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Fusing Indissolubly the Cycle and the Trend: Richard Goodwin's Profound Insight

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DRAFT

“FUSING INDISSOLUBLY THE CYCLE AND THE TREND: RICHARD GOODWIN’S PROFOUND INSIGHT”^{*1}

I

I start with a personal note. I had the good fortune to be, first, a student of Dick Goodwin’s in the 1950s (in that as a Ph.D student at King’s, I went to his lectures on Central planning in India, see Goodwin (1982), Ch. 11, Goodwin (1983), Ch. 6), and then his colleague in the 1960s when I first lectured at Cambridge. He and I were Part I examiners in 1965. Richard Kahn was Chairman of examiners and Dick and I had not done all of the very detailed tasks that Richard as a meticulous but demanding chair required of us. Richard was (in)famous for his fierce temper and most people were scared stiff of it; but not Dick. When Kahn telephoned about our misdemeanours, luckily Dick answered the phone and stood by, smiling, occasionally putting in a short response, while Richard screamed down the phone. After a quarter of an hour even Kahn was exhausted so I received barely a scolding when Dick put me on the phone.

^{*}I am most grateful to Peter Kriesler and, especially, to Vela for extremely helpful comments on, and corrections of, a draft of this tribute. Maynard Keynes once wrote to Joan Robinson about Richard Kahn that “there never was anyone in the history of the world to whom it was so helpful to submit one’s stuff” (*C.W.*, vol XIII, 1973, 422). Now there are two.

I was one of the readers for Cambridge University Press for Dick's book of his lectures to Prelims, *Elementary Economics from the Higher Standpoint* (1970). It contained a fundamental set of principles and Dick's wonderful diagrams. There were many typos but none, Vela assures me, were "remotely crucial". I had wondered whether students could have been put off by them because they did not think their teachers could make mistakes, yet they could not understand the arguments. So there must be other reasons why it tended to remain a closed book to students and the profession alike, perhaps because of the closed minds of some teachers?²

When I came back to Cambridge in 1982, Dick would often call in to the Faculty in the 1980s and 1990s for a chat, see Goodwin (1997a), and I had the great pleasure of writing an oral history of him for the series of founding fathers and mothers of post-Keynesianism in the *Journal of Post Keynesian Economics*, see Harcourt (1985; Sardonì (ed.) (1992)). Dick's *magnum opus*, co-authored with Lionello Punzo, *The Dynamics of a Capitalist Economy* (1987), is the jewel in the crown of my series, *Aspects of Political Economy*, with Polity Press. Dick also contributed a profound two page chapter on "Keynes and Dynamics", Goodwin (1997b), to A "Second Edition" of *The General Theory*, vol. 1, Harcourt and Riach (eds) (1997). As with Michal Kalecki, not a word is wasted; the two pages abound with deep insights and incisive sketches of the dynamic processes that underlie the laws of motion of the capitalist mode of production.³

It was an extraordinary privilege and pleasure to have known and worked with him.⁴ So it was with great pleasure that I said ‘Yes’ to Vela’s request that I contribute to this special issue of the *Cambridge Journal of Economics* to honour Dick by celebrating the Centenary of his birth in 1913.

II

Frank Hahn once told me that he viewed our profession as akin to a pyramid. At the top was the tiny band of theoretical and/or mathematical economists who made the fundamental contributions to and advances in our discipline. Moreover, they also knew about and thoroughly understood all that was occurring in the ever widening layers below that together served to make up the whole pyramid. We lesser breeds without the Law were slotted in at our appropriate levels. (He, of course, was a top person while I was slotted in by him at a very low level indeed.) We either did not know of or, if we had an inkling, could not understand what was going on above us (though we could and should admire and respect those responsible for it). We *did* comprehend what was happening in the layers below our’s.

I was forcibly reminded of Hahn’s graphic account when preparing this essay to honour Dick. For not only could Dick rightfully take his place at the top of the pyramid, he also had a deep understanding and comprehensive overview of what had been contributed by others who had been or were still at

the top. Moreover, he had a similar understanding and respect for the contributors and the contributions associated with the levels below.

