The Fault Line between Keynes and the Cambridge Keynesians: A Review Essay

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ABSTRACT *This essay reviews Michael Ambrosi's important but neglected book on the formative period of Keynesian economics. The book traces the evolution of a Cambridge macroeconomic tradition running from Marshall and Pigou to Keynes, and interprets* The General Theory *as a response to Pigou's analysis of unemployment. Ambrosi also argues that Keynes's disciples, Richard Kahn, Nicholas Kaldor and Joan Robinson, were in the 1930s wedded to a Pigovian methodology, and did not immediately recognise that Keynes had redefined the meaning of equilibrium in* The General Theory. *Keynes's attempt to redefine the analytical basis of neoclassical economics was thwarted, not merely by the neoclassical synthesis, but by those who claimed to be the inheritors and guardians of his vision.*

The absence of a thorough review of Michael Ambrosi's *Keynes, Pigou and Cambridge Keynesians*[1] in the six years since its publication may reflect its daunting length and complexity, including some fairly high-powered mathematics rather unusual in a study in the history of economic thought. Yet Ambrosi has done for Pigou what Sraffa did for Ricardo and thereby illuminated *The General Theory* (Keynes, 1936; henceforth *GT*). Ambrosi's book rehabilitates both Pigou and Keynes as theorists of the first order and pinpoints what went wrong with Post-Keynesian economics at Cambridge.

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[1] Gerhard Michael Ambrosi: *Keynes, Pigou and Cambridge Keynesians: Authenticity and Analytical Perspective in the Keynes-Classics Debate* (Basingstoke: Palgrave Macmillan, 2004). In what follows, cited page numbers refer to this work except where indicated otherwise. Harcourt (2006) provides an insightful sketch of Ambrosi's argument.

The central claim is of evolution rather than revolution in the Cambridge tradition from Marshall and Pigou to Keynes, followed by a fateful break between Keynes and his putative disciples, the Cambridge Keynesians. The three central parts (II–IV) of the book consider different aspects of the discourse between Keynes and Pigou: first, *The General Theory* itself as a response to Pigou's *Theory of Unemployment* (1933); second, Pigou's reaction and the role of Kaldor (1937); and third, Joan Robinson's essay (1937) on 'generalising *The General Theory*' to the long period, to which Pigou (1937) was primarily addressed. Neither Kaldor nor Robinson emerges from this analysis as an effective defender of Keynes's position; Kahn, behind the scenes, proves to have been positively obstructive. The disciples failed to grasp the right end of the baton until defeat was upon them. At the heart of the break between Keynes and his followers, Ambrosi places a 'Citizen Kane'-style emphasis on a single phrase—'frozen land'—of which he writes 'it is a token for illusions which misled revolutionary fervour into barren land' (p. 333).

The introductory Part I identifies three pathological tendencies in the development and study of macroeconomic thought since Keynes: a constant stream of 'revolutions' that have not resulted in substantive change; a tendency to regard Keynes as 'Delphic', an unwitting author who does not understand his own work; and a dismissal of Keynes's portrayal of neoclassical economics as a 'Klassical' [*sic*] caricature (Hutchison, 1978). Ambrosi's response in Part II is to begin by identifying A. C. Pigou as Keynes's foil, not his whipping boy, and to reconstruct both Pigou (1933) and Keynes's critique from purely Marshallian elements with the help of modern mathematical tools. His endeavour is to recreate the Cambridge mind of the time and make progress by understanding what was really in question.

Part II (The Pigovian Node of the Keynes-Classics Debate) begins by noting the tension between historical and rational reconstruction. Ambrosi's solution to the problem of authenticity is to use both Pigou's own results and the policy implications that Keynes attributed to neoclassical theory in *The General Theory* to test a fully articulated, 'micro-founded', mathematical version of the model outlined in Pigou (1933). Citing 'Note XXI' of Marshall's *Principles* (1920), Ambrosi emphasises that, contrary to the usual canard, the Cambridge tradition fully accepted the need to think in terms of general equilibrium. Furthermore, Pigou and Keynes both eschewed the assumption of homogeneous output and were grappling with a problem more complex than most modern macroeconomists are prepared to address. Keynes's critique of Pigou (1933) can be understood as two-fold, from the internal perspective of contemporary Marshallian theory and from the external perspective created by the introduction of the principle of effective demand.

