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ERRONEOUS ANALOGIES & MISLEADING METAPHORS: FINDING A SOLUTION REQUIRES FINDING THE RIGHT CONTEXT

In theory, there is no difference between theory and practice.
In practice, there is.
– Yogi Berra

When the capital development of a country becomes a by-product of a casino, the job is likely to be ill done.
– John Maynard Keynes

History may not repeat itself, but it rhymes.
– Mark Twain

Confusing Explanations

French scholar Clement Juglar was one of the first economists to try to understand the causes of financial panics. In his published assessment *A Brief History of Panics and Their Periodical Occurrence in the United States* (1889,1915), he commented on the roughly one dozen financial panics that had taken place since the country's founding and decided that an overriding set of conditions always preceded such panics. As his translator explained:

> The symptoms of approaching panic, generally patent to every one, are wonderful prosperity as indicated by very numerous enterprises and schemes of all sorts, by request for workmen, a rise in salaries, a lowering of interest, by the gullibility of the public, by a general taste for speculating in order to grow rich at once, by a growing luxury leading to excessive expenditures, a very large amount of discounts and loans and bank notes…and a very small reserve in specie [exchange] and legal-tender notes, and poor and decreasing deposits.

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Juglar surveyed those same panics and found another list of characteristics that signaled the end of financially stressful times.

> On the other hand, a steady and radical reduction of loans and discounts, following a panic and extending until new enterprises are very scarce, till prices are very low, till there is wide-spread idleness among workmen, a decrease in salaries and in interest rates, when the public is wary and speculation dead, and expenditures are cut down as far as possible, may be taken to mean a rapid and continued resumption of every prosperous business; but if the above process is only partially performed, renewed trouble must result – in other words, liquidation to really be helpful…must be thorough.

Surveying Juglar's lists of prepanic symptoms, one can easily find similarities to the time just prior to current financial troubles, especially "speculating to grow rich at once," a "large amount…of loans" and "excessive expenditures." But other items on Clement's list, such as a "rise in salaries" and "a wonderful prosperity," do not ring true. If some of the conditions leading to the problem are different, can today's analysts make use of the list of conditions signaling the end of the problem?

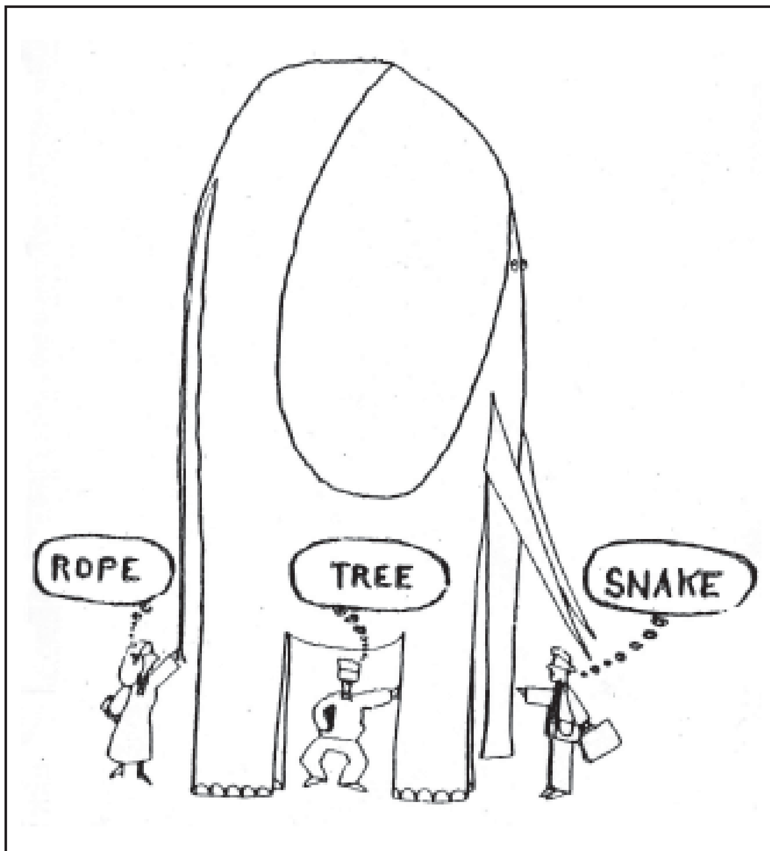
In *The Panic of 1907* (2007), professors Robert F. Bruner and Sean D. Carr note that people looking for explanations as to why markets crash and banking panics happen often resort to one of two extreme kinds of explanations: (1) a "highly detailed and idiosyncratic" assessment that makes the event seem unique to the point of irrelevance, or (2) "one big idea, a sole cause large enough to cover a multitude of sins." Thus, today we have those who point to the details of the subprime-loan fiasco, blame those who took out those loans and then say that such a unique financial activity does not have a precedent from which to learn. We also have seen examples of analysts who point to greed as the one "big idea" that explains everything that has gone wrong, and in doing so, offer nothing insightful as to how to react.