Of those at the top with Dick, the most influential on his own contributions include Smith, Ricardo, Malthus, Marx, Wicksell, Keynes, Sraffa, Kalecki, Hicks, Harrod, Joan Robinson⁵, Kahn, Kaldor, von Neuman, Schumpeter, Tinbergen, Richard Day and Philippe Le Corbellier. Le Corbellier was a great influence on Dick when Dick was at Harvard. His work on the theory of oscillations was crucial for anyone thinking fundamentally about the cyclical processes at work in capitalist economies.

Dick was a skilful mathematician and a brilliant geometer (reflecting his passion and skills as a very fine abstract painter). He was always interested in mathematical innovations, absorbing them as they came along and thinking through how they could be applied in economic theory to illuminate and add to basic economic intuitions. He was very conscious of the limits on our understanding of the complicated, interrelated processes at work in economic systems, even when powerful techniques were used to get a grasp on them. He never thought we could create an overall, 'compleat', theory which would allow us to incorporate all relevant influences within it.

His own understanding and contributions were based on deep absorption of the writings of his mentors and his own observations of and on the political and economic processes at work in society in his day and in the past. With regard to his understanding of capitalism past and present, his central organising

concepts were associated with his lifetime desire to make sense of the cyclical nature of its laws of motion. From his earliest work to his last, this was central to his thought and his analysis.

Dick pondered on the relationship between the cycle and the trend, very quickly coming to the insight that they could *not* be regarded as separate phenomena, explicable in isolation from each other because the factors responsible for them were largely independent of one another. Rather, they were fused indissolubly, see Goodwin (1953; 1982, 117)⁶. In my favourite Goodwin article on these issues, Goodwin (1953; 1982), published in a rather obscure and now defunct journal, *The Yorkshire Bulletin of Economic and Social Research*, he set out his views and reasons in elegant, succinct and wise prose. In the article the contributions of Marshall, Keynes and Schumpeter figure prominently but as a Twentieth Century eclectic, see Harcourt (1985; Sardonì (ed.), 1992), the influence of Marx, Harrod and Domar are also present.

One of his insights when tackling these issues is paralleled by a mature view of Joan Robinson's, to wit, that at least at the level of the economy as a whole, the short period relates to a point in time, "a moment in a stream of time ... a state of affairs, [an] adjective not a substantive" Joan Robinson (1971, 17-18). Tom Asimakopulos was highly critical of this but I have come more and more to think that it has much to commend it.⁷ In Dick's chapter in Harcourt and Riach (eds) (1997), he sets out arguments which lead to a similar conclusion.

“Writing in the 1930s Keynes was ... not much concerned with change or growth in discussing the short – or medium – run behaviour of the economy ... The economy was so depressed that for a decade it showed little technological progress or growth ... not unnatural for Keynes to use a statical view of analysis.

[Keynes] adopted ... the multiplier from his pupil and friend Richard Kahn. In Keynes this became a single number which could be used to estimate the effect of a change in the public budget ... [A]s formulated by Kahn, it was a dynamic, temporal sequence asymptotic to a final equilibrium, approached ... after a considerable time lag. If ... there is a continuing variation in the government deficits or surpluses, ... each time period initiates a different magnitude of successive multiplier effects on income and demand ... [A]t any one time the economy is subject to a large number of different stimuli in various states of decay. The sum of all these coexisting diminishing effects will be, for any particular historical stretch, a highly complicated, irregular time series.” Goodwin (1997b, 162).

Keynes too was very much aware of these puzzles. Witness the passages in *The General Theory* in which he discusses the characteristics of the long-period level of employment. Thus, when writing that “[a]n uninterrupted process of transition ... to a new long-period position can be complicated in detail”, he adds “But the actual course of events is more complicated still. For the state of expectation is liable to constant change, a new expectation being

superimposed long before the previous change has fully worked itself out ... [T]he economic machine is occupied at any given time with a number of overlapping activities, the existence of which is due to various past states of expectation”. Keynes (1936, 50).

Earlier on he had written “that, although expectation may change so frequently that the actual level of employment has never had time to reach the long-period employment corresponding to the existing state of expectation, nevertheless every state of expectation has its definite corresponding level of long-period employment” (48).

