Dumb Networks and Smart Capital

Walter B. Wriston

More than 50 years ago there was a popular song that went, "O Baby, what I couldn't do with plenty of money and you." In those days what most of us thought of as money was limited to hard cash, travelers checks, and bank deposits. A few adventurous souls had a credit card of one kind or another, but their widespread use ran counter to our Depression culture, which decreed that one should save up to buy appliances. Having expended five years of our lives in the Second World War, my generation wanted the appliances now and was prepared to borrow the money to get them. This new attitude contributed to a sea change in the way many Americans looked at money, credit, and markets. The postwar boom at home and the expansion of trade abroad required broader and faster markets.

The Advent of a Network Economy

Today's global markets, which we now take for granted, did not arrive without some serious problems along the way. Immediately after the war, all markets and payment systems relied on manual systems. There were a few hand-cranked adding machines around and one of the largest departments in most banks was the messengers. In New York all interbank payments were settled by exchanging official checks at the New York Clearing House. By 1969, as the volume of payments increased, this system bogged down as there were simply not enough officers to sign the checks or messengers to deliver them. All this was long before the advent of the computer chip, and windows were something you looked out of. To solve this problem a whole new system had to be invented and put in place.

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In those days, before the advent of our current network economy, innovation was not thought to be as important as refining current practice, but the explosion of world trade and capital movements overwhelmed the old system, and no amount of refinement to a manual system could keep up with the growth of transactions. A new and innovative system was required, but old values and concepts die hard and often leave behind words that no longer describe what is happening in the real world today. In his book *The World As I See It*, Albert Einstein (1934: 83–84) wrote, "We have . . . forgotten what features in the world of experience caused us to frame [prescientific] concepts. . . . There is the further difficulty that our language is compelled to work with words which are inseparably connected with those primitive concepts."

By today's standards, the markets that existed immediately after World War II and for some 20 odd years thereafter were primitive. Few even remember that in 1968 the New York Stock Exchange choked and ground to a halt on 16 million shares a day. There were more than $100 million of unclaimed dividends floating in the market with no clear record of who owned them. Over 100 member firms, many of which were household names, went bankrupt and disappeared forever. We had to close the market on Wednesdays for six months and shorten the trading day by one hour on the other days. Those drastic restrictions gave a little group of six people, called BASIC, time to devise and implement fixes like the Depository Trust Company, the jumbo certificate, the placement of CUSIP numbers, and many other things that now constitute a good part of the modern stock market. When its work was done, the group being entirely private and unaffiliated with government, self-destructed. Interesting enough, no governmental agency was involved in this successful redesign. Today the talking heads on TV mention in passing that "trading was moderate" as 450 million shares changed hands. And the market today is capable of handling two-billion-share days.

Not only is the sheer volume of turnover today an order of magnitude different from yesterday, but telecommunications has so closely linked the world's nervous system that distant markets often move in sympathy with one another. On what has been called Black Monday (October 17, 1987), the New York Stock Exchange index dropped 22.6 percent, the Chicago Mercantile Exchange S&P Futures plummeted 28.6 percent, Japan's market dropped about 15 percent, Britain's stocks fell 11 percent, Sydney's were off 25 percent, and Hong Kong's free fall caused the authorities to close the market altogether.

Globalization in the Foreign-Exchange Market

A similar globalization has taken place in the foreign-exchange market. When I started at Citibank, our head trader estimated that

the total turnover in the New York market was about $50 million a day. If the Federal Reserve wanted to influence the dollar rate, its trading desk could call Citibank or Morgans and place an order for $10 million, which was large enough to move the market. Today with the foreign exchange market at about a trillion dollars a day, central bank intervention can only result in expensive failure, as there is not enough money in any central bank to influence the exchange rate on anything but a momentary basis.

The markets that existed under the old Bretton Woods agreements were certainly not based on primitive concepts, but sometimes we use words like "fixed exchange rates" just as if that condition existed for more than what in historical terms constituted momentary pauses between devaluations. The pervasive inflation in many countries and the constant devaluations caused the eminent economist Yogi Berra to remark, "A nickel ain't worth a dime anymore." Today's floating rate system has reduced these pauses between changes in currency values essentially to zero. It is worthwhile to remember that in that so-called stable Bretton Woods environment there were hundreds of currency devaluations, great and small, which affected almost every currency in the world. Major currencies were not exempt; indeed, they led the way. For example, the devaluation of the British pound on September 19–20 in 1949, triggered devaluations by 15 nations ranging from Austria to India and South Africa. In November 1967, the British again devalued their currency by about 14 percent. In March the following year, the central banks of the world created a two-tier market for gold: one price for official transactions and one for private transactions. In August 1969, it was France's turn and the franc was devalued by about 11 percent. The next September Germany allowed the D-Mark to float and in October revalued it by 9 percent.

