SCHUMPETER'S 'BUSINESS CYCLES' REVISITED

A. Freeman

The apparent contradiction between Schumpeter's attachment to Walrasian equilibrium and his advocacy of a theory of cyclic economical movement was discussed. Also the economic role of institutions was investigated. I remain unconvinced of endogenous long cycles and with the theory of capitalist self-restoration. I think we can deduce better explanations of capitalist dynamics from the ideas of Marx and Keynes. In conclusion, the differences between Marx's and Schumpeter's views were discussed on capitalist crisis as regards the function of exogenous and endogenous variables are quite critical. Marx presents an endogenous theory of decline, in which accumulation is self-limiting. Schumpeter presents an endogenous theory of recovery, in which the entrepreneur and the financier combine forces to create an expansive virtuous circle.

I would like to introduce, to Russian readers, the issues raised in a paperby my father, Chris Freeman, which played a special part in both our lives. The University of La Tuscia, where I was working in 1997, invited Chris to deliver a memorial lecture on Schumpeter. He spent a lot of time writing it, but his doctor advised him not to take the flight and I gave it in his place.

Perhaps because I studied the paper with especial care in view of having to deliver itor perhaps because my studies ran on parallel tracks, I have remained preoccupied with both this paper and the issues it raises, which I think are central to the problems we still face today. I like to think I shared these preoccupations with Chris; since I inherited them from him, there is sound support for this surmise.

The first question I will discuss is the apparent contradiction between Schumpeter's attachment to Walrasian equilibrium, and his advocacy of a theory of cyclic economic movement. The second is the economic role of institutions. They are intimately connected, as I hope to show.

With the Second Theoretical Crisis of Economicsclearly upon us, or perhaps if Joan Robinson (1971) was right, its third theoretical crisis, it is a timely moment to consider both such questions.

At first sight, the notion of equilibrium conflicts with any idea of any economic fluctuation other than constrained randomness. On the face of it, it is difficult to see how we can explain recurrent upturns and downturns if we presuppose that nothing is changing. It is as if we sought to explain the movement of the planets by supposing them stationary at the centre of the sun. One might "save the phenomena" (Duhem 1908) by treating this state as the average of their motion,[1] but this is a poor guide to planetary survival.

Schumpeter's radical stance is to use cycle theory to defend Walras. I believe the result is false but this is not the point; pace Samuelson, the reason for studying controversies in economic theory is to understand the true nature of the alternatives.

Schumpeter's approachin Business Cyclesis to propose the equilibrium point as the centre around which the economy moves. This is a departure from the Walrasian standard; he acknowledges that the economy is almost never in the state that equilibrium supposes. The radical nature of this break must be understood. One may reconcile equilibrium with small fluctuations, even occasional crashes, by discounting them as exceptional, small, or manageable. Equilibrium is then rhetorically presented as true "most of the time", or a good approximation, small enough to

[1] Actually it isn't, because planets move in conics, not circles.

ignore.[1] Or one argues, as in Samuelson's 1992 textbook, that they are manageable:

The United States has experienced numerous cyclical ups and downs. At the same time, we have avoided depressions — the prolonged, cumulative slumps like those of the 1870s, 1890s, or 1930s. What has changed in the last 50 years? Primarily, developments in macroeconomics now allow governments to take monetary and fiscal steps to prevent recessions from snowballing into a persistent and profound slump. If Marxists wait for capitalism to collapse in a final cataclysmic crisis, they wait in vain. The wild business cycle that ravaged mature capitalism during its early years has been tamed. (Samuelson and Nordhaus 1992:371-372).

Schumpeter makes a bolder leap: he explicitly recognises the real economy will always be some distance from its hypothetical equilibrium. The consequences for the traditional defence of equilibrium need to be grasped. First and foremost, the Schumpeterian leap rules out the use of 'discountable deviations'. If we wish to say that cyclic motion is the essence of equilibrium, then we have already conceded that deviations from equilibrium are significant economically.

But by the same token, all standard defences fall. In place of 'the economy is in equilibrium most of the time' we have 'the economy is never in equilibrium.' In place of 'a good approximation' we have to write 'not even close'. In fact, no other defence is left except one, namely Schumpeter's: equilibrium is the centre of the oscillations.

