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Market Instability: The High-Speed-Pothole Theory

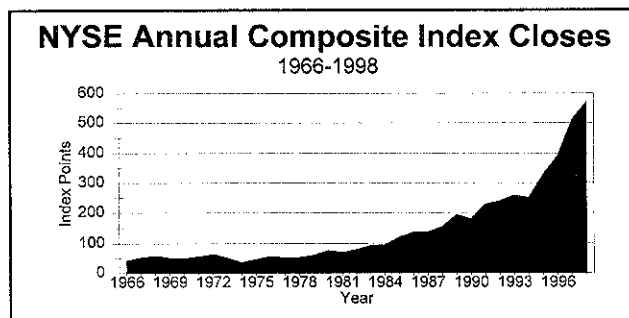
It takes organized science quite a long time to reach a consensus on the evident if the conclusion is either unpalatable or its explanation unknown. That the Earth went round the sun had the former problem; that South America had once been joined with Africa had the latter. The possibility of recurrent market collapse over generational periods has both problems. But by the standard of naive observers, the inexplicable can sometimes be rather obvious.

Perhaps, as economic expansion occurs, following some earlier collapse, a cautious (depression-era) generation that was traumatized by the collapse is eventually replaced by a generation confident that growth is inevitable and unstoppable. This change in psychology could, in extreme cases, produce what economists have called a "mania"--an implicit or explicit belief that "structural changes" in the market place, or new inventions, have provided a new environment of limitless growth. People may come to believe--those few who bother to think about it--that new regulations will protect against the causes of the last collapse or, in any case, that collapse is not on the horizon and when it does appear, that they can sell their investments in time. Alan Greenspan's warning against "irrational exuberance" captures some of this.

The Danger of Habituation

Quickly becoming habituated to new dangers

that do not immediately materialize--like the citizens of Pompeii who came to ignore the rumblings--this new generation fails to regulate the dangers provided by new economic tools (e.g., today's derivatives or hedge funds). It gives insufficient attention to the extent of participation in the marketplace of unregulated areas or processes (e.g., today's emerging markets and stepped up currency flows). And it does not factor in the explosive power of new communications (e.g., modern technology that can release negative information simultaneously to millions armed with the means to sell instantaneously.) In sum, the new generation is not fully aware of how much has changed since the last collapse.



The Absence of Personal Experience

In particular, the new generation has no personal experience with the speed with which an atmosphere of comfortable greed can be turned into one of abject fear or the imperceptible way in which an atmosphere of investment can become a climate of speculation. Even the experts turn out not to know of important dangers, e.g., witness the general astonishment at the dangerous leverage achieved by the hedge fund Long Term Capital Management. And even sensible investors come to overlook the Ponzi-scheme aspect of stock markets in which higher participation means higher prices only until the rate of participation (inevitably) stops rising. The increasing

involvement of blue collar workers in the market today reminds one of the apocryphal story of the bootblack in 1929 whose requests for a stock market tip, rather than a quarter, persuaded a rich client that he had better sell at once since there were no more investors left to be drawn into the action.

But mixed with the assertive self-confidence of a new generation's romance with a long boom, there develops a quiet subterranean feeling of unease, first among the professionals, that too much money is being earned too easily and that this cannot go on forever. At this point, the economic expansion becomes vulnerable psychologically as all watch each other to see any initial signs of a rush to sell. Calamity awaits a suitable shock, or series of shocks, which need not be very numerous or large if a national market is sufficiently supersaturated with the preconditions of a collapse.

Looked at this way, an economic expansion would seem to have a mean time to failure that shortens as the expansion, outrunning regulation and creating inappropriate expectations, continues. Imagine, by analogy, the probability that your car's tires will be disabled by hitting a pothole. The higher the speed of the car, the more likely it is that a pothole of fixed size will injure a tire sufficiently to disable the car. As a result, at ever higher speeds, it may be only a matter of time before the car encounters a pothole it cannot handle.