The more common practice when interpreting contemporary problems has been to seek analogies, prior events that are seen as similar and that can provide lessons as to how to react (or how not to react). In fact, Bruner and Carr do just this when they suggest that the panic of 1907 provides an analogy to today and offer some suggestions as to how to react to this and other financial crises. Beyond analogies, leaders often resort to metaphors to give vibrancy or urgency to what is taking place. Again Bruner and Carr do this when they suggest that panics happen because of a "market's perfect storm."

But analogies and metaphors carry risks. When they are inexact, they can create false impressions about the events they are intended to describe, and consequently, in instances where actions must be taken, they can encourage inappropriate responses. Bruner and Carr enliven their analogy this way: "The economic situation in the early twenty-first century…offers some arresting parallels to 1907." They then list the seven aspects of the "perfect storm" of 1907 and explain how, in their estimation, such conditions exist today.

This past September, Gary Gorton, the mathematical finance consultant responsible for the risk models used by AIG when purchasing credit default swaps, said in a presentation to the Kansas City Federal Reserve that the "Panic of 2007," as he titled his talk, "was something akin to a hurricane, or an earthquake, something beyond human control." Saying that economic events are a metaphoric "perfect storm" or "earthquake" of financial and social forces gives the impression that, like natural disasters, economic conditions are brought on by natural forces (perhaps lingering concepts of some "invisible hand"), that nothing could have been done to avoid such a storm (except "trim one's sails" or "navigate" elsewhere or "evacuate buildings" or some other confusing metaphor) and that riding out the storm or accepting the damage as the work of some large force "beyond human control" provides little insight into what can be done.

These kinds of metaphors do not help individuals understand what is taking place nor do they anticipate what might yet take place. Today's pervasive and surprisingly interconnected effects have created an unusual downturn, which has prompted many observers, analysts and leaders to search for analogies and metaphors that might provide insight into how the crisis will play out. Given such critical dependence on analogies and metaphors, it might be advisable to take a closer look at some of the ones being circulated.



Easy Analogies, Difficult Realities

Speakers, writers and others who discuss economic realities in public often invoke a past occurrence, a situation that listeners or readers might know something about, to help explain what is taking place today. Leaders charged with managing or addressing the current financial crisis turn to an analogy or two to learn how others similarly charged reacted. Such are the uses of analogies. Yet analogies that have been brought to the fore lately might encourage ineffective responses because the past situations, while on the surface similar, ultimately do not match very well with the current crisis. Consider these analogies:

Black Monday Analogy – With stock markets falling steadily over the past year, the easy temptation is to look to another time when the stock market took a precipitous fall: Black Monday 1987. That bleak day on Wall Street resulted in the largest single-day asset crash in U.S. history, with the New York stock market losing more than 20 percent of its value on October 19, 1987.

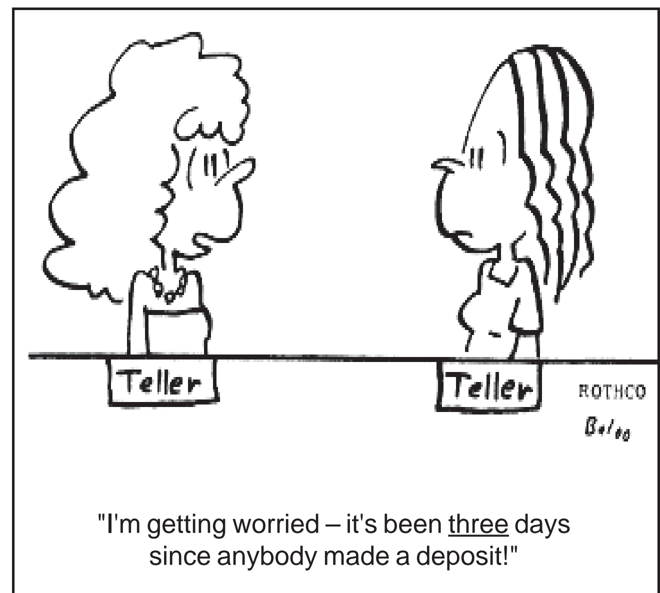
The connection to today's crisis might be that back then the market was also heavily leveraged, but the risks were different. Prior to the Black Monday collapse, the net value in the U.S. of all stock options – emerging new investment instruments at the time – was $3 trillion, while the net value for the underlying stocks was $2 trillion. At the same time, programmed trading and so-called portfolio insurance were altering the dynamics of stock market trading. During the prior year or so, mergers and acquisitions ballooned – 1,500 of them in the first nine months of 1987 – and most were financed with new kinds of debt instruments, including high-risk loans, pejoratively dubbed "junk." Then as now, investors worried about record-setting deficits, yet then, funds such as Fidelity's Magellan were fully invested, meaning that market superstars like Peter Lynch saw nothing but stock increases ahead. When the sell-off started in earnest on October 19, institutional traders triggered most of it, with Fidelity alone accounting for 25 percent of the day's volume and with index arbitrageurs responsible for another 12 percent. Program trading accounted for 20 percent of the volume in trades. Later studies showed that of the 282 mutual funds, only 2 percent of their total assets were traded on that day, that most money taken out of equities simply went to money markets and that, for the most part, individual investors stayed put. Even though confidence was shaken for a while, liquidity was not an issue, and the New York