However this rhetorical, hand-waving defence, whilst widely adopted, is mathematically indefensible. As I showed in Freeman (2006) it cannot be true in general because for all but the simplest harmonic oscillations, the hypothetical stationary point is neither the average nor the centre. I think this accounts for Schumpeter's interest and friendship with Goodwin; the closest to a sustainable defence is a variation on 'good approximation' in which the orbit of the economy is sufficiently close to the hypothetical static point that its equations of motion are of the first order, and therefore approximate to a simple harmonic oscillator. Nice try, but no cigar; observed departures from any hypothetical equilibrium are too large for this defence, even during the normal business cycle.

I believe this is the underlying reason that Schumpeter has always been a fringe figure, and why even Austrian economists have some difficulty welcoming him to their ranks. The argument leaves equilibrium theory defenceless, and with it all the optimality results that flow there from. Hence Samuelson's (1983:175) derisory dismissal:

Like other students of Schumpeter and like his academic colleagues and friends, I tended to regard as a bit comical ... his 1939 fascination with the fol de rol of Kondratieff long waves, superimposed on the decade length sinusoidal undulations of the major Juglar business cycle and on the Kitchin-Crum workaday 40-month National Bureau cycles. Among us professionals the recent revival of Kondratieff moonshine — in its disparate Rostow, Forrester, Shonihara, and Christopher Freedman [sic — A. F.] *reincarnations — does not make us look back more kindly on Schumpeter's Ptolemaic epicycles.*

Why, then, did Schumpeter take this bold step? Two important reasons suggest themselves. First, a theory of cycles does away with crisis, and with it the primary case for public intervention. This is not an unimportant issue in the battles most dear to Austrian hearts of the time, the need to keep at bay the then growing impact of the thinking of Karl Marx. Many eminent interpreters (see Fagerberg 2003) offer convincing evidence of an affinity between Marx and Schumpeter. There is, it is true, a common emphasis on the economic effects of science and innovation. There, however, I believe the similarity ends. To illustrate the point let us first consider Schumpeter's fulsome endorsement of Marx as a pioneer of business cycle theory:

He [Marx] aptly says that 'the superficiality of Political Economy shows itself in the fact that it looks upon expansion and contraction of credit, which is a mere symptom of the periodic changes of the industrial cycle, as their cause.' ... We find practically all the elements that ever entered into any serious analysis of business cycles, and on the whole very little error. Moreover, it must not be forgotten that the mere perception of the existence of cyclical movements was a great achievement of the time. Many economists who went before him had an inkling of it. In the main, however, they focussed their attention on the spectacular breakdowns that came to be referred to as 'crises'. And these crises they failed to see in their true light, that is today, in the light of the cyclical processes of which they are mere incidents (Schumpeter 1965:41; emphasis added).

Recognition indeed, which contains however a poison pill in the last sentence: the 'true light' in which crises must be seen is 'the cyclical processes of which they are mere incidents'. But if this is accepted, then capitalism is in fact crisis-free, and Marx's error consisted in failing to reconcile his own discovery of cycles with his predilection for forecasting immanent self-destruction. Schumpeter uses Marx against Marx, neutralising his most dangerous message: that capitalism

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[1] The steady state may be extended, not without difficulties, to proportionate expansion: a 'von Neumann ray'.

is inherently crisis-prone, unleashing destructive forces of such power that future generations will have no choice but to replace it.

French Economist Clément Juglar (1915[1862]) wrote what has since become, more or less, the definitive account of what is now called the business or trade cycle. Schumpeter credits Marx and Juglar with the contemporaneous 'discovery' of the business cycle, as if the two shared the same identical idea. They did not. For Marx, the cycle may be regular, but it manifests itself in crisis:

These contradictions, of course, lead to explosions, crises, in which momentary suspension of all labour and annihilation of a great portion of the capital violently lead it back to the point where it is enabled [to go on] fully employing its productive powers without committing suicide. Yet, these regularly recurring catastrophes lead to their repetition on a higher scale, and finally to its violent overthrow (Marx 2005:750)

The cyclic movement therefore expresses a more intractable problem: capitalism undermines the conditions for its own existence. Underlying the short cycle is a longer process of decline, or more accurately, self-transformation, which the cycles express, as we may fancifully put it, like a rock descending an incline in a series of shuddering bumps. We will return to this fundamental difference in our conclusion.

