

RE-THINKING MACROECONOMIC POLICY AND THE COMING OF SINGULARITY: BEYOND THE CONTEMPORARY WORLD

1. INTRODUCTION

Many publications have appeared in recent years, devoted to re-thinking macroeconomics and macroeconomic policy. Their number has accelerated since the Great Recession that depressed much of the global economy and depressed the profession that failed to anticipate it.

There are many strands to rethinking macroeconomics. As the strands are woven together, a differentiated version is emerging, which the paper attempts to summarize. The main theme is about re-thinking current re-thinking, because, at least in this author's view, rethinking up to now, amounts to patching up a deeply compulsive paradigm: so deep that, with some justice, it can be described as a basin of attraction (an attractor). Two attractors are described in the paper: Attractor 1, as conceived by current rethinking and Attractor 2, conceived as a Singularity. Attractors and Singularity are defined below.

Attractors

Two attractors are distinguished. Attractor 1 concerned with theory. Attractor 2 concerned with events, accelerating change and Singularity.

An attractor is a set of values that a dynamic system tends towards, even though it is occasionally shifted by shocks from one path to another. A variety of themes are involved in rethinking macroeconomic theory and policy. The basin of attraction contains connected sub-sets: The (Post) Washington Consensus, Neo-Conservatism, Neo Liberalism and Modern Capitalism. Their intersection consists of faith: faith in property rights, faith in competition and the market system as organizing principles that converges towards equilibria within the attractor. There are many possible paths because shocks shift the dynamical system from one to another.

Singularity

Singularity is used here to describe the outcome of accelerating growth of ideas, technology and intelligence, that enables the creation of machines that can create generation upon generation of ideas, technologies and intelligences so powerful that human beings are unable to comprehend them and so powerful that they are beyond human control.

We can only indicate the nature of new theory that will emerge. Maybe, we might surmise, the new theory will correspond to a version of the Uncertainty Principle. Maybe the characteristic mindset required of the new theory of Attractor 2, is truly scientific in the sense in recognizing the necessary search for understanding and explaining reality alongside recognizing the existence of the ineffable.

The second section concerns Attractor 1.

- a. Rethinking views the macroeconomy as a complex adaptive system operating far from equilibrium. So current notions based on equilibrium should be abandoned when constructing models on which policies are based.
- b. Further, the macroeconomy is an open system, interacting with other open complex subsystems, including technology, politics, religions, nations, the biosphere, cultures and religions. As part of opening the macro economy to other systems, it should extend the disciplines it draws upon.

The third section concerns Attractor 2

- c. Accelerating change in ideas, technologies and events, means that for better or worse staring into the face of Singularity.

2. ATTRACTOR 1

Re-thinking amounts to patching up contemporary economics, with a variety of concepts, perhaps, in themselves, capable of exploding the fundamental themes underlying Attractor 1, into a Singularity. They include complex adaptive systems, emergence, disequilibria, self-ordered criticality, the fractal structure of organizations, percolation and contagion. But it is asserted that there is "a universal convergence," and a "common core of wisdom embraced by all serious economists" and those who don't concur are designated "cranks", a prejudice, hard wired into economic thinking that makes Attractor 1 a prison.

Attractor 1, in spite of hard wiring, is flexible enough to allow considerable diversity among contributors rethinking macroeconomics theory and policy. But their contributions, perhaps only for the moment, are connected subsets of a grand narrative based on acquisitiveness and attachment to property ownership, competition, rivalry, self-interest and the primacy of the market as an automatic control mechanism that is faulty in detail, but the best that is available.

Attractor 1 is made up of connected sub-sets. Contemporary rethinking is diverse, but its diversity is contained, allowing revisions that seem '*all of a piece*'; part of a coherent paradigm, *built on sand*, contained within a grand narrative, made up of connected sets: The Post Washington Consensus, Neo-Conservatism, Modern

Capitalism and Neo-liberalism. Thinking of the set of ideas within each theme, their intersection consists of dogma: too much faith in property rights, faith in competition and the market system as organizing principles that converges towards equilibria within the attractor.

There are many possible paths because shocks shift the dynamical system from one to another. Occasionally paths within the diverge into outliers. The Bush administration, for example, believing the USA to be the pillar of democracy, sought to impose Neo Liberalism via Regime Change.

The behavioural motivation of private property rights is amended to embrace the management of common property. Decentralized allocation of resources is amended by the need for judicious tweaking by governments, which in a global economy brings problems of co-ordination.

That the deterministic principle of Attractor 1 as containing equilibria is being conceptualized as a balance of probabilities is perhaps the most promising shift of focus, it embraces the Entropy Law. Equilibrium in is cast in as a balance equation; a balance between the probability of inflows into and the probability of outflows from, the macroeconomy...

