

Luigi L. Pasinetti: An Intellectual Biography

Leading Scholar and System Builder of
the Cambridge School of Economics

Mauro L. Baranzini & Amalia Mirante



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The authors have done full justice to the towering contributions of Luigi Pasinetti. Their scholarly biography conclusively establishes Pasinetti's contributions as original and path-breaking. Pasinetti is possibly the last great system builder in the profession.

—GC Harcourt AO FASSA FAcSS FRSN – *Emeritus Reader in The History of Economic Theory*, Cambridge, 1998; *Professor Emeritus*, Adelaide, 1988; *Honorary Professor*, UNSW Australia, 2016–2019

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Through closing the gap between Keynes and Sraffa on the level of principles, Luigi Pasinetti has paved the way for building up a system of classical-Keynesian political economy. An immense achievement!

—Heinrich Bortis, *emeritus professor of economics, University of Fribourg, Switzerland; life-member of Clare Hall, Cambridge*

Professor Pasinetti's work on multi-sectoral dynamic analysis in the tradition of Adam Smith and other classical political economists has inspired a whole generation of economists to work on the importance of structural change in the development processes of a wide range of economies at different stages of development. He made this fundamental contribution amongst many others, such as those on income distribution, economic growth, and productivity analysis in a successful attempt to progress further with the themes of classical political economy and those of John Maynard Keynes.

—Michael A Landesmann, *the Vienna Institute for International Economic Studies and Johannes Kepler University Linz; formerly fellow of Jesus College, Cambridge*

Luigi Pasinetti is one of the leading and most original theoretical economists of our age. His contribution to the understanding of the structural dynamics of industrial economies and his development of a production-based theory of capital, value and income distribution make the scope and ambition of his work to stand comparison with the great Classical Economists of the past such as Quesnay, Smith and Ricardo. This intellectual biography is the first comprehensive reconstruction and assessment of his lifework.

—Roberto Scazzieri. *University of Bologna and National Lincei Academy, Rome. Gonville and Caius College and Clare Hall, Cambridge*

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Cover illustration: Photograph of Luigi L. Pasinetti, May 2000, University of Lugano, Switzerland; photo by Ely Riva, courtesy of Università della Svizzera italiana

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Preface and Acknowledgements

Born on September 12, 1930, Luigi Lodovico Pasinetti started writing and publishing scientific papers in 1955. At present (January 2018) he is working at the final draft of a volume entitled *A Theory of Value*, to be published in 2018. As he is blessed with a strong constitution, Pasinetti, whose scientific career has already spanned 64 years, may well continue working for many more years. By the early age of 40, Pasinetti had already stirred up three scientific controversies. These involved him in debates with at least eight future Nobel Prize laureates (Robert Solow, Paul Samuelson, Franco Modigliani, John Hicks, James Meade, James Mirrlees, Amartya Sen and Joseph Stiglitz) and many other highly distinguished economists, such as Christopher Bliss, Nicholas Stern, Frank Hahn, Robin Matthews, Mark Blaug, Samuel Hollander, Carlo Casarosa, Edmond Malinvaud and Avinash Dixit.

Yet, Pasinetti's scientific contribution is not limited to this. His research programme has led him to develop new analytical tools (hence, our label of 'tool-maker' rather than 'tool-user'), like the concept of 'vertically integrated sectors', as a 'completion' of 'input-output analysis'. He has also built on the dichotomy between 'natural models' (which describe the very basic relationships among variables) and 'institutional models' (where different institutional structures, or set-ups, come into play). We owe it to this original approach if a number of empirical rules and theoretical frameworks, often incompatible with traditional theory, came to

be more satisfactorily explained and understood. Pasinetti's entire scientific life has been driven by the desire to provide new frameworks of interpretation of the mechanisms underpinning modern economic systems.

Not only is Luigi L. Pasinetti considered the most 'senior living heir of the Cambridge School of Economics and the last of the great system-builders', but, since the late 1950s, he has also been one of the most influential economists of the Anglo-Italian school of economics.¹ He has in fact upheld the Classical Italian and British tradition of economic thought at the frontier of economic research.

As already pointed out in the Introduction to the Essays in his honour (see Baranzini and Harcourt 1993, p. 4), Pasinetti has an extraordinary clarity of mind and vision. On the strength of that, he has been able to carry out a remarkably unified research programme, one that encompasses a great number of strands within its scope. Because of the clarity and simplicity of his vision, unsympathetic critics have sometimes taken him to task; and this is not surprising for a promoter of several scientific controversies. Pasinetti's research programme, stretching over more than 64 years, has followed a coherent pattern. It first outlined the weaknesses of the marginalist or neoclassical model, and then, step by step, laid the foundations of the reconstruction (on mixed classical/'pure' Keynesian bases) of a 'more general theory' in order to identify, explain and analytically recompose the mechanisms and dynamics of modern economic systems. This has been carried out with powerful tools of analysis, in particular the methods of 'vertical integration' and 'hyper integration' (Pasinetti 1973, 1988). He made it possible for a number of very complicated phenomena taking place in the modern economic systems to be clarified and understood. Let us mention, in particular, the unequal distribution and pace of technical progress and productivity, the non-linear variations in the composition of demand, the presence of a great variety of asymmetric behaviours, the complex role of institutions (though Pasinetti begins with a core model which is free from institutions) and the relevance of income and wealth distribution among factors of production and different socio-economic classes.

¹ As, for instance, pointed out in Baranzini and Mirante (2013, 2016).

This volume is not simply a tribute to the scientific achievements of a distinguished scholar; it is also a comprehensive and specifically planned, up-to-date assessment of the nine most important lines of inquiry of Pasinetti's vast research programme. This was done by evaluating his contributions, suggesting new insights and providing an all-inclusive bibliography that has directly taken up the contributions of Pasinetti. In the case of just one line of research, concerning the Kaldor/Pasinetti theory of income distribution and profit determination, we quote at least 400 scientific papers and volumes spawned by the so-called Two-Cambridges controversy. Last, but not least, the volume provides a more general assessment of the significance and implications of a number of issues of the second generation of the *Cambridge School of Keynesian Economics*, of which Pasinetti has been the 'senior heir', along with Geoff Harcourt, since the death of its founding members Richard Kahn, Joan Robinson, Nicholas Kaldor and Piero Sraffa in the 1980s.

This scientific biography has had an incubation of at least 20 years. A number of institutions, scholars and friends have supported our project in several ways. First of all, thanks are due to our present academic institutions, respectively the Faculty of Economics of the University of Lugano (which Pasinetti contributed to set up in 1996) and the University of Applied Sciences and Arts of Southern Switzerland. We also thank the following institutions for providing, at various stages, research facilities and an intellectual environment that stimulated our work in a fundamental way. In Italy, we thank the National Lincei Academy, Rome, and the CRANEC (Centre for Research on Economic Analysis and International Economic Development) of the Catholic University of Milan. In Cambridge, we thank the Marshall Library and the King's College Modern Archives; in Oxford, The Queen's College. We are particularly grateful to a number of scholars and colleagues for their valuable help and support. Among these, in alphabetical order, Enrico Bellino, Heinrich Bortis, Simona Cain, Alvaro Cencini, Terenzio Cozzi, Carlo D'Adda, Nadia Garbellini, Kazuhiro Kurose, Giandemetrio Marangoni, Caterina Mari, Antonietta Mira, PierCarlo Nicola, Micaela Notarangelo, the late Pier Luigi Porta, Alberto Quadrio Curzio, Claudia Rotondi, Takao Sasaki, Mario Seccareccia, Kumaraswamy Vela Velupillai and Ariel Luis Wirkierman. Roberto Scazzieri deserves a special mention: during

the long years of gestation of this volume, he has always stimulated and assisted us in many ways; his support has been decisive at various stages of drafting the various chapters. We are also grateful to Micaela Tavasani of the Catholic University of Milan for her help and for providing a number of photographs for the special inset. Tony Thirlwall, Lord Kaldor's literary executor, has authorized us to use the letters in the Kaldor Archive, which are also in Pasinetti's archives, in any way we wished. Dorothy Hahn-Salter has kindly given us permission to quote and reproduce a drawing of a letter that Frank Hahn wrote to Nicky Kaldor in 1964. Geoff Harcourt has been kind enough to read the whole final draft, and we are indebted to him for pointing out numerous misprints and for suggesting several important integrations. The final draft has also been meticulously checked by Andrea Carrera, who drew out attention to a number of misprints and omissions. We are grateful to all of them for their precious contribution. We bear full responsibility for any remaining omissions and inaccuracies. Finally, we must thank Luigi L. Pasinetti for patiently answering our countless queries. That said, we have done our best to be as independent as possible in our challenging task.