Dick’s most influential statement of his mature views on these issues is his extraordinary contribution to Maurice Dobb’s *Festschrift* (Feinstein (ed.) (1967)), “A growth cycle,” Goodwin (1967). There, he applied the analysis of the Volterra prey-predator model whereby the analogy of “the symbiosis of two populations – partly complementary, partly hostile – is helpful in understanding ... the dynamical contradictions of capitalism ... especially when stated in a ... Marxian form”. Goodwin (1967; 1982, 167). In Dick’s model it is the corresponding relationships between capitalists and workers, profits and wages, that bring about a growth cycle, alternative periods of fast and slow rates of growth.

In his 1987 *magnum opus* with Punzo, his views are set out within the context of production interdependent processes and their relationship to overall movements of aggregates in the economy. In his Foreword to the 1987 book,

Paul Samuelson (who had been at Harvard with Dick, “a dear friend”) describes how the profession, or rather “Researchers at the frontiers of political economy”, had been waiting since “around 1950” for Dick’s “forthcoming [but not yet appeared] treatise on nonlinear business cycles”... Now Mother Nature gives a second chance ... [Goodwin’s] new book is an epic poem dealing with great issues ... Good burgundy is worth waiting for. Vintage produce from the Goodwin workshop repays us with compound interest for our long abstinence”. Samuelson (1987, ix).

Here though I want to concentrate on the 1953 article because the insights are set out so clearly in prose before the author captures them in the formal analysis of the appendix (so conforming strictly to what was to become the rubric of the *Cambridge Journal of Economics*).

III

Dick starts with the astute observation that “[N]o problem in economics is more difficult than the one posed by the almost universal evidence that while capitalist economies grow, they do not expand steadily ... they sometimes advance rapidly but at other times they stagnate or decline.” Goodwin (1953; 1982, 112). “The usual answer is simple enough ... long-run changes in ... technique, population etc [result in] the trend ... a short-run dynamic structure ... leads to alternating expansions and contractions ... [Superimposing] by simple addition [gives the] behaviour we actually observe” (112). He then gets

to the heart of the matter: can we reliably discuss a trendless cycle and a cycle-free trend?⁸ “[His] impression [was] that we would have to answer both questions in the negative [so] implicitly condemning the current theories” (112). With the years reinforcement of this impression became stronger and more confidently expressed.

His aim in the 1953 article was “to indicate briefly a possible way of fusing the two analyses more closely”, naming Schumpeter as the only economist he knew who had “constructed a unified theory of growth and cycle” (112). He mentions the statistical procedure of decomposing time series into four components – trend, cycle, seasonal and residual. He points out that if we detrend the series (he has no trouble with deseasonalising them), we are destroying Schumpeter’s theory that there are *not* “two clearly separate and identifiable causes, one producing a trend ... the other generating a cycle”. For Schumpeter “cycles [would not] exist in the absence of growth” (113).

Dick refers to the superposition principle and *linear* dynamical systems where analytically independence of their parts is possible (though this may not have significance for economic as opposed to statistical analysis). This is even more marked in non-linear cycle models associated with Kalecki, Kaldor, Hicks and Dick himself.⁹ In them decomposition is “purely descriptive”.

For Dick it is the province of economic historians, to whom the task has been relegated, to discuss historical trends. He concentrates on the theories of it. He starts with the classical economists whom he interprets as working out the

implications of Malthusianism for wages, profits and rent. (The classical approach makes a modified return in Dick's own thought when in his growth cycle in the 1967 Dobb volume, he nevertheless accepts Say's Law, though in a manner the classicals (but not neoclassicals) would not, in that they never had full employment of labour as in characteristic of the Law. (When Joan Robinson read his paper, she coupled Dick to Marx in the acceptance of Say's Law, a reading by her of Marx I have never been able to understand.)