Stock Exchange put some limits on trading. Eventually, an essentially technical stock-market panic – technical because of the internal, not external stresses – leveled out. As one historian of the panic noted, "The Crash of 1987 was like a huge whale washed up on the shore for no readily apparent reason." That is hardly analogous to today's situation.

while American consumers currently have roughly $14 trillion in debt. (American consumers in the 1960s and early '70s managed to save roughly 9 percent of their after-tax income, but that dropped to just one percent in the most recent decade and actually turned negative last year.) Third, Japan faced its crisis alone, while the remainder of the world enjoyed

The Japan Analogy – When an asset collapse occurs at the same time as a banking crisis, Japan during the 1990s becomes a facile analogy. As with the current crisis, Tokyo's struggle to right the country's economy came after a colossal real-estate bubble burst, and that triggered considerable instability in the banking industry. The ongoing economic malaise came to be called Japan's Great Recession, which started in 1991, included three narrowly defined recessions and lasted in some form until 2003. Because the U.S. problems seem to have started with a real-estate market collapse and because that has triggered bank industry instability, the Japan analogy has become popular. Tokyo, which now sees itself as a potential "white knight" for western financial institutions, has even offered to provide Washington with accountants and lawyers experienced in the 1990s financial cleanup to help the U.S. come back from its troubles. (*International Herald Tribune*, 10/22/08)

But on closer inspection, the analogy does not hold. First, Japan during the Great Recession was the world's largest creditor nation, while the U.S. is currently the world's largest debtor nation. Second, Japan's consumers had roughly $2 trillion in savings at the time, expanding economic times, especially in Japan's export markets such as the U.S., when it was experiencing its dot-com boom. Today, the economic troubles are global, affecting nearly all developed-country markets and even many developing-country markets. (*New York Times*, 10/19/08; *Christian Science Monitor*, 10/23/08)



"I'm getting worried – it's been three days since anybody made a deposit!"

The American 1970s Analogy – The fear that those in charge are losing control of the economy and that the crisis has taken on a life of its own typically leads to a look back to the 1970s, when nothing the government could do seemed to slow inflation or stimulate the economy. The most memorable malady of the 1970s' economy was called "stagflation," the historically novel combination of inflation and economic stagnation, described by one commentator of the time as a condition when "all things that should go up – the stock market, corporate profits, real spending income, productivity – go down, and all things that should go down – unemployment, prices, interest rates – go up." Inflation went "up" to 15 percent in the decade, and unemployment went "up" to 9 percent. The Standard & Poor's (S&P) 500 went "down" nearly 50 percent. (*Wall Street Journal*, 2/21/08)

Talk of such "stagflation" surfaced recently when oil and food prices suddenly jumped while the negative effects of the real-estate and financial-instrument collapse were hitting the economy. Price increases have since abated, but concerns about losing control of the economy continue.

The economic troubles that marred the 1970s resulted from extravagant deficit spending, especially in Vietnam and on newly created welfare programs, the Nixon administration's decision to separate the value of the dollar from gold (August 1971) and the decision by the Organization of Petroleum Exporting Countries (OPEC) to cut oil supply and force up prices (October 1973) – related to Arab anger over the Arab-Israeli War of that same year. As a result, by the start of 1974, oil prices had tripled.

President Richard Nixon warned that the U.S. was headed "toward the most acute shortage of energy since World War II," ordered home thermostats lowered during the winter to 68 degrees, highway speed limits decreased to 55 miles per hour, an expansion of nuclear energy, additional funding for alternative fuels and the easing of environmental laws on energy use. He then launched "Project Independence" to free the country from foreign energy sources by 1980.