Cleverly, Schumpeter deals with this, as we have seen, by arguing that Marx's theory of crisis is superseded by his discovery of cycles. In this he reposes on Juglar's thinking, which evolves in the opposite direction: the cycle becomes a natural, even desirable feature of capitalism. An important adaptation of the rather implausible 'laws of evolutionary motion' sought by the classical economists took place, as Besomi (2010:1) notes:

Clément Juglar's contribution on periodical crises is often credited with having marked the definite transition from the theories of crises to the theories of business cycles… The champion of this view is, as is well known, Schumpeter, who propagated it on several occasions.

Schumpeter, we might say, goes for Marx's Juglar. He saves the phenomena in a unique and ideologically powerful way: since periodic or regular motion is a constitutive feature of capitalism, crisis has no sting. It is simply the way capitalism corrects itself.

Therefore, just as much as Schumpeter had to acknowledge, and even lay claim to Marx's 'discoveries', he conducts his acknowledgement in just such a way as to re-interpret Marx as a theorist of cycles, not crises. He constructs an antinomy between Marx's discovery of the regularity of crisis, and the concept of crisis itself. There is 'on the whole' very little error in Marx. This error is, however, Marx's attachment to the superseded notion of crises, which, with the other economists of his day, he 'failed to see in their true light, that is today, in the light of the cyclical processes of which they are mere incidents.'

The role of causal explanation in the theory of restoration

Schumpeter now encounters his biggest problem. If the weakness of his answer has contributed to its marginalisation in economics, we should remind ourselves that Samuelson helped it ignore the question.

When Business Cycles was written, it was widely accepted that regular industrial crises, with a periodicity of 7–11 years, were expressions of an underlying cyclic process. The Samuelsonian postwar consensus that Keynesian measures made such cycles a 'museum piece, a thing of the past', was yet to come. The circumstances of the 1930s obliged Schumpeter to probe deeper. This calls attention to a frequent misunderstanding. Though celebrated as a theorist of 'Long Waves of Expansion', he responds more to the rather different problem of Long Periods of Contraction. As C. Freeman puts it

There have been periods of deep structural adjustment in the 1830s, 1880s, 1930s and 1980s, which were regarded at the time and by historians since, as unusually difficult times for the economy. These periods cannot be treated in just the same way as the minor recessions of the 1950s and the 1960s or similar recessions in other periods of high boom, such as the 1850s and 1860s or the 1890s to 1913. (Freeman 1998:13, emphasis in original)

His Austrian opposition to intervention and thereby Keynes came up, as C. Freeman points out, against the difficulty of the extraordinary depth and persistence of the depression:

Whilst in Business Cycles Schumpeter regarded depression as an 'unnecessary' and pathological departure from equilibrium (Business Cycles, pp. 150-155) which could be aggravated by scares or panics and whose depth could not be predicted, he nevertheless continued to stress the "natural" equilibrating tendencies of the system…he had greater faith in the resilience of the economy than Keynes and devoted very little attention either to the role of institutions or to the role of technology in achieving a more stable dynamic equilibrium…Keynes took up the position of the scourge of "laissez-faire" theories because he thought that there was a great deal which could and should be done to counteract depressive forces in the British and in the world economy…As is well known, *Schumpeter wrote a highly critical, even vitriolic review of the "General Theory"* (C. Freeman 1998:16)

Schumpeter is lucid about the theoretical issue at stake which are those of mechanism not position: 'If we succeed in describing the economic system by means of a general schema embodying certain properties of it, there is obviously some point and much practical utility in asking the question whether the system, as thus depicted, will by its own working produce booms or crises or depressions, and if so under what circumstances.' (p. 34)

The impulse towards a 'general' theory of cycles is that most theorists of short cycles recognise some mechanism of self-restoration, even if arising only from a previous overshoot. But for really long depressions, no such rescue is at hand. There is no a priori basis to think that capitalism can extract itself from such conditions. Their very infrequency makes general statements difficult: and the standard theories did not even suggest how the system could get into such a mess in the first place, let alone how to get it out.