Dick, in common, he says, with the rest of us (then), saw classical theory as inadequate and so replaced by "the neoclassical theory of Marshall and others" (113). In this move the theory of the long-run trend was "lost", until credit for "bringing us [again] face to face with [it] belongs ... to Mr Harrod" in Harrod (1939, 1948), a theory of "great simplicity and grand sweep" (114).¹⁰ Dick interpreted Harrod as completing the work of his master, Maynard Keynes, who had not aimed to provide a theory of long-period growth, nor did he have much to say about what determined investment as opposed to working out the short-period consequences of a level of investment. Though Keynes's theory of accumulation is unsatisfactory as Kalecki, Lerner, Joan Robinson and Asimakopulos were to point out, see Harcourt (2006, Ch.4), Dick is a bit hard on Keynes who wrote two key chapters, 11 and 12, on it in *The General Theory*.

Dick argues that Harrod's original statement of his growth theory is in his 1936 book on the trade cycle.¹¹ Dick argues that Tinbergen pointed out in his review of Harrod's book that Harrod's theory gave rise to a compound interest

rate of growth (as Dick had told Harrod when the review was published, see Harcourt 1985; Sardonì (ed.), 1992, 381, n8, 386). Dick argues (115) that Harrod appears to have accepted this view¹², for subsequently he restated his theory in terms of long-period growth.¹³ Dick documents the “apparently striking verification” of the theory in Kuznet’s data for the USA over a hundred year period. The data show an average saving ratio of 10 per cent and a capital-output ratio of about 3 to 1 which when “applied to the Harrod formula by Professor Domar” gave a predicted rate of growth just above 3 per cent per annum (114).

Dick pointed out a fatal flaw that, as Harrod emphasised, his theory described what *could* happen, not what *does* happen. g_w , Harrod’s warranted rate of growth, is unstable, most unlikely to be attained, and even if it is, it will not be sustained. Why? Dick argues that because it takes (often considerable) time “to produce capital goods, the future would have to be foreseen perfectly to have the capital accumulated in a quantity exactly to match output” (114). Moreover, once an error is made attempts to get back into adjustment “will only lead to further displacement from the proper adjustment” (114).

In his 1950 book on the trade cycle Hicks made a slight modification to meet this puzzle; he made investment depend on already realised sales. But despite what Hicks argued (through having the economy bouncing back and forth between a ceiling and a floor), in fact he had produced a theory of the cycle from which all growth elements had disappeared. Hicks obscured this by

having an unexplained trend in autonomous investment, with no theory as to why the ceiling and floor should be rising and no use for autonomous investment anyway, as induced investment in Hicks's model provides all the capital that is anticipated to be needed.

While it is difficult to provide a simple theory, Dick always thought Schumpeter was right that “a vigorous boom” generates the trend and “the leap forward into new levels of output ... governs the subsequent slump” (115). So Dick's aim was to sketch “a theory which will unite the two aspects”. Increased outlays increase demand and “then ... increased output or supply.” (115) This essential time structure of capitalism makes “smooth progress so difficult”, as Dick notes M. Aftalion “pointed out long ago ... [We] get buoyant markets followed by dislocation and transitional stagnation” (115).

Dick's is a model in which is fused “indissolubly the cycle and the trend, [a theory which] is parallel to but not the same as Schumpeter's, in that it is the boom which generates the trend, and one cannot discuss the one without the other. [Moreover] when output is falling it is falling ... all that there is to say ... no such thing as a trend factor which continues to rise right through the depression” (117).

The elements of Dick's theory include inventory cycles associated with the writings of Lundberg and Metzler¹⁴ in which undershooting and overshooting of production in contrast to sales and attainment of desired levels of inventories are key features. When output levels reach new heights induced

investment in fixed capital comes into play. The fundamental Marshallian distinction between fixed and variable costs is invoked. It has the implication that capital and outlays associated with its finance “are ‘fixed’ for a very much longer period of time in the downward than in the upward direction. This is but a simple application of Marshall’s famous principle that the short period is very much shorter for expansions than for contractions” (117).¹⁵

Dick sums up his theory in a succinct paragraph:

“When ... the economy has finally accumulated enough capital, investment is reduced, sales fall, investment is further reduced and sales fall further ... Whereas investment will be reduced to the same level as in the last depression, sales will not because of the great additions during the boom to the body of ‘fixed outlays’... a high level of sales will not be entirely lost [and this may be coupled with] the explosive effect of the induced investment in fixed capital which invariably occurs in the later stage of the boom ... [I]n each swing the economy goes higher than ... previously, but it does not swing back lower ... because of the nature of the cost structure” (117). Then because the cycle could exist without the trend but not visa versa, Dick considers a Harrod-type growth process to show that “the trend will generate a cycle just as easily as the cycle will create the trend” (118).

