a joint product, *Jahrbücher für Nationalökonomie und Statistik,* 192, pp. 415–439 (reprinted in Salvadori & Steedman, 1990; and in Schefold, 1997b).
Schefold, B. (1978b) Multiple product techniques with properties of single product systems, *Zeitschrift für Nationalökonomie,* 38, pp. 29–53 (reprinted in Salvadori & Steedman, 1990; and in Schefold, 1997b).
Schefold, B. (1978c) On counting equations, *Zeitschrift für Nationalökonomie,* 38, pp. 253–285 (reprinted in Salvadori & Steedman, 1990; and in Schefold, 1997b).
Schefold, B. (1980a) Fixed capital as a joint product and the analysis of accumulation with different forms of technical progress, in: L. L. Pasinetti (Ed.) *Essays on the Theory of Joint Production* (London: Macmillan; Italian edn 1977) (sections of this appear, further developed, in Schefold 1976a, b, c, and 1978a, b).
Schefold, B. (1980b) Von Neumann and Sraffa: mathematical equivalence and conceptual difference, *Economic Journal,* 90, pp. 140–156 (reprinted in Schefold, 1997b).
Schefold, B. (1985a) Ecological problems as a challenge to classical and Keynesian economics, *Metroeconomica,* 37, pp. 21–61 (reprinted in Schefold, 1997b).
Schefold, B. (1985b) On changes in the composition of output, *Political Economy: Studies in the Surplus Approach,* 1 (no. 2), pp. 105–142 (reprinted in Bharadwaj & Schefold, 1990; and in Schefold, 1997b).
Schefold, B. (1985c) Sraffa and applied economics: joint production, *Political Economy: Studies in the Surplus Approach,* 1 (no. 1), pp. 17–40 (reprinted in Steedman, 1988a; and in Schefold, 1997b).
Schefold, B. (1988) The dominant technique in joint production systems, *Cambridge Journal of Economics,* 12, pp. 97–123 (reprinted in Schefold, 1997b).
Schefold, B. (1989) *Mr Sraffa on Joint Production and Other Essays* (London: Unwin Hyman).

Schefold, B. (1995) On the classical and Marshallian foundations of Keynesian and Post-Keynesian economics, in: G. C. Harcourt, A. Roncaglia & R. Rowley (Eds) *Income and Employment in Theory and Practice: Essays in Memory of Athanasios Asimakopulos* (London: Macmillan) (reprinted in Schefold, 1997b).

Schefold, B. (1997a) Classical theory and intertemporal equilibrium, in: B. Schefold, *Normal Prices, Technical Change and Accumulation* (London: Macmillan).

Schefold, B. (1997b) *Normal Prices, Technical Change and Accumulation* (London: Macmillan).

Schefold, B. (2000) Paradoxes of capital and counterintuitive changes of distribution in an intertemporal equilibrium model, in: H. D. Kurz (Ed.) *Critical Essays on Piero Sraffa's Legacy in Economics* (Cambridge: Cambridge University Press).

Schumpeter, J. A. (1954) *History of Economic Analysis* (New York: Oxford University Press).

Semmler, W. (1984) *Competition, Monopoly, and Differential Profit Rates: on the Relevance of the Classical and Marxian Theories of Production Prices for Modern Industrial and Corporate Pricing* (New York: Columbia University Press).

Serrano, F. (1995) Long period effective demand and the Sraffian supermultiplier, *Contributions to Political Economy,* 14, pp. 67–90.

Sraffa, P. (1925) Sulle relazioni fra costo e quantità prodotta, *Annali di Economia,* 2 (1), pp. 277–328; English translation, J. Eatwell & A. Roncaglia, 'On the relations between cost and quantity produced', in: L. L. Pasinetti (Ed.) *Italian Economic Papers*, Vol. 3 (Bologna: Il Mulino & Oxford University Press, 1998).

Sraffa, P. (1926) The laws of returns under competitive conditions, *Economic Journal,* 36, pp. 535–550.

Sraffa, P. (1951) Introduction, in: P. Sraffa (Ed), with the collaboration of M. H. Dobb, *The Works and Correspondence of David Ricardo*, Vol. I (*On the Principles of Political Economy and Taxation*), (Cambridge: Cambridge University Press).

Sraffa, P. (1960) *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory* (Cambridge: Cambridge University Press).

Steedman, I. (1977) *Marx After Sraffa* (London: New Left Books).

Steedman, I. (Ed) (1979a) *Fundamental Issues in Trade Theory* (London: Macmillan).

