

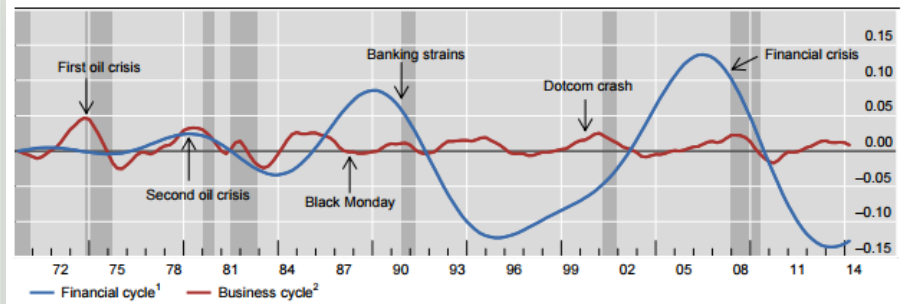
SUMMARY

As shown on the *BIS chart* to the right, for the past 40 years, the US financial vs business cycles have followed a path typified by Lotka–Volterra³ Predator-Prey equations of unstable focus⁶. The scientific nature of this proof explains why Classical Economics' static, linear-math model fails to describe a set of interactions whose principal dynamics is intrinsically nonlinear. Yet, while we insist on using unreliable prescriptions to study the economy, "Ecosystemic Economics" has been applied since 1967.⁵ In fact, the unstable feedback system model predicting the paths revealed by the BIS chart was inferred by Hyman Minsky in his 1985 *Financial Instability Hypothesis*. Minsky's "Long Cycle" Debt to Capital model traces Top-Down-Controlled⁶ Predator-Prey Dynamics when predator size (Debt plus annual carrying cost) grows exponentially with each cycle, until it depletes prey size (Capital plus annual income). Surprisingly, over the nearly five centuries since the advent of *Information Symmetry* (Capitalism), Bottom-Up Controlled Resource Competition keeps escalating, while cyclically relapsing each 40-60 years, back to a pre-capitalist, Top-Down Controlled dynamics. Our goal is to show the global economy is currently ending a Top-Down Controlled cycle. Yet, in this note, I only intend to address some of the fundamental notions implied by the extraordinary fit of Minsky's Long Cycle model to the BIS chart shown above.

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The financial and business cycles in the United States

Graph 1



¹ The financial cycle as measured by frequency-based (bandpass) filters capturing medium-term cycles in real credit, the credit-to-GDP ratio and real house prices. ² The business cycle as measured by a frequency-based (bandpass) filter capturing fluctuations in real GDP over a period from one to eight years.

Source: update of Drehmann et al (2012).

What separates science from non-science is the margin for interpretation¹

Though Economics introduced many appealing concepts since Adam Smith's original theories, static assumptions continue failing to describe the powerfully nonlinear nature of human interaction. Yet, two decades into the 21st-century, we continue to apply grossly inadequate arithmetic recipes to manage our global resources, while knowing, for instance, that a pair of simple ODE developed in the 1920s can trace the High vs Low Exponential IRR patterns underlying the Financial vs Business cycles. Hence, instead of serving billions of people, Economics has become a snake-charmer's quintessential magic wand (aside from his mandatory 64,000 crayon-case of Misleading Indicators²).

Curiously, submitting Economics to scientific rigor could save the lives of millions...

As the real dynamics governing Economics become obvious to everyone, illusionists like those presently devastating Venezuela, Argentina or Brazil (*see bottom 10%*) would be rapidly recognized. Even G-7 central-bank intentions would become instantly transparent: For instance, on the BIS chart above, notice that since the 70s, the US financial and business cycles have traced the predator-prey dynamics³ pattern of unstable focus (a system that keeps moving away from equilibrium after any initial shock), better known today as Minsky's "Long Cycle"⁴.

The good news is human economics follows laws common to every living creature⁵

The bad news is Minsky's "Long Cycle" tracks "top-down controlled⁶ predator-prey dynamics: As unlimited bailouts by central banks/governments make unlimited predation possible, the predator (Debt) to prey (GDP) proportion escalates exponentially with each cycle oscillation. Then, based on Arditi-Ginzburg "For very efficient predators, the only possible outcome is complete extinction of the system: the predators die out after exhausting the prey." Fortunately, a top-down controlled cycle would lead to collapse, not catastrophe, so as excess-debt collapses, excess asset-prices evaporate and the new cycle starts with prey size (GDP) growing unchallenged ("bottom-up controlled").

¹ There must be a hundred better definitions, unless one favors perceptual relevance

² [Statistics require detrending](#), as data providers tend to pick modes (nominal, percent change, indexed, sum, average, etc.) or parameters (price, time, relevant unit) that back their assertions, yet might be statistically irrelevant or mathematically meaningless

³ The [Lotka-Volterra](#) (1925-26) ordinary differential equations were originally employed to study predator-prey dynamics in Theoretical Biology

⁴ Minsky's "Long Cycle" is typified in the BIS chart by the US financial cycle's pattern of greater amplitude waves (characteristic of unstable feedback systems) that forms over decades, as the proportion of Debt to GDP rises exponentially with each oscillation

⁵ "[Predator-prey dynamics](#)" equations have been applied in economic theory, since at least 1967, when Richard Goodwin used Kolmogorov's version. Their application to Minsky's Long Cycle was first proven by Asada in the late 90s, then Keen and others

⁶ See details in Arditi-Ginzburg's 1989 ("[ratio dependent](#)") version of Lotka-Volterra's predator-prey dynamics