The macroeconomy as a complex adaptive subsystem

The simplest measure of the complexity of a system is the length of its description, the length (words or number of zeros and ones) of the string necessary to specify the system precisely. An open system is just as it says, open to the other systems it interacts with.

The macroeconomy has long been recognized as a complex adaptive system. But policies are still founded on equilibria. Textbooks expound aggregate supply and demand, where systems deviate from equilibrium due to external shocks, or failures to adjust through wage or price rigidity. Business cycles are portrayed deviations from a long run equilibrium trend which is either self-correcting or modifiable by fiscal and monetary policy. Hence financial crises that the most casual observation shows them to be endemic come as a surprise because they are assumed to be tail events in the behaviour of variables such as asset prices, unemployment and deviations from growth paths that are normally distributed.

Contrary to the irreducibility of complex systems to their parts, macroeconomic systems are modelled upon the building blocks of micro-economic optimising behaviour households and firms. Alternatively, DSGE (Dynamic Stochastic General Equilibrium) models which are the foundation of macroeconomic policy are based on the behaviour of *representative agents* which is rather like analysing

systems made up of particles in random motion as if the behaviour (momentum) of individual particles were the same or that we can learn about the macrosystem from their average behaviour.

Critics point out forcibly that adopting such models is in denial of the most casual observation that individuals differ in so many respects; education, skills, mobility, personality and so on. It also underplays the influence of risk, luck and chance in determining peoples' status, wealth and opportunity. Adopting *bad* assumptions that people are behave alike or have characteristics that are alike, that is as if they were homogeneous leads to *bad* policy

From the outside, experts in the subject are distrusted as are experts generally, but economists are distrusted more so. Macroeconomics is a complex sub-system of a bigger complex system state that includes international politics, foreign relations, ecological, technological and a host of other subsystems including global business. All of them are subsystems that are open to one another and even the grandest system which they are part of is also an open system. And projecting into probable future scenarios, the contemporary state hovers at the edge of singularity.

Black Swans fractals and criticality

As a complex system, the macroeconomy hovers at the edge of chaos, far from equilibrium, self-organizing to a critical point where change on all scales is possible. It is a scale free system, suggesting it has a fractal structure that enables local effects to contaminate (percolate through) the entire system and through to other systems. It is open to probabilistically abnormally not normally distributed events, described by a fat tailed or Black Swan PDF's. The macroeconomic system is sensitive to the initial conditions of the state of the macroeconomy and other subsystems, so that the path of macroeconomic variables within its customary attractor is unpredictable and capable of jumping from its customary attractor to an inconceivable other second attractor: Attractor 2.

3. ATTRACTOR 2

This section considers the implications Attractor 2; "Accelerating change in ideas, technologies and events, that mean, for better or worse, staring into the face of Singularity." This involves more than patching up frivolous assumptions.

A complex system cannot be reduced to its individual parts. Reductionism is futile. Emergence means the emergence of novelty and consequences that cannot be

predicted even probabilistically. More likely, before the event, they cannot even be imagined. Emergence complexity and singularity are connected.

The macroeconomy is self-organizing to the brink of Singularity, Singularity being a new state, where to borrow from the Irish poet William Butler Yeats, who anticipated the idea, “All [*is*] changed, changed utterly: And a terrible beauty is born.” Later he anticipates a future, in which, “*Things fall apart, the centre cannot hold; Mere anarchy is loosed upon the world....*” He goes on to ask; “... And what rough beast, its hour come round at last, Slouches towards Bethlehem to be born?”

There are many aspects to Singularity. Yeats, captures Singularity in the excerpts from his poems above. He sees it as immanent, incomprehensible change, for the better or the worse, or both, a slouching beast, born of darkness, bringing both redemption and terror of impermanence. Singularity in science is a situation in which a huge mass is contained in an infinitesimally small point where the laws central to physics and mathematics no longer hold. Examples are phase transitions, the state of the universe at the Big Bang and the prospect of the Sixth Great Extinction.

4. CONCLUDING REMARKS

Failure to predict the Great Recession was traumatic. But traumas are a kind of singularity, perhaps opening up new economics. Technological singularity has a millenarian flavour which is more explicit in Yeats poems above. A future is envisaged in which “*technological change is so rapid and its impact so profound, that life will be irreversibly transformed*”.

Equilibrium is probabilistic state, that can be understood in terms of entropy. And low entropy as richness of information and consciousness.

Predicting the nature of Singularity and perhaps even dating it is futile. Speculating on the new Attractor 2, perhaps, if humans abandon the notion that they are the most exquisite pattern detecting beings, other aspects may emerge: unity of being, correspondence between systems, the ineffable as a principle and empathy.

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