Chapter 8 (Pigou's 'Real Demand for Labour') finds that Pigou's model is a genuinely macroeconomic 'real' model that anticipates Lucas by 50 years while avoiding the fallacies of using representative agents and of composition. Ambrosi reconstructs Pigou's model by reducing Pigou's textual assumptions to primitive Marshallian production and utility functions within a two-sector equilibrium framework, en route to Pigou's portmanteau function $\phi(x) = n$, relating employment in the wage-goods sector (x) to aggregate employment (n). In chapter 9 Ambrosi derives Pigou's core result, the negative elasticity of the aggregate real demand for labour with respect to the real wage, as a formal result in quasi-general equilibrium comparative statics that follows from the Marshallian axioms; 'quasi' because Pigou's model omits workers' preferences, a point on which Keynes focuses. Nevertheless, the model has the remarkable property of linking a macroeconomic aggregate (total employment) to a microeconomic variable (the marginal product of labour in the wage-goods sector). Ambrosi then simplifies the complex general result by the assumption of constant elasticities but emphasises that this does not correspond to the modern Cobb-Douglas aggregate production function.

The next step, in chapters 10 and 11, is to consider what Ambrosi calls Keynes's internal and external critiques of Pigou. The internal critique is that Pigou's model is under-determined in allowing changes in the real wage to affect employment, since both should be general equilibrium values. The external critique is that Pigou's model is not *over*-determined, in other words, it lacks the additional constraint on employment presented by the new principle of effective demand.

Pigou's result that the real wage elasticity of the demand for labour is negative suggests that employment can be increased by reducing real wages, that there is a degree of freedom; by way of internal critique, Keynes points out that in a neoclassical general equilibrium both employment and the real wage are determined endogenously. The missing ingredient in Pigou's model is an explicit treatment of labour supply; when the model is extended to include a macroeconomic labour supply function $n = \chi(x)$, we see that employment can only be increased by changes in endowment, preferences or technology, the parameters of general equilibrium. In other words, Pigou's theory is not a theory of unemployment but of full employment (*GT*, p. 275); observed unemployment is in the final analysis voluntary and its elimination requires a change in workers' preferences.

Keynes's internal critique concludes with a list of policy implications which he understands to follow from Pigou's theory (*GT*, p. 7), a list which no doubt most readers have found cryptic. Deploying his mathematical skills to good effect once again, Ambrosi shows that his reconstructed Pigovian model supports Keynes's list as a comprehensive representation of Pigou's results and therefore a conclusive statement of the limited relevance of neoclassical theory for employment policy. In Pigou's theory, variations in the real demand for labour can only arise from changes in supply-side parameters which are usually taken as given in the short period, even if modern real business cycle theorists have sought to argue otherwise.[2]

Turning to Keynes's external critique of Pigou in chapter 11, Ambrosi first notes Keynes's claim to depart from neoclassical equilibrium theory only by the relaxation of the Second Classical Postulate (labour supply) from an equation to a non-binding constraint. He then approaches Keynes's principle of effective demand from a Pigovian perspective, making a connection between Pigou's $\phi(x)$ and Keynes's employment function $F(D_w)$, by treating Pigou's wage-goods as equivalent to Keynes's consumption-goods, something which Keynes himself was prepared to consider reasonable. The connection is the underlying Marshallian micro-foundation in terms of equilibrium between non-workers' preferences for wage-goods (or consumption) and non-wage goods on the one hand (assuming workers do not save), and the technical conditions of production on the other. Mathematically, Keynes's employment function is the inverse of the aggregate supply function $Z_w(N)$ at any given point of effective demand. The employment function relates aggregate employment to effective (N.B. not aggregate) demand and defines a locus of different

2 A small criticism is that Ambrosi interprets Keynes's first definition of involuntary unemployment (*GT*, p. 15) as involving an increase in labour supply in response to a fall in the real wage (p. 89). All Keynes states is that the 'supply of labour willing to work' (but clearly not all employed), before and after the fall in the real wage, is greater than the existing volume of employment; after the change, we do not know whether the labour supply has risen or fallen or whether involuntary unemployment exists; all we know is that there was involuntary unemployment before the change.

points of effective demand corresponding to different levels of employment at which consumers, investors and entrepreneurs (but not necessarily workers) are all individually in neoclassical equilibrium.