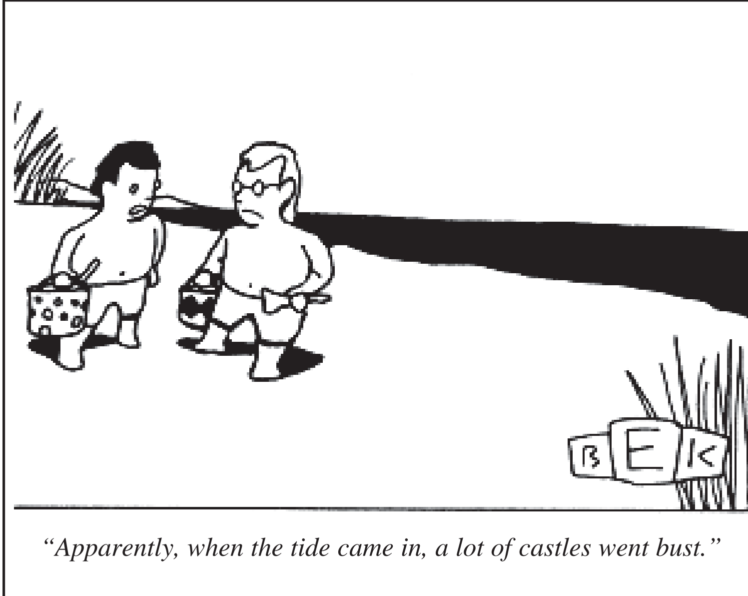
President Nixon had imposed wage and price controls on the economy for 90 days in August 1971 and reimposed them in August 1973 – prior to the oil boycott. In January 1973, after the country ended its vestigial gold-standard policy, U.S. equity markets peaked and started downward. Overall, the S&P 500 took a nearly 50 percent drop in 22 months, from January 1973 to October 1974. But that did not end the economy's problems. When the U.S. left the gold standard, 35 dollars bought an ounce of gold; by 1981, an ounce of gold cost $850 dollars, a huge decline in the dollar's relative value.

While the current era has a foreign war to fund, its costs are considerably less in relation to the country's GDP than those of the Vietnam War. In addition, the current economic crisis has no inflationary events similar to the country's going off the gold standard and while OPEC's oil prices did recently spike, they have since settled down. In fact, recent announcements of overstocks hint at imminent deflation. For instance, fewer laptop computers shipped from China has meant slower demand for chips, and Toshiba, Japan's largest chip maker, announced in late October that it lost $275 million in the second quarter because of a global glut in chips. A similar situation has hit flat-screen television shipments, which forced Samsung, Korea's electronics giant, to admit that global oversupply of glass displays created the company's largest quarterly drop in profits in three years. Moreover, recent competitive currency devaluations – called publicly a "coordinated" action by central banks – points toward a downward direction in prices, as exporting countries seek to keep their products competitive. (*New York Times*, 11/1/08)

The 1970s had more to do with asset-value inflation – in part due to the dollar's precipitous decline following an abandonment of the gold standard and in part due to the OPEC oil embargo – than about an asset-class collapse as has recently happened in real estate, the banking industry and, increasingly, the wider industrial arena. These realities of the 1970s are hardly analogous to today's set of conditions and effects.

The decade of the 1970s does have one distant link to an asset-class collapse, and that involves the problem of savings and loans. By the end of the decade, most such community banking institutions had old loans on their books with 4 to 6 percent interest rates, while they were essentially forced to offer savings-account customers interest rates between 8 and 10 percent because inflation had moved past 13 percent. Rather than bail out troubled savings and loans at that time (1981), which by one estimate would have cost roughly $15 billion, Washington decided to deregulate the

savings and loan industry and allow S&Ls to invest in riskier assets to overcome the interest-rate deficit. Those riskier investments led to the collapse of the S&L industry in the late 1980s, which ultimately cost citizens in excess of $400 billion.



"Apparently, when the tide came in, a lot of castles went bust."

The Market Crash of 1929 and the Great Depression Analogy – The mother of all economic analogies is the Great Depression of the 1930s. "During the next half century [after the Depression]," explained business historian Robert Sobel, "memories and legends of that period haunted the nation." The haunting continues mainly because that economic collapse is in the personal memory of many families and because it suggests the ultimate inability of humans and their institutions to solve certain kinds of economic problems.

