

Options for Managing Systemic Bank Crises

n

Bernard Lietaer (blietaer@earthlink.net)
with Dr. Robert Ulanowicz (ulan@cbl.umces.edu)
& Dr. Sally Goerner (sgoerner@mindspring.com)

Abstract

The on-going financial crisis is not the result of a cyclical or managerial failure, but a structural one. Part of the evidence for this assertion is that there have already been more than 96 other major banking crises over the past 20 years, and that such crashes have happened even under very different regulatory systems as well as at different stages of economic development. We urgently need to find better solutions because the last time we faced a breakdown of this scope, the Great Depression of the 1930s, ended up in a wave of fascism and WW2. However, so far the conventional solutions being applied – nationalization of the problem assets (as in the Paulson bailout) or nationalization of the banks (as in Europe) – only deal with the symptoms, not the systemic cause of today’s banking crises. Similarly, the financial re-regulation that will be on everybody’s political agenda, will, at best, reduce the frequency of such crises, but not avoid their re-occurrence

The good news is that a systemic understanding and technical solution are now available that would ensure that such crashes become a phenomenon of the past. A recent conceptual breakthrough, that takes its evidence from balanced, structurally sound, and highly functioning eco-systems now proves that *all* complex systems, including our monetary and financial ones, become structurally unstable whenever efficiency is overemphasized at the expense of diversity, interconnectivity and the crucial resilience they provide. The surprising systemic “a-ha” is that sustainable vitality involves diversifying our types of currencies and institutions and introducing new ones that are designed specifically to increase the availability of money in its prime function as a medium of exchange, rather than for savings or speculation. Additionally, these currencies are expressly designed to link what would remain otherwise unused resources with unmet needs within a community, region or country. These currencies are known as “complementary” because they do not replace the conventional national money, but rather operate in parallel with it.

The most effective way for governments to support such a strategy of a more diverse and sustainable monetary ecology would be to accept a well-selected, robust complementary currency in partial payment of taxes during the period when banks will not be in position to fully finance the real economy. The choice of which complementary currency to accept reflects both a technical issue (robustness and resilience against fraud) and a political one (what type of activities are desirable to support). We recommend as first candidate for this role, a professionally run business-to-business (B2B) complementary currency on the model of the WIR system, which has been successfully operational for 75 years in Switzerland, involving a quarter of all businesses of that country. This system has been credited by an American econometric analysis as a significant counter-cyclical stabilizing factor that explains the proverbial stability of the Swiss economy.

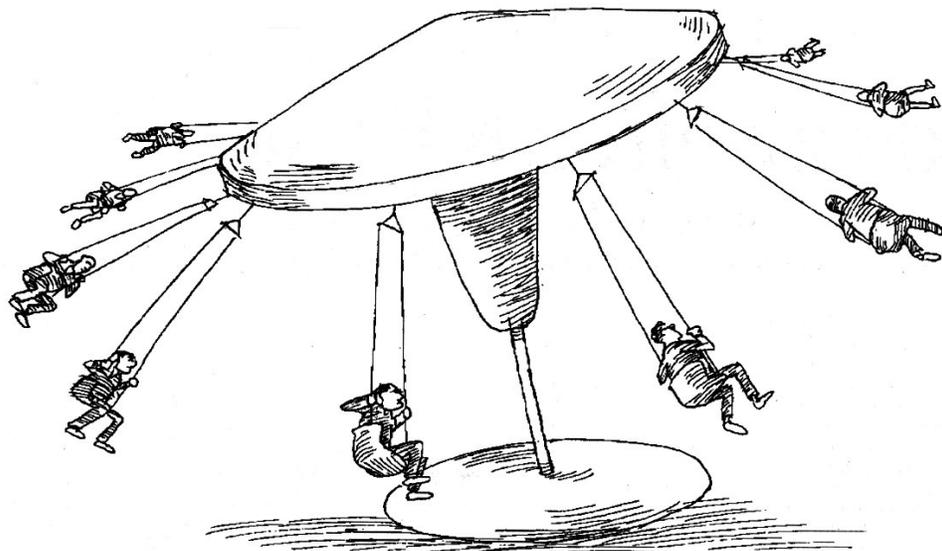
This paper begins with a short metaphoric story, followed by seven sections as follows:

- I. The Crisis of 2008
- II. Why Save the Banks?
- III. Re-Regulation of the Financial Sector
- IV. Conventional Solutions: Nationalizations
 - a. Nationalizing “Toxic Assets”
 - b. Nationalizing Banks
 - c. Unresolved Problems
 - d. Nationalizing the Money Creation Process
- V. Systemic Stability and Economic Vitality
 - a. Beyond the Blame Game
 - b. The Stability of Complex Systems
 - c. Application to Other Systems
 - d. Application to Financial Systems
 - e. The Systemic Solution
- VI. Our Proposal
 - a. The Business Sector
 - Another Story
 - b. National Governments
 - c. Cities and Local Governments
 - d. Some Practical Considerations
 - e. Answering Some Objections
 - f. Some Advantages
- VII. Conclusion: Synthetic Table of the Options

A Metaphoric Story

*“Money is like an iron ring we put through our nose.
It is now leading us wherever it wants.
We just forgot that we are the ones who designed it.”*
Mark Kinney

In the early 1980s, the most prominent citizens of a small town in Western Germany were having dinner together. The group included notable local businessmen, the mayor and the local judge. They had plenty of wine with the dinner and after the wine added some schnapps, so soon they were getting all getting jolly tipsy. On the plaza outside the restaurant there was a carnival, with a merry-go-round. By the time the group left the restaurant it was well after midnight and the plaza was empty. One of them thought it would be fun to jump on the merry-go-round, and soon everyone followed suit. They each got in a chair while one of them put the motor in action and then leapt on a chair as it started turning. However, the laughter came to an end after a few minutes of going round and round as they realized, one by one, that they could not stop the machine: the control button was now well out of reach and they could not dismount without incurring serious injury. They could get the machine running from its starting position, but lost the capacity to manage it once it got in full swing.



They started shouting louder and louder for help but nobody heard them. It was not until after six o'clock the next morning that someone finally came by and called the fire department and the police who stopped the machine. By then one had died from a heart attack and three ended up unconscious in the hospital. One of them dropped out to become a member of an obscure religious sect. All of them suffered psychological scars that would take years to heal.

This is a true story.¹ It is also a metaphor for where we are now with the state of the world's money system, as we are all embarked on a huge planetary machine running on autopilot. And we seem to have forgotten how to slow it down, without risking its collapse.

I. The Crisis of 2008

By now, everybody knows that we have entered a major global financial crisis. Indeed, the infamous "subprime crisis," which first hit the American banking system in August 2007, has been spreading internationally. It reached a new level of global banking systemic contagion in September 2008. The question that is being debated is the depth and extent of the crisis — whether it can become as bad as the 1930s Depression. For instance, Alan Greenspan, the former

¹ Source: Peter Sloterdijk: *Aus Herbstschrift 1*, Steierischer Herbst 1990

Deleted: t

Chairman of the US Federal Reserve, stated publicly: "Let's recognize that this is a once-in-a-half-century, probably once-in-a-century type of event."²

The causes of this crisis will be debated for years to come. Some blame unrestrained greed, others see a "sorcerer apprentice" problem in which financial engineering created products too complex even for their creators, still others condemn excessive financial deregulation, or incompetence by bankers and/or regulators. What nobody is arguing about is that the financial sector has chalked up simultaneous losses on an unprecedented scale. Here is a sample of what had been officially acknowledged by mid August 2008:

- Lehman Brothers (USA) - \$17 billion (bankrupt on Sept. 15, 2008)
- Morgan Stanley (USA) - \$12 billion
- Merrill Lynch (USA) - \$46 billion (taken over by Bank of America on Sept. 15, 2008)
- Citigroup (USA) - \$47 billion
- Bank of America - \$7 billion
- JP Morgan (USA) - \$5 billion
- Goldman Sachs (USA) - \$3.8 billion
- Bear Stearns (USA) - \$3.2 billion (went bankrupt in March 2008)
- Wachovia (USA) - \$6 billion
- UBS (Swiss) - \$37 billion
- Credit Suisse (Swiss) - \$6 billion
- Northern Rock Bank (UK) – £50 billion + (went bankrupt in February 2008)
- Royal Bank of Scotland (UK) - \$11.8 billion
- Barclays Bank (UK) - \$9.9 billion
- HSBC (Bank, UK) - \$6 billion
- HBOS (Bank, UK) - \$2 billion
- Lloyds TSB Bank (UK) - \$1.7 billion
- Deutsche Bank (Germany) - \$10 billion
- BayernLB (Germany) - \$3 billion
- IKB (Germany) - \$2.6 billion
- Commerzbank (Germany) - \$1.1 billion
- WestLB (Germany) - \$1.5 billion
- Credit Agricole (France) - \$7 billion
- Societe Generale (France) - \$6 billion
- Nataxis (France) - \$4.3 billion
- UniCredit (Italy) - \$1.6 billion
- National Australia Bank - \$1 billion

Adding it all up, so far simultaneous losses of a record US\$ 348 billion are being acknowledged. We estimate, however, that this represents less than half of the total of the subprime issue alone. Indeed, the total loss to the financial system due to the subprime crisis is at least US\$ 1.2 Trillion.³ The subprime is only the tip of the iceberg, however, as the same lax practices that

² Interview of Greenspan on ABC television channel by Stephanopoulos on September 14, 2008

See <http://blogs.abcnews.com/politicalradar/2008/09/greenspan-to-st.html>

³ This rough estimate is based on the following facts:

- the total US residential mortgage market has a volume of about US\$ 10 Trillion. See statistics of debt outstanding for home mortgages in <http://www.federalreserve.gov/releases/z1/Current/Coded/coded-2.pdf>
- of which about US\$ 6 Trillion has been packaged in derivatives technically called COD's

were applied to mortgages were also prevailing for car loans or student loans, and particularly credit card debt in the United States

What all this means, in practice is that, we have now entered the period of unprecedented financial instability that was predicted in my earlier book, *The Future of Money*⁴. It is most likely that the ensuing crisis will play out in a classic two or three steps downwards for every step upwards pattern. Every small step forward (i.e. any temporary improvement) will predictably be hailed as the “end of the crisis.” It is quite understandable why governments, banks and regulators will make such statements simply because saying otherwise would only make the situation worse.