The fundamental difference between Pigou and Keynes is not in the definition or analysis of effective demand, but in the difference between the whole locus and a particular point. Pigou argues that the real wage determines employment in the wage-goods sector (*x*) and so through a general equilibrium represented by $\phi(x)$, total employment. Implicitly he considers only the single point of effective demand corresponding to Say's Law. Pigou does not say so explicitly, but his method dictates that labour supply is in equilibrium, i.e. a matter of workers' choice, so that involuntary unemployment in Keynes's sense cannot exist. Pigou's system is under-determined unless labour supply is taken into account, so that the resultant position of Classical general equilibrium corresponds to the Second Classical Postulate, i.e. full employment. Keynes's system, by contrast, is over-determined, relative to the Classical general equilibrium, with employment determined by a range of possible values of effective demand, irrespective of labour supply, represented by $F(D_w)$. Involuntary unemployment is the result of this over-determination, of the equilibrium defined by the monetary choices of entrepreneurs, investors and consumers overriding the equilibrium that would be chosen by workers, if the employment decision was theirs to make.

Taken as a whole, Part II is a brilliant exposition of the meaning and intent of chapter 2 of *The General Theory*, interpreting Keynes's words in the terms of Pigou. By imposing certain Pigovian simplifications on Keynes's analysis (two sectors, constant production elasticities, zero user cost), Ambrosi is able to bring out, with striking clarity, the key difference between them.

Part III (The Fledgling Debate) turns to the odd next stage of the (non-)debate between Keynes and Pigou, centred on Pigou (1937). Chapters 16 and 17 offer another detailed reconstruction of the models implicit in Pigou (1937) and Kaldor (1937) and the relationship between them. While Keynes had expressed disappointment that Pigou's initial (1936) review of *The General Theory* did not address its substance, Pigou (1937) did respond to the key question of the relationship between money wages and employment. Pigou recognised that the transmission channel had to be monetary but claimed that money wage cuts could increase employment independently of the rate of interest, contra *GT* chapter 19 (the 'Keynes effect'). Kaldor (1937) responded by identifying the special assumption in Pigou (1937) that time-preference is independent of employment, a critique which Pigou (1938) accepted, and so the usual story ends. Ambrosi's contribution is to establish that Kaldor's argument is Pigovian, rather than Keynesian, and to argue that Keynes's disciples (notably Kahn, Kaldor and Joan Robinson) stifled the debate over what Keynes regarded as the key issues, the assumption of a stationary state or 'frozen land' economy and the nature of short-period equilibrium analysis.

Marshall defined as 'short' the period over which the employment of existing resources would return to equilibrium after a shock (in modern parlance), and as 'long' the period over which the capital stock would adjust by the production or consumption of capital goods. It follows that a characteristic of long-period equilibrium is zero net investment, although Marshall saw this as a tendency rather than something to be observed in reality. Pigou took this long-period stationary state as the foundation of his analysis and sought to explain unemployment in terms of divergence from that static equilibrium. It is this foundation to which Keynes objected and did so explicitly in a draft paragraph, omitted from his published rejoinder to Pigou (1937) at the insistence of Kahn:

> There also seems to be a confusion between a 'short period' during which finished capital equipment is assumed to be constant, and a 'short period' during which no new capital goods are allowed to be in course of production. The former 'short period' merges into the long period and the changes of the real world; but the latter relates to a frozen land remote in its characteristics from all experience. (*CW* XIV, p. 238)

Keynes insisted on using a short-period analysis (i.e. of the determinants of equilibrium employment), necessarily assuming a given capital stock, and yet at the same time a positive rate of net investment. Pigou had castigated this in his review, stating that Keynes was 'assuming in fact a stationary state and at the same time a moving one' (Pigou, 1936, p. 122), and concluding that Keynes was muddled.