"The specter of another Great Depression," as one newspaper fretted publicly, is so handy as an attention-getting analogy today because that earlier economic collapse involved a severe decline in stock markets, a significant increase in unemployment, rapid declines in several asset classes and a significant government intervention into the private sector (the New Deal), some of which have been happening recently and all of which observers worry might befall our economy. Selected recent events and specific numbers encourage such an analogy. For instance, within the span of a couple of weeks in October, the U.S. had the largest nationalization in history (Fannie Mae and Freddie Mac), the largest bankruptcy in histroy (Lehman Brothers) and the largest bail out in history (AIG). Also, in mid-October, General Motors' market capitalization was lower than it was in 1929. (*Christian Science Monitor*, 10/16/08; *Guardian Weekly*, 10/17/08 and 10/31/08)

Yet, saying that the current financial crisis is the worst since the Great Depression or that similar kinds of numbers are surfacing is not the same thing as saying that the two crises are analogous. Also, discussing such a monumental analogy becomes especially problematic because, to this day, economists disagree extensively on the causes of the Great Depression as well as why it persisted in the face of considerable government action. But as economist John Kenneth Galbraith noted in *The Great Crash 1929* (1954), "When people are least sure, they are often most dogmatic."

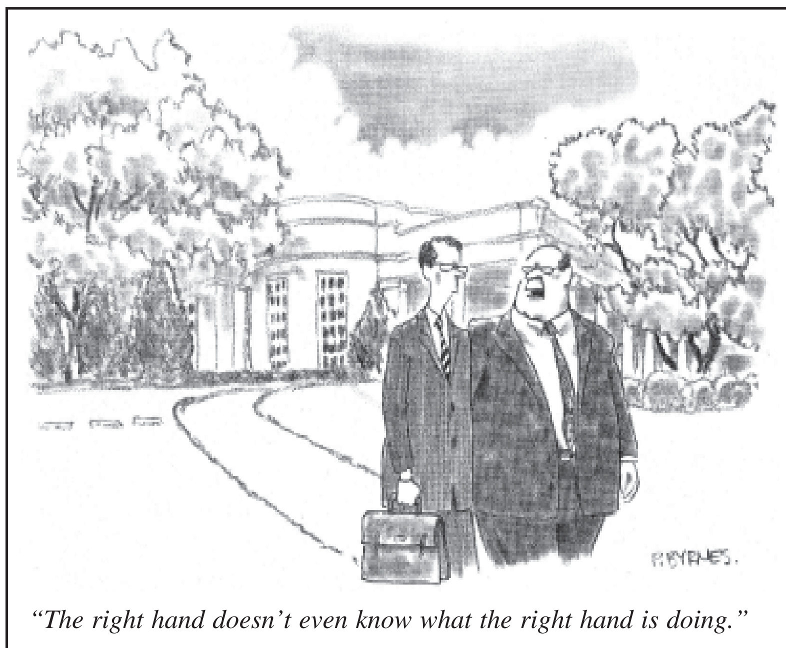
Economist John Maynard Keynes said the depression resulted from overbuilding, overproduction, overindebtedness and overvalued stock. Galbraith disagreed with much of that, especially the part about overproduction, and actually disconnected the stock market crash of 1929 from the economic depression that followed. He explained that the inadequacies of economic and institutional structures (*e.g.*, banking and corporate structures) of the 1920s fostered "the [1920s] speculative orgy," and the depression that followed. Meanwhile, monetarists insist that the Fed's contractionist policies after the market crash of 1929 created illiquidity and that, in turn, caused the economic depression.

Interestingly enough, Ben Bernanke, the current chairman of the Federal Reserve, developed his academic reputation by studying the Great Depression, and he has written that the illiquidity that followed the stock market crash was the result not of the Fed's policy but of the constraints required by being on the gold standard. Being a firm believer in market dynamics, Bernanke felt compelled to demonstrate how human-mounted constraints like the gold standard provoked the economic crisis.

These and other explanations make one point clear: The analogy between contemporary conditions and the Great Depression is flawed. Certainly, the realities of speculation and over-indebtedness from the 1920s have a striking similarity to conditions leading to

the current fiscal crisis, but the gold-standard issue and overproduction seem unrelated to today's excessive dependence on complex and little understood financial instruments.

One connection between this era and the 1930s, however, deserves some attention. Most economists suggest that the stock market crash of 1929 did not have to lead to some expansive economic depression. The years between 1929 and 1932 were critical, and most point to the government's decisions to raise taxes and to pass the Smoot-Hawley Tariff, which constrained trade, as critical mistakes that pushed the economy downward. Thus, that earlier example does suggest that ineffective or inappropriate actions can turn a bad situation into a crisis – a lesson that deserves attention today. That reality prompts a question: Does Bernanke's unique expertise in that earlier economic crisis keep him from seeing what is actually happening today and what needs to be done to address current realities?



"The right hand doesn't even know what the right hand is doing."

