Diagnosing 'seizures' in the US economy

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Since 2008, the U.S. economy has been "seizing" uncontrollably. Now a Tel Aviv University researcher says that a comparison of the multifaceted economic downturn with the uncontrolled spasms of an epileptic is not inappropriate — and may say something about the origins of the disaster.

In a recent article published in the journal *PLoS ONE*, Prof. Eshel Ben-Jacob of Tel Aviv University's School of Physics and Astronomy, his doctoral student Dror Y. Kenett and economist Dr. Gitit Gur-Gershgorn examined the dynamics of the S&P 500 over the last decade, employing methods originally developed by Prof. Ben-Jacob to analyze the brain activity of epilepsy patients.

They discovered that a dramatic transition in the financial markets in 2001 would have been an accurate predictor of the meltdown that occurred in 2008 — and their methods also suggest a solution.

Dysfunction, diagnosis and treatment

In epilepsy, one sector of the brain takes over and tampers with the normal activity of other brain sectors. His analysis of the financial markets demonstrates the same dysfunction, Prof. Ben-Jacob says, revealing epileptic seizure-like behavior that resulted in the excessive dominance of the financial services sector, distorting healthy activity in other sectors of the economic marketplace, such as real estate investment and the activities of banks, governments and investment companies. This dominance led to "market stiffness," which proved to have fatal implications during the financial crisis.

This dominance and consequent "market stiffness" were manifested in the emergence of market "seizure" behavior — bursts of very high stock correlations that usually coincided with local minima in the S&P 500 Index.

"In epilepsy, the overdominance of the epileptic focus on the functioning of all other regions of the brain can result from excess activity of the neurons because the links between them are too strong, or from insufficient inhibition," Prof. Ben-Jacob says. Drawing an analogy to the stock market, he suggests that "surgical intervention" could sever some excess links between different sectors of the financial marketplace, along with a stronger inhibition of its excess activity — by increasing interest rates, for example.

The dangerous dominance of the financial sector might have been a direct consequence of hasty and dramatic U.S. interest rate cuts and other remedies used in 2001 to overcome the fallout from the "dot com" bubble collapse, Prof. Ben-Jacob says. He counsels that current U.S. policymakers may be trying to "avoid the major and painful surgery needed to cure the market."

Provided by Tel Aviv University

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