The reason to recite this very cursory list of revaluations and devaluations is to suggest that what is often remembered as stable exchange rates in the days of Bretton Woods were stable only in relation to floating rates and then only in some parts of the world. There were collars on rates that limited both upside and downside mouvements, but when economies diverged pressures became too great and the collars were adjusted time and again. Since so much scholarly work on this subject is oriented toward Europe, many forget that in Latin America there were constant revaluations almost too numerous to count.

The Marriage of Computers and Telecommunications

Today we have a wholly new situation. The marriage of computers with telecommunications has created a truly global market in every-

thing from money to stocks to commodities. The magnitude of the change is illustrated by the fact that today "All the world's businesses spend more on telecommunications each year than they do on oil" (Maass 1997: 134). Indeed this capital investment has provided the world with a new kind of energy. These huge networks—public and private—have even created a new kind of an economy, a network economy in which the law of increasing returns operates: the more people connected to the network or the clearinghouse, or your fax machine, the more valuable it becomes.

Emergence of the Eurodollar Market

Perhaps the beginning of a truly global market was triggered by America's desire to maintain price controls on interest rates. The Federal Reserve's Regulation Q, which prevented American savers from getting a fair return on their savings, also prevented foreigners from getting world rates on dollar deposits. Since most foreign countries did not have such interest rate controls and their banks routinely took foreign currency accounts, the conditions were ripe for the birth of the Eurodollar. The market gravitated toward London because of the City's reputation for maintaining a free market. Indeed when controls were put on sterling, the Bank of England left the Eurodollar market alone.

The advent and explosive growth of the Euromarket empowered by telecommunications permitted people around the world to get a fair return on their dollars, with the added benefit of keeping them outside the United States away from possible seizure. The market grew exponentially and has become the greatest floating pool of capital in the history of the world. This so-called stateless capital did not please everyone. A high official of the United States journeyed to London in 1979 to publicly urge at a meeting of the International Monetary Conference that reserve requirements be put on Eurodollars. At that public meeting the head of the Swiss National Bank arose and said that he for one would never do that as it would "disadvantage" the banks in his country. The British took a similar stance and so the market has grown to a point that it has taken on a life of its own.

The Network Economy: A Complex Adaptive System

It can be argued that the speed and size of these global markets today have created a difference in kind and not just in degree from markets in the past. After all it is speed alone that transforms a harmless piece of lead into a deadly bullet or a group of still pictures into a motion picture. The speed, size, and complexity of the market made possible by the convergence of computers and telecommunica-

tions has had and is having a profound effect on the world we live in. Nicholas Negroponte (1995: 6) went even further when he opined, "Computing is not about computers any more. It is about living." And certainly markets of all kinds impact all our lives. Since markets are basically driven by information about money or stocks or commodities, the instant and almost universal availability of this information makes the modern Reuters or Bloomberg screen light up in a way that is different in kind from smaller, slower, and more primitive times.

The global market today might be described as the very model of what has become known to scientists as a complex adaptive system. The agents, or people who influence the system, range from learned central bankers to 21-year-old traders at some small merchant bank. The agents in the global market are numbered in the millions, each having his or her own agenda and interacting in ways to produce a result that cannot be predicted. When the pundits on the evening news explain why the dollar is strong or weak, or why the stock market went up or down 120 points, they advance the limits of creative writing but not necessarily our understanding.

These great complex systems are nonlinear and tend to resemble biological rather than mechanical systems. In these systems, chaos theory postulates that small events tend to have large consequences over time. The classic example is that of a butterfly moving its wings over China affecting the weather weeks later in Wisconsin. The global market exhibits some of these characteristics. Despite massive work by the Santa Fe Institute and many others, we do not know just how these complex systems work. As Mitchell Waldrop (1992: 11) put it, "The marketplace responds to changing tastes and lifestyles, immigration, technological developments, shifts in the price of raw materials, and a host of other factors."

The Possibility of Systemic Failure

Because of all these unknowns, as the global money markets grew and speeded up it was every regulator's—and every participant's—nightmare as to what would happen if a small event like the failure of a bank somewhere severed the weakest link in the payment chain. If that happened, would the music stop and the whole system come crashing down? Or, to use a Washington term, would we have a systemic failure?