Cambridge and Lugano, Switzerland
October 2017

Mauro Leo Baranzini
Amalia Mirante

References

- Baranzini, M.L., and G.C. Harcourt, eds. 1993. *The Dynamics of the Wealth of Nations; Growth, Distribution and Structural Change: Essays in Honour of Luigi L. Pasinetti*. Basingstoke and London/New York: Macmillan/St. Martin's Press.
- Baranzini, M.L., and A. Mirante. 2013. The Cambridge Post-Keynesian School of Income and Wealth Distribution. In *The Oxford Handbook of Post-Keynesian Economics*, ed. G.C. Harcourt and P. Kriesler, vol. I, 288–361. Oxford: Oxford University Press.

- Baranzini, M.L., and A. Mirante. 2016. *A Compendium of Italian Economists at Oxbridge: Contributions to the Evolution of Economic Thinking*. London/New York: Palgrave Macmillan.
- Pasinetti, L.L. 1973. The Notion of Vertical Integration in Economic Analysis. *Metroeconomica* 25 (1): 1–29; reprinted in Pasinetti, L.L., ed. 1980. *Essays on the Theory of Joint Production*, 16–43. London: Macmillan.
- Pasinetti, L.L. 1988. Growing Sub-systems, Vertically Hyper-Integrated Sectors and the Labour Theory of Value. *Cambridge Journal of Economics* 12 (1): 125–134.

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1

Introduction: Luigi L. Pasinetti—A Leading Scholar of the Second Generation of the *Cambridge School of Keynesian Economics*

If all this causes headaches for those nostalgic for the old-time parables of neoclassical writing, we must remind ourselves that scholars are not born to live an easy existence. We must respect, and appraise, the facts of life.

(Paul A. Samuelson, summing up the ‘Symposium on Paradoxes in Capital Theory’, *Quarterly Journal of Economics*, 1966)

1.1 Introduction

Luigi Pasinetti is with no doubt a leading scholar, probably the most influential, of the second generation of the *Cambridge School of Keynesian Economics*, both because of his achievements and for his early involvement with the direct pupils of John Maynard Keynes.¹ Pasinetti, with Geoff Harcourt² and a few others, belongs to that generation that was not

¹ Baranzini and Harcourt (1993, p. 2) have defined him as the ‘Senior heir of the Cambridge Post-Keynesian School of Economics’ and Harcourt (2012, p. 137) has defined him as ‘the last of the great System-Builders’.

² Geoff Harcourt entered King’s College, Cambridge, in September 1955, while Luigi Pasinetti arrived at Gonville and Caius in September 1956, just few yards away. Harcourt’s own biography

directly involved with Keynes but that was in direct contact with his pupils. The first generation of the School includes, apart from John Maynard Keynes himself, in alphabetical order, his direct pupils Richard Kahn, Nicholas Kaldor, Joan Robinson and Piero Sraffa. To these we may add Richard Goodwin, who arrived in Cambridge in 1950, four years after Keynes's death, as a pupil of Joseph Schumpeter. This impressive group of scholars started initially, at least to some degree, within the mainstream of their time. But soon 'they all moved well and truly outside it, attempting to create [...] a revolutionary alternative'.³

But Pasinetti has gone further, and may be considered a real 'system-builder'. Basically, he was unsatisfied with the line of research initiated in Cambridge in the 1950s and much developed in the 1960s, concerning the disaggregated analysis of the economic system, carried out in particular by David Champernowne, Richard Goodwin, Piero Sraffa, Richard Stone (and Wassily Leontief in the United States). In his words:

Both the macro-dynamic growth models and input-output analysis impressed me at the time; but they left me profoundly dissatisfied when I tried to use them in order to understand what was going on in economic systems with a very high degree of dynamism, i.e. of technical progress. (Pasinetti 1981, p. xi)

This led Pasinetti in his 1962 Cambridge Ph.D. thesis to put forward his groundbreaking contribution in the field of 'structural economic dynamics'. In few words, Pasinetti's defines the conditions for an economic system to reach and maintain full labour employment and full capacity utilization when the system is subject to structural change caused by a differentiated and continuously changing technical progress of the

is given in Harcourt (1999) and in many other papers. The first author of this volume has a long-taped version of it, taped over many years.

³ Harcourt (2006, p. 1). The whole passage of G. C. Harcourt reads as follows:

Maynard Keynes, Richard Kahn, Richard Goodwin, Nicholas Kaldor, Luigi Pasinetti, Joan Robinson and Piero Sraffa all started initially, at least in some degree, within the mainstream of their time. They all moved well and truly outside it, attempting to create either a revolutionary alternative or to rehabilitate the classical-Marxian tradition, in most cases in the light of the Keynesian revolution. (Harcourt 2006, p. 1)

productive sectors, and to a continuously changing composition of consumers' demand (Engel's law). In order to solve this dynamic multi-sector model, Pasinetti later on devised two new tools of analysis—the vertical integration approach and the vertically hyper-integration sectors—which has led a number of authors to rightly label him a 'tool-maker' as opposed to the term 'tool-user'.

It is beyond doubt that when Pasinetti arrived at Gonville and Caius College in Cambridge in September 1956 and was matriculated as a graduate student, he was about to start a life-long association with the Cambridge School of Keynesian Economics. How did his 'passional critical attitude' start? Again, in his words:

It was Richard Goodwin who skillfully directed my very first timid steps into research work. And later, when I began to write a great deal, Richard Kahn very patiently read, criticised and commented every single note I submitted to him. Through Kahn I came in contact with that unique mixture of radicalism, wisdom and social concern that was the distinct mark of Keynes's environment. Through Goodwin I was stimulated to open up my intellectual curiosity and interests towards tools of analysis that came from outside. At the same time, I also benefited from long discussions, and often from daily conversations, with Nicholas Kaldor, always bubbling with new ideas, Joan Robinson, always hard as a rock on her theoretical conceptions, and Piero Sraffa, the real master of all critics. It is from them that I learnt that passionate critical attitude which has been the *conditio sine qua non* for starting and pursuing an investigation of this type. (Pasinetti 1981, p. xiv)

One indication that Pasinetti since the mid-1980s has been widely considered a leading figure of the Cambridge School of Keynesian Economics was that he was asked to give the address at the memorial service of the late Lord Richard Kahn, delivered in the Chapel of King's College in Cambridge, of which both had been official fellows, on October 21, 1989. He was also requested to write official biographies of Joan Robinson (1903–83), Piero Sraffa (1898–1983), Nicholas Kaldor (1908–86), Richard Kahn (1905–89), Richard Stone (1913–92) and Richard Goodwin (1913–96). Some of these personal and scientific biographies have been republished by Pasinetti and discussed in Pasinetti

(2007, 2010). We may say that in this precious work Pasinetti is rivalled only by Geoff Harcourt, who for a long period has been responsible for the obituaries of *The Economic Journal*. On October 21, 1989, at the service in honour of Richard Kahn, Pasinetti stated that:

This is the third time, over a short span of years, that the congregation assembles in this Chapel to commemorate, and reflect upon the life of, a major contributor to that intellectual breakthrough that has become known in the world of economics and politics as ‘the Keynesian Revolution’. (Pasinetti 1989, p. 1)

Pasinetti was referring to the previous commemorations of Joan Robinson and Nicholas Kaldor; he went on to say that

If one adds that another memorial service, shortly after that of Joan Robinson, was held in Cambridge, though in another Chapel, for yet another close associate of Keynes, Piero Sraffa, one cannot resist the impression that today’s ceremony concludes a whole historical phase, almost an era, in the recent history of economic thought. This group of Cambridge economists has been protagonist of one of those extraordinary and unique events in the history of ideas that decisively pushed ahead and created a break with the past. (Pasinetti 1989, p. 1)

Pasinetti, as we shall see below, was one of the major contributors to the controversies on the measurement of technical progress, on capital theory, on income distribution and on the theory of value that were fought out between Cambridge, England, and Cambridge, Massachusetts, during the ‘raging’ 1950s, 1960s and 1970s, with ‘upshots’ in the 1980s and 1990s and even into the twenty-first century. As pointed out in Baranzini and Harcourt (1993, pp. 3–4), the battle was, as we shall see, won by Cambridge, England,⁴ but paradoxically the losing side was awarded, over the years, a number of Nobel Prizes (while significantly none of the above-mentioned Cambridge

⁴ See, for instance, Cohen and Harcourt (2003), or Pasinetti’s ‘Lezione inaugurale, Accademia dei Lincei’, May 2010.