Metaphors That Say Too Much

While analogies are intended to offer insight into how people in the past dealt with conditions that allegedly have characteristics similar to those of a contemporary issue, interested parties invoke metaphors as a way to state what is real and true, to characterize conditions in one general context and to make a situation "easier" to understand. The current economic meltdown has undermined two widely used metaphors.

The "invisible hand" – When Adam Smith introduced the idea of the "invisible hand" in his *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776), he described how an individual seeks employment that is "most advantageous" to himself, "and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an *invisible hand* to promote an end which was no part of his intention. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it." In other words, the invisible hand guides individuals – unbeknownst to them – to pursue their self-interest in ways that protect or help other segments of the economy.

Despite the naturalist sentiment behind Smith's thoughts – it influenced Charles Darwin – over time, his process perspective morphed into near theological grandeur, with advocates indicating that markets have "self-correcting" mechanisms. Some "holy ghost" of operations makes sure that markets do not become chaotic. While Smith's metaphor might still have some value, the "self-correcting invisible hand" has lost credibility. One fallen acolyte of the self-correcting theology was Joseph Ackermann, chief executive officer of Deutschbank, who, having grasped the breadth and severity of derivatives' risks to his country's entire banking system, admitted, "I no longer believe in the self-correcting nature of markets." (*Wall Street Journal,* 3/18/08)

Former Federal Reserve Chairman Alan Greenspan, appearing before the House Committee on Oversight and Government Reform last month, seemingly connected his shattered beliefs to Adam Smith's original concept of the invisible hand. "Those of us who have looked to the self-interest of lending institutions to protect shareholders' equity, myself included, are in a state of shocked disbelief." That is, the invisible hand had failed to guide those institutions to take such a kind of self-interested action that would protect and help other segments of the

economy, leading Greenspan to question whether self-interest ever serves the general interest. (*New York Times*, 10/24/08)

"There, there it is again – the invisible hand of the marketplace giving us the finger."

The Math Metaphor – The quantification of systems (*i.e.*, modeling) has become a popular way to assay risk and plan strategically. Models look at things like "value at risk" (VaR) or the more recent Co-VaR, which assimilates an institution's reputation into the formula, to determine what the given losses might be within the context of selected variables. With greater computer power have come more complicated models that can assimilate more and more variables into the model. However, as the recent financial implosion verifies, increased sophistication has not meant increased accuracy.

Many models depend on historical data for their structure, and so, when new financial instruments are created – such as collateralized debt obligations (CDOs) – a trivial data set is available to ascertain how those instruments might behave in both normal and extraordinary conditions. This lack of understanding led to some amusing exchanges over pricing CDOs and so-called credit swaps. We cited one such exchange in a 2005 *Briefing*:

> Evidently, putting a price tag on the credit-swap premium is close to putting a price tag on a used car. Make an offer. One would-be buyer of a senior tranche (that is, the low-risk tranche, in this instance, with a triple-A rating) thought the price she was offered was not appropriate. "I said, 'This wouldn't merit a triple-A by Moody's,' and the salesman said, 'Well, if you want more spread, you can have it.'" She said she wanted a spread associated with a double-A, and the salesman responded, "You can give me a bid at a double-A level." In another pricing example, a "quant jock" was more direct. He told a professor studying credit swaps…"We can't accurately price them, although we're confident that we're getting a good price for them." ("'Leaning on Air' and 'Puking Tranches': Lingering Elevated Expectations Meet Post-Growth Realities," **IF 2613**, 6/17/05)

In nearly every model, something is assumed to be constant or nearly so: pricing, marketability of products, volatility or liquidity. Often models are rewritten after a significant event, such as the failure of Long-Term Capital Management in 1998. But conditions change as well. In the instance of the heavy credit-swap exposure at AIG, the company's highly sophisticated risk models, which according to executives gave them "a very high level of comfort," did not take into account future collateral calls by buyers of the credit swaps AIG had issued and write-downs based on AIG's changing corporate-debt rating. The model took into account a mountain of data as to the likelihood that the CDOs might default but not these exogenous issues. (*Wall Street Journal*, 11/3/08)

Many models relating to mortgage risk assumed that real-estate prices would not decline across the entire country at once, a financial risk with minuscule odds and a reality that had not happened for decades. Accepted models insisted that extreme drops in real estate were always restricted to subregions or smaller areas. "This kind of national fall has happened before," explained Markus Brunnermeier of Princeton University, "back in the Great Depression, and it has happened in other countries." But most models used only more recent data and only data from U.S. markets. (*New Scientist*, 9/27/08)

Each financial crisis is unique, principally because each prior crisis has forced changes in the system – for instance, more regulation, new financial

instruments, larger institutions with more layers of management, different rules, etc. "By definition [liquidity crises] are rare, extreme events," explains Michel Crouhy, head of research and development at the French investment bank Natixis, "so all the models you rely on in normal times don't work anymore." (*New Scientist*, 9/27/08)

Thus, one is tempted to conclude that all "quant" models are wrong in some way, and only an unanticipated event – the kind of event that brings franchise risks and perhaps economic collapse – can reveal how and in what ways they are wrong. Or, as Warren Buffett more humorously told Charlie Rose, "Beware of geeks…bearing formulas." (*Wall Street Journal*, 11/3/08)

"Please, could you lose the hindsight, just for today?"