In common with all Austrians, Schumpeter wished to show that intervention is a misguided policy. To do so, he had to extend the properties of self-restoration which manifest themselves in the industrial cycle, to establish that recovery even from deep depression will be automatic. This requires a universal mechanism for recovery, a core principle of capitalist functioning that can rise to every crisis. That principle is innovation:

the outstanding fact in the economic history of capitalist society, or in what is purely economic in that history, and also that it is largely responsible for most of what we would at first sight attribute to other factors. (p. 86)

This must be an endogenous factor, part of what is 'purely economic' in the history of capitalism. Otherwise, we would not be speaking of self-restoration, but of exogenous intervention, the enemy. But also, it must be the primary endogenous factor, being 'largely responsible for most of what we would at first sight attribute to other factors'. And, finally, it must be a factor unleashed by the depression — the power of 'Creative Destruction'.

This provides a comprehensive response to both arguments for intervention: the humanistic argument that we should mitigate suffering; and the scientific argument that if we don't do something things will get worse. Schumpeter can respond that the pain of depression is necessary, Like some latter-day Aeschylus (Agememnon 210) he foreshadows the lugubrious Herr Schaueble in his argument if not Schaeuble's sheer sadistic political vindictiveness:

Zeus, whose will has marked for man the sole way where wisdom lies; ordered one eternal plan: man must suffer to be wise.

This view of the necessary suffering of economic depression he holds in common with all Austrian theorists. It is far removed from the cheerful optimality of his contemporary Vifredo Pareto. Yet its theoretical basis is unique: 'Creative destruction' unleashes the force of the innovator. Interfere with it, and the forces of creation will remain confined; and the recovery will die in its cot.

Schumpeter was marginalised from the mainstream, though not from the hearts of many economists of the left and of the right, because he entered the lists at an unfortunate time for his reputation as scholar. Events like the Great Depression, fascism, and the Second World War are hard to discount as mere incidents; worse still, if one's cheerful message is that such catastrophes are not only necessary for capitalism's survival but likely to recur, the popular masses may reactin unintended ways. Worse still, post-war reconstruction marginalised the Austrianvision, as Europe built welfare states whilst America turned to the 'Keynesian' management techniques for which Samuelson became chief evangelist. His Austrian colleagues were marginalised anyhow, his adaptation of their basic doctrine was at best quirky and at worst downright threatening, and state intervention remained the new norm in academia until Friedman and the dawn of neoliberalism.

It is in this light that we consider the second reason for Schumpeter's reconstruction of Walras. His attitude to state involvement in the economy and more generally to the role of institutions expresses an overlooked theoretical integrity. Chris Freeman draws our attention to his deep-rooted antipathy to Keynes. One might dismiss his vitriolic review of the General Theory as academic jealousy or an uncharacteristic outburst. However, it makes more sense to seek a consistent interpretation which makes it coherent with his cycle theory.

The connection is rather obvious. Once we suppose the economy is cyclic, we cannot but enquire into the mechanism of cyclic regularity; when growth rises above average, some force or set of forces must bring it down, and when it falls below, the same or another force must make it rise.

Chris Freeman notes the vagueness in Schumpeter's mechanism of decline, as highlighted by Kuznets; this is not the point. Schumpeter was the apostle of growth, not a prophet of doom, a function he was probably happy to delegate to the Marxists. His demons are delegated to catch their fallen angels; he is justly famous for his theory of the mechanism of rise, accounting for the abiding respect he earned from his most crabbed critics, and for Chris's consuming life interest: innovation. The romantic entanglement of the financier and the entrepreneur, driven by the lure of the surplus profits arising from the deployment of new techniques and products, launch benign phases of investment-led expansion that save capitalism from itself.

Moreover, the worse the crisis, the greater the marriage prospects. Laissez Faire is thus the logical conclusion of self-restoration. If capitalism possesses internal mechanisms of restoration, intervention is not only unnecessary but may well make things worse, subverting the banker and nipping innovation in the bud. Just as Schumpeter's cyclic restatement sets out to save equilibrium theories from themselves, self-restoration is positioned to save Laissez Faire policies from themselves.