UK economists were awarded one, apart from Sir Richard Stone and, to a certain extent, Amartya K. Sen). Notwithstanding the strength and the high analytical rigour of such a group of thinkers, as time passed, the 'Keynesian' and later the 'post-Keynesian' schools have progressively lost ground (at least until the great crash of 2007 when all, at least for some time, became new Keynesians), while the marginalist school has taken over and, numerically at least, has become the dominant school in most of the Western world. In a certain sense the first 'Keynesian Revolution', led by John Maynard Keynes himself, Richard F. Kahn and Joan V. Robinson, had been able to 'create a break with the past' and to convert most of the leading economists and fellow politicians of the 1930s, 1940s and 1950s; but when the time was ripe for a continuation of the 'Keynesian Programme' to issues concerning the long run, the majority of economists did not follow. The 'Keynesian Programme' suffered a halt and its leading members found themselves besieged mainly in Cambridge, England. To this specific point, Pasinetti (2007, 2010) has recently returned.

Pasinetti has an extraordinary clarity of mind and vision, so he has been able to carry out a remarkably unified research programme, one which encompasses a great number of strands within its scope. Because of the clarity and simplicity of his vision, unsympathetic critics have sometimes taken him to task; and this is not surprising for a promoter of four scientific controversies. Among these critics, we may mention, in chronological order: Robert Solow (1959, 1970, 2009, 2012), Frank Hahn (1964), James Meade and Frank Hahn (1965), Maurice Allais (1965a), Robert Dorfman (1965), David Levhari (1965), James Meade (1966), Paul Samuelson and Franco Modigliani (1966a, b), Christopher Dougherty (1972), James Mirrlees and Nicholas Stern (1973), Domenico Mario Nuti (1974), Giuseppe Campa (1975), Joseph Stiglitz (1975), John Hicks and Samuel Hollander (1977), Christopher Bliss (1986, 2010), Florian Fleck and Claus-Michael Domenghino (1987, 1990), Paul Samuelson, indirectly (1991), Edmond Malinvaud (1995), William Baumol (2009, 2012) and Moshe Syrquin (2012). They have often confused clarity of vision, the focus on fundamental, central, conceptual points, with undue simplification.

1.2 A 'Tool-Maker'⁵ Rather than a 'Tool-User'

Pasinetti's research programme, which spans over more than 60 years (since his first paper was published back in 1955), has followed a coherent pattern, first outlining the weaknesses of the marginalist or neoclassical model, and then laying step by step the foundations of the reconstruction, on mixed classical/'pure' Keynesian bases, of a 'more general theory' in order to identify, explain and analytically recompose the mechanisms and dynamics of the modern economic systems. This has been carried out with powerful tools of analysis, in particular the methods of 'vertical integration' and 'hyper-integration' (Pasinetti 1973, 1988), so allowing the understanding of a number of very complicated phenomena taking place in the modern economic systems, such as the unequal distribution and pace of technical progress and productivity, the non-linear variations in the composition of demand, the presence of a great variety of asymmetric behaviours, the complex role of institutions (although Pasinetti begins with a core model which is free from institutions) and the relevance of the distribution of income and wealth among factors of production and different socio-economic classes.

Pasinetti's theory of vertical integration provides a precise analytical formulation to a way of representing the economic system that has been of critical importance for the development of dynamic analysis since the early applications of this method in Smith's *Wealth of Nations*. An especially important feature of Pasinetti's formulation is that a number of critical assumptions and essential logical steps, which were only implicit in the earlier economists, may now acquire a definite meaning. At this stage, it may be recalled that the concept of vertical economic structure, in its dynamic applications, has been mainly associated with the analysis of technological requirements for economic expansion (Smith), or with the technological interrelatedness in its implications for the diffusion of particular impulses (Pigou). On the other hand, vertical integration has been linked

⁵ This definition has been used by Professor Sir Robin Matthews when he spoke at Sir John Hicks's official commemoration. On this point see also Scazzieri and Zamagni (2008, p. 4). See also Matthews (2004), quoted in Scazzieri et al. (2008, p. 423).

with the autonomous role of effective demand on the dynamic path (Malthus and Keynes). (Baranzini and Scazzieri 1990, p. 299)

It emerges that Pasinetti's analytical formulation provides a logical framework in which technological and demand conditions may be integrated in order to give a comprehensive interpretation of the dynamics of the 'wealth of nations'. Pasinetti's study on the 'long-term evolution of industrial economic systems' was originated, in his own words, by 'a combination of three factors – one factual and two theoretical' (Pasinetti 1981, p. xi).

The factual element was provided by the extremely uneven development – from sector to sector, from region to region – of the environment in which I lived (post-war Europe) at the time I began my training in economics. [...] Both the macro-dynamic growth models and input-output analysis impressed me at the time; but they left me profoundly dissatisfied when I tried to use them in order to understand what was going on in economic systems with a very high degree of dynamism, i.e. of technical progress. And I began to think that an attempt might be made to develop a theoretical scheme which, while retaining the analytical character of input-output analysis, could also deal with uneven increases in productivity, in the way the macro-dynamic models had begun to do, but only for the very simplified case of a one-commodity world. It was from this determination to look for new tools of analysis that the present work has come into being. (Pasinetti 1981, p. xi)

The second problem which held back Pasinetti's project is connected with a distinctive feature of his research programme, that of a 'level of investigation which is so fundamental as to be independent of the institutional set-up of society', the so-called 'natural' feature. The elaboration of this concept was refined in stages. In his well-known (1962) article 'Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth', Pasinetti was able, starting from Kaldor's income distribution theory, to define a 'natural' rate of profit at the macro-economic level, determined by the natural rate of growth of the system and the propensity to save of the 'pure' capitalists' class. However, this type of 'natural system' was not fully satisfactory since, as Pasinetti (1981, p. xiii)

himself points out, 'it did not take long to realise that introducing behavioural (savings) relations did not fit consistently into a theoretical framework which was basically conceived independently of institutions'.

A few years later, in a paper published in the *Journal of Post Keynesian Economics* (1980/81) with the title 'The Rate of Interest and the Distribution of Income in a Pure Labour Economy', Pasinetti was able to fix the concept of 'natural' at the industry or sector level (and hence no longer at the macro-level) where there logically exist a whole series of 'natural' rates of interest, at a stage which even precedes the process of capital accumulation. As a matter of fact, in a pure labour economic system, characterized by structural dynamics of technology and prices, there exists a rate of interest on interpersonal loans that keeps 'labour commanded' equal to 'labour embodied' through time. This natural rate of interest, obtained independently of any institutional framework (as we shall explain below), allowed for the completion of Pasinetti's theoretical scheme, making it logical and complete.⁶

Pasinetti (1981, p. xiii) rightly emphasizes the relevance of an institution-free scheme of inquiry: 'For the first, more fundamental, stage of analysis a complete and self-contained theoretical scheme has at least clearly emerged'; for these first important steps towards a full-scale reconstruction of political economy allow a more comprehensive methodological approach. In fact, alternative schemes of analysis provide a general rule (such as the equality between marginal productivities and factor payments) and successively are constrained to modify such a rule in order to take into account a number of exceptions (such as the presence of market imperfections, etc.). On the contrary, in the case of the 'natural' system approach, the presence of a particular institutional set-up does not modify the basic framework, but simply provides additional information. In addition, in the case of a modification of the institutional set-up the framework does not require modifications bound to alter its 'scope and method'. For instance, the 'natural' framework does not require the existence of 'symmetric' relations; rather it presupposes a world characterized by 'asymmetric' and 'cumulative' behaviour, as in the case of stickiness of prices due to oligopolistic situations, mark-up

⁶ This point has been developed in Baranzini and Harcourt (1993, p. 6).

pricing rules in manufacturing businesses, contractually fixed wage rates and so on, and many other institutional factors continually evolving (on this point see, for instance, the contribution of Sylos-Labini in Pasinetti's *Festschrift* published in 1993).