The next logical phase in this systemic crisis is now unfolding on automatic pilot. Whatever governments do, the banks and other financial institutions will want to cut back drastically on their loans portfolios wherever possible, in order to rebuild their balance sheets after huge financial losses. This in turn will weaken the world economy to the point of a recession, which in turn, will strike the banks’ balance sheets, and so on, down a vicious spiral towards a possible depression. Thus, while cutting back on its loan portfolio is a logical reaction for each individual bank, when they all do it simultaneously, it deepens the hole they are collectively digging for the world economy and ultimately for the financial system itself.

We are not alone in this view. The London-based newspaper *The Independent* gathered the opinions about the on-going crisis from a series of outstanding personalities⁵:

- *"This recession will be long, ugly, painful and deep. All the credit losses associated with it will be closer to \$2 trillion – leading to the most severe systemic financial and banking crisis since the Great Depression. The credibility and viability of the most sophisticated financial system is at stake now, as most of this financial and banking system is on its way to substantial and formal insolvency and bankruptcy."* (Nouriel Roubini – Professor of Economics and International Business, New York University)
- *"The USA is a nation that is consuming too much, and the Bush Administration's response has been to tell people to consume more." "The idea that banks should self-regulate, relying on their own risk management systems and rating agencies, is absurd. We lost sight of why regulation is needed. The trouble is that regulators are too close to the people they are regulating. There was a party going on and nobody wanted to be a party pooper."* (Joseph Stiglitz – Professor of Columbia University and 2001 Recipient of the Nobel Prize for Economics)
- *"The second stage [of this economic crisis] is an attempt by the banks to cut their losses and leverage and reduce their lending so helping to drive the economy into recession. That will then feedback via bad debts and impact the capital strength of the banks so we will see an adverse vicious circle of weak banks creating a weak economy, which in turn creates more weak banks."* (Charles Goodhart – Professor Emeritus, London School of Economics)

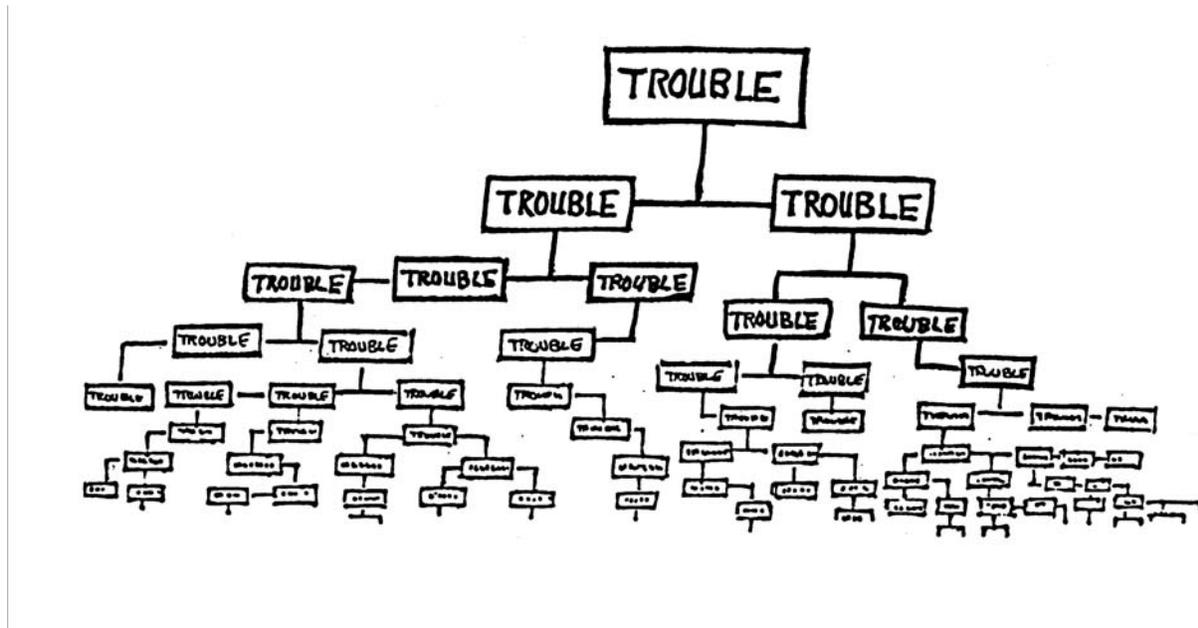
-
- the interbank market discounts those instruments by at least 20%, which is confirmed by the estimates that about 20% of the mortgages payments will not be honored. The market discount in actual exchanges of these instrument as of the current writing (September 2008) is in fact 40 to 60%. Being conservative by applying the 20% discount, we have 20% of 6 Trillion = 1.2 Trillion.

⁴ Lietaer, Bernard: *The Future of Money: Creating new Wealth, Work and a Wiser World* (London: Random House/Century, 2001).

⁵ All subsequent quotes in this section originate in *The Independent* (Business Section) August 5, 2008

- "There is a super bubble that has been going on for 25 years or so that started in 1980 when Margaret Thatcher became Prime Minister and Ronald Reagan became President. That is when the belief that Markets are best left to their own devices became the dominant belief. Based on that we had a new phase of globalisation and liberalisation of financial markets. The idea is false. Markets do not correct towards equilibrium." "The whole construct, this really powerful financial structure, has been built on false grounds. For the first time this entire system has been engaged in this [economic] crisis." (George Soros – Global Financier and Philanthropist)
- The Economist editorializes on October 11, 2008 in its lead story: "Confidence is everything in finance...With a flawed diagnosis of the causes of the crisis, it is hardly surprising that many policymakers have failed to understand its progression."⁶.

In short, our financial system is in deep trouble from top to bottom...



The last time we dealt with a crisis of this scale, the 1930s, it ended up creating widespread totalitarianism and ultimately World War II. The trillion dollar questions are:

- How can we do better this time?
- What are the strategies that will avoid getting us caught into an economic tailspin?
- What are *all* the options available to deal with large scale systemic banking crises?

II. Why Save the Banks?

Since governments' initial response has been to bailout banks and other financial institutions, the first question must be: Why should governments and taxpayers get involved in saving banks in the first place? After all, when a private business fails, it is considered part of the "creative destructiveness" that characterizes the capitalist system. But when large banks fail, somehow that doesn't seem to apply, as shown again in the present-day scenario.

The short answer to why banks are being saved is fear that the 1930 Depression nightmare would again become a reality. Since banks enjoy the monopoly of creating money through providing loans, bankrupt banks means reduced credit which in turn results in a lack of money for the rest of the economy. Without access to capital, business and the means of production contract which causes mass unemployment and a host of collateral social problems. Thus, when banks are in trouble, they can trigger what is known as a "Second Wave" crisis, through a ferocious circle making a victim of the real economy: bad banking balance sheets => credit restrictions => recession => worse bank balance sheets => further credit restrictions and so the spiral downward goes...

It is to avoid such a tailspin that governments feel the need to prop up the banks' balance sheet. This exercise is currently under way. For instance, several major banks were able to refinance themselves earlier in 2008, mainly by tapping sovereign funds; but as the depth of the rot has become more obvious, this has become harder to do. Central banks will help by providing an interest yield curve that makes it easy for financial institutions to earn a lot of money at no risk.⁷

The next logical step is also formulaic. Whenever a bank that is "too big to fail" is in real trouble, the recipe has always been the same, at least since the 1930s: the taxpayers end up footing the bill to bail out the banks, so that they can start all over again. Of the 96 major banking crises around the world that the World Bank has counted over a recent 25 year period,⁸ taxpayer bailouts have been the answer in every instance. For example, the United States government that had funded Reconstruction Finance Corporation during 1932-53 period, repeated the exercise with the Resolution Trust Corporation for the Savings and Loan crisis in the 1989-95 period. Other more recent examples include the Swedish Bank Support Authority (1992-96) and the Japanese Resolution and Collection Corporation which started in 1996 and is still ongoing. In the current international crisis, the first institutions that were "saved" in this way during the current crisis included Bear Stearns in the US, and the nationalization of Northern Rock in the UK. Mid-October 2008, European governments pledged an unprecedented 1.873 trillion Euros, combining credit guarantees and capital injections into banks, based on the strategy pioneered by the United Kingdom.⁹

These bailouts end up being expensive for the taxpayers and the economy at-large. One exception has been in Sweden, which ended up costing "only" 3.6% of the GNP because important parts of the portfolio could be unwound over time at better conditions than those when the assets were originally acquired. But such outcomes are rare, the exceptions rather than the rule. Some

⁷ Central banks will encourage low short-term interest rates and higher longer-term ones, which makes it possible for banks to borrow at low cost from customers and the markets, and invest in long-term government bonds. This was done for instance in the US during the late 1980s, and it worked as planned. It enabled the banks to rebuild their balance sheets. However, even this relatively "mild" crisis (representing a bailout of 3.7% of GNP) took more than six years to be absorbed.