A marketplace in securities picks up speed, and develops the preconditions of collapse, not only by drawing in an unstable fraction of potential investors and generating excessively optimistic price earnings ratios. It also develops not-fully-tested tools of investment and it may become dangerously intertwined with the fortunes of other stock markets or with political or psychological events abroad. At some point, it quietly dries up the available funds

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necessary to bolster the market against declines; in some cases, the sources of investment are destroyed, perhaps by war or by some event like the Asian contagion. At this point, market declines can cycle downwards without the normal resistance of bargain-hunters. And if this goes on far enough, stock market losses can have real effects on the economy.

The Instability of Collective Decisions

One cannot predict with precision when a shock will occur of sufficient size to cause such an uncontrollable implosion. But that it cannot occur immediately after the puncturing of a past bubble, on the one hand, and that it is likely to occur every few generations, on the other, is plausible. Put another way, to the extent that a speculative boom went unchastised by collapse, it would all too often just continue until it *did* collapse--just as a person determined to play Russian Roulette until a bullet hits him will eventually die.

At bottom, free market economic expansions are less than completely stable because they depend on a collective willingness to participate by lending or investing. In effect, the banking system extends more credit than it has deposits on the grounds that depositors will not, through some quirk of fate, all request it at once. Similarly, people agree to buy stock in a corporation and/or to invest in a foreign country on the assumption that not everyone else will decline to do so at once. If this depended only on statistical laws of large numbers, there would be no problem but, unfortunately, and evidently, there are reasons why all depositors or investors might well move, as one, in the same direction--as they did when the Asian crisis erupted.

In sum, economic expansion on the contemporary scale requires a sustained mass participation. For individuals in this mass, it is not irrational to run for the exits in a crisis. In today's world, economic regulation is rudimentary compared to the ever evolving stresses and strains, and the scale of money flows, so it is not at all irrational for individuals to expect the worst when an alarm goes up.

Of course, America and Western Europe have developed central banks with a capacity to provide liquidity when necessary to avert collapses. More generally, America, by itself, is sufficiently rich in

rules, regulations, and law, and sufficiently free of corruption and distrust, to be able, perhaps, if it were alone in the world, to manage expansion well. Perhaps periods of expansion and decline in an isolated modern-day America could run longer than the 50-60 years of which the Soviet economist Nikolai Kondratieff (in 1922), and the celebrated German economist Joseph Schumpeter (in 1939), wrote.

But a major source of boom in this cycle has been global investment into precisely the areas of the world that were least well-endowed in law and attitudes to control the unprecedented influx of cash. DeTocqueville wrote that the wealth of a country was to be found "in its people and in its laws"; one corollary may be that countries without a major endowment of laws can never get reliably rich until sufficient laws are passed and implemented to regulate the economy effectively. This could take many decades for many countries.

The Problem Isn't What But When

Before July, the public had not been loudly warned that its investment in emerging markets was not only risky in itself but strategically risky, i.e., that any collapse abroad might trigger a mass withdrawal of investments however unjustified. The nuclear power industry sometimes testified that any reactor meltdown abroad--even in a very unregulated country--could imperil the nuclear power industry everywhere. But the financial industry has been, collectively, less aware.

Or it just kept quiet about it. As John Kenneth Galbraith has written eloquently, these expansions tend to devour and suppress their skeptics. The mob shouts down those who tell them their methods of accumulating easy wealth are flawed. Also working to maintain participation in the market is a human reluctance to let go of assets. In this regard, people are like the jungle primates who can be captured by putting a shiny object in a gourd with a narrow neck. The monkey reaches into the gourd and puts his fingers around it. But when his fingers form into a fist, the gourd is too narrow to permit him to remove it. Unwilling to relinquish his prize, he simply waits--and is captured. Many human primates are going to be captured by a falling stock market in just this way.