One More Analogy, One More Metaphor

Rather than the popular analogies and metaphors currently circulating around economic discussions, we would like to propose a different analogy and another metaphor to expand the context around discussions of today's economic situation.

The Panic of 1873 Analogy – Historian Scott Reynolds Nelson has recently written, "When commentators [on today's crisis] invoke 1929, I am dubious." He points, instead, to the Panic of 1873. The situation that led to the global panic of that year started innocently enough in Europe with a boom in residential home building, funded by easily accessible mortgages. In the expanding European economy, the U.S. then played the role China plays for the U.S. today, in that early example shipping cheap foodstuffs to Europe, undercutting local food prices and triggering what Europeans called the American Commercial Invasion. That, in turn, prompted a slowdown in the European agricultural sector and then the wider economy, which resulted in business cutbacks. The slowdown caused problems for holders of those easily accessible loans. Banks worried about other banks and their exposure to these instruments, and they stopped loaning money, forcing the interbank lending rate to skyrocket. Banks hoarded money, choking liquidity and forcing many small businesses to close.

In the U.S., railroad bonds, especially those issued by Jay Cooke and Company to fund the Northern Pacific Railroad, ran into trouble. With capital markets freezing up, companies seeking to expand infrastructure in the West were without funds to pay off current debts or continue building. In September 1873, Cooke and his company went bankrupt. Within days, the stock market crashed, and a significant recession – some say it was a full-blown depression – followed. The ensuing six years saw unemployment skyrocket and nascent union movements collapse. Fifty-one hundred banks went bankrupt in 1873 alone. Bankruptcies steadily increased, and by 1878, no fewer than 10,478 banks went under. Farm indebtedness shot up, and more than one million "tramps," the homeless unemployed (many of whom were Civil War veterans), appeared on the country's roadways. The economic recession – the worst in U.S. history to that point – culminated in 1877, a year of social conflict between workers and employers and between the poor and public officials – a year so torn by conflicts that one historian called it "the year of violence." Meanwhile, men with cash – historical figures such as Andrew Carnegie, Cyrus McCormick and John D. Rockefeller – started buying up their competitors at "fire sale" prices, and industrial concentration, corporate

trusts and the Gilded Age had begun. (*Chronicle Review*, 10/17/08)

Meanwhile, back in Europe, societal and international tensions led to a series of protectionist measures that slowed trade, citizens turned to scapegoating citizens on the edges of society and anti-Semitism spread. Today banks are hoarding their cash, protectionist measures have passed parliaments in many countries, and the recent increases in racism in Italy and skinheads and their political allies in Austria give early credence to the analogy. (*Guardian Weekly*, 10/24/08)

"OK, now that we all agree, let's all go back to our desks and discuss why this won't work."

The Complexity-Ecosystem Metaphor – Ecosystems are self-organizing networks of influences and forces that find equilibrium. Yet new forces can unbalance them, sometimes requiring intervention to rebalance the system or halt a downward spiral of destruction. To take one example, invasive species destabilize existing ecosystems. For instance, when the goby fish entered the Great Lakes in the ballast of ships traveling from the Black Sea, the existing Great Lakes ecosystem became extremely unbalanced. No predator existed, so the foreign fish thrived, consuming food that had grown proportionately to existing components of the system prior to the goby's appearance. The goby completely extirpated one native fish and caused significant die-outs of others. Eventually, a predator of the goby appeared, but just as a rebalancing started, another foreign species arrived, destabilizing the system again. Such an ecosystem metaphor for the current economic condition accounts for the introduction of novel forces, such as new financial instruments, and their constant destabilizing effects on the financial system. This metaphor also suggests that an intervention must focus on rebalancing the overall system, not just one part (*i.e.,* banks).