Ambrosi argues that the disciples were wedded to a Pigovian methodology, which Robinson herself came to reject only late in life, as did Kaldor. They did not immediately recognise that Keynes had redefined the meaning of the short and long equilibrium periods in *The General Theory*. Keynes's attempt to redefine the analytical basis of neoclassical economics was thwarted, not merely by the neoclassical synthesis, but at its very outset by those who claimed to be the inheritors and guardians of his vision. Kaldor (1937), Ambrosi writes (p. 227), 'stands at the decisive crossroads of divergent interpretational developments in the Keynes-Classics debate.'

An important element of Ambrosi's argument is his demonstration that a 'Keynesian' consumption function can be (and implicitly was by Keynes) derived from the theory of time-preference (p. 184). This matters for Ambrosi's main thesis because Keynes explicitly disagrees with Kahn's view that Pigou's 'gross error' is in treating the rate of interest as determined by time-preference. Keynes himself regarded this treatment as a consequence of the deeper, overriding assumption of a stationary state, which eliminates uncertainty and liquidity-preference at a stroke.

In the course of a sophisticated technical detour, Ambrosi connects his argument with modern intertemporal macroeconomics. He shows that the influence of current income on consumption does not depend on the assumption of liquidity constraints. He corrects Leijonhufvud's (1968) statement that Keynes rules out intertemporal price effects in favour of a demonstration that these cross-effects are zero under the standard assumption of additively separable logarithmic utility. Furthermore, he demonstrates that the abstraction (necessary for the determinacy of the equilibrium model) from the aggregate wealth effects of a change in interest rates (Barro, 1990) depends upon the assumption of zero aggregate net saving, i.e. the very assumption of a stationary state that concerned Keynes, and not simply upon the netting out of inside debt on consolidation. This assumption has the effect of making the rate of time-preference the exogenous variable, rather than the rate of interest.

Ambrosi makes a strong case that the implicit theory of personal consumption in *The General Theory*, albeit psychological, is grounded in the supposition that agents are rational: it is not 'behavioural' in today's sense. Indeed, on this account, Modigliani and Friedman were simply reasserting stationary state thinking in which the marginal propensity to consume becomes unity. Ambrosi does not address the point that in *The General Theory* the propensity to consume is not only a matter of households but of the government, corporate and foreign sectors (*GT*, pp. 94–104, 120–122). I have argued elsewhere (Hayes, 2007) that in *The General Theory* Keynes justifies his assumption that the marginal propensity to consume is less than unity, not by choice theory, but as the logical corollary of the observation of a market value for aggregate output (*GT*, p. 64). Nevertheless, while it remains true that Keynes does not offer an equilibrium theory of consumption in *The General Theory*, Ambrosi has convinced me that there is no reason to doubt that Keynes understood and accepted the Ramsey/Fisher theory of personal consumption as valid within the limits of Classical thought.

Part IV (A Post-Keynesian Dilemma: Keynesian Employment and Pigovian Equilibrium in Joan Robinson's 'Keynesian Extension') offers a devastating critique of Robinson's 1936 essay on 'The Long-Period Theory of Employment' (reprinted with changes in Robinson, 1937). Since this essay has been regarded as the fountainhead of the Cambridge Post-Keynesian approach (see Amadeo, 1989; Kregel, 1983), Part IV is also an indirect indictment of this research programme, characterised by Robinson herself as the reconciliation of Keynes and Sraffa. The core theme, once again, is the centrality of the stationary state in the Pigovian concept of long-period equilibrium shared, at this time, by Robinson. Ambrosi employs the method previously applied to Pigou and Kaldor, the reconstruction of an implicit model which he then tests for consistency, both internally and against Robinson's specific conclusions. Ambrosi's model of Robinson (1937) is consistent with her conclusions, including the curiously un-Keynesian one that a fall in the interest rate may reduce employment. The problem, he finds, is that the model is inconsistent with several of Keynes's primary concerns, including the consumption function, the nature of liquidity and the distinction between the rate of interest and the marginal physical product of capital.