Dick closes his discussion in the text by briefly discussing “the vital factor of technical progress”. One reason for brevity is that “there is probably very little that economists have to say about it” (119).¹⁶ Its impact though

strengthens and enriches Dick's analysis. Schumpeterian innovational investment can occur even if we have less than the desired amount of capital. So when sales are rising investment in fixed capital occurs earlier than would be the case with induced investment only, making the expansion more vigorous, further and faster. If outlays apart from investment are weak, we get weak expansion, if large, we get strong ones. As innovations vary from cycle to cycle we get great differences in the behaviour of individual cycles and "variations in realised rates of secular expansion" (119).

IV

Much of the rest of Dick's professional life was devoted to expanding on the insights contained in this paper and the two other earlier papers. Because, like Keynes, he had a great feel for the different lengths of time of nevertheless intertwined processes in his aggregative models, he concentrated on technical tools that allowed him to emphasise what was happening at an instant in time, not a period, though periods of different lengths were vital in determining the size of impacts of different factors at a point in time.¹⁷

He also matched the illuminations contained in his multiplier as matrix models, Goodwin (1949, 1950, 1980, all reprinted in Goodwin 1983), to his understanding of production interdependent models. As we argued above, Marx

did not assume Say's Law and Dick certainly did not once he developed his 1967 paper into more embracing models.

In the Epilogue to his 1987 book with Punzo, having expressed his admiration for von Neuman, he explained why von Neuman's "magisterial theory of steady-state growth [which had] dominated much of economic thinking since the end of the last war", Goodwin and Punzo (1987, 158), must nevertheless be rejected. It had little to no application to a system which "generates chaotic sequences". There then follows a superb précis of the mature Goodwin "vision" and a succinct explanation of the rise of neo-liberalism.

"When an innovation becomes important enough to have a significant impact on the general 'state of trade', many players increase their investment demand, which only furthers the boom, leading to a self-reinforcing upward instability in the system. The result is an unmaintainable rate of growth which will initially be slowed down by the capacity limits of the investment trades. This gently darkens the future horizon, leading to lowered individual projections and hence to investment outlays. There ensues the tragic, interdependent, downward pursuit curve – with each producer cutting his outlay, which only reduces the demand and outlay of others, and so on down. Thus the economy first grows too fast and then too slow. These endogenous bifurcations are reinforced by the parallel evolution of labour markets. As unemployment is reduced, accompanied by a rise in profits from fuller employment of capacity, both money and real wages rise owing to the tightness

of the labour market and the vulnerability of profits. Thus, not only do the prospects for investment worsen, but the reasons for investing weaken and the means for investing are squeezed.

As Barone pointed out long ago¹⁸, the enormous number of players and equations makes calculation infeasible.¹⁹ Therein lies one of the central dilemmas of our world. The only way out of the irrational, highly sub-optimal, behaviour of capitalism is central planning with optimal control. However, owing to the ever-increasing complexity of interdependence of the modern world, such a procedure is either impossible or so crude as to be undesirable. The Keynesian type of compensatory control has also been found unsatisfactory. Disillusion with control has led to a nostalgia for the golden age of *laissez-faire* and to a desire to dismantle state intervention designed to moderate the anarchy of decentralized n -person games.” Goodwin and Punzo (1987, 159).

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¹ In referring to Dick’s “profound insight” I am not implying that he was a hedgehog for, most decidedly, his wide-ranging and deep knowledge, and his contributions to many areas of economics, made him even more a fox.

² Not all teachers; Vela has sent me a letter (13.2.1973) from Ed Nell to Dick. Nell wrote: “I very much enjoyed all except the misprints in your book ... I don’t think the economics ... is ... elementary... it took my graduate seminar ... the better part of a semester to get through it ... it was certainly rewarding and ... your diagrams were amazingly ingenious.”

