NOTE TO THE INTERPRETER FOR PRESENTATION FOR

Forecasting the new economy
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Slide 2

I will focus this presentation on interdependence some of the ways in which it is represented (a) in our globalised world (b) developments in network theory and (c) relationships between small world networks, scale free networks, fat tailed distributions and fractals (d) risk as a public good.

Slide 3

These things have implications for the global economy and government policy. The current financial crisis, for example arose from systemic risk that spread like a virus across the global network of financial institutions; clusters of closely linked institutions. Financial institutions have evolved over the last 30 years into a small world structures; that is, highly clustered and short path lengths between them. In other words, financial institutions became Too Big to Fail (TBTF). Now the virus has spread to sovereign states: Greece, Ireland possibly Spain, Portugal and Italy (the so called PIIGS). This situation possibly will lead to the breakup Eurozone since some countries are Too Big to Bail Out (TBTBO).

What I am describing here is interdependence across space; geographic contagion (sometimes called percolation). Interdependence leads to paradoxes in policy which I will speak about later.

Slide 4

So change on all scales is possible as illustrated by the scale free distribution, or fat tailed distribution. This is a typical representation of *scale freeness*; a logarithmic linear relationship between the size of changes and their probability. Putting the expression in slide 4 into log linear terms we have Log y = log c – a log x as portrayed in the slide.

Slides 5 and 6

But still people remain faithful to outdated models of the world. Thinking in through the lens of terms of the normal (Gaussian) distribution; especially seeing risk as something that can be diversified effectively. Irrelevant and inaccurate models of reality have become reality. As Magritte reminds us a picture of a pipe is not a pipe; a map is not the territory.

Slides 7, 8 and 9

Interdependence occurs across time as well as across space. We should distinguish between statics and dynamics. In dynamic systems, often feedbacks occur. One criticism of conventional models of finance is that they ignore feedback if effects. Diversified portfolios spread risk but only in so far as there are no feedback effects, but if there are feedback effects then risks increase as diversification increases.

(These slides contain some technical points that we will not discuss in any detail. Briefly slide 8 illustrates the proposition that provided the correlation coefficient between any two assets i and j ρ_{ij} is not equal to 1 then diversification reduces risk: and slide 9 means that if there are feedbacks between one time period and the next (h[ρ(t)] and h[ρ(t$^{/}$)]), then diversification may result in increased systemic risk. Thus if bank 1 is distressed and forced to sell assets held by a number of banks at reduced prices or if it can only borrow at higher rates then and becomes even more distressed this may spread to other banks (banks 2, 3 and so on) : so diversification results in increased system risk.)

Slide 10

Networks are a good metaphor for interdependence. Networks have two key aspects: nodes and linkages (or edges) between them. The default state of many networks seems to be small world networks.

Slides 11 and 12

Small world networks have many highly connected clusters of nodes but any node in the network is can be connected to any other by a small series of steps as for example in slide 11.

Slide 12 illustrates small worlds in a different but equivalent way. The default state of many networks is small world in that the probability (of clusters) of nodes with a relatively small number of connections is high, but there a small but significant probability of a few very highly connected nodes. As with many phenomena, the internet illustrates many aspects of a small world network.

Slides 13 and 14

One characteristic of small world networks is that they are robust against random attacks, but fragile against targeted attacks. That is attacks that affect highly connected nodes.

Such was the case in the recent crisis, when highly diversified assets (MBS, CDO's, CDS's) disintegrated because highly interconnected banks, (as illustrated in slide 13) were too highly leveraged.

As counter examples The Worldwide web has inbuilt characteristics that avoid fragility. Similarly state subsidised corporates like Al Qaida are distributed in such a way as to retain their network connectivity yet be robust.

Slide 15 and 16

A fractal looks identical whether viewed through a telescope, or a microscope or with the naked eye. There is a repeated pattern, within the pattern, within the pattern.

(Correspondences itemised in slide 15 are illustrated in slide 16 follow from the relationship noted in slide 4: no matter what scaling factor we use to measure x and y in centimetres metres, miles or kilometres the relationship remains the same, in just the same way as the fractal in slide 16 has the same shape at the macro or micro level.)

Slides 17, 18 and 19

Interdependence as we have described it here brings paradox to policy makers. The world faces Yin Yang of paradoxical issues:

(a) Excess supply or deficient demand: Chinese inventory and infrastructure investment (plus bank bailouts, Quantitative easing and so on in developed economies –especially in the USA and UK) prevented the Great Recession of 2007 – 2010 becoming a Great Depression (as in 1929 – 1939). But it increased the capacity to produce at a time of lower consumption in the high demand areas especially the USA.

(b) Deficits In the balance of trade (exports less than imports, $X - M < 0$) in high consumption economies who need to depreciate their currencies, and surpluses (exports greater than imports $X - M > 0$) in economies that rely on export level growth. The world economy is unbalanced, with surplus economies (Germany and China especially together with resource rich economies such as Russia) needing to reduce their surpluses to let deficit economies reduce their deficits.

(d) Currency wars: consequent on (a) ad (b) surplus countries seek maintain their growth momentum by artificially depreciating their currencies.

(e) Changing balance of world economic power as China and India re-emerge as the world's biggest economies with perhaps others following.