Warren Buffett once said that it is easy to predict *what* is going to happen, the problem is

predicting *when*. So these general considerations--unproven to economic science--are not, in any case, sufficient to determine what will happen in 1999 and 2000. Under normal circumstances, one could hope for a soft landing to an overly expanded U.S. stock market. The Dow having gone from 1,000 to 9,300 in less than two decades, and having dropped off almost 20% and then returned to 9,000 since this summer, it might just return slowly but steadily to much lower numbers as corporate earnings began to fall off. This is, really, what happened in the slow-motion bear market of 1969 to 1982. Or the ascent might continue, as it did after the 500 point drop in 1987, risking a later drop. Or nothing bad might happen for a long time.

But the same potential shocks in the wings that forced an earlier alarm are still there and could produce the surge to the exits that would lead to a more profound market failure. One is the long-predicted collapse of the Japanese stock market, which has long been at levels advertised as ones that would make its banks, heavily invested in the market, insolvent. Another is the further collapse of Russia. Still another is a currency devaluation by China or problems in Latin America. The Fed has bought time with lower interest rates but little more.

There are also domestic dangers. Chess players are warned to view the relaxation of tension on a chess board, that occurs with some swaps, because, like a spring uncoiling, the resultant energy can wholly revise the board landscape. If and when the stock market starts to unwind, with every drop of 2,000 or so in the Dow, or sharp changes in the bond market, we can confidently expect over-leveraged losers, in hedge funds or in other users of derivatives, to be injured. These failures could bring further unraveling through injury to investors completely innocent of any speculative activity. It has become clear that no bank, however careful, can really understand the financial situation of all those with which it is dealing, in what George Soros has called a "daisy chain of counter parties". When and if the market declines sharply, we will all be, to an unfortunate extent, tied together with the worst of the speculators.

Still, all this would not be, by itself, enough to point with alarm at the possibility of a far-reaching market collapse--it only indicates the ever-present

possibility. What does unnerve one is both the specter and the reality of the year 2000 (Y2K) problem of computer programs. The market hates uncertainty and this problem is the biggest bushel of uncertainty the modern stock market has ever faced--much worse than an impending war because, for the body politic, it represents not a traditional external threat but a new and unknown disease of the nervous system. By itself, in the run-up year 1999, this problem is likely to be a heavy weight on the market and could produce a panic as citizens try to escape market risk by becoming liquid before the new millennium. In a few months, companies will be disclosing their compliance--more often their weakness in compliance--with the Y2K problem in their quarterly announcements of corporate earnings. There could be a flight to quality-compliance. (And a growing public awareness of the dangers of Y2K computing problems could occur in early 1999 when glitches surface that are induced by programming errors in implementing the new, and technically complicated, European Euro.)

Y2K Is a "Real" Problem

Worse, the Y2K problem is not just an uncertainty but a real and far-reaching problem in which all kinds of economically important undertakings (e.g., airlines, railroads, financial systems, tax collection procedures, etc.) are likely to be running at less than full efficiency until the bugs are exposed and ironed out in the year 2000 itself. It is now perfectly clear that this problem cannot be fully resolved in advance.

So my professionally uninformed view is that sharp stock market declines, and even economic collapses of free market capitalism, probably can be expected every few generations for a long time to come. But whether or not they are, we seem to be in a particularly dangerous phase. In the Asian contagion, the world has certainly hit a pothole at high speed. Now in a peculiar state between apprehension and renewed hopes, popular confidence in the state of the world economy is marching into the wall of the year 2000 problem. □

--Jeremy J. Stone
--Stone began as a game theorist and received his Ph.D. only in mathematics, not economics.

FAS Sponsors Nuclear Warhead Transparency Workshop

Charles Ferguson

On November 9 and 10, FAS hosted a Russian-American workshop on nuclear warhead transparency at the State Plaza Hotel in Washington, DC. Frank von Hippel, FAS Fund Chairman, and Anatoli Diakov, Director of the Center for Arms Control, Energy and Environmental Studies at the Moscow Institute of Physics and Technology, presided over the proceedings that brought together experts from governmental agencies, non-governmental organizations, and academia.