⁸ Caprio and Klingelbiel, "Bank Insolvencies: Cross Country Experience," *Policy Research Working Papers* no.1620 (Washington, DC: World Bank, Policy and Research Department, 1996).

⁹ Front page headline in the *Financial Times* Tuesday, October 14, 2008 pg. 1.

examples of the staggering cost of bailing out banks as a percent of the corresponding countries' annual GNP, as estimated by the World Bank.¹⁰

At the time of this writing, the crisis in the US has already cost 5.8% of the country's GNP¹¹, and a conservative estimate is that it will end up costing at least 10%. Governments, the world over, have just bled themselves dry to a totally unprecedented extent, just to save the banking system -- to the point that the *Financial Times* even wonders whether the worldwide panic in the stock markets in October 2008 "is not about faith in the banks, but faith in the governments to save them."¹²

This begs the question: What happens when the costs for rescuing the bank system become unreasonable? Governments learned in the 1930s that they can't afford to let the banking system go under, as this brings down the entire economic system. What they may learn in our times is that they can't afford to save the banking system.¹³

For instance, the scale of the commitments made by European countries for the bailout of the banking system is without precedent, representing potentially a multiple of their annual GDP. To give an idea of what we are dealing with, here is the ratio of the assets of the three largest banks in each country that were now guaranteed by their respective governments. This ratio represent 130% of annual GDP for Germany; 142% of annual GDP for Italy; 147% of GDP for Portugal; 218% for Spain; 257% for France; 253% for Ireland; 317% for the UK; 409% for the Netherlands (2 largest banks); 528% for Belgium-Luxemburg; 773% for Switzerland (2 largest banks); and 1,079% of the GDP for Iceland (the first country that went formally bankrupt).¹⁴

¹⁰ *The Economist* September 27, 2008, pg 79 as well as the earlier Caprio and Klingelbiel "Bank Insolvencies: Cross Country Experience," *Policy Research Working Papers* no.1620 (Washington, DC: World Bank, Policy and Research Department, 1996).

¹¹ Values to September 15, 2008. This includes the US\$ 700 Billion Paulson bailout, the US\$ 85 Billion for AIG, and 25 Billion for Bear Sterns. It doesn't include the likely costs of the Freddie Mac and Fannie Mae packages which own or guarantee some US\$ 5,400 Billion in mortgages, or whatever guarantees were provided that aren't public knowledge yet as of this writing.

¹² Gillian Tett "Leaders at wits' end as markets thrown one tantrum after another" *Financial Times* October 11/12, 2008. pg 1 and 2.

¹³ The *Financial Times* makes the point that the worldwide panic in the stock markets in October 2008 "is not about faith in the banks, but faith in the governments to save them." Gillian Tett "Leaders at wits' end as markets thrown one tantrum after another" *Financial Times* October 11/12, 2008. pg 1 and 2.

¹⁴ All percentages computed from data from the map in the *Financial Times* September 30, 2008 page 3

III. Re-Regulation of the Financial Sector

The first strategy, re-regulating the financial sector, will predictably be on everybody's political agenda, particularly for a new administration in the US. The debate about how and what to regulate will be intense. History shows, however, that we have engaged in the same cat and mouse game between regulators and banks for several centuries, since the beginning of the privatization of money issuance function to the banking system. To be precise, while such re-regulation may avoid the repetition of the identical traps and abuses next time, over time new loopholes will be discovered or created, resulting in a new variation of the same type of banking crisis.¹⁵

Some re-regulation is, at this point, politically unavoidable, and we concur with the general consensus that it is also necessary. It will be clearly shown below, however, why this solution will, at best, only reduce the frequency of such crashes, not their repetition. Furthermore, stricter regulation may also lengthen the period necessary for banks to improve their balance sheets, which will simply deepen and prolong the "Second Wave" problem.

IV. Conventional Solutions: Nationalizations

There are two conventional ways for governments to prop up the banks balance sheets, both involving a form of nationalization. The first is nationalizing what Ben Bernanke called in his presentation in the US Congress, "the banking system's toxic assets": the second is nationalizing the banks themselves. Let's briefly explore the advantages and disadvantages of both.

A. Nationalizing the Toxic Assets

This solution is invariably preferred by the banks themselves. It consists of either the government itself (in the initial Paulson bailout plan, for example, it is the U.S. Treasury Department) or a specially created institution funded by the government buying assets from the banks that they now want to jettison. Of course, determining the price at which these assets are purchased is a very tricky issue, particularly when a liquid market for such assets has dried up completely, as is the case now. If the government buys the assets at too high a price, it will be seen as a straightforward subsidy for previous bad behavior, and accentuate the "moral hazard" problem (defined below), something that is politically unpalatable. On the other hand, if the government buys the assets at too low a price, it doesn't really replenish the banks' balance sheet.

Buying the toxic assets is also by far the most expensive solution, because it doesn't take advantage of the leveraging factor available in the banking system. Consequently, the injection of money by the government as capital directly to the banks is a lot more effective financially.

B. Nationalizing the Banks

The second way to buttress the banks is by governments providing capital directly to banks themselves, either by buying stocks, or by acquiring a newly issued preferred stock. For example, this is what Warren Buffet did for Goldman Sachs in September 2008 in the US: he injected \$ 5

¹⁵ See the classics in this domain, such as Charles Kindleberger *Manias, Panics and Crashes: A History of Financial Crises* (New York: Basic Books, 1985).

Billion in the form of preferred stock that would give him not only 7% of the capital, but also a guaranteed 10% dividend forever.

In Europe, governments have typically taken the bank-nationalization road, although with less demanding terms than what Warren Buffet obtained. Nationalizing the banks was the option taken for instance in Sweden in 1992; and in 2008 first for Northern Rock in the UK, and then for a wide range of banks in all countries by mid-October 2008.

There are two advantages in this approach compared to the previous one of nationalizing the toxic assets. First, thanks to the fractional banking system by which all money is created, when banks make loans to customers, they can create new money at a multiplier of the amount of capital they actually have. Consequently, if a bank's "leveraging factor" was 10, then injecting \$1 billion in the bank's capital would make it possible for it to create at least \$10 billion in new money, or carry \$10 billion in problem assets. In fact, the multiplier is typically much higher. For instance, Lehman's and Goldman Sachs' ratio of assets to capital was respectively 30 and 26, before they both disappeared. Some European banks had even a higher leverage: BNP Paribas at 32; Dexia and Barclays' leverage ratio are both estimated at about 40; UBS' at 47; and Deutsche Bank's a whopping 83.¹⁶ Therefore, very conservatively put, it is 10 times more financially effective for governments to bolster the balance sheets of the banks directly than to buy toxic assets.

The second advantage to buying bank shares instead of toxic assets is that there is generally a market which indicates some relative value between different banks. In contrast, when the market for toxic assets has dried up, there is no such indication, and the decisions can be quite arbitrary.

The banks themselves, of course, prefer to avoid the dilution of bank equity and control that this approach implies. Politically, nationalizing the banks also sounds like the "socialization" of the economy, since the former communist states nationalized their banks. This ideological taint may explain why this approach was not initially considered in Washington.

Yet, we must also not underestimate some of the unmentioned additional risks of the crisis. The cost of bailing out the world's financial system will unquestionably significantly increase most governmental debt, which somehow will have to be financed from somewhere. For instance, the US biggest financiers today — China, Russia and the Gulf states — are rivals to the US, not allies. The question is: What will happen to an already shaky dollar during such wrangling?

C. Unresolved Problems

The first objection to nationalizing banks or their toxic assets is the well known "moral hazard" problem. If banks know that they will be saved when in trouble, they may be tempted to take higher risks than otherwise would be prudent. When these risks pay off, the profits are held privately and translated into generous dividends and bonuses to the banks' shareholders and management. But when they fail, the losses end up being absorbed by the taxpayers. The current salvage programs confirm that this problem hasn't gone away and is unavoidably further strengthened by new bailouts. Christine Lagarde, Minister of the Economy, Industry and Employment in the current Sarkozy government in France, stated "Moral hazard has to be dealt

¹⁶ The leverage ratio is total assets/capital, which is the inverse of capital/assets ratio. The estimates for the capital to asset ratios are respectively 2.4% for Barclays, 2.1% for UBS and 1.2% for Deutsche Bank according to the *Economist* September 27, 2008 pg 84. See also "Briefing" in *Trends-Tendances* October 2, 2008 pg 17.

with later...Maintaining the functioning of our markets is the top priority”.¹⁷ This is exactly the argument that has been used at every systemic crisis...

Secondly, even if both strategies –bailing out the banks and re-regulation of the financial sector – are implemented reasonably well, neither resolves the “Second Wave” problem: the banking system will get caught in a vicious circle of credit contraction that invariably accompanies the massive de-leveraging that will be needed. Depending on how the re-regulation is implemented, it may actually inhibit banks from providing the finances needed for a reasonably fast recovery of the real economy. In any case, given the size of the losses to be recovered, it will take many years, certainly more than enough time to bring the real economy into real trouble.¹⁸

In practice, what this means for most people in the US, in Europe, and in most other parts of the world, is that, in Professor Nouriel Roubini’s words, “*this recession will be long, ugly, painful and deep.*” We are only at the beginning of a long, drawn-out economic unraveling.

The social and political implications for such a scenario are hard to fathom. The last time we looked into a problem of this size and scope was in the 1930’s, and that event resulted in social and economic problems that ended up manifesting violently in a wave of fascism and ultimately World War II. Still, there are important differences with the situation of the 1930s. So far, the situation is less extreme economically, in unemployment and business bankruptcies, than what happened in the 1930s.