In this way one obtains a sharp differentiation between those economic problems that have to be solved on the ground of logic alone—for which economic theory is entirely autonomous—and those economic issues that 'arise in connection with particular institutions, or with particular groups' or individuals' behaviour – for which economic theory is no longer autonomous and needs to be integrated with further hypotheses, which may well come from other social sciences' (Pasinetti 1981, p. xiii). It is with this kind of issues that Pasinetti's life-long effort has been concerned, and a clear distinction between the two levels of inquiry (the first 'natural', the second 'institutional') is always kept in the foreground, as in his 1993 volume on structural economic dynamics.

The next step came in fact in 1993, 12 years after his *Structural Change and Economic Growth. A Theoretical Essay on the Dynamics of the Wealth of Nations*, when Pasinetti published, as usual with Cambridge University Press, a much-condensed volume with the title: *Structural Economic Dynamics: A Theory of the Economic Consequences of Human Learning*. The volume explores the structural dynamics (a) of production (caused by the continuous change in the composition of demand due to Engel's Law), (b) of prices and (c) of employment caused by the uneven diffusion of human learning. The whole analysis is carried out in terms of a 'pure labour model', a model in which 'labour', to be intended as human activity in general, is the only factor of production. It is, in other words, the development of a 'pure labour economy', that is, of an economy in which the activity of production (of both capital and consumer goods) is carried out by labour alone, 'labour unassisted by any intermediate commodity'. According to Geoff Harcourt:

The theory is simple, yet its aim is to catch a number of basic features of industrialised societies. Economists have known for a long time of the two basic phenomena at the root of the long-term movements of our industrial societies: *capital accumulation and technical progress*. But, according to Pasinetti, the privileged position has always been given to capital

accumulation. Pasinetti's volume (1993) reverses this approach, and technical progress is assigned the central role. Within a multi-sector framework, he first describes (against a background of 'natural relations') the structural dynamics of prices, of production and of employment (implied by differentiated rates of productivity growth and of expansion of demand); he then discusses a whole series of problems that arise at the institutional level. 'Individuals' and social learning, know-how and diffusion of information emerge as the fundamental factors accounting for the features and fates of industrial societies – the source of their troubles, and the source of their wealth. The pure labour theory of value allows Pasinetti to shift the theory of long-term economic development from a traditional framework based on capital accumulation to new foundations based on learning, technical progress and diffusion of knowledge. So Pasinetti, as with Kaldor, is the source, rarely acknowledged, of the conceptual basis of neoclassical endogenous growth theory that has been developing over the past twenty years and more. [...] (Harcourt 2006, pp. 130–1)

1.3 On Keynes and the Cambridge Keynesians

We may conclude this short introduction with Pasinetti's volume *Keynes and the Cambridge Keynesians: A 'Revolution in Economics' to be Accomplished*, published by Cambridge University Press in January 2007 and translated into Italian in 2010 by Editori Laterza, Roma-Bari. The Italian translation has a new long preface ('Premessa alla presente edizione italiana') which discusses the theoretical implications of the huge financial crisis that started in 2007, a fact that could not be anticipated in the English edition. This Preface was recalled by Pasinetti in his 'Lectio brevis' read at the *Assembly of the Moral, Historical and Philological Sciences of the Accademia dei Lincei* of Rome in May 2010 and then, on Saturday, July 10, 2010, at the workshop on the *Philosophical and political economy underpinnings of Sraffa's work*, at Queens' College, Cambridge, in July 2010. It is an important piece of work, since it reassesses the relevance of the Dual Theorem of Meade-Samuelson and Modigliani on income distribution and of the Modigliani-Miller Theorem with the financial crisis of 2007/08 and beyond.

The volume *Keynes and the Cambridge Keynesians: A 'Revolution in Economics' to be Accomplished*, as with most Pasinetti's publications, had an unusually long gestation period (about 15 years), mainly due to the complexity of the arguments put forward. In Book I, Pasinetti reassesses the content of the 'Keynesian Revolution' after 70 years of its taking place, and considers the issue of 'Scientific Revolutions and Alternative Paradigms'. He quotes the epistemologist Thomas Kuhn (1970) for whom 'revolutions' in science are connected to 'discoveries' that are not compatible and cannot be accommodated within the preceding theories or scheme of analysis. In other words, such discoveries cannot be 'absorbed', or taken in, by existing paradigms. And he goes on arguing that:

When new evidence, i.e. when new empirical observations, conjectures or analytical discoveries, come to light, they may be either compatible or incompatible with the prevailing paradigm. When they are incompatible, they do *not* cause, for that reason only, the abandonment of the prevailing paradigm; they rather set in motion a series of attempts to *adapt* the prevailing paradigm so as to accommodate, in some way, the new evidence. In the extreme, if adaptation of the prevailing paradigm turns out to be impossible and the new evidence does not fit in, the evidence itself is set aside as an 'anomaly', an 'exception', or even simply ignored (at least for the time being). Of course, this sort of adaptation (or patching-up) process is bound to make the prevailing paradigm itself less and less satisfactory. This may help to stimulate new ways of thinking. But the paradigm itself will not be abandoned only because it has become less and less satisfactory in explaining the new evidence. It is only when a new paradigm, a new more satisfactory and comprehensive frame of reference that explains the anomalies, becomes available that the old one is discarded and the new one is accepted. A scientific revolution thus takes place. (Pasinetti 2007, p. 17)

Pasinetti maintains that this applies also to social sciences, in particular to the economics. And he brings to a close his *Book I* as follows:

Perhaps, in spite of all, as a final consequence of the mounting difficulties in the attempts at reconciliations, it may well be the task of a new generation of economists to produce that break with orthodox economics that

was started, genuinely attempted, strongly pursued, but not accomplished by Keynes and the Keynesian group. Many dramatic changes took place in the last two decades of the twentieth century on the economic and political sense. New minds – liberated from the prejudices that have been obfuscating our vision – may well have become better equipped to bring about that genuine Keynesian revolution which has so far remained unaccomplished. (Pasinetti 2007, p. 50)

Book II of the 2007 *Keynes and the Cambridge Keynesians: A 'Revolution in Economics' to be Accomplished* offers five detailed and thoughtful scientific biographies of that group of thinkers, excluding the master of them all, John Maynard Keynes, that sparked and carried forward the Keynesian revolution. It is worth pointing out that when Pasinetti arrived in Cambridge in September 1956 they were all in the midst of their scientific careers; and John Maynard Keynes had died just ten years before. In fact Richard F. Kahn (1905–89) was just 51, and not yet Lord Kahn; Joan V. Robinson (1903–83) had just published her *opera magna* (*The Accumulation of Capital*), which was still in the bookshop windows, and she was not yet a Professor; Nicholas Kaldor (1908–86) had just hurriedly published his seminal paper in *The Review of Economic Studies* on 'Alternative Theories of Distribution' and was neither Lord nor Professor yet; Piero Sraffa (1898–1983), although already 58 years old and not fully integrated into the group, was four years away from publishing his *Production of Commodities by Means of Commodities*; and Richard M. Goodwin (1913–96) was less than halfway through his scientific production. Pasinetti got to know them all immediately; and he would teach and research, on and off, the next two decades side-by-side with them. He is therefore the scholar most qualified to reconstruct their academic achievements. In fact, he begins his task by writing that:

In this work [...] I shall devote my major efforts to highlighting [...] the constructive part of their efforts. I shall therefore argue that the relevant message that should be extracted from the works of the Cambridge School of Keynesian Economics is, in fact, positive – not negative. In essence, my conviction is that essentially the 'revolution in economics' that Keynes proposed is bound to have a future in economic theory, simply because the 'monetary production economies' that he singled out for investigation are

precisely the kind of economies that have increasingly been emerging since the industrial revolution. In other words, history is on the side of Keynes's theory, not against it. And if this is so, the consequences are far reaching. (Pasinetti 2007, pp. xv–xvi)

And he sums up the biographies as follows:

The foregoing biographical sketches on Kahn, Joan Robinson, Kaldor and Sraffa may help – I hope – to highlight the multifaceted and significant aspects of the Cambridge School of Keynesian Economics. I hope the reader may have been able to grasp the unity, in some basic sense, of their purposes and at the same time the intriguing disparities in their approaches in many other respects. The whole picture is bound to raise further questions. But I hope the set of essays is powerful enough to make the reader perceive the achievements of some definite landmarks. (Pasinetti 2007, p. 199)

The third part of the volume summarizes the whole vision of Pasinetti's economic theorizing. He is of the same opinion of Kaldor (as well as of Keynes), that is, that it is necessary to go beyond the marginalist approach to economics. In particular, it is important to operate at the 'natural' level, well before institutions are introduced into the analysis. And he concludes as follows:

It is precisely on this point, i.e. on a radical change of the current dominant paradigm, that Keynes's 'revolution in economics' may find a dramatically forceful, earlier unexpected, vigour and regain the lost strength for a decisive resumption of what began with wide expectations and awed fascination but has remained a 'revolution' still unfulfilled – a revolution still needing to be accomplished. (Pasinetti 2007, p. 360)

This is the 'scientific will' of Luigi Pasinetti, written shortly before turning 80, at least for the Italian edition. Provided his very good health will continue to bless him, he still has a long way to go in carrying forward this revolution. After all, Adolph Löwe (who lived to 102), Maurice Allais (99), Giovanni Demaria (101), Ronald Coase (102), John Kenneth Galbraith (98), Paul A. Samuelson (94), Kenneth Arrow (96), Wassily

Leontief (93), Friedrich Hayek (92), Milton Friedman (94), Robert Solow (born 1924) and Douglass Cecil North (95) are good examples of long-living front-running economists.⁷

1.4 Pasinetti's Contribution According to His Colleagues and Followers

At his stage, we might quote a number of scholars who have taken up Pasinetti's research lines by sharing his approach, and often by pushing forward the frontiers of knowledge on which Pasinetti has been working in the last six decades. This will be done in detail in Book II of this volume. In this section, we shall confine ourselves to quote three of his most significant scientific colleagues and followers. We start with his life-long colleague G. C. Harcourt, who in his 2006 volume on *The Structure of Post-Keynesian Economics. The Core Contributions of the Pioneers* cogently reassesses Pasinetti's scientific contribution as follows:

We may talk of 'new foundations' of economic analysis. Pasinetti has provided a new theoretical framework capable of synthesizing the works of Smith, Ricardo, Marx, Keynes, Sraffa and Kaldor, by appropriately modifying parts of their foundations and completing still other parts so as to arrive at a whole, coherent framework. The scheme itself is, however, so enormous that it is unrealistic to expect it to be completed by Pasinetti himself. It has been often pointed out that Pasinetti has, among other original contributions, successfully achieved the difficult task of providing a bridge between two different levels of analysis, sharing the same scope but not the method – i.e. that of Keynes and Kaldor on the one side and of Sraffa on the other; the former was characterised by a mainly macro-economic scheme built in order to explain the working of actual economies and also founded on simple, though revolutionary, foundations. The latter

⁷ The first author of this volume remembers discussing the general longevity of economics scholars with Professor James A. Mirrlees when the news of the premature death at 49 of the Cambridge economist Michael James Farrell (1926–75), Fellow of Gonville and Caius College and Reader in Economics in the University, reached Oxford. As far as longevity is concerned, we might also quote Pasinetti's fellow member of the Lincei Academy of Rome, Rita Levi Montalcini (born April 22, 1909, who died on December 30, 2012, aged 103).

was based instead on an extremely refined system of inter-industry relations, not so much directly concerned with the most pressing problems of the modern economic systems, but more with the construction of a lucid and self-contained model within which the oldest questions of our subject may find answers. (Harcourt 2006, p. 131)

Prue Kerr and Roberto Scazzieri, in their paper written for the *Oxford Handbook of Post-Keynesian Economics* (2013), underline that:

The starting point of Pasinetti's research programme had been his early interest in the measurement of technical progress and productivity in a capital-using economy (Pasinetti 1959). Pasinetti had been influenced by ongoing discussions at Cambridge, where Robinson was extending Keynesian ideas to the long run and Stone was disaggregating macro entities into interacting sectors. It may also be conjectured that his interest in the measurement of actual economic magnitudes probably had much to do with his stay at Harvard (1957–58) and his acquaintance with Wassily Leontief and his group. (Kerr and Scazzieri 2013, p. 276)

Kerr and Scazzieri then go on to discuss the way in which growth and long-term dynamics did become the focus of analysis of Cambridge economics in the late 1950s and early 1960s. Pasinetti was the promoter of this groundbreaking research programme:

The basic idea is that modern economic growth is inherently associated with certain changes in the proportions among sectors of the economy, as well as among sectoral levels of employment (*structural change*). In this connection, the conjecture began to appear that appropriate theoretical modeling of an economic system undergoing technical change should have structural change at its core, rather than considering it simply as the result of external (exogenous) influences. Pasinetti's approach to structural dynamics is thus a blend of economic theory and economic history. [...] Pasinetti's Cambridge Ph.D. dissertation (1962) became the starting point of a life-long theoretical investigation into the long-run properties of a growing multi-sectoral economy. (Kerr and Scazzieri 2013, pp. 276–7)

Fairly soon the investigation has concentrated on the two following 'fundamental dynamic factors': (i) Engel's law leading to changes in the

composition of consumers' demand due to *per capita* income increases; (ii) an increasing average labour productivity as a result of technical progress, but differentiated among economic sectors. According to Kerr and Scazzieri, Pasinetti's refinement of structural economic dynamics has been unfolded in a 'sequence of steps':

First, he identifies as its benchmark economy a system of productive sectors in which all commodities are produced by means of labour alone (*a pure labour economy*), or by means of labour assisted by produced means of production that can nevertheless be 'reduced' to quantities of labour in a finite number of steps. Second, Pasinetti rejects the possibility of investigating the 'fundamental' structural layers of an economic system by concentrating exclusively on specific behavioural and institutional contexts. Third, he emphasizes that the theoretical questions to be asked are questions about constraints and opportunities, rather than about the identification of specific configurations of economic variables in historical time. (Kerr and Scazzieri 2013, pp. 277)

In this way, the analysis of the configuration of economic variables in historical time and the conditions for full employment and for full utilization of the productive capacity are drifted into the background. This is why the two authors add that Pasinetti proposes

a 'separation theorem' by distinguishing between pre-institutional and institutional features of a growing economy (Pasinetti 2007). In his view, the pre-institutional (in Pasinetti's terminology, 'natural') level of investigation allows identification of the structural conditions that need to be met for full employment to be possible on a dynamic path. In other words, it is at the natural level of investigation that we may single out which combinations of consumption and labour coefficients are ultimately compatible with full employment. [...] Pasinetti's focus on the pre-institutional stage of analysis highlights material possibilities and constraints at a deep structural layer that are not necessarily compatible with existing institutions. (Kerr and Scazzieri 2013, p. 277)

More recently, Heinrich Bortis (2017, pp. 127–8) of the University of Fribourg has stated that "There is hope that a classical-Keynesian alternative

may be set up. Indeed, through his life work Luigi Pasinetti has prepared the way for elaborating a system of classical-Keynesian political economy. [...] The Anglo-Italian School must now take up the great heritage of John Maynard Keynes and Piero Sraffa, carried on, to a considerable extent, by Luigi Pasinetti and Pierangelo Garegnani, to work out a classical-Keynesian system of political economy in opposition to Walrasian-Marshallian neoclassical economics.'

1.5 The Frame of Analysis of Pasinetti's Contribution

We now refer to two important aspects of Pasinetti's scientific vision, which are already to be found in his inaugural lecture given in 1963 (when he was not yet 33 years old) at the Catholic University of Milan and published in 1964–65.

1.5.1 The Exchange *Versus* the Production Paradigms

We start by noting that Sir John Hicks (1976, 1986) repeatedly suggested that it is no longer possible to see the development of economic theory as a linear evolutionary process from the mercantilists to contemporary economics. For him alternative 'paradigms' characterize the past and present situation of our science. Both Hicks (1976) and Pasinetti (1963, 1965), who had met and exchanged views at Nuffield College, Oxford, in the academic years 1959–61 (see below), seem to agree on a fundamental distinction between the theories centred on the analysis of the production phenomena and the theories centred on the analysis of exchange. Hicks, in order to emphasize the distinction, labels 'political economy' the first group of theories, and 'catallactics' the second. Hicks's and Pasinetti's viewpoints complement each other. On the other hand, Hicks stresses how changes in economists' concentration of attention might also be independent of changes in the basic ingredients of economic life; see, for instance, his explanation of the 'triumph of catallactics' which runs in terms of intellectual superiority of the exchange over the production

research line at the time when the overtaking took place in the 1870s (Hicks 1976, pp. 214–5). Pasinetti, in contrast, highlights the influence of external events, that is, the reaction of the establishment to Marx's predictions, on the internal dynamics of economic theory.