Nine years after the end of the Cold War, Russia and the United States have still not begun serious negotiations on how to transparently and verifiably account for and dispose of many thousands of nuclear warheads. The Strategic Arms Reduction Treaty (START II), currently before the Russian Duma, does not require nuclear warhead dismantlement. However, the 1997 Helsinki Protocol to START III included an agreement to require transparent and verifiable dismantlement of nuclear warheads in START III.

Major Policy Issues

To help establish the foundation for expanding START III and future arms control endeavors into these areas, this workshop addressed the following major policy issues. First, what are the principal Russian and U.S. political interests in warhead elimination? On the Russian side, it appears to be in getting rid of the U.S. "up-load hedge." In 1994, the U.S. decided to maintain the capability to rapidly deploy twice the START II permitted strategic warheads. On the U.S. side, the principal interest appears to be in obtaining transparency in Russia's remaining stock of non-strategic (tactical) nuclear warheads and reductions down to around the U.S. level of about 1,000 tactical warheads. The U.S. could, therefore, potentially use its excess strategic warheads as a bargaining chip to get Russia to destroy thousands of its tactical warheads.

Second, can the United States provide increased financial assistance for Russian warhead dismantlement in exchange for reciprocal transparency? Since 1995, through the highly-

enriched uranium (HEU) deal, money has begun to flow into Russia to pay for converting 500 tons of HEU into a low-enriched form unsuitable for weapons. Because global uranium markets have limited capacity to absorb low-enriched uranium for power plants, this deal is scheduled for completion until 2014. Workshop participants discussed how to accelerate the deal in order to secure this weapons material faster and, perhaps, also provide Russia with an additional incentive to negotiate warhead elimination transparency on a reciprocal basis with the U.S.

Initial Steps

The main accomplishment of this workshop was to identify several initial possible steps toward the goal of warhead elimination and fissile material transparency, including getting the two countries to:

- State how many warheads have been eliminated and remain to be eliminated under the 1991 Bush-Gorbachev initiatives.
- State the total number of warheads on each side, specifying initially only the total numbers of strategic and tactical warheads and not the numbers of particular warhead types.
- Disclose the total amount of plutonium each country has in and outside of warheads (which the U.S. has already announced) and HEU.
- Exchange unclassified diagrams showing layouts of and warhead progression through national dismantlement facilities.
- Study how to verify the shutdown of excess warhead production capacity.
- Agree on a transparency agreement on conversion of nuclear warhead plutonium pits to unclassified forms. □

Bureaucracy and the Government Secrecy System

Steven Aftergood

We are accustomed to think of bureaucracy with disdain. To speak of bureaucracy is often to connote an absence of independent judgment and a self-defeating labyrinth of arcane procedures. But an accurate perception of what such organizations do and how they do them is a prerequisite to their reform.

Bureaucracy has long been the dominant form of government administration because it tended to get the job done better than the alternatives. "The decisive reason for the advance of bureaucratic organization has always been its purely technical superiority over every other form," wrote Max Weber. With its objective, rule-based decision-making process, bureaucracy offered "the greatest possible acceleration in the despatch of official business, combined with precision, clarity and continuity."

By paying close attention to bureaucratic structure and operation, we may learn how to improve their functioning and how to successfully modify them to adapt to new realities.

Secrecy as a Bureaucracy

In particular, we can gain new insights into the government's national security classification system by examining it as a bureaucracy. The mission of the classification system is simple enough: it is to protect national security by preventing the disclosure of sensitive information. But the execution of that mission is dauntingly complex, involving the annual creation of millions of new secrets and the expenditure of billions of dollars.

The scale of this activity has meant that it can only be accomplished in an orderly, predictable, and more or less reliable fashion if bureaucratic procedures are adopted, as they have been.