More important still, a financial/banking issue isn’t the only one we have to deal with: It happens to coincide with several major global challenges, by now well documented: Climate change and mass species extinction, the increase of structural unemployment, and the financial consequences of unprecedented aging in our societies. In some respects, therefore, today’s crisis is less dramatic, and in others far worse than what our previous generation had to face. This is exactly the convergence of issues that our 2001 forecast predicted we would be facing now.¹⁹

D. Nationalizing the Money Creation Process

Nationalizing the money creation process itself is an old, if much less conventional approach, that reappears periodically in the “monetary reform” literature, particularly during periods of major banking crises, such as the one we are living now. For historical reasons, the right to create money was transferred to the banking system as a privilege, originally to finance wars during the 17th century. So, contrary to what some people believe, our money isn’t created by the governments or the central banks, it is created as bank debt. When banks are private, as they are in most of the world, the creation of money is therefore a private business. If the banking system abuses this prerogative, this privilege could or should be withdrawn. The logic is not new: money

¹⁷ Michael Macenzie and John Authers “The week that panic stalked the markets.” *Financial Times* October 11/12, 2008. pg. 2.

¹⁸ As was also the case in the 1930s, we can expect that there will be pockets of exceptions in the economic evolution. For instance, one could have lived very comfortably through the 1930s in Latin America. The exceptions this time will probably be the Gulf Area and a few other key oil producing countries.

¹⁹ Lietaer, Bernard, *The future of money: Creating new wealth, work and a wiser world.* (London: Random House, 1999).

is a public good, and the right of issuing legal tender belongs at least theoretically to governments.²⁰

So, while bailing out the banking system through nationalizing them or nationalizing the problem assets are the classical policy options, it can also be expected that proposals for nationalizing the money creation process itself will reemerge, as they have in previous predicaments, including the 1930s. Under a government run monetary system, the governments would simply spend money into existence without incurring interest at its creation; banks would become only brokers of money they have in deposit, not creators of money, as is the case now.

This would definitely make systemic banking crises a problem of the past. It would also provide the possibility to re-launch the economy through a large-scale Keynesian stimulus at a much lower cost to the taxpayers, given that the money so created wouldn't require interest to be reimbursed in the future.

One objection to a government run monetary system is that governments may abuse this power, issue more money than is appropriate, and thereby create inflation. Although that inflation argument is valid, there is no reason that Milton Friedman's proposal for the issuance of money by the central banks couldn't be applied to governments: put in place a rule that obliges the issuing body to increase spending by no more than a fixed 2% per

²⁰ For instance, the US constitution specifies that the power of issuing money is an exclusive prerogative of Congress. There is a long list of famous quotes concerning this topic by various American presidents and founding fathers. Here are some samples:

- "If Congress has the right under the Constitution to issue paper money, it was given to be used by themselves, not to be delegated to individuals or corporations." (*Andrew Jackson*, when he dissolved the Second Bank of the United States);
- "History records that the money-changers have used every form of abuse, intrigue, deceit, and violent means possible to maintain their control over governments by controlling money and its issuance." (*James Madison*);
- "If the American people ever allow private banks to control the issue of their currency, first by inflation, then by deflation, the banks...will deprive the people of all property until their children wake-up homeless on the continent their fathers conquered.... The issuing power should be taken from the banks and restored to the people, to whom it properly belongs." (*Thomas Jefferson*);
- "The Government should create, issue, and circulate all the currency and credits needed to satisfy the spending power of the Government and the buying power of consumers. By the adoption of these principles, the taxpayers will be saved immense sums of interest. Money will cease to be master and become the servant of humanity." (*Abraham Lincoln*);
- "The issue of currency should be lodged with the government and be protected from domination by Wall Street. We are opposed to...provisions [which] would place our currency and credit system in private hands." (*Theodore Roosevelt*);
- "I am a most unhappy man. I have unwittingly ruined my country. A great industrial nation is controlled by its system of credit. Our system of credit is concentrated. The growth of the nation, therefore, and all our activities are in the hands of a few men. We have come to be one of the worst ruled, one of the most completely controlled and dominated Governments in the civilized world no longer a Government by free opinion, no longer a Government by conviction and the vote of the majority, but a Government by the opinion and duress of a small group of dominant men." (*Woodrow Wilson, who was the president who signed in 1913 the Act creating the Federal Reserve*)

For more information on proposals to re-nationalize money creation, see Joseph Huber and James Robertson, *Creating New Money: A Monetary Reform for the Information Age* (London: New Economic Foundation, 2000)

year, reflecting the improvements of productivity in the economy. Furthermore, given that the current method of creating money through bank-debt has made the 20th century one of the highest inflationary centuries on the historical record, inflation is obviously not a problem that can be claimed to be specific to the process of money issuance by governments.

The most important reason that this solution is unlikely to be implemented is that it will be doggedly resisted by the banking system itself. The financial system has always been and remains today a powerful lobby, and losing the right to create money would hit them at the core of their current business model.²¹

Our own objection to this solution is that, even if governments were to issue the money, it may protect us from banking crises, but it will nevertheless not solve the core systemic problem of the instability of our money system. In short, it may protect us from banking crises, but not from monetary crises.

V. Understanding Systemic Stability and Vitality

The solution we propose below is new, and relates to the identification of the fundamental systemic reason for our monetary and financial instability. Understanding this solution, however, requires we review some evidence as to why a systemic problem is likely, develop a scientifically-sound understanding of its nature, and, finally, identify effective ways to address the trouble.

The good news is that now we know a lot more than in the 1930s and there are many more tools available than even a decade ago. Consequently, it is now possible to identify the deeper underlying systemic causes as well as a new way to deal with them. Furthermore, this new way is one that governments can afford, and which actually resolves a number of other social and economic issues that exist even when there is no financial crisis.

At first sight, it may not be the bankers' preferred solution, but it would actually stabilize their own portfolios while structurally stabilizing the economies of the world. It would also give them a whole new line of business, in activities that would be particularly attractive for local and regional banks. Introducing such a systemic solution is the only way to avoid periodically repeating the banking-crisis exercise, which all conventional approaches are condemned to do because they deal only with some of the symptoms, and not the cause.

A. Beyond the Blame Game

A lot of energy will be spent on trying to allocate the blame for this disaster. Greed in the financial sector, lack of oversight by regulators, policies that over-emphasize deregulation, and incompetence at various levels, will all become favorite targets. Our view is that any or all of

²¹ The current modus operandi also provides a hidden permanent subsidy to the banking system through seigniorage. Huber and Robertson estimated this yearly subsidy at 49 billion Pounds for the UK; \$114 billion per year for the US; 160 billion Euros for the Euro zone; and 17.4 Trillion Yen for Japan. These benefits would accrue to the governments in the case of nationalization of the money creation process. The details on which these estimates are based n Joseph Huber and James Robertson's *Creating new Money: A Monetary Reform for the Information Age* (London: New Economic Foundation, 2000) pgs 79-84.

these may indeed have played a role, but at the core we are dealing with a much deeper systemic issue, as already stated.

Still, while the current crisis may be the biggest one ever, it isn't the first such crisis. The World Bank has identified no less than 96 banking crises and 176 monetary crises in the 25 years since President Nixon introduced the floating exchange regime in the early 1970s.²² Furthermore, while less frequent than over the past couple of decades, booms and bust cycles involving banking and monetary crises were, in Kindleberger's words, a remarkably "hardy perennial"²³ even before this period. Kindleberger describes no less than 48 massive crashes from the 1637 tulip mania in Holland to the 1929 crash on Wall Street.

Such repeated breakdowns, in very different countries and times, under different regulatory environments, and in economies with very different degrees of development should be seen as a first telltale symptom of some underlying systemic or structural problem.

If such a deeper issue is involved, it would explain why each new set of regulations achieve, at best, a reduction in the frequency of banking and monetary crises, without getting rid of them or their horrific economic and socio-political costs. If such a deeper structural problem exists, it would also explain why even some of the brightest and best educated people on the planet have not been able to avoid major financial catastrophes, however diligently they do their work, whether on the regulatory or on the financial services side. Finally, if our money system is indeed a structural "accident waiting to happen", then even controlling the greed through tighter regulations will also only defer when the next disaster will hit.

B. The Stability of Complex Systems

We now have scientific evidence that a structural issue is indeed involved. The theoretical origin of this evidence may be surprising to the economic or financial community, although it wouldn't be such a surprise for scientists familiar with natural ecosystems, thermodynamics, complexity or information theory.

The nature of this systemic problem is scientifically described elsewhere in peer-reviewed literature, and only a short, simplified summary will be provided here. For readers desiring full technical and mathematical proof of what will be claimed here, please refer to the relevant paper.²⁴

For the past twenty five years, major progress has been made on understanding what makes natural eco-systems sustainable or not. This work is the natural extension of Nobel Prize winning chemist Illya Prigogine, and Club of Rome Cofounder Erich Jantsch's work with self-organizing energy-flow systems. In fact, according to Kenneth Boulding (1981), many early economists held energy views. This changed when those who favored Newtonian mechanics during the late 19th century (such as Walras and Jevons) turned economics into today's familiar views on the mechanics of "rational actors" and the reliable self-restraint of General Equilibrium

²² Caprio & Klingebiel, 1996

²³ Kindleberger, Charles *Manias, Panics and Crashes* (New York: Wiley & Sons, 3d ed. 1996) pg 1.

²⁴ See Robert Ulanowicz, Sally Goerner, Bernard Lietaer and Rocio Gomez "Quantifying Sustainability: Efficiency, Resilience and the Return of Information Theory" *Journal of Ecological Complexity* forthcoming 2008.