This nightmare came true on a Friday afternoon, June 28, 1974, triggered by the failure of a small German bank called Bankhaus, I.D. Herstatt, K.G.a.A. By coincidence that Friday afternoon there was a retirement party going on for the senior credit officer of Citibank,

Mr. Lester Garvin. A group of us were in his office drinking champagne from paper cups and wishing him well when the phone rang with the news that the Chase Manhattan Bank, which was acting for Herstatt, had stopped all payments into the Clearing House Interbank Payments System (CHIPS), which then ground to a halt. The party in Mr. Garvin's office was of short duration. The main problem was how to restart the system and let the payments clear so that the participants in the world's banking system would know what their liabilities were. As the evening wore on we learned that the German banking authorities at about 10:30 a.m. Eastern Standard Time had closed down Herstatt.

All the banks that were players in the world market enjoyed a line of credit from other banks. These lines of credit were necessary because quite often payment orders arrived when there was not enough money in an account to cover them. Money would flow into the account from many different areas—from money transfers from the Federal Reserve, from other banks, from the payment of maturing credits, or a dozen different sources. In the meantime, the payments were made by creating an overdraft, the allowable size of which was governed by the credit line. If all worked well, the overdraft was eliminated during the day as payments flowed in—if payments did not arrive, the overdraft continued, creating a credit risk and possible loss.

The German central bank, the Bundesbank, in the spirit of free enterprise, decided to let Herstatt fail, which I believe was the correct decision. As in all disasters, fate played an important role. While the Bonn office of Herstatt had already closed, the Frankfurt office was still open and an officer from Citibank Frankfurt hand-carried the papers to collect a spot foreign-exchange payment. He searched in vain for people to talk to, but the place was deserted. The staff had all left to watch the World Cup soccer matches and never completed the clearing so our officer returned empty-handed.

Back in New York the immediate solution to the problem appeared to us to be quite simple, and that was to permit any bank to return payments for 24 hours after the date on which they were made, in the same manner that a Clearing House bank had 24 hours to return a bad check which was drawn upon it. This simple device gave everyone confidence that they would be able to unravel anything that came along and enough time to do so. The rule required all participants in the system to honor all payment orders and permitted them to recall any the next morning if they had not received funds to cover them. CHIPS started up on Monday and operated smoothly and successfully, but the British banks and some other Europeans took violent exception to the fact that the payments through the CHIPS system were not

final until 24 hours after they had been implemented. Long roller-towel cables appeared on the desks of bankers in New York alleging that Eurodollar payments in London were "final" even though everyone knew that the payments could not be final until they were debited or credited to an account in New York.

As long as the sun rises in the East and sets in the West, there will be a five- or six-hour time difference between London and New York, and that time span between London payments and final settlement in New York constitutes the credit risk. In today's world almost anything can happen in six hours, or six minutes.

Back in New York bankers set to work to build more and more safeguards into the CHIPS system with reciprocal credit lines and such other devices to limit the liability of any one bank. As of January 3, 1997, CHIPS now has in place procedures to cover the simultaneous failure of the two largest participants at their largest net debit position, and still fulfill its clearing function. It is interesting to note that no government agency was involved in any aspect of the Herstatt crisis. It was handled entirely by the New York Clearing House.

A Sea Change in the Global Monetary System

The development of the global market I have sketched was occurring contemporaneously with a sea change in the world's monetary system. For the first time in history, no major currency is tied directly to a commodity like gold or silver. In 1911, long before the advent of information technology, Irving Fisher opined that "irredeemable paper money has almost invariably proved a curse to the country employing it" (Fisher 1911: 131). He certainly had history on his side. The advent of the Gold Standard and the Gold Exchange Standard furnished for a time a discipline on the creation of money, but now with the uncoupling of money from any commodity, those old arrangements have been replaced by an even more draconian device which I call the Information Standard. This new discipline is being administered by a completely new system of international finance.

The Information Standard

Unlike all prior arrangements, this new system was not built by politicians, economists, central bankers, or finance ministers. No high-level international conference produced a master plan. The new system was built by technology. While clearing systems reside in real buildings, the new world's financial market is not found on any map, but consists of more than 200,000 electronic monitors in trading rooms all over the world linked together, and the value of any currency is

Eroding the Power of the State

The global market is just one reflection, albeit a powerful one, of

determined by the price that the market will pay for it in exchange for another. Whatever price the market puts on a currency, it is almost constantly being condemned by someone somewhere as too high and by someone somewhere else as too low. Few governments are entirely satisfied with the value the market places on their currency. Someone is always demanding that government do something to push the value

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