Schumpeter thus hits on the key political flaw in equilibrium theory. If one supposes that the natural state of the economy is steady and optimal, then when it deviates from this golden ideal, the only logical conclusion is that it is broken. The obvious policy response is that it should be fixed, by the firm hand of government. Schumpeter offers a theoretical response to such an ill-advised reaction: deviation from the centre is a requirement of restoration; the famous 'creative destruction' must have its way. Once self-restoration enters the theoretical arsenal of the economist, one can argue in any situation, no matter how bad, that the best thing to do is let capitalism take its course.

I think any systematic reading of Business Cycles makes clear that at least through the Thirties and well into the Forties, Schumpeter was resolutely Austrian in his opposition to state intervention. As for the context and direction of his political views, which are well beyond the scope of this commentary, I cannot do more than recommend Swedburg's introduction to the 1976 edition of Capitalism, Socialism and Democracy. My argument here concerns the theoretical consistency of Schumpeter's ideas; I think Chris Freeman convincingly demonstrated that Schumpeter's theory of business cycles is indissolubly connected to a theory of self-restoration, and with it, a theoretical foundation for rejecting institutional interference in the economy, most of all, state interference.

To complete that picture, I finish with the most controversial aspect of Schumpeter's oeuvre, the concept of Long Waves of capitalism, of which though not the originator, he is surely the most dedicated protagonist. What was its attraction for Schumpeter?

Again, it is the only logical way to reconcile a theory of cyclic self-restoration with events like the Great Depression. Schumpeter's central difficulty was the following: it is one thing to argue that the regular business cycle, whose repetitive 7–10 year alternation of boom and slump can be observed throughout capitalist history, is a structural feature of the capitalist economy: large branches of orthodox economic theory, not least Real Business Cycle theory and Rational Expectations, have no problem with this idea. It is quite another to claim that prolonged, profound periods of stagnation like the Great Depression, taking the economy far from anything resembling stability, let alone optimality, can be construed as evidence for equilibrium. The more things fall apart, the less defensible is the claim that the centre must hold.

This is of especial theoretical significance today as we enter a period of history disconcertingly similar to that in which Schumpeter's ideas were formed. Schumpeter, notwithstanding his hesitations about the pathological character of the Great Depression, eschewed a course he could have taken. He could have concluded there are two separate processes at work in the capitalist economy, one being the short-term cyclic motion that gives rise to the business cycle, the other a secular trend of decline which does not respond to deviations from equilibrium in the same way as the business cycle.

He took the opposite route, groping for a universal theory of cycles, based on a universal principle of self-restoration. The scientific merit of this evolution is precisely the grasp for universality at any cost. In pushing to its logical limit the theory of cyclic motion, Schumpeter makes it possible to study this theory in its pure form. The result is an endogenoustheory of long cycles (Menshikov 1989) in which both decline and restoration, over large periods, are governed by forces essentially internal to capitalism. The alternative is that restoration in the long cycle is governed by exogenous forces, that is to say, institutions. But in that case, we no longer have a theory of cycles: as Desai (2015) remarks, we have a theory of history.

Schumpeter was in my view fully aware of this issue which is why he is exercised, in the early chapters of Business Cycles, to distinguish between internal and external forces.

What can be learned from all of this? Like Chris Freeman, I remain unconvinced of endogenous long cycles, and with it the theory of capitalist self-restoration; also like him, I think we can deduce better explanations of capitalist dynamics from the ideas of Marx and Keynes. I have moved away from the idea which Ernest Mandel (1995) pioneered, that Long Waves can play a useful role in such accounts, and am more convinced of Perez's (2012) concept of Great Surges, which I further think are not automatic, but called into being by the action of institutions (Freeman 2015). The issue then is, naturally, which institutions are required, and what they should do.

However I also believe that an indispensable function of the economist is to understand theories she doesn't agree with. This is a basic principle of pluralism (Freeman 2010), to which Chris with his support for the AES 1992 declaration (Hodgson et al 1992) was an early subscriber. The reason lies far deeper than magnanimity or the modern pragmatic idea that one can create useful explanations of reality by sewing together disparate theoretical body parts stolen from dead economists.