Theory, an approach which completely dominates not only all of the academic economic literature, but also the boardrooms and political venues of the world.²⁵

This new approach, as shown below provides a very concise and solid explanation as to why we need to start using a new set of tools to understand the monetary and economic dynamics as they actually manifest in the real world. In this approach, complex systems, such as ecosystems, living organisms, and economies are all seen as matter-, energy-, and information-flow systems. For example, the famous food chain is actually a matter/energy flow-network built of complex relationships among organisms. Plants capture the sun's energy with photosynthesis; animals eat the plants; species then eat each other in a chain to top predator, only to have all organisms die, decompose, and their energy/matter be recycled by bacteria.

Decades of studying natural ecosystems, in particular, have led to very sophisticated mathematical understandings of how a network structure affects an ecosystem's long-term viability, as judged by its balance between throughput efficiency and rebound capacity. *Throughput efficiency* measures the ability of a system to process volumes of the relevant matter-, energy- and/or information-flow. *Rebound capacity* measures the ability of a system to recover from a disturbance. With these distinctions we are able to define and precisely quantify a system's sustainability in a single metric.

In general, a system's rebound capacity is enhanced by *diversity* and more *interconnections* (pathways for the matter-, energy- and/or information to flow) because there are more channels of interaction to fall back on in a time of trouble or change. For example, a predator fish may "connect"—acquire energy and resources, usually by eating—to three or four other species (for example, turtles and snakes), or it may link to only one (prawns). A fish that depends on a single other species for its food supply will find it hard to adapt if that one species gets in difficulty for whatever reason. Researchers, therefore, use therefore the amount of diversity and connectivity to quantify a system's rebound capacity.

Diversity and connectivity also play an important role in throughput efficiency, but in the opposite direction: efficiency *increases through streamlining*, a process by which *diversity and connectivity decreases*. Furthermore, as a flow system becomes more efficient, it tends to build up a kind of self-fueling momentum (technically called "autocatalysis") that further eliminates diversity as it gradually streamlines the process. Generally, increasingly efficient systems tend to become more directed, less diverse, and consequently more brittle.

The main point is that nature does not select for maximum efficiency, but for an optimal *balance* between the two opposing poles of throughput efficiency and rebound capacity. These poles, as we have mentioned before, pull in opposite directions because rebound capacity increases with diversity and backups through multiple pathways (connections), while efficiency increases by eliminating diversity and redundant pathways through streamlining. The healthiest ecosystem is the one with an optimal balance between these two opposing pulls, because both are indispensable for long-term sustainability and health.

We now have a way of quantitatively measuring all the relevant components separately: total throughput, throughput efficiency, and rebound capacity. Furthermore, the underlying mathematics are well-behaved enough so that there exists only one single maximum for a given

²⁵ The misclassification of economics as a system in equilibrium is brilliantly explained in chapters 2 and 3 of Beinhocker, Eric *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics* (Cambridge, Mass: Harvard Business School Press, 2006).

network system. The shape of the relationships between sustainability and its constituent elements can generically be shown as in Figure 1. Observe that there is an asymmetry: to attain optimality, rebound capacity is more important than efficiency!

Since rebound capacity and throughput efficiency are both necessary, but pull in opposite directions, nature tends to select those systems which have an optimal balance of the two, which can vary depending on the system. Therefore, *sustainability can be defined as the optimal balance between throughput efficiency and rebound capacity*. A system is therefore maximally sustainable when that balance attains its optimal mix. This can be graphically illustrated as in Figure 1.

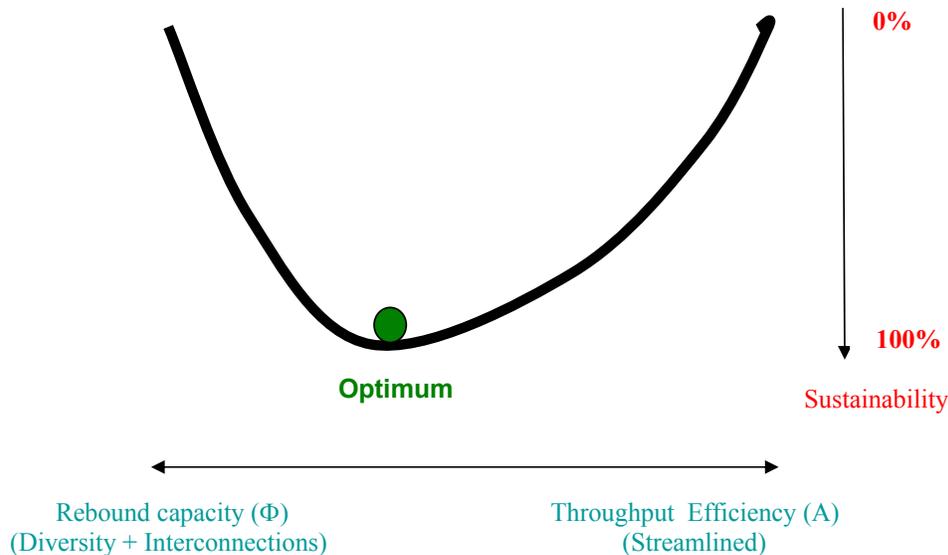


Figure 1: Sustainability curve mapped between the two polarities of efficiency and rebound capacity. Nature seeks not a maximum of efficiency, but for the optimum balance between these two requirements. Metaphorically, this is similar to a ball searching for the lowest point in the curved surface under the influence of gravity. Notice that the arrow of Sustainability is pointed downwards, to preserve this gravity metaphor.

Until recently, total throughput and throughput efficiency have been the only means for us to identify the relative success of a system, whether in nature or in economics. Now, however, we can distinguish whether a particular increase in throughput and efficiency is a sign of healthy growth or just a relatively short-term bubble that is doomed to collapse.

Furthermore, we can assume that over time nature has solved many of the developmental problems in ecosystems, problems with which humanity still struggles in economic terms. Otherwise, these ecosystems simply wouldn't exist today. It is also interesting to note that all

ecosystems have their most critical parameters within a very specific and narrow range, that can be computed with precision, called the “Window of Vitality”²⁶ See Figure 2.

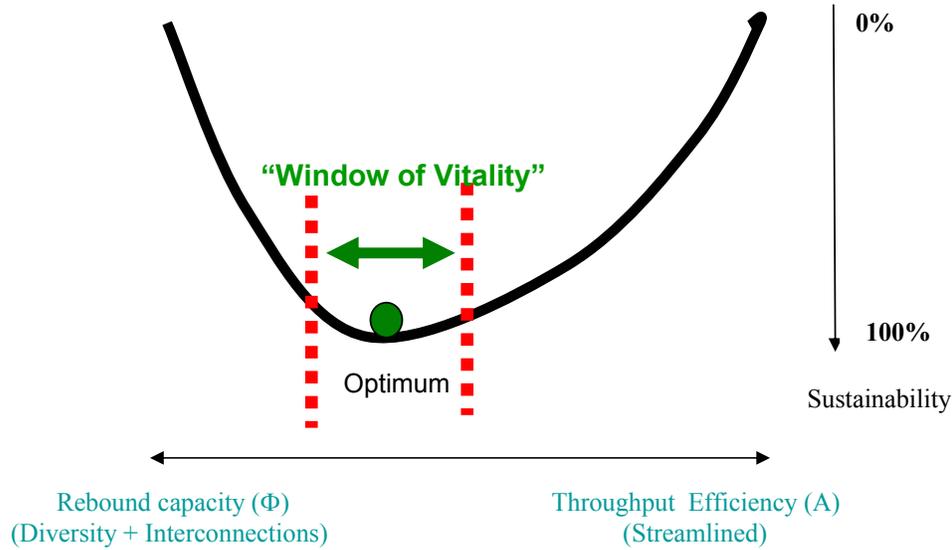


Figure 2: The “window of vitality” in which all sustainable natural eco-systems operate. All natural eco-systems invariably operate within a fairly narrow range on each side of the Optimum point.

3. Application to Other Complex Systems

It is critical to understand that these findings arise from the very *structure of a complex system*, and therefore that they remain valid for any complex network with a similar structure, regardless of what is being processed in the system: it can be biomass in an ecosystem, information in a biological system, electrons in an electrical power network, or money in an economic system.

Indeed, the question will undoubtedly be raised whether what we learn from ecosystems makes sense when applied to economic communities. It seems not unreasonable to assume that this is so, because much the same dynamics and structure are at work in the economic theatre as in ecosystems. This is precisely one of the strong points of using a web-like network approach instead of machine-like metaphor. As Goerner (1999) points out: “all systems, no matter how complex, fall into one of a few classes. All members of a class share certain common patterns of behavior.” Similarly: “The wonderful thing about this universality is that it does not matter much how close our equations are to the ones chosen by nature, as long as the model is in the same

²⁶ Ulanowicz, R.E.. *A Third Window: Natural Foundations for Life*. Oxford University Press, New York. 2008

universality class ...as the real system. This means that we can get the right physics out of very crude models.” (Cvitanovic 1984.)

These findings remain therefore relevant not only for ecosystems, but any other complex system with a similar network structure. For instance, Vaz and Carvalho (1994) have portrayed the immune system in terms of a network. Might not the elucidation of its window of vitality provide significant new perspectives on the health of an organism?

The fields of engineering, business and economics have all been focusing almost exclusively on efficiency, and therefore constitute a wide open field to explore the validity of the proposed metrics to improve sustainability.