Part V (Paradigms and Perspectives) summarises and draws the strands of the arguments together. Together with Part I, this will suit those short on time and willing to take Ambrosi's painstaking justification of his arguments on trust. However, such a shortcut risks missing the full force of those arguments and Ambrosi himself refuses to summarise his book 'in a nutshell.'

The central message of chapter 25 is that for all the Post-Keynesian talk of paradigm shifts, Keynes's disciples failed to follow Keynes's shift away from long-period thinking, at least until very late in their careers, and ended up in a no-man's land between Keynes, Pigou and Marx. Chapter 26 sets out the analytical consequences of reading *The General Theory* in the context of the authentic debate between Keynes and Pigou. In a nutshell (!), these are based on a recognition of Keynes's use and enhancement of Marshallian choice-theoretic 'microfoundations' within a generalised macroeconomic framework which encompasses standard general equilibrium theory. While involuntary unemployment is a sign of disequilibrium in a Walrasian framework, within Keynes's it is a symptom of a different problem in constrained optimisation: the system is over-determined. In both systems the real wage is too high, but for different reasons. Imperfect competition is irrelevant.

The book concludes in chapter 27 with a brief look to the horizon beyond the battlefield of the Keynes-Classics debate, to the research possibilities unleashed by the settlement offered by Ambrosi. He singles out the concept of liquidity-preference, greeted at best with scepticism by his disciples, and the philosophical basis of Keynes's economics, with a possible link to Hegel rather than Moore as the dominant influence. Food for thought indeed.

In place of a nutshell, Ambrosi offers a fault line, the 'frozen-land' metaphor, to encapsulate his thesis. He characterises Keynes's method as one of comparative static 'momentous equilibrium', which seems to follow Keynes's 'division between the theory of stationary equilibrium and the theory of shifting equilibrium' (*GT*, p. 293). Ambrosi is surely right that these basic questions about the treatment of time and the definition of equilibrium should have been thrashed out in 1937 or 1938 and that the unsatisfactory state of macroeconomic debate ever since owes a great deal to the failure to do this. It is unfortunate, if understandable given the tone of Pigou's review, that Keynes did not respond immediately to Pigou's claim that Keynes was assuming in fact a stationary state and at the same time a moving one. Indeed Ambrosi's main complaint against Kahn is precisely that he stopped Keynes from doing so in 1937.

Ambrosi's own treatment of this fundamental issue (pp. 402–409) is not easy to follow. He contrasts Keynesian momentous (he appears to mean momentary) equilibrium with 'atemporal' Arrow-Debreu and stationary or 'eternal' Pigovian conceptions (pp. 105–106). The case for momentous equilibrium theory stems from the indisputable incompleteness of the markets required for Arrow-Debreu equilibrium and the need to reclaim equilibrium analysis from the scholastics, for application to markets as they actually exist. He draws a distinction between 'ex ante' and 'anticipated ex post', arguing that the latter abstracts from the intractable dynamic problems of expectations formation. Ex post analysis requires only accounting consistency in the sense of Walras' Law, so that by extension *anticipated* ex post analysis assumes that expectations are consistent both in accounting and choice-theoretic terms.

This sounds like the assumption of short-term rational expectations. However, Ambrosi further distinguishes between expectations that are consistent with each other (accounting consistent) and expectations that are consistent with a model. The latter may contain theoretical claims that go beyond accounting consistency, e.g. the quantity theory of money or the assumption of a stationary state. For these reasons, Ambrosi prefers the term ‘rationalised expectations’, referring solely to the former concept of accounting consistency.

Ambrosi’s approach appears to correspond to what Keynes referred to in his 1937 lectures as the method of trial and error (*CW* XIV, p. 183). Divergent expectations lead to false trading relative to the Keynesian over-determined or constrained general equilibrium, but this equilibrium must be assumed stable if theory is to have any policy relevance, so that the dynamics can be neglected. This method contrasts with what Keynes referred to as judicious foresight, in a sentence that Ambrosi omits from his quotation: ‘Ex ante decisions may be decided by trial and error or by judicious foresight, or (as in fact) by both.’ Keynes’s ‘judicious foresight’ corresponds to short-term rational expectations in the sense which Ambrosi rejects.