So why rob Schumpeter's grave for his 'real' ideas? Because one can only truly understand a theory by grasping its true opposite. Moreover one can only test a theory empirically, if one correctly states its opposite: otherwise, we will test the wrong thing. It's the easiest thing in the world to 'prove' a theory by comparing it with a straw opposite. If instead we wish to restore the status of economics as an inductive science, insisting that facts must inform theory — which all who knew Chris recognise as the very foundation of his approach to all economic phenomena –we must introduce a process of hypothesis testing in which the alternativeto every claim is as carefully chosen as the claim itself.

With this in mind, we can formulate with great exactness the rival hypotheses, concerning the present state of the economy, that need to be tested. Thanks to the work of Chris and SPRU, we even know how to test them. The issue is quite precise; what are the conditions for innovation to take place on the expanded scale associated with exceptional upturns?

Schumpeter leaves us a precise account of the mechanism on which his supporters and opponents coincide. There are two decisive agents, the entrepreneur and the financier. The entrepreneur discovers, or acquires knowledge of, an alteration to the process of production which would allow him, if he develops it, to make a profit above and exceptional to the norm. He convinces the financier that the process will yield exceptional returns and pledges a part of them in consideration for the advance of capital. The financier complies, the innovation is introduced, and the anticipated profits yielded — launchingthe whole gear-train of expanded development.

But what are the conditions for the entrepreneur to secure his knowledge, for the capital to be advanced, and the innovation to succeed? Will Schumpeter's mechanism always work, that is to say, is it endogenous to capitalism? Once we acknowledge cyclic variation we are obliged to say that under some circumstances it works, and under some circumstances it does not. What are these circumstances?

It is here we discover the true extent of the real opposition between Marx and Schumpeter, despite superficial similarities which have seduced many into equating them, and which as we have seen, Schumpeter himself laid stress on, with the intention however of demonstrating the rational superiority of a theory claiming to originate with Marx, yet diametrically and dialectically opposite to it.

Both Marx and Schumpeter offered general theories in which events outside the control of governments could and would arise: Marx in foreseeing them, Schumpeter in refusing to ignore them. By merely recognising such events as part of reality, these theorists consigned themselves to the status of heretics. However, they made themselves natural ports of call for the armies of doubters which really deep crises produce: hence the return of Capital study groups, and an intense new interest in theories of innovation.

Yet Schumpeter's logic leads to the conclusion that the economy can save itself from humanity, while Marx's leads to the conclusion that humanity must save itself from the economy. Schumpeter, in a nutshell, presents an endogenous theory of recovery; this is precisely what Marx recognizes as impossible. Without state intervention, capitalism cannot save itself from the contradictions which it generates from within itself; even with state intervention, society can only be saved from capitalism by a state with objectives other than simply to save capital.

Thus the differences as regards the function of exogenous and endogenous variables are quite critical. Marx presents an endogenous theory of decline, in which accumulation is, essentially, self-limiting. Schumpeter presents an endogenous theory of recovery, in which the entrepreneur and the financier combine forces to create an expansive virtuous circle.

What about growth? Here the critical question is the relation between innovation and accumulation. For Schumpeter, the entrepreneur, working with the financier, creates the surplus. Some person seizes on an invention, and realizes that an exceptional profit can be made by investing in it. But he cannot make his innovation without finance; a critical figure in the boom is therefore the banker, the lender, whose indispensible social function is to make money available for investment.

The means to invest are called into existence by the banker, who advances finance for the venture on the promise of exceptional profit. Innovation, which combines investment with invention, is thus the source of accumulation, the reason that investible funds exist. This is of a piece with Schumpeter's Smithian concept of equilibrium which isactually rather peculiar: a ground state generating no unconsumed surplus.