For instance, electrical power grids have been systematically optimized for decades towards ever greater technical and economic efficiency. It has come as a surprise to many engineers that the fact that they have approached maximum efficiency is the very reason why large-scale blackouts have suddenly been breaking out “out of nowhere” with a vengeance. A few years ago, several of such blackouts hit large areas the United States, for instance. The data should be available to model these systems as networks because that is what they literally are. One can then quantify their efficiency and resilience, and their window of vitality. The solution on how to rebalance such a system to make it less brittle, and determine its optimal sustainability would be an obvious “hard science” test application of the metrics described here.

4. Application to Financial Systems

Our global monetary system is also an obvious network structure, in which monopolistic national currencies flow within each country (or group of countries in the case of the Euro), and interconnect on a global level. The technical justification for enforcing a monopoly of national currencies within each country was to optimize the efficiency of price formation and exchanges in national markets. In his seminal paper of 1955 on this topic, Milton Friedman proposed that letting markets determine the value of a national currency would further improve the overall efficiency of the global system. This idea was actually implemented by President Nixon in 1971, to avoid a run on the dollar at that time. Since then, an extraordinarily sophisticated and efficient global communications infrastructure has been built to link and trade these national currencies. The trading volume in the foreign exchange markets reached an impressive \$3.2 trillion *per day* in 2007, to which another daily \$2.1 trillion of currency derivatives should be added.²⁷ Nobody questions the efficiency of these markets.

This system’s lack of rebound capacity, however, shows up not in the technical field of the computer networks (which all have backups), but in the financial realm. This fact has been demonstrated in a spectacular fashion by the larger number of monetary and banking crashes over the past thirty years. Such crises, particularly a combined monetary and banking crash, is—other than war—the worse thing that can happen to a country. All the evidence shows that our global network of monopolistic national moneys have evolved into an overly efficient and dangerously brittle system. It can be seen as if it is on automatic pilot. There is some irony in the fact that whenever a systemic banking crisis unfolds, the larger banks are invariably helped to absorb the

²⁷ Bank of International Settlements (BIS) 2005 *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity 2008 - Final Results* . Washington, DC.

smaller one, under the logic that the efficiency of the system is thereby further increased. This situation is illustrated in Figure 3.

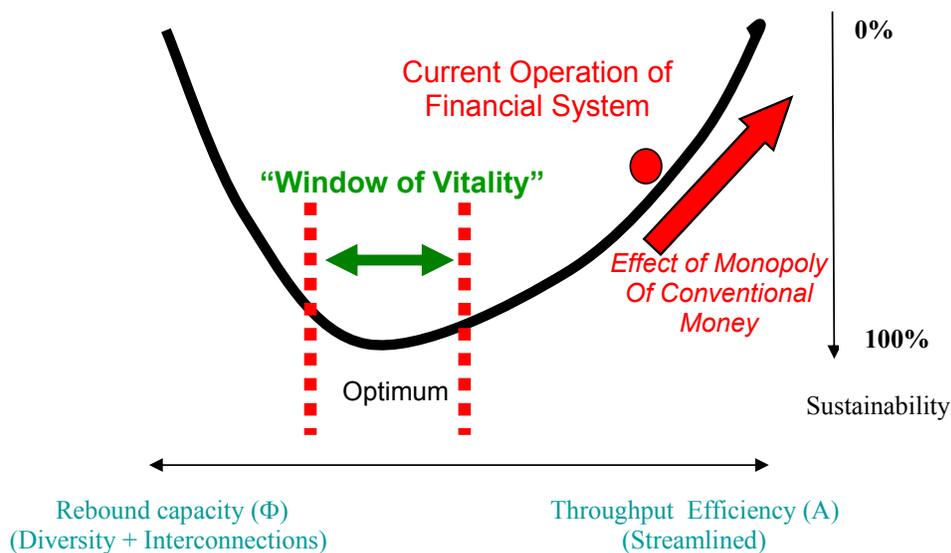


Figure 3: Today’s global monetary ecosystem is significantly overshooting the optimal balance because of its exclusive emphasis on efficiency. A general belief prevails that all improvements need to go further in that same direction (red arrow), which will drive us further away from optimal sustainability. For instance, in case of a banking crisis the banks that are already “too big to fail” invariably are encouraged to absorb the smaller ones, further reducing diversity. This leaves the overall system insufficiently resilient and adaptive. Such a system is “an accident waiting to happen”, condemned to collapse, however well people try to manage it.

The point being made here is truly profound and has wide-reaching implications for all complex systems, natural or human-made, including our worldwide economy. Since rebound capacity and throughput efficiency are both necessary but pull in opposite directions, nature tends to select those systems, which have an optimal balance of the two. A system is maximally sustainable when that balance attains its optimal mix. This research also shows why placing too much emphasis on efficiency automatically sacrifices diversity and interconnectivity, and the entire system becomes unstable and collapses.

5. The Systemic Solution

Conventional economic thinking assumes the de-facto monopolies of national moneys as an unquestionable given. In contrast, the evidence points to the conclusion that systemic monetary sustainability requires a diversity of currency systems, so that multiple and more diverse channels of monetary links and exchanges can and will emerge, as seen in Figure 4.

-

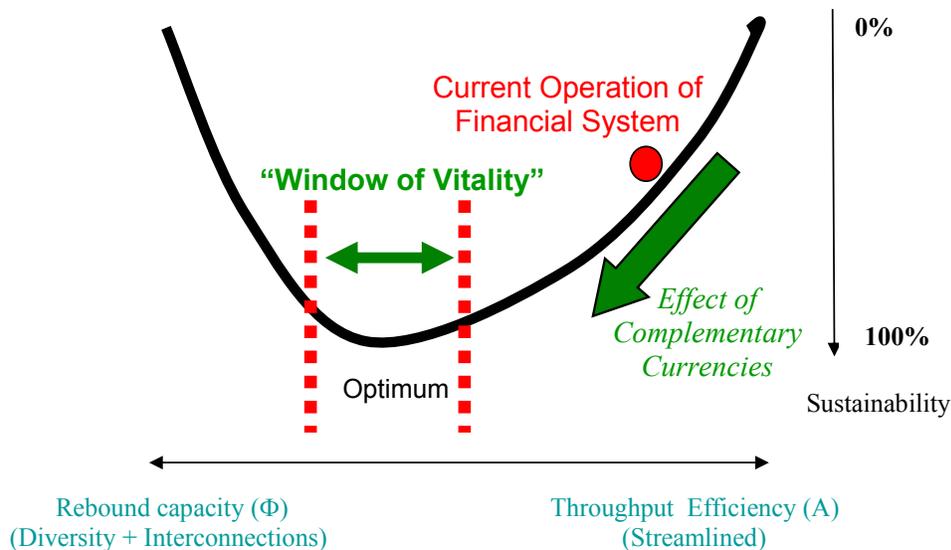


Figure 4: The Effect of Diverse and Multiple Complementary Currencies

The operation of diverse types and multiple currencies pushes the economy back towards its optimal sustainability (green arrow). This reduces unquestionably efficiency, but it also increases the rebound capacity of the whole economy by facilitating transactions that otherwise wouldn't occur, through a diversity and interconnections that otherwise wouldn't exist.

The systemic solution is therefore to increase resilience of the monetary system, even if at first sight that will be less efficient. This is the lesson from billions of years of evolution in natural ecosystems. This means in practice letting several types of moneys circulate among people and businesses for exchanges, through the implementation of complementary currencies. As these complementary currencies start going mainstream, this strategy will predictably ensure also a much higher degree of interconnectivity in the system. This approach will certainly appear unorthodox to conventional thinking, but conventional thinking is precisely what got us into this trouble to begin with. It can also resolve the dilemma of what to do now about today's systemic banking crisis.

The predictable argument from traditional economics against this idea will be that using multiple currencies within a national economy is reducing the efficiency of the price formation process and of the exchanges among economic agents. That argument is valid, but we know now that this emphasis is precisely what has reduced the resilience of the system, what is making it so brittle...

VI. Our Proposal

Our proposal involves three components: a) actions by the private business sector, b) decisions by national governments, and c) decisions by city and local governments.

a. The Business Sector

The “real” economy, the one where businesses manufacture and sell goods and services, will predictably turn out to be the next victim of the financial crisis. Whatever governments do for the banks, credit will be a lot harder for companies to obtain from banks for years to come. Once a domino effect plays out in the real economy, when a chain of bankruptcies is started with all its effects on unemployment and other social problems, it is even harder to stop than the dominos in the banking system. Hoping that governments will be in a position to save even important businesses after having born the cost of bailing out the banks, is futile. However, there is something that companies can do themselves to avoid the worst aspects of this problem.

Another Story

Once upon a time, during a crisis similar to the one we have now started living, sixteen businessmen got together to decide what they could do among themselves. Each had received a notice from their respective banks that their credit line was going to be reduced or eliminated; hence bankruptcy was only a question of time. They realized that business A had needed the bank loan to buy goods from business B, which in turn needed money to buy stuff from its own suppliers. So they decided to create a mutual credit system among themselves, inviting their clients and suppliers to join. When business A buys something from B, A gets a credit and B the corresponding debit. They created their own currency, whose value was identical to the national money, but with the interesting feature that it didn’t bear interest. A debit in this currency needed to be reimbursed with sales to a participant in the network in the same currency.

The country’s banks mounted a massive press campaign to try to squelch this revolutionary idea. Miraculously, that campaign failed, and this little system saved the businesses involved at the time. A cooperative was set up among the users to keep the accounts dealing with that currency. Soon participants could also borrow from that cooperative in that currency at the remarkably low interest rate of 1.5%. All such loans need to be backed by inventory or other assets. Over time, the system grew to include one quarter of all the businesses of the entire country.