Be that as it may, at least Ambrosi’s anticipations do not attribute to Keynes the assumption that these anticipations are fulfilled, for which there is no textual warrant, a point relevant to the current debate over the nature of the principle of effective demand (Hartwig, 2007; Hayes, 2007; Allain, 2009). On this Ambrosi and I agree. What I find missing is a detailed consideration of the intertemporal nature of production—indeed he incorrectly suggests that Keynes neglects this (p. 287). Furthermore, in correctly emphasising the differences between Keynes and Pigou and the similarities between Marshall and Walras, he overlooks Keynes’s own distinctive redefinition of Marshall’s long period (*GT*, p. 48) and indeed Keynes’s rather crucial statement, in this context, that ‘long-period conditions are *not necessarily static.* For example, *a steady increase in wealth* or population may constitute a part of the unchanging expectation’ (ibid., n1, emphasis added). Ambrosi is silent on the dynamic passages immediately following this quotation, which describe a process of convergence of the short-period equilibrium to a long-period position in a given state of expectation, which to my mind implies short-term rational expectations.

The missing link here, I think, is that for Keynes the position of equilibrium is defined by 'the' (common) state of expectation, which may be stationary or shifting, and a stationary state of expectation may allow for positive investment. Thus while Ambrosi's association of the rate of interest with the rate of time preference in a Pigovian stationary state remains correct, Keynes's stationary state of expectation could involve a difference between these rates.

Returning to the intertemporal nature of production, there is a remarkable lacuna in Ambrosi's neglect of user cost and of Keynes's concern with capital as the consequence of production 'by processes which occupy time' (*GT*, p. 46). It is surprising that Ambrosi praises Robinson (1937) for her inclusion of depreciation in her model and rightly suggests this as an area for further work, yet dismisses Keynes's own contribution in this very area as 'one of the weakest analytical aspects of Keynes's book' (p. 129). With uncharacteristic brevity, he cites Keynes's correspondence with Townshend (*CW* XXIX, pp. 239–247) as conclusive, even though Townshend's critique was directed not at user cost itself, but at Keynes's attempt to link aggregate supply prices with the ordinary supply prices of the general price level. In view of the careful attention he pays to the appendix to chapter 19 of *The General Theory*, Ambrosi's neglect of the appendix to chapter 6 (one of the few passages that Pigou's review found praiseworthy) is puzzling.

This neglect leads Ambrosi slightly astray. He insists (p. 123) on writing sectoral, as opposed to industrial, production functions without pointing out that Keynes does not allow this. The step from a sectoral employment function to a sectoral production function is not strictly legitimate. This shortcut is quite understandable, given Ambrosi's wish to emphasise the continuity between Pigou's two-sector model and Keynes's similar division between consumption and investment, but Keynes does not assume homogeneity of consumption or capital goods in deriving the principle of effective demand (he limits such assumptions to the special case of deriving a Pigou-style elasticity of the price level in *GT* chapters 20–21). It is probably also true that Ambrosi's already quite tough mathematical proofs and geometry would at the very least become much more difficult if user cost were taken into account. There is a place for metaphor, as he points out (p. 410) when making for the purposes of illustration the assumption of homogeneous output for the economy as a whole, as Keynes himself does in *GT* chapters 20–21. Nevertheless, the definition of a 'depreciation inclusive sectoral aggregate supply function' (p. 281) seems to me quite problematic.

Ambrosi's book is the fruitful harvest of a lifetime's work. It has established the authentic context of the core debate between Keynes and Pigou, without which *The General Theory* cannot be understood. In the process it has made sense of Pigou's nearly impenetrable *Theory of Unemployment*. Ambrosi's is a work of serious scholarship, not an easy read, but well repaying the effort. He has indeed by rigorous and impartial analysis re-created the 'Cambridge mind' of the time so that, perhaps, macroeconomics can move forward rather than round in circles.

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