For Marx in contrast the surplus pre-exists, arising from the wage relation. The capitalists have money on their hands which they have to spend. Accumulation is the mother of innovation, exactly reversing Schumpeter's conception:

The value of the old industry is preserved by the creation of the fund for a new one in which the relation of capital and labour posits itself in a new form. Hence exploration of all of nature in order to discover new, useful qualities in things... Just as production founded on capital creates universal industriousness on one side... so does it create on the other side a system of general exploitation of the natural and human qualities, a system of general utility, utilizing science itself just as much as all the physical and mental qualities. (Marx 2005:409)

But what about the 'other side' of the movement — the account of decline? The weak point of Schumpeter's theory, noted in Kuznets' (1940) review, is its lack of a real explanation for decline. 'Do the heroic entrepreneurs get tired?' he asks exasperatedly. For Marx, capitalism is inherently crisis-prone: accumulation undermines its own foundations by lowering the profit rate as the capital stock accumulates.[1]This is, incidentally, far theoretically closer to the ideas of Keynes than Schumpeter, for whom: 'The ordinary theory of distribution, where it is assumed that capital is getting now its marginal productivity (in some senseor other), is only valid in a stationary state. … the extent of investment in any direction will depend on a comparison between the rate of return over costand the rate of interest' (Keynes 1971:139-140. The second emphasis is mine).

The demand for capital is strictly limited in the sense that it would not be difficult to increase the stock of capital up to a point where its marginal efficiency had fallen to a very low figure... There turn from [new means of production] would have to cover little more than their exhaustion by wastage and obsolescence together with some margin to cover risk and the exercise of skill andjudgment (idem, emphasis mine)

There is a neat symmetry: for Marx, capitalism is endogenously crisis-prone whereas for Schumpeter, it is endogenously restoration-prone.

The obverse of this lacuna in the Schumpeterian tradition is a question that has probably caused Marxist thinkers more vexation than any other: given the long-term self-destructive effect of accumulation on the profit rate, how and under what circumstances does capitalism launch its recoveries? We cannot deduce, from the mere fact that a surplus is available to finance innovation, that it will necessarily be used in this way. If we made this assumption we would have a Marxist self-restoration theory, which would leave unanswered the question 'how can we explain long contractions?'

Exogenous factors, I believe, supply the missing link. The recovery from 1929 can be fully explained on the basis of Marx's own theories (Freeman 2009a) by noting the critical role of the Developmental State (Bagchi 2003) in all actual capitalist booms. The postwar boom is no exception: its foundation was the huge involvement of the US State in the economy from 1942 onwards, reaching 52 % of GDP at its height while private investment remained at 3 %.

This suggests a small, but critical research programme. Focussing on the mechanisms of the economy's motion, it is clear that powerful forces exist which can at times drive it to grow very fast, as in booms, and others that slow its growth to an unsustainable crawl or worse. Under what circumstances will the first set of forces outperform the second? And which of these forces may we treat as endogenous, and which as exogenous? These questions can be investigated from any one of several standpoints. I have outlined what I believe to be the theoretical essence of the approach of Schumpeter and of Marx. Other readings of these theorists are of course legitimate, if supported by hermeneutic evidence. All other non-ignorable theories whether Sraffian, Post-Keynesian, Institutionalist or other as yet unknown explanations, should of course also be given proper consideration.

My father's life was based on the insistence that one indispensable circumstance was the directed intervention of institutions under the conscious control of human agents, to ensure the best possible use of science accompanied by the widest diffusion of knowledge, hence the greatest possible levels of education, of access to knowledge,

[1] The 'disproofs' of this theory that dominated the Samuelson era are now known to have no foundation once Marx's presentation is interpreted as temporal. See for example Freeman (1996), Kliman (2007), Kliman et al (2015).

and the systematic deployment of policies to provide for national systems of innovation that really work to enhance the lives of billions of people.

Schumpeter's theory of self-restoration comprises the precise, testable opposite of that theory. Let us now, therefore, test these two alternative hypotheses, as in Marianna Mazzucato's (2013) superb book on the state as entrepreneur. Let us see in which nations, at what times in history, and under what institutional régimes the financier, the entrepreneur, and the citizen have actually worked in the way that Schumpeter and Chris respectively — and differently — claimed they would.Let's invite economists of all persuasions to investigate, objectively, scientifically and impartially, what those conditions really are, and let's then take all and every appropriate measure that will bring those conditions into existence. This, as Chris himself dubbed it, the Economics of Hope. It is sorely needed today.

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