Seventy years later, an American professor noticed that that country’s economy was significantly more stable than that of its neighbors, and made an econometric study proving that the secret for the country stability was that strange little unofficial currency that was circulating among businesses in parallel with the national money. Whenever there was a recession, the volume of business in this unofficial currency would expand significantly, thereby reducing the impact on sales and unemployment. Whenever there was a boom, business in national currency boomed, while activity in the unofficial currency proportionally dropped again. The surprising implication of this study was that the spontaneous counter-cyclical behavior of this little system actually helped the central bank of the country in its efforts to stabilize the economy.

This is not a fairy tale, but is also a true story, the one of the WIR system. The country is Switzerland and the sixteen founders met in Zurich in the year 1934. And the system is still operational today. The annual volume of business in the WIR currency is now about \$2 billion per year, and the American professor is James Stodder from Rensselaer University. His

remarkable quantitative study²⁸ uses more than 60 years of high quality data to prove the points made in this story. The WIR system is also now accepting deposits and making loans in both Swiss Francs and WIR.²⁹

We propose that businesses take the initiative of creating such Business-to-Business (B2B) systems at whatever scale makes most sense to them. The big advantage, compared to what happened in Switzerland, is that with what is available with today's information technologies, setting up such a system can be achieved in a fraction of the time of what happened in the 1930s. And, timeliness is going to be critical if one wants to avoid the social and economic ravages that will be unleashed by the unraveling of complex business supply chains. In the U.S., a nation-wide system would be justified. In Europe, ideally, such a system should be conceived to be able to operate at the European level. Otherwise, we are going to see a lot of the economic gains achieved by European integration go to naught over the next decade.

There is one more thing that the businesses who get involved in such systems should consider doing: lobbying their respective governments to have them accept this currency temporarily, in partial payment of business taxes. This could apply only temporarily, i.e. for the period during which the banking system will not be in a position to fulfill its traditional role of financing the real economy to the extent that is necessary. Partial payment of taxes – it could be as little as 10 or 20% - would be the most effective incentive that governments could provide to accelerate the widespread acceptance of this currency. The lobbyists have a simple but powerful argument: governments have just spent trillions of taxpayers money to save the banking system, in the hope that this would avoid that the rot spreads to other businesses. The strategy proposed here doesn't cost the government any money, will actually increase tax revenue, and is the best systemic way to avoid that the rot will spread anyway, whatever they do to help the banks.

b. National Governments

When everything is said and done, governments will not be willing or able to force banks to lend out to the real economy, anymore than you can push on a string. Therefore, in addition and parallel to accepting the usual bank-debt conventional money, during the transition period — until the banking system has recovered fully enough to play its traditional role — accepting some complementary currency for payment of taxes makes a lot of sense. Which currencies should be acceptable for payment of what types of taxes is a political question that remains open for each government to decide.

As stated above, by accepting this currency in partial payment in taxes, the government provides a powerful incentive for businesses and people to accept this currency. Governments should probably not get involved in creating or managing such systems. Their role should be to assess and determine the criteria of quality and reliability that makes the currency qualify for acceptance by the government. They also have a built-in interest in receiving payments in a robust currency. It is obvious that the existence of such a currency facilitates exchanges that otherwise wouldn't happen, while conventional money or credit are difficult to obtain. These additional exchanges, in turn, increase the taxable income of the businesses involved, thereby starting a virtuous loop that counteracts the credit reductions by the bank.

²⁸ James Stodder, "Reciprocal Exchange Networks: Implications for Macroeconomic Stability". Albuquerque, New Mexico: Paper presented at the International Electronic and Electrical Engineering (IEEE) Engineering Management Society (EMS) August 2000,

²⁹ www.WIR.ch and http://en.wikipedia.org/wiki/WIR_Bank

There are two ways for a governmental entity to decide what percentage of taxes could be payable in complementary currency. The first one is to determine how much that entity purchases from the business sector. For instance, if 20% of the budget is for purchases from a specific group of corporations, it could make sense to accept up to 20% of payment in the currency of that specific group. Another approach is to levy taxes from a business in proportion to the volume of business that it realizes in that currency. In other words, all dollar sales are taxable in dollars, and all sales in complementary currency are payable in the corresponding complementary currency. For example, if a company does 10% of its business in complementary currency, the taxes would be payable in that currency in the same proportion.

This strategy will increase taxable income to governments at different levels, particularly during a recession when such taxable income will dwindle. When people and businesses are strangled by lack of money, taxable income is automatically squeezed as well. By accepting some payments in currencies other than bank debt money, by definition more governmental income is possible. This isn't theory. For instance, during the crisis of the Rubble of the late 1990s, the Russian government accepted corporate taxes paid in copper in payment of taxes. What we propose is a lot less extreme: complementary currencies are a standardized medium of exchange which governments can spend to provide services in the locations and communities that accept the complementary currency.

One important decision for national governments will be to allow cities and local governments to choose the complementary currency that they are interested in encouraging by accepting in payment of the city or state taxes. Why this is important is explained next.

c. *The Cities and Local Governments*

There are two reasons why we recommend to allow cities and local governments choose their own complementary currencies to implement this strategy. First, cities and local governments will be the first governmental entities to get into still deeper trouble than they are today; and second, given that this approach is radically new, it is simply safer to test out a new system as a pilot at a city or local level, rather than directly on a large scale at the national level.

Indeed, cities and other local government entities will find themselves in the first line to bear the brunt of the social effects of the looming recession, while at the same time they will see their tax revenue shrink, and conventional financing through debt become much harder to obtain. This kind of problem is not going to be limited only to the US. The London-based *Observer* asks "What could possibly come along in the middle of this series of economic nightmares to make things even worse? How about a total depletion of local government finances that pay for the things that make up the very fabric of American society. Imagine that rippling across the rest of the world, reducing public services to skeleton operations... 'What is most disconcerting about the way this turmoil is panning out,' says Sujit Canagaretna, senior fiscal analyst at the Council of State Governments (CSG), 'is that most state governments were already in a terrible state. But now things have worsened considerably and the credit markets have a real choke hold on almost all state treasuries. It is so bad that economic activity in most states has all but ground to a halt.' ... As the spectre of a long and painful recession looms ever larger across the globe, it is troubling to note that these dual problems facing governments

across America - falling tax revenue and reduced access to debt - are universal. Brace yourselves for another great American export."³⁰

The second argument is that some diversity in experimenting with a strategy that is new can only be beneficial to all concerned. If specific issues are considered a political priority, other types of complementary currencies than the B2B one we described above could be considered as well. For instance, if carbon reduction is considered an important priority, a carbon reduction currency program could be launched and accepted in partial payment in taxes. Some applications of the eco-money programs in Japan are precedents that are relevant in this domain. Similarly, local or regional taxes could be paid partially in conventional money, and partially in regional currencies.³¹ Or international businesses could pay some of their taxes in Terras, a proposal for a global commercial currency which is fully backed by a basket of commodities.³² In short, a whole new set of tools to create incentives for specific behavior patterns, either corporate or individual, is now available, and in most cases have already been tested somewhere in the world.³³

d. Some Pragmatic Considerations

The speed at which the pragmatic application of this strategy is greatly facilitated in our times, thanks to the availability of various softwares to manage complementary currency, and the Internet as a communication tool. For instance, the WIR cooperative which we talked about above has a large scale system operational in Switzerland in four languages, which can deal simultaneously with national money and WIR. There are also several other fully operational softwares available for specific complementary currency applications.

It would be a good idea to consider particularly open source software for use in this case, as this would provide the flexibility to add new functions, or new currencies on the same smart card, without having to wait for the propriety software developers to catch up with their backlog. For instance, the Strohalm Foundation in the Netherlands has an open source software for mutual credit systems used for social purpose applications, which is already in operation in various countries. Similarly, the European Union has funded in cooperation with the French government the development of the SOL system using three different types of complementary currencies on the same smart card.³⁴ This application is currently in pilot test phase in five different regions in France, and could easily be expanded for additional languages, and a fourth currency application for the B2B currency that is described here.

³⁰ James Doran: "America's Latest Export: Empty Municipal Coffers" *The Observer* October 12, 2008 pg 8.

³¹ This strategy is explained in Bernard Lietaer *Pour une Europe des Régions: les Regios, compléments nécessaires à l'Euro* (Paris: Fondation Mayer, 2008).

³² See www.terrairc.org for technical details.

³³ See Bernard Lietaer *The Future of Money: Creating New Wealth, Work and a Wiser World* (London: Century, 2001) and *Of Human Wealth: New Currencies for a New World* (Boulder, CO: Citerra Press, forthcoming 2008).

³⁴

Obviously, implementing a strategy of this nature should be done in careful steps, starting with pilot application on a limited scale. A European wide project, for instance, should be started with a cooperative venture on a smaller scale.

e. Answering Some Objections

There will predictably be a theoretical economic objection to the proposal made here: a multiple currency approach is less efficient in terms of the price formation and exchanges. This objection is valid. However, we have shown elsewhere³⁵, including in a peer-reviewed paper³⁶ that over-emphasis on efficiency is in fact the systemic cause of the brittleness of any complex system, including the financial system. Such brittleness has been demonstrated spectacularly during the global banking crisis, but the World Bank had identified before this one, no less than 96 banking crashes and 176 monetary crisis affecting 130 countries over a 25 year period. Therefore, our proposal provides a *systemic* solution to the instability of the monetary system, something which the current approaches are not even trying to achieve. Systemic solutions are the only ones that will avoid having to go through the same type of problem repeatedly in the future.

Finally, for the banking system itself, our proposal involves only temporarily giving up the monopoly of issuing legal tender, a much less drastic compromise than losing, for instance, the right for issuing legal tender altogether, or of a nationalization. Furthermore, as stated above, the example of the WIR complementary currency systems has proven to be a key factor in fostering the proverbial stability of the Swiss economy, which is helpful also to a banking system's portfolios.

f. Some Advantages of the Proposed Approach

This multi-scale multi-stakeholder strategy has a number of advantages for the different parties involved, particularly during the transition period that we now have entered.