The use of classification guides to standardize classification practice, for example, holds an obvious but useful lesson for would-be reformers of government secrecy policy: To change secrecy, it makes little sense to focus on the people who wield the classification stamp; you have to change the classification guides.

In this light, it appears that one proposed reform of secrecy policy may add little value. A 1997

Commission recommended that employees who classify information "derivatively"-- i.e. who are following the instructions of a classification guide-- should identify themselves on the documents that they mark as classified. But because such employees are allowed to exercise little discretion, holding them "accountable" for exercising this function may be more trouble than it is worth.

In contrast, another of the same Commission's recommendations seems to go to the heart of the matter: The Commission urged the CIA to clarify the meaning of the "intelligence sources and methods" that it protects through secrecy.. This proposal hits home because any new limitation in the definition of "sources and methods" would propagate throughout the intelligence community's classification guides and should quickly result in a diminution of secrecy.

Arguably, however, the Commission erred in referring the matter to the CIA. Accusing the Agency of being too secretive is not a criticism that registers within the culture of intelligence. The CIA has no charter to be anything but secretive; its "intelligence sources and methods" do not even have to be classified to be withheld from disclosure.

It follows, then, that its charter should be modified. This could be easily accomplished, for example, by amending the statute to say that only those intelligence sources and methods that are "sensitive" are to be withheld from disclosure.

Harnessing Bureaucracy

The point here is that by understanding how the secrecy system functions as a bureaucracy, it is possible to locate the points at which decisions are made and to target efforts at reform at those points.

This has been achieved with notable success in the declassification regime established by President Clinton's executive order 12958, which actually harnessed bureaucracy in the service of openness. Thus, in the last two years an unprecedented 400 million pages of historically valuable documentation have been declassified. □

The Public Eye: Surveillance Abroad by Non-Profits at Home

John E. Pike

After years of planning and preparation, the Public Eye initiative is now moving into high gear, thanks to the generous support of the John D. and Catherine T. MacArthur Foundation. The Public Eye initiative will use newly available commercial satellite imagery to monitor nuclear weapons facilities in countries such as India and Pakistan. By early 1999 commercial satellites will provide the public with relatively inexpensive imagery capable of seeing objects a few feet across. The information gathering and perception shaping powers of imagery intelligence, previously reserved for the superpowers, will thus be at the disposal of the non-governmental policy community.

Public Eye will work with subject matter experts concerned with nuclear weapons proliferation and the news media, to advance the application of this powerful new resource for research, analysis and public education, demonstrating both the potentials and limitations of this revolutionary new source of information.

During the Cold War, satellite and aerial reconnaissance was a powerful instrument of superpower statecraft. The U-2 spyplanes caught glimpses of the secrets behind the Iron Curtain in the 1950s, and by the early 1960s American imagery intelligence satellites provided an increasingly complete appreciation of the status of Soviet nuclear and conventional forces. But until now the power of imagery intelligence has been limited to the handful of nuclear weapons states with the financial and technical resources to develop and operate highly sophisticated space reconnaissance systems.

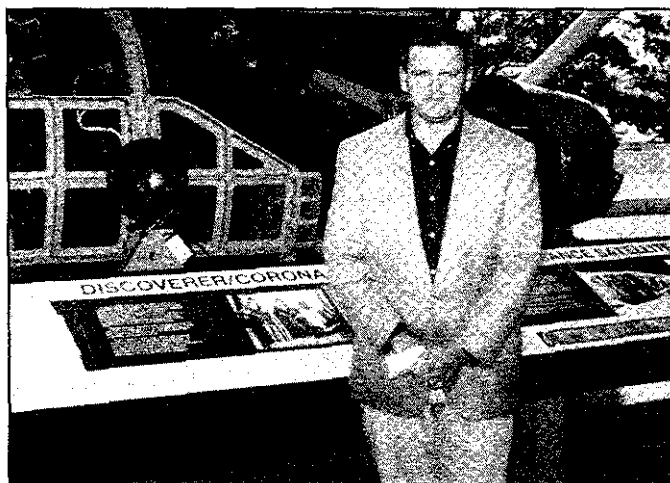
Satellite Resolution of Three Feet Are Emerging

But starting in 1999 several American companies plan to launch imagery intelligence

satellites with capabilities that will approach or surpass those of many current or prior national systems. The new systems will provide imagery with resolution of about three feet, facilitating ready identification of buildings and distinguishing between trucks and cars, though not sufficient to see individual people.