By nature, ecosystems inevitably become more complex – more biomass, more creatures, more expansion. As operations within the system become more efficient, eliminating what is extraneous, the system, as well as its components, expands and grows. Because the system grows as an entity, the component parts become increasingly interdependent and interconnected. A healthy or balanced system helps keep component parts healthy and vice versa. "It becomes an extremely efficient system for remaining constant in the face of the normal range of conditions," explains Thomas Homer-Dixon, author of *The Upside of Down* (2006) and a University of Toronto professor who studies complex systems. But efficiencies increase risks, and redundancies provide cushions against those increased risks. The Internet, for instance, overcomes the failure of critical "nodes" – hubs of traffic – because so many alternative pathways and additional lines await new traffic that is blocked when any node goes down. Without this kind of redundancy, an efficient system, when confronting extraordinary conditions, lacks the flexibility (*i.e.,* the redundancy) to survive the new conditions. Collapse can happen.

Initially in complex systems, Homer-Dixon notes, "increasing connectedness and diversity helps" because a connection to another segment can bring assistance. But when one place is faced with extreme or unusual conditions, dramatic changes lead to a cascading effect across the whole system, often causing collapse. To some extent, that is what has happened in the current crisis, with the unanticipated introduction and the significant expansion of invasive financial species (*i.e.,* CDOs, SIVs and credit swaps). They destabilized the entire system, triggering a globalized cascade of effects across the highly interconnected and interdependent economic system, the range and scope of which leaders, especially in countries such as Iceland, are still trying to grasp and understand.

Using the ecosystem metaphor can assist systems managers, whether they are political or corporate leaders, to anticipate, respond to and perhaps avoid such cascading crises. For instance, losing redundancy (*i.e.,* increased efficiency in economies) elevates risk to the overall system, as does shrinking diversity. Thus, when the banking industry launches a massive

consolidation campaign – to eliminate redundancies and shrink institutional diversity – the process can actually increase the risk of a systemic collapse. Also, the metaphor suggests that leaders should focus on rebalancing the overall complex system rather than just healing troubled pieces of the system. Thus, leaders might need to rethink their decision to flood the market with liquidity without appending to that new cash flow a way to make sure those monies actually circulate through the entire system. In the context of the metaphor, if a system lacks food or water, then just putting an abundance of new food or water in one section of the system does not rebalance the system, and can, in fact, destabilize the system even further. "The source of the current problems," explains complexity researcher Yaneer Bar-Yam of the New England Complex Systems Institute, "is ignoring interdependence." (*New Scientist*, 10/28/08)

Homer-Dixon, assessing the dynamic within complex ecosystems, suggests that some breakdowns actually help the system eventually advance, while others lead to collapse. "We need to allow for the healthy breakdown in natural function in our society," he notes, "in a way that doesn't produce catastrophic collapse, but instead leads to healthy renewal." (*New Scientist*, 4/5/08)

Starting Over

While he was still chairman of the Federal Reserve, Alan Greenspan, in what must have been one of his rare moments of candor, observed: "The economic and financial world is changing in ways that we still do not fully understand." The system had become much more complex than the one Clement Juglar assayed with his lists of pre- and post-panic characteristics. (*Financial Times*, 6/6/05; see also **IF 2613**, cited earlier)

In a recent *Briefing*, we outlined some mistakes and misjudgments that have made the current financial crisis worse than it had to be. Those errors in thinking – shared by doctors who make erroneous diagnoses – kept many leaders from acting early and effectively when "symptoms" of the current financial crisis started to surface. The effects of those errors have been profound (see "Emotion, Instinct and Reason: Thinking and Decision-Making in a Time of Crisis and Uncertainty," **Special Briefing**, 9/30/08).

With this *Briefing*, we suggest that erroneous analogies and misleading metaphors might be creating confusion in the minds of those seeking to find effective responses to current realities. In suggesting a different analogy and another metaphor, we do not want to add to the confusion, but merely to reinforce the point that accurate analogies and working metaphors can move our understanding forward.

Some economists think that the Great Depression did not have to happen in the way it did, and that effective responses to economic realities in the months and years after the market crash of 1929 would have created different and less catastrophic conditions. In the months and years after the panic of 1873, government action was, for the most part, nonexistent, and the unraveling economy experienced a sustained recession (or even depression) and social conflict eventually turned violent. With a more active group of governments this time taking effective steps to address the stresses that seem analogous to those of that earlier panic, society can avoid the highly conflicted environment that the earlier panic produced. But understanding the larger dynamic is necessary.

The complexity-ecosystem metaphor, as a tool to understand what is taking place and to suggest a course of action, encourages systemic, not simply isolated, fixes. Rebalancing a teetering system requires action across the system. Again, effective government actions and a compliant institutional network can make a difference. But depending on inaccurate analogies and confusing metaphors cannot provide useful insights for those who must redress the crisis.

"Good news. The test results show it's a metaphor."