Alberto Quadrio Curzio⁸ and Roberto Scazzieri^{9,10} were the first to study the implications of such a proposal and its application to the

⁸ Alberto Quadrio Curzio was a research student at St. John's College, Cambridge, from September 1962 to September 1963. Ever since he has been intensely associated with Cambridge; first with Robin Matthews and Luigi Pasinetti and, later on, especially with John Eatwell. For the academic year 2010–11 he was elected Distinguished Academic Visitor at Queens' College, Cambridge; invited as Visiting Research Fellow at the Centre for Financial Analysis & Policy, Judge Business School; and elected Member of the Advisory Board of the *Centre for Financial History of the University of Cambridge*. He is a Fellow of *Academia Europaea* and other scientific institutions. In 2015, he was elected President of the Lincei Academy in Rome. He is the founder and editor-in-chief since 1984 of *Economia Politica*, *Journal of Analytical and Institutional Economics*, now co-published by Il Mulino and Springer. Quadrio Curzio has contributed to Cambridge School of Economics in a 'dual' role. The first was devoted to preserving the relevance of such an approach in Italian research and academic institutions. His aim was also to extend this approach to the political and social fields as well. The second contribution of Quadrio Curzio is represented by his scientific research programme with respect to the following analytical domains: scarce resources, income and wealth in a structural perspective; the process of accumulation, multi-sectoral links and technological scarcity within structural dynamics; raw commodities, industrial markets and the long-term evolution of economics systems. He has hence followed the path traced by economists in the structural tradition such as Thomas Roberto Malthus, David Ricardo, Piero Sraffa and Wassily Leontief. We may say that the research programme started since the mid-1960s by Alberto Quadrio Curzio has provided an ambitious and path-breaking analytical framework for the analysis of resource-based structural economic dynamics. In that tradition, non-produced resources play a critical role in shaping economic dynamics. The volume *Resources, Production and Structural Dynamics* (see Baranzini et al. 2015) has been edited in order to provide an assessment of Quadrio Curzio's research programme and to tackle new lines of investigation.

⁹ In particular we may mention the five volumes of *Protagonisti del pensiero economico*, edited by Quadrio Curzio and Scazzieri (1978–83); see also Baranzini (1979), Baranzini and Scazzieri (1986) and Quadrio Curzio (1993a, b).

¹⁰ Since January 1975, Roberto Scazzieri has been closely associated first with the University of Oxford and since the early 1990s with the University of Cambridge. Apart from Sraffa he is probably the Italian economist who has had the most long-lasting institutional involvement with Oxbridge, besides holding since 1990 his chair of economic analysis at Bologna. He took a *Laurea* in Economics and Politics at Bologna with a dissertation on 'Productivity laws and price determination' written under the supervision of Alberto Quadrio Curzio. He was then awarded a Stringher scholarship by the Bank of Italy, and in 1975 he enrolled at Linacre College, Oxford, where for five years he worked under the supervision first of David Soskice and thereafter of Michael Bacharach on an M.Litt. thesis on 'Scale and Efficiency in Classical and Post-Classical Models of Production'. Then he worked under the supervision of Michael Bacharach on a D.Phil. thesis. In 1993, Scazzieri published with Clarendon Press a volume with the title *A Theory of Production. Tasks, processes, and Technical Practices*. Scazzieri's work fills an important gap in the existing theoretical literature on production structures. In the mid-1980s the editors of *The New Palgrave. A Dictionary of Economics*

documentation of a particular period in the history of economic analysis and economic history, especially in their *Introduction* to the four volumes on the leading economists since David Ricardo. In fact, they have attempted a thoughtful and original reconstruction¹¹ of the history of economic theory in which the relative strength or weakness of the exchange and production research lines depends on a special interplay of ‘internal’ or ‘external’ history. Changes in the organization of economic life are considered influential, particularly when they determine a change in the relative importance of two distinct aspects of productive activity: (1) production of commodities by means of commodities; (2) the transformation of primary resources into final consumption goods. In this interpretation, economists tend to be more interested in (1) *or* in (2), depending on whether their description of the productive system is framed in terms of inter-industry relationships or in terms of vertically integrated sectors, respectively. The structural dynamics of the economic system may thus influence the evolution of economic thought. The dichotomy exchange/production was tested in the volume *Foundations of*

did ask him and Luigi Pasinetti to write one entry on ‘Structural economic dynamics’ and another on ‘Capital theory: paradoxes’. In this way, Scazzieri remains one of the very few economists to have published a joint paper with Luigi Pasinetti. In the early 1990s, he decided to move his research interests from Oxford to Cambridge, where he was first appointed Visiting Fellow at Clare Hall in 1992; Visiting Fellow at Gonville and Caius College in 1999; Visiting Fellow, Centre for Research in Arts, Social Sciences and Humanities (CRASSH) in 2004; Visiting Research Fellow, Centre for History and Economics, King’s College; and Senior Research Associate at the Centre for Financial History, Newnham College. In Cambridge he continued his research focusing on the economics of structural change, working primarily on a comparison between ‘horizontal’ and ‘vertical’ models of economic structure and on the micro- and meso-foundations of structural economic dynamics in projects that have involved collaborative research with Alberto Quadrio Curzio, Luigi Pasinetti, Carlo Poni, Patrick Suppes, Richard Arena, Maria Carla Galavotti, Harald Hagemann, Prue Kerr, Michael Landesmann, Pier Luigi Porta, Antonio Andreoni, Ivano Cardinale, D’Maris Coffman, Silva Marzetti, Adrian Pabst and many others including the first author of the present volume. More recently, he has undertaken research on the role of social structures in determining the patterns of economic interdependence (and vice versa). The Hicksian contributions to economic theory have occupied Scazzieri in the conception and scientific structuring of the meeting ‘John Hicks: One Hundredth Anniversary Workshop’ held at Bologna in 2004; the papers were gathered and edited in 2008 by Roberto Scazzieri, Amartya K. Sen and Stefano Zamagni. In September 2012 Roberto Scazzieri and Michelle Baddeley (see Sect. 10.4 below) were the convenors of a conference in honour of Luigi Pasinetti on ‘The Economics of Structural Change: Theory, Institutions and Policies’, which was sponsored by the Cambridge Political Economy Society. Roberto Scazzieri was among the founders and a managing editor of *Structural Change and Economic Dynamics* launched in 1990 and initially published by OUP. Issue 7.2 of this journal was dedicated to *Pasinetti’s Structural Dynamics* with an *Introduction* by Roberto Scazzieri.

¹¹ Quadrio Curzio and Scazzieri’s seminal work was also well received in France: see Lutfalla (1983).

Economics. Structures of Inquiry and Economic Theory, published in 1986; it contains the contribution of renowned scholars.

In the same volume, Pasinetti (1986) argues that the exchange-production duality may be traced back to a deeper dichotomy in the theories of value. In fact, many precious insights are to be gained from the pre-theoretical stages of the discussions on value, where diverging principles become acceptable, considered within a normative framework. Pasinetti identifies in Adam Smith and William Stanley Jevons, respectively, as the reference points for discussing two alternative paradigms: (a) the *pure-preference model* (or pure-exchange model), which looks at all economic problems as if they were problems of optimal allocation of resources, and where prices are determined by individuals' preferences and resource endowments; (b) a *pure-labour economy model*, where production and exchange are inherently linked by labour specialization and where prices emerge from the necessity of an extensive division of labour. In particular, Pasinetti stresses the relevance for each paradigm of developing its basic structure ('first skeleton') by concentrating on one single principle. This basic structure may be unfolded, in spite of successive generalizations of each paradigm, by identifying what is essential and cannot be left out from the theory under consideration. The examination of the distinct ways in which prices are determined and of the way in which the two lines of research are successful in integrating exchange and production leads Pasinetti to maintain that alternative visions of economic life may be associated with different goals of analysis. This ought to ensure a degree of autonomy for alternative frames of analysis.