NGOs Shaping and Making News

This will provide many segments of the non-governmental policy community with unrivaled opportunities. Just as imagery intelligence informed and illuminated internal government policymaking, substituting fact for conjecture, now non-governmental analysts will have direct evidence to supplement traditional analytical sources and methods. And just as powerful governments have in the past used imagery intelligence to make and shape the news, so too will non-governmental organizations be able to exploit and disseminate imagery to further their



Tim Brown is the latest addition to the FAS staff, working on the Public Eye initiative.

policy agenda. The news media has long recognized that a picture is worth a thousand words, and now non-governmental actors will have compelling pictures to draw attention to their stories, enabling them not only to shape news but to make news, by releasing timely imagery to the media.

We are implementing the Public Eye initiative in three stages.

The first stage consists of our online Imagery Intelligence Gallery, a unique online resource that includes an archive of over 600 overhead aerial and satellite images of diverse subjects and from a wide variety of sources, as well as dozens of supporting historical and technical documents.

We have exploited this currently available imagery to demonstrate how newly available satellite imagery

can be used to monitor the development of facilities over time, and to identify the unique signatures of special facilities, such as prisons. This is being supplemented by commercially available aerial imagery of facilities in the United States, to provide a basis for signature identification and comparison.

Second, we have given particular attention to exploitation of the recently declassified CORONA satellite product. Although hundreds of thousands of images acquired by the US intelligence community through 1972 have been declassified, the CORONA product remains a vastly underutilized resource. This product remains difficult to access, and readily available replication services impose significant and unacceptable degradations in imagery quality and resolution.

FAS's Vick is Unique Source

Our multi-talented staff analyst Charles Vick has devoted significant effort to identifying more cost-effective means for accessing this treasure trove of historical material. At present he is virtually the only source for high-quality CORONA imagery, and is frequently called on to provide this imagery support to analysts and journalists. Most recently, his imagery of the Dimona facility graced the cover of Avner Cohen's new book on the Israeli nuclear weapons program. He is also working with diverse subject matter and area specialists to develop a

comprehensive imagery product archive of CORONA [and other imagery products, as they are declassified], providing comprehensive coverage of areas of interest, notably the missile, space, nuclear and other special weapons facilities of countries ranging from the former Soviet Union to China and Israel.

And third, as new high resolution satellite imagery becomes available, and contingent on available resources, we anticipate complementing this historical archive with contemporary coverage, to facilitate interpretation of the evolution of the facilities of interest. While the costs of this new imagery remain uncertain, it is clear that we will depend on the participation of the community of analysts interested in South Asian weapons proliferation to assist in both the selection and interpretation of this newly acquired imagery.

Recognizing the complexity of this initiative, we have recently added Tim Brown to our staff. Before coming to FAS he was the Warren Brooks fellow at the Cato Institute studying environmental issues. Tim graduated from the American University in 1990 with a degree in International Service and concentrations in national security, foreign policy and intelligence. Tim has written on the use of commercial space imaging satellites for arms control and regional security. Tim has also worked for the Department of Energy analyzing counter-terrorist issues. □

Our Arms Sales Monitoring Project, in the person of Lora Lumpe and Jeff Donarski, has published a splendid, 120 pp. guide to the arms trade and what citizens can do about it, called: "The Arms Trade Revealed: A Guide for Investigators and Activists." \$10 for FAS members; contact Anna Rich at 202-675-1009 or arich@fas.org

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