³ Sadly, Dick died in Siena on August 6, 1996 when the volumes were in proof stage.

⁴ One of Joan’s and my treasured possessions is a Goodwin abstract painting of the Ponte Vecchio in Florence.

⁵ My copy of Dick’s selection of *Essays in Economic Dynamics* (1982) comes from Joan Robinson’s library. It was given to her by Dick who wrote on the title page

For Joan
il miglior fabbro
and incomparable teacher
Dick Goodwin

⁶ Vela has pointed out to me that there are three interrelated papers in which Dick dealt with the trend and cycle as ‘indissoluble’. First is his chapter in the Alvin Hansen *Festschrift*, which was edited by Metzler (1948). Dick reprinted the chapter in Goodwin (1982), omitting the first section in the Hansen *Festschrift*. The title was changed from “Secular and cyclical aspects of the multiplier and the accelerator” to “An oscillatory mechanism with a flexible accelerator”. Second, there is a paper, “A model of cyclical growth”, which was published in Lundberg (ed.) (1955), but which was written and delivered before Goodwin (1953) at the IEA Business Cycle Conference, held in Oxford in September, 1952. Goodwin (1953) is a mild rewriting of the first two.

⁷ In *The Accumulation of Capital*, Joan Robinson (1956, 179), she regarded the short period not as a definite period of time but as a convenient abstraction in which changes in the stock of capital goods could be neglected. Tom was happy with that but not with her later view because it left “no time available to permit variations in the utilisation of productive capacity in response to changing short-term expectations”, Asimakopulos (1984, reprinted in Kerr (ed.) with Harcourt, 2002, vol V, 448).

⁸ Vela tells me that the Schumpeterian precept that Dick carried with him, at least since about 1944, was ‘the cycle is simply the form the growth takes’.

⁹ Though Dick coupled Kalecki with these economists in this article, Vela assures me that Dick “always made clear that all of Kalecki’s macroeconomic trade cycle models were LINEAR!”

¹⁰ Harrod taught Dick when Dick was a Rhodes Scholar at Oxford, but Harrod did not have a high opinion of him, unlike his pupil’s opinion of his teacher (though not as a person – he thought him “stand-offish” but as an original thinker who was very stimulating, Harcourt (1985; Sardoni (ed.) 1992, n8, 386)). Dick did not work very hard at Oxford (he had already done very well at Harvard), as he was more interested in, or at least devoted much time to, visits to Germany and Italy, both for political reasons and to absorb the great artistic treasures of the continent, see Harcourt (1985; Sardoni (ed.) 1992).

¹¹ Dick has the date as 1937.

¹² Vela, who has exhaustively researched this issue, writes that: “there is no record in Harrod’s writings that he accepted Tinbergen’s critique”.

¹³ But Harrod explicitly set out his theory as one of a rate of growth at a point in time, see Kregel (1980), Harcourt (2006, Ch.7). For a complementary discussion of Harrod’s approach and contributions, see Nevile and Kriesler (2008), especially pp. 4-5.

¹⁴ Vela tells me that “RMG always knew and emphasised that Metzler linearised – ‘unforgivably’ – Lundberg’s piece-wise linear model, which means ‘nonlinear model’”.

¹⁵ Marshall’s principle was the starting point for Kahn’s seminal work on the economics of the short period, see Kahn (1929; 1989) and of one of his principal points of influence on Keynes in the making of *The General Theory*, see Harcourt (1994).

¹⁶ This calls to mind Arthur Smithies’ comment on modern growth theory: “Perhaps the whole problem is too complicated for adequate reflection in a formal model ... we could do worse than re-read Adam Smith (or possibly read him for the first time). In Book I, he said that the division of labour was the mainspring of economic progress; and in Book II, that accumulation was a necessary condition for increasing division of labour. How far have we got beyond this?” Smithies (1962, 92).

¹⁷ Whether Joan Robinson obtained this from Dick, or Dick from her, or both arrived at it independently, I do not know.

¹⁸ Vela points out that it was Pareto, much before Barone, who pointed this out.

¹⁹ Again Vela comments: “Neither Pareto, nor Barone, said ‘infeasible’; they said that the calculation was ‘intractable’ – in modern terminology”.