1.5.2 The Interdependence *Versus* the Causality Framework

As pointed out in Baranzini and Scazzieri (1986, pp. 45–6), Pasinetti has put forward a view concerning the logical structure of marginalist (or neoclassical) and classical theories that reinforces Phyllis Deane's argument according to which:

Probably the most distinctive general characteristics of the Cambridge school's approach to growth theory are that its models tend to be explanatory

rather than predictive, involving behaviouristic rather than mechanistic assumptions, and strongly concerned with directions of causation through time rather than with mutually determining sets of variables. They focus (as Keynes did) on the causes and mechanisms of change rather than the conditions of equilibrium and they stress the need to develop theories which are designed to apply to specific types of economy and to particular period of historical time i.e. to construct ‘historical’ or causal models. (Deane 1978, p. 203)

In fact, Pasinetti much earlier on had maintained that:

The marginalist theory of general equilibrium ... is essentially based upon a system of simultaneous equations. Suffice it to think of the elegant formulation of Vilfredo Pareto. For Pareto, the entire economic system is represented by a number of demand functions and a number of supply functions. When these functions apply simultaneously it is possible to derive the equilibrium conditions, i.e. market prices and physical quantities to be exchanged. Necessarily the logical scheme is that of a system of simultaneous equations. Nothing of the sort was the determination of the various economic magnitudes in the theoretical schemes of classical economists; here there is no necessity for the variables to be always determined in a simultaneous way. As a matter of fact, most of the explanations are of a uni-directional nature. (Pasinetti 1964/5, pp. 243–4)

It is at this point that Pasinetti, in order to distinguish between the two schemes, introduces the concepts of ‘symmetry’ and ‘asymmetry’, asserting that the marginalist model may be represented by a system of inter-dependent equations, where ‘interdependence’ means ‘simultaneous and symmetric relationships among variables’. Classical, modern classical and Keynesian models are, however, characterized by the absence of such a symmetry: here the relationships among variable are uni-directional, and not bi-directional. Such an asymmetry determines a ‘causal relationship’, or ‘causal chain’, or ‘recursivity’.

This does not mean, as Pasinetti (1964/5, pp. 245–6) points out repeatedly, that one cannot find a certain number of simultaneous relationships, for instance, in the Keynesian macroeconomic model; but in these cases,

we are confronted with subsystems of simultaneous equations, which are incorporated in an explicitly causal chain. (Baranzini and Scazzieri 1986, p. 46n)

The use of asymmetric relationships in the explanation of the history of economics has been stressed by Sir John Hicks in his volume *Causality in Economics*. Hicks maintains that given chains of events often ought to be interpreted as ‘sequential causality’. As we pointed out,¹² this requires making an example, that event ‘A causes B on the condition that A happens before B and also on condition that there are sufficient reasons for maintaining that all intermediate events are causally related to one another so as to produce the final effect B during the given time interval’ (see Hicks 1979, pp. 87–8).

1.6 The Main Lines of Pasinetti’s Research Programme

The scientific path of Pasinetti may be divided into nine, but strongly inter-related, strands. They represent outstanding and path-breaking contributions mainly in the fields of the theory of growth, saving behaviour, income distribution, capital accumulation, technological change and institutional settings. Following a conceptual thread, which *grosso modo* coincides with the publication sequence, we might identify: (a) the issue of the measurement of productivity changes; (b) the mathematical formulation of Ricardo’s theory; (c) the Cambridge theory of profit determination, income distribution and capital accumulation; (d) the capital theory controversy; (e) structural economic dynamics; (f) the pure labour theory of value; (g) the ‘natural’ *versus* ‘institutional’ settings; (h) the stylized facts and resource scarcity; and (i) the causes of the recent financial crises. We shall review these topics in much detail in Part II.

¹² Baranzini and Scazzieri (1986, p. 46).

1.7 Conclusion

We may conclude this introduction with an excerpt of the opening of the mathematician Edoardo Vesentini, then President of the *Accademia Nazionale dei Lincei* of Rome, of the 2003 *Conference on Sraffa*, as reported by Pasinetti:

The history of science is rich of crucial turning points in which decisive progress seems to emerge from the meeting of streams of studies, of lines of research, apparently far away from one another. They are moments of transition from one period of ‘normal science’ (in the sense of Kuhn 1962) to another, in which for example Galileo was able to read the mathematical characters with which the ‘Great Book of Nature’ has been written. [...] The individual vicissitudes of the protagonists of these turning points [...] may be seen in different, often divergent, ways [...] down to the simple ‘natural quest for knowledge’ which was so dear to Federico Cesi [the founder of the Lincei Academy in 1616]. (Pasinetti 2008, p. 2, quoting Edoardo Vesentini)

Pasinetti has certainly been a leading scholar, probably the most influential, of the second generation of the Cambridge School of Keynesian Economics; additionally, since the early 1960s he has been one of the most influential economists of the so-called Anglo-Italian school of economics.¹³ At the early age of 40, he had already stirred three scientific controversies, directly with at least eight future Nobel Prize recipients and many other much-distinguished economists. But he has also vigorously pursued a far-reaching research programme on the fundamental dynamics of our society. Along the lines of thought first explored by Sir Roy Harrod, Professor Joan Robinson and Lord Nicholas Kaldor, he has concentrated on the dynamics of the modern economic systems, characterized by a non-proportional growth and by structural dynamics, due to non-uniform increases of productivity in the various sectors and to ‘Engel’s law’ represented by a non-uniform evolution of consumers’ expenditure. This research programme, not surprisingly, has led him to

¹³ On this point see, for instance, Baranzini and Mirante (2016).

develop new analytical tools like the concepts of ‘vertically integrated sectors’ or ‘highly integrated sectors’, as a ‘completion’¹⁴ of input-output analysis. Additionally, he has drawn attention to the dichotomy between ‘natural models’, which describe the very basic relationships among variables, and ‘institutional models’ where different institutional set-ups come into play. Thanks to this original approach a number of empirical rules and of theoretical frameworks, which were often incompatible with the traditional theory, came to be more satisfactorily explained and understood.¹⁵ Pasinetti’s whole scientific life has been driven by the desire to provide new frameworks for the explanation of the mechanisms at the bases of modern economic systems.¹⁶ All this is expressed in the conclusion to his volume on *Keynes and the Cambridge Keynesians; A ‘Revolution in Economics’ to be Accomplished*:

The real challenge is to get rid of the old ways of thinking [...] It may sound upsetting, but this is not going to take place if economists and policy makers stubbornly and firmly remain convinced of the irreplaceability of the now prevalent economic paradigm, proudly associated with neoclassical economic theory. It is precisely on this point, i.e. on a radical change of the current dominant paradigm, that Keynes’s ‘revolution in economics’ may find a dramatically forceful, earlier unexpected, vigour and regain the lost strength for a decisive resumption of what began with wide expectations and awed fascination but has remained a ‘revolution’ still unfulfilled – a revolution still needing to be accomplished. (Pasinetti 2007, pp. 359–60)

¹⁴ Pasinetti maintains that the term ‘completion of’ is better than that of ‘alternative to’ or ‘distinguished from’. The ‘vertically integrated’ and the ‘input-output’ analyses complete (and support) each other reciprocally.

¹⁵ In fact, in the third edition of the *Who’s Who in Economics* (1999, p. 869) Pasinetti states that ‘On the positive, I have pursued a wide investigation into the fundamental dynamics of industrial societies. Along the lines that were adopted after Keynes by Harrod, Domar, Kahn, Joan Robinson and Kaldor, I went on to enquire into such movements of the economic systems through time that are characterized by non-proportional growth and structural change due to the unevenness from sector to sector of productivity changes and the hierarchical structure of consumers’ needs (“Engel’s Law”). This work led me to call for the elaboration of new analytical tools (such as vertically integrated sector analysis, as distinguished from input-output analysis) and also for changes in the methodology of economics itself, especially with reference to a separation of basic relations typical of industrial societies as such from relations specific to particular institutions. From this analysis, many empirical regularities and a number of theoretical contributions, which had earlier been difficult to absorb into marginal theory, seem to find a more natural and satisfactory theoretical explanation.’

¹⁶ On this point, see Baranzini and Quadrio Curzio (2012, Sect. 9).