Steedman, I. (1979b) *Trade Amongst Growing Economies* (Cambridge: Cambridge University Press).

Steedman, I. (1980) Heterogeneous labour and 'classical' theory, *Metroeconomica,* 32, pp. 39–50.

Steedman, I. (1982) Joint production and the wage-rent frontier, *Economic Journal,* 92, pp. 377–385 (reprinted in Steedman, 1988a).

Steedman, I. (1984) Natural prices, differential profit rates and the classical competitive process, *The Manchester School,* 52, pp. 123–140.

Steedman, I. (Ed.) (1988a) *Sraffian Economics*, 2 vols (Aldershot: Elgar).

Steedman, I. (1988b) Sraffian interdependence and partial equilibrium analysis, *Cambridge Journal of Economics,* 12, pp. 85–95.

Steedman, I. (1989) On Pasinetti's 'G' matrix, *Metroeconomica,* 40, pp. 3–15.

Steedman, I. (1992) Questions for Kaleckians, *Review of Political Economy,* 4, pp. 125–151.

Steedman, I. (1994) 'Perverse' behaviour in a 'one-commodity' model, *Cambridge Journal of Economics,* 18, pp. 299–311.

Steedman, I. (1999) *Production of Commodities by Means of Commodities* and the open economy, *Metroeconomica,* 50, pp. 260–276.

Steedman, I. (2001) [Review of Quadrio Curzio & Pellizzari (1999)], *Economic Record,* 77, pp. 423–424.

Steedman, I. & Metcalfe, J.S. (1981) On duality and basic commodities in an open economy, *Australian Economic Papers,* 20, pp. 133–141.

Steedman, I. *et al.* (2001) Exhaustible natural resources and Sraffian analysis: … a symposium, *Metroeconomica,* 52, pp. 239–328 (with contributions by C. Bidard & G. Erreygers, E. Hosoda, H. D. Kurz & N. Salvadori, C. Lager, S. Parrinello, B. Schefold).

Stirati, A. (2001) Inflation, unemployment and hysteresis: an alternative view, *Review of Political Economy,* 13, pp. 427–451.

Swift, J. (1729) *A Modest Proposal for Preventing the Children of Poor People From Being a Burthen to Their Parents, or the Country, and for Making Them Beneficial to the Publick* (S. Harding, Dublin); reprinted in: H. Davis (Ed.) *The Prose Works of Jonathan Swift*, Vol. 12 (*Irish Tracts 1728–1733*), (Oxford: Blackwell, 1955).
Sylos-Labini, P. (1984) The theory of prices in oligopoly and the theory of growth, in: P. Sylos-Labini, *The Forces of Economic Growth and Decline* (Cambridge, MA: MIT Press; French version 1971).
Trezzini, A. (1995) Capacity utilisation in the long run and the autonomous components of aggregate demand, *Contributions to Political Economy,* 14, pp. 33–66.
Trezzini, A. (1998) Capacity utilisation in the long run: some further considerations, *Contributions to Political Economy,* 17, pp. 53–67.
Varri, P. (1980) Prices, rate of profit and life of machines in Sraffa's fixed-capital model, in: L. L. Pasinetti (Ed.) *Essays on the Theory of Joint Production* (London: Macmillan; Italian version 1974).
Vianello, F. (1985) The pace of accumulation, *Political Economy: Studies in the Surplus Approach,* 1 (no. 1), pp. 69–87.
Walsh, V. (1996) *Rationality, Allocation and Reproduction* (Oxford: Clarendon).
Walsh, V. (2000) Smith after Sen, *Review of Political Economy,* 12, pp. 5–25.
Walsh, V. & Gram, H. (1980) *Classical and Neoclassical Theories of General Equilibrium: Historical Origins and Mathematical Structure* (New York: Oxford University Press).
West, T. L. & West, G. S. (1984) *Plato and Aristophanes. Four Texts on Socrates: Plato's* Euthyphro, Apology, *and* Crito *and Aristophanes'* Clouds (Ithaca, NY: Cornell University Press).
White, G. (1989) Normal prices and the theory of output: some significant implications of recent debate, *Political Economy: Studies in the Surplus Approach,* 5, pp. 129–149.
White, G. (1996) Capacity utilization, investment and normal prices: some issues in the Sraffa-Keynes synthesis, *Metroeconomica,* 47, pp. 281–304.
Wicksteed, P. L. (1914) The scope and method of political economy in the light of the 'marginal' theory of value and distribution, *Economic Journal,* 24, pp. 1–23.
Woods, J. L. (1990) *The Production of Commodities: an introduction to Sraffa* (London: Macmillan).