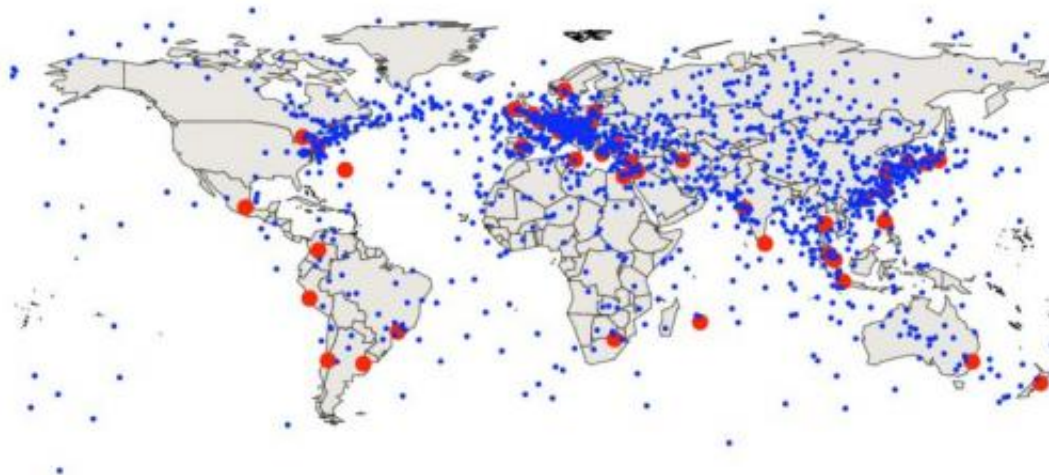


Physics could help financial traders

March 24 2011, by Deborah Braconnier



Optimal intermediate trading node locations [small circles] for all pairs of 52 major securities exchanges [large circles]. While some nodes are in regions with dense fiber-optic networks, many others are in the ocean or other sparsely connected regions. Image credit: APS, DOI:10.1103/PhysRevE.82.056104

(PhysOrg.com) -- While most people know that the shortest distance between two points is a straight line, this concept is proving even truer in the world of stock trading. In a world where buying low and selling high means all the difference, racing the speed of light between to different financial markets can mean greater profit.

With financial markets being located all over the world, [stock trading](#) has become reliant on the speed of fiber optic cables and their ability to process information. While fiber optic cables are currently operating at

about 90 percent of the [speed of light](#), Dr. Alexander Wissner-Gross shares how companies might be able to exploit physics and position themselves in locations capable of more competitive speeds and transactions.

In a paper [first released in 2010](#) in the *Physical Review E*, Dr. Wissner-Gross determined locations that are at the most optimal sites to best compete with the current locations of [financial markets](#). With the idea that the quickest route between two points is a straight line, he determined locations which would essentially be right in the center of that line. This location being ideal in the fact that you then had the shortest distance to cover for both markets, thus better setting your business up to buy low and sell high between the two markets.

For example, should you be a trader working off the [New York Stock Exchange](#) and the exchanges in Europe, your ideal location would end up somewhere in the middle of the Atlantic Ocean. However, while this information is valid, there are not many companies ready to construct a floating office.

With this problem in mind, Dr. Wissner-Gross is now looking at determining land points which would approximate these mid-ocean locations. Using the above example of New York and Europe, he would now look at a location such as Nova Scotia.

This physics trick may just be able to provide a very competitive edge to many companies, and over the years, we may just see many financial trading hubs popping up in the least likely locations. No more will they be dependent on buzzing cities and large markets, but they could be springing up in rural areas that provide the best locational advantage to cutting the distance needed to travel the world of fiber optic cables.

More information: Relativistic statistical arbitrage, A. D. Wissner-

Gross and C. E. Freer, *Phys. Rev. E* 82, 056104 (2010)

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