Bibliography

- Allais, M. 1965a. Discussion. *Pontificiae Academiae Scientiarum Scripta Varia* 28: 694–695.
- . 1965b. The Role of Capital in Economic Development. *Pontificiae Academiae Scientiarum Scripta Varia* 28: 697–978.
- Baddeley, M., and R. Scazzieri. 2012. Introductory Remarks. In *The Economics of Structural Change: Theory, Institutions and Policies: A Conference in Honour of Luigi Pasinetti, Gonville and Caius College*, Cambridge, September 12–13.
- Baranzini, M., and G.C. Harcourt. 1993. *The Dynamics of the Wealth of Nations: Growth, Distribution and Structural Change: Essays in Honour of Luigi L. Pasinetti*. Basingstoke/London/Macmillan/New York: St. Martin's Press.
- Baranzini, M., and A. Mirante. 2016. *A Compendium of Italian Economists at Oxbridge: Contributions to the Evolution of Economic Thinking*. London/New York: Palgrave Macmillan.
- Baranzini, M., and A. Quadrio Curzio. 2012. *From Adam Smith to Structural Dynamics: Luigi Pasinetti's Life-Long Contribution*. Paper presented at the Conference 'The Economics of Structural Change: Theory, Institutions and Policies', in honour of Luigi L. Pasinetti, Gonville and Caius College, Cambridge.
- Baranzini, M., and R. Scazzieri, eds. 1986. *Foundations of Economics: Structures of Inquiry and Economic Theory*. Oxford/New York: Basil Blackwell.
- , eds. 1990. *The Economic Theory of Structure and Change*. Cambridge: Cambridge University Press.
- Baranzini, M., C. Rotondi, and R. Scazzieri, eds. 2015. *Resources, Production and Structural Dynamics*. Cambridge: Cambridge University Press.
- Baumol, W.J. 2009. Lecture in Appreciation of Luigi Pasinetti's Book. In *Proceedings. Rendiconti degli atti dell'Accademia Nazionale dei Lincei*. Round table on Luigi Pasinetti's book *Keynes and the Cambridge Keynesians. A 'Revolution in Economics' to Be Accomplished*, ed. T. Cozzi, 775–781. Rome: Scienze e Lettere.
- . 2012. Growth: Towards a Structural Endogenous Macro-Model. In *Structural Dynamics and Economic Growth*, ed. R. Arena and P.L. Porta, 125–134. Cambridge: Cambridge University Press.
- Bliss, C.J. 1986. Progress and Anti-Progress in Economic Science. In *Foundations of Economics*, ed. M. Baranzini and R. Scazzieri, 363–376, *op. cit.*
- . 2010. The Cambridge Post-Keynesians: An Outsider's Insider View. *History of Political Economy* 42 (4): 631–652.

- Bortis, H. 2017. Review of M. Baranzini and A. Mirante's *Compendium of Italian Economists at Oxbridge. Contribution to the Evolution of Economic Thinking. History of Economic Thought and Policy* 6 (2): 125–128.
- Campa, G. 1975. Indeterminatezza del saggio di profitto e rilevanza della propensione a risparmiare dei lavoratori e della tecnologia nel paradosso di Pasinetti. *Giornale degli Economisti e Annali di Economia* 34 (1/2): 16–55.
- Cohen, A.J., and J.C. Harcourt. 2003. Whatever Happened to the Cambridge Capital Theory Controversy? *Journal of Economic Perspectives* 17 (1): 199–214.
- Deane, P. 1978. *The Evolution of Economic Ideas*. Cambridge: Cambridge University Press.
- Dorfman, R. 1965. Discussion. *Pontificiae Academiae Scientiarum Scripta Varia* 28: 691–692.
- Dougherty, C.R.S. 1972. On the Rate of Return and the Rate of Profit. *The Economic Journal* 82 (328): 1324–1350.
- Fleck, F.H., and C.-M. Domenghino. 1987. Cambridge (U.K.) Versus Cambridge (Mass.): A Keynesian Solution of “Pasinetti's Paradox”. *Journal of Post Keynesian Economics* 10 (1): 22–36.
- . 1990. Government Activity Does Invalidate the “Cambridge Theorem of the Rate of Profit”. *Journal of Post Keynesian Economics* 12 (3): 487–497.
- Hahn, F.H. 1964. A Letter to Nicholas Kaldor, 30th July 1964, Luigi L. Pasinetti's archives.
- Harcourt, G.C. 1999. Horses for Courses: The Making of a Post-Keynesian Economist. In *The Makers of Modern Economics*, ed. A. Heertje, vol. IV, 32–69. Cheltenham/Northampton: E. Elgar.
- . 2006. *The Structure of the Post-Keynesian Economics: The Core Contributions of the Pioneers*. Cambridge: Cambridge University Press.
- . 2012. Luigi Pasinetti: The Senior Living Heir of the Cambridge School of Economics and the Last of the Great System-Builders. In *Structural Dynamics and Economic Growth*, ed. R. Arena and P.L. Porta, 137–144. Cambridge: Cambridge University Press.
- Hicks, J.R. 1976. “Revolutions” in Economics. In *Method and Appraisal in Economics*, ed. S.J. Latsis, 207–218. Cambridge: Cambridge University Press.
- . 1979. *Causality in Economics*. Oxford: B. Blackwell.
- . 1986. Is Economics a Science? In *Foundations of Economics. Structures of Inquiry and Economic Theory*, ed. M. Baranzini and R. Scazzieri, 91–101, *op. cit.*
- Hicks, J.R., and S. Hollander. 1977. Mr. Ricardo and the Modern. *Quarterly Journal of Economics* 91 (3): 351–369.

- Kaldor, N. 1956. Alternative Theories of Distribution. *The Review of Economic Studies* 23 (2): 83–100.
- Kerr, P., and R. Scazzieri. 2013. Structural Economics Dynamics and the Cambridge Tradition. In *The Oxford Handbook of Post-Keynesian Economics*, ed. G.C. Harcourt and P. Kriesler, vol. I, 257–287. Oxford: Oxford University Press.
- Kuhn, T.S. 1962/1970. *The Structure of Scientific Revolutions*. 2nd ed. Chicago: University of Chicago Press.
- . 1970. Reflections on My Critics. In *Criticism and the Growth of Knowledge*, ed. I. Lakatos and A. Musgrave, 231–278. Cambridge: Cambridge University Press.
- Levhari, D. 1965. A Nonsubstitution Theorem and Switching of Techniques. *Quarterly Journal of Economics* 79 (1): 98–105.
- Lutfalla, M. 1983. Review of A. Quadrio Curzio and R. Scazzieri (Eds.). *Protagonisti del pensiero economico, Revue d'économie politique* 93 (4): 610–611.
- Malinvaud, E. 1995. Luigi Pasinetti's Structural Economic Dynamics: A Review Essay. *Journal of Evolutionary Economics* 5 (1): 59–69.
- Matthews, R.C.O. 2004. Hicks, Sir John Richard. In *Oxford Dictionary of National Biography*, ed. H.C.G. Mathew and B. Harrison, 32–33. Oxford: Oxford University Press (in Association with the British Academy).
- Meade, J.E. 1966. The Outcome of the Pasinetti Process: A Note. *The Economic Journal* 76 (301): 161–165.
- Meade, J.E., and F.H. Hahn. 1965. The Rate of Profit in a Growing Economy. *The Economic Journal* 75 (298): 445–448.
- Mirrlees, J.A., and N.H. Stern, eds. 1973. *Models of Economic Growth*. London: Macmillan.
- Nuti, D.M. 1974. On the Rates of Return on Investment. *Kyklos* 27 (2): 345–366.
- Pasinetti, L.L. 1959. 'On Concepts and Measures of Changes in Productivity' and 'Reply to Robert M. Solow'. *The Review of Economics and Statistics* 41 (3): 270–282 and 285–286.
- . 1962. Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth. *The Review of Economic Studies* 29 (4): 267–279.
- . 1963. *A Multisector Model of Economic Growth*. Cambridge: Polyhedron Services (Printed by King's College).
- . 1964/5. Causalità e interdipendenza nell'analisi econometrica e nella teoria economica. In *Annuario dell'Università Cattolica del Sacro Cuore, Anno Accademico 1964–65*, 233–250. Milan: Vita e Pensiero.