- This approach will avoid or reduce the strangulation of the real economy by the banking credit contraction that unquestionably is going to occur.
- The decision that governments should take – accepting partial payment of taxes in money other than exclusively bank debt money – rests completely within their own political decision power. This strategy is also very flexible: a government can decide to accept payment of certain taxes only, only for a given percentage, for specific types of complementary currencies chosen to be robust and have other positive effects, and/or only for specific periods.

³⁵ Bernard Lietaer, with Robert Ulanowicz and Sally Goerner: “*Options for Managing Systemic Banking Crises*” Working Paper October 2008.

³⁶ See Robert Ulanowicz, Sally Goerner, Bernard Lietaer and Rocio Gomez “Quantifying Sustainability: Efficiency, Resilience and the Return of Information Theory” *Journal of Ecological Complexity* forthcoming 2008.

- Complementary currencies have proven a useful tool for enabling the design of incentive schemes in a wide variety of domains, regardless whether there is a crisis or not. The evidence for this can be found in a number of publications.³⁷
- Until now, taxes are payable only in “legal tender” which means conventional bank-debt money. Any currency is an incentive scheme, and our current way of dealing with taxes and subsidies is limited to the single instrument of national money. With complementary currencies, a whole additional array of options become available, which can focus on - and fine tune precisely - the objectives that one wants to reach. We can, therefore, tailor the complementary currencies accepted for payments of taxes to the massive challenges faced around the world currently.
- Perhaps most importantly: this strategy will avoid repeating the worst part of the 1930s scenario where a Second Wave strangulation was left to play out fully, which resulted in massive bankruptcies in the productive economy, intolerably high unemployment and untold suffering, and a toxic political fallout that has proven a dangerous mess to disentangle when started. Hjalmar Schacht, Hitler’s central banker, pointed out correctly that the electoral popularity of Nazism was directly due to mass “despair and unemployment”...

VII. Conclusion: Synthetic Table of the Options

The following table summarizes the implication of each of the five approaches to any large scale systemic banking crisis, as described here.

Those implications are different for different actors. The following points of view are considered: the impact on bankers; on taxpayers and central governments; on local governments; on the 2d wave effects, and on the systemic cause.

The different icons represent:



Degree of problem or dislike



Degree of solution or preference



Unaddressed, not dealt with in any way.

³⁷ See for instance: Edgar Cahn *No more Throwaway People* (Washington: Time Banks USA, 2004); Deirdre Kent *healthy Money, Healthy Planet: Developing Sustainability through new money systems* (New Zealand: Craig Potton Publishing, 2005); Ellen Hodgson Brown *The Web of Debt* (Baton Rouge, Louisiana, 2007); Lietaer, Bernard *The Future of Money* (London, Random House, 2001); and Lietaer, Bernard & Belgin, Stephen *Of Human Wealth: New Currencies for a New World* (Citerra Press, forthcoming 2008); Greco, T. *Money: Understanding & Creating Alternatives to Legal Tender* Vermont: 2003; Cahn, E. *No More Throwaway People*; Cahn, E. & Rowe J. *Time Dollars*.

Options for Managing a Systemic Banking Crisis

Approach	Bankers	Taxpayers/ Central Governments	Local Governments	2d Wave	Systemic Cause
DO NOTHING 1929-1932	 disaster	 disaster	 disaster	 disaster	 Unaddressed
Conventional Nationalizing Problem Assets	 Preferred	 Most Expensive (no leverage)	 Unaddressed	 delayed	 Unaddressed
Nationalizing Banks	 Equity Dilution	 10x leverage	 Unaddressed	 delayed	 Unaddressed
Unconventional Nationalizing Money Creation	 End of current business model	 LT solution (but inflation?)	 Unaddressed	 Governments spend money into existence	 Unaddressed
Complementary Currencies	 End of <i>monopoly</i> of money creation	 LT solution	 LT & ST solution	 LT & ST solution	 Systemic Solution

Abridged Bio of the Author

Bernard Lietaer has been active in the domain of money systems for a period of 30 years in an unusual variety of functions. While at the Central Bank in Belgium he co-designed and implemented the convergence mechanism (ECU) to the single European currency system. During that period, he also served as President of Belgium's Electronic Payment System. His consultant experience in monetary aspects on four continents ranges from multinational corporations to developing countries. He was General Manager, Co-Founder and Chief Currency Trader for the Gaia Hedge Funds, one of the world's largest off-shore trading funds during which time *Business Week* identified him as "the world's top currency trader" in 1992. He is the author of fourteen books, written in five languages, including *The Future of Money* translated in 18 languages. More information is available on www.lietaer.com

Some Related Litterature

- Atlan, H. 1974. On a formal definition of organization. *J. theor. Biol.* 45:295- 304.
- Bank of International Settlements (BIS) 2005 *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity 2008 - Final Results* . Washington, DC.
- Bateson, G. 1972. *Steps to an Ecology of Mind*. Ballantine Books, New York .
- Cvitanovic P. *Introduction to Universality in Chaos*. Bristol, UK: Adam Hilger p. 11.
- Daly, H. E. and Cobb, J. B. 1989. *For the Common Good* Beacon Press, Boston.
- Frankel J. & Rose, A. 1996. "Currency Crashes in Emerging Markets: an Empirical Treatment" *Journal of International Economics* Vol. 4, pgs 351-366.
- Goerner, S., 1999. *After the Clockwork Universe: the Emerging Science and Culture of Integral Society*. Floris Books, Edinburgh, UK pg 135.
- Holling, C.S. 1986. The resilience of terrestrial ecosystems: local surprise and global change. pp. 292-317. In: (W.C. Clark, and R.E. Munn, Eds.). *Sustainable Develoment of the Biosphere*. Cambridge University Press, Cambridge, UK.
- Jolly, A. 2006. A Global Vision. *Nature* 443:148.
- Kaminsky, G. & Reinhart, C. 1999 "The Twin Crisis: the Causes of Banking and Balance of Payment Problems" *American Economic Review*, Vol. 89, #3, pgs 473-500.
- Lietaer, B. 2001. *The Future of Money*. Century, London. 371p.
- Lietaer, B. 2008 forthcoming. *Of Human Wealth: New Currencies for a New World* Citerra Press. Boulder, CO.
- Meadows, D.H. et al 1972. *Limits to Growth* Potomac Associates, Washington
- OECD 2000. *Towards Sustainable Development* Organization for Economic Cooperation and Development. Paris
- Pimm, S.L. 1982. *Foodwebs*. Chapman and Hall, London. 219p.
- Pimm, S.L. and Lawton, J.H. 1977. Number of trophic levels in ecological communities. *Nature* 268:329-331.
- Rutledge, R. W., B. L. Basorre, and R. J. Mulholland. 1976. Ecological stability: an information theory viewpoint. *J. theor. Biol.* 57:355-371.
- Shannon, C.E. 1948. A mathematical theory of communication. *Bell System Tech. J.* 27:379-423.
- Tibbs, H. 1999. Report for the Global Business Network 'Sustainability' . *Deeper News* Vol. 3, #1, January 1999.
- Tilman, D., Wedin, D., and Knops, J. 1996. Productivity and sustainability influenced by biodiversity in grassland ecosystems. *Nature* 379:718-720.
- Tribus, M., and E. C. McIrvine. 1971. Energy and information. *Sci. Am.* 225(3):179-188.
- Ulanowicz, R.E. 1980. An hypothesis on the development of natural communities. *J. theor. Biol.* 85:223-245.
- Ulanowicz, R.E. 1986. *Growth & Development: Ecosystems Phenomenology*. Springer-Verlag, NY. 203 p.
- Ulanowicz, R.E. 1997. *Ecology, the Ascendent Perspective*. Columbia University Press, NY. 201p.
- Ulanowicz, R.E. 2002. Information theory in ecology. *Computers and Chemistry* 25:393-399.
- Ulanowicz, R.E. In review. *A Third Window: Natural Foundations for Life*. Oxford University Press, New York.
- Ulanowicz, R.E. and J.S. Norden. 1990. Symmetrical overhead in flow networks. *Int. J. Systems Sci.* 1:429-437.
- Ulanowicz, R.E., Bondavalli, C. and Egnotovitch, M.S. 1996. *Network Analysis of Trophic Dynamics in South Florida Ecosystems, FY 96: The Cypress Wetland Ecosystem*. Annual

- Report to the United States Geological Service Biological Resources Division University of Miami Coral Gables, FL 33124.
- Vaz, N. M., and Carvalho, C. R. 1994. Assimilation, tolerance and the end of innocence. *Ciênc. cult.* (São Paulo) 46(5/6):351-357.
- Wagensberg, J., Garcia, A., and Sole, R.V. 1990. Connectivity and information transfer in flow networks: two magic numbers in ecology? *Bull. Math. Biol.* 52:733-740.
- WCED 1987 (World Commission for Cooperation and Economic Development). *Our Common Future* Oxford University Press, Oxford, UK.
- Wilhelm, T. 2003. An elementary dynamic model for non-binary food-webs. *Ecol. Modelling* 168:145-152.
- World Bank 1996. Caprio and Klingelbiel. Bank Insolvencies: Cross Country Experience. *Policy Research Working Papers #1620*. Washington DC: World Bank, Policy and Research Department.
- Zorach, A.C. and R.E. Ulanowicz. 2003. Quantifying the complexity of flow networks: How many roles are there? *Complexity* 8(3):68-76.