

Chapter 2

Economic Instability: Ongoing Causes

But what do they know (referring to big bankers and Wall Street executives)?
The answer, as far as I can tell, is: not much.

Paul Krugman, economics *Nobel laureate*, January 15, 2010

I am writing this chapter¹ a year to two years after the “great economic meltdown of 2008.” In 2008 I would not have thought it necessary to write this chapter, especially in the elementary form it has taken. However, over two years have passed, the “recession has been declared over²”; federal legislation has become law which claims to reform the U.S. financial system;³ yet basic flaws at the heart of the crisis have not been honestly addressed by the people entrusted by society with the power to do so, e.g., our government and our financial industry. Some of these flaws are most easily described using mathematics, and it is on these aspects of the crisis I will concentrate. The good news is that given the immensity of the problems being discussed, the mathematical structures involved are very simple! The bad news is that this chapter is likely to remain timely for a long time to come. In any event, the mathematical structures I am about to discuss which have economic importance are timeless.

¹A preliminary version of this chapter was delivered as a paper at a Cambridge University, U.K., conference in August 2009. This paper was published as part of the conference proceedings; see “One Mathematical Perspective of Economics, Ecology and Society: Some Natural Necessities in Elementary Interdisciplinary Mathematical Education,” *The International Journal of Science in Society*, Volume 1, Issue 2, November 2009, pp.111-120; <http://ijy.cgpublisher.com/product/pub.187/prod.25>.

²For example, it was widely reported in September 2010 that the National Bureau of Economic Research declared the 18 month recession had ended in June 2009.

³For example, see the “Restoring American Financial Stability Act of 2010.”

2.1 Necessary Conditions for Economic Success

We will be tossing some very large numbers of dollars around, so let's begin by getting an intuitive grasp of how large these numbers are. If you need a refresher on how to write 1 million and so on mathematically, see page 59.

Exercise 2.1 Millions, Billions, Trillions

- (i) Is a million seconds longer or shorter than one year? If shorter, what fraction of a year is it?
- (ii) How many years is a billion seconds? If you expressed your answer to part (i) in decimal form, what is the easiest way to do this exercise using part (i)? Hint: A billion is one thousand times a million.
- (iii) How many years is a trillion seconds? Again, what is the easiest way to do this exercise using part (ii)?
- (iv) To simplify the math, suppose a large number of people earn \$10 per hour. How long would it take one person at that wage rate to earn a trillion dollars? How many people would have to work for one year at that wage rate to earn a trillion dollars? Assume an eight hour day, five day work week, with two weeks off for vacation (hopefully). (Approximately what fraction of the adult working population of the United States is this number of people?) At the time you read this is the U.S. federal minimum hourly wage more or less than \$10? On the day I wrote this, my state of Colorado just *reduced* its minimum wage to \$7.24 per hour.

There are two words in mathematics with very special and important uses: *necessary* and *sufficient*. Let's take a look at how mathematicians use these terms; for that's how they will be used in this book.

Exercise 2.2 The Concepts of Necessary and Sufficient.

- (i) These two concepts are in some sense part of the logical notion of *implication* used in mathematics. "A implies B" is often written " $A \implies B$." This means that *if* A is true (if A "happens"), *then* B is true (then B "happens"). If it is true that $A \implies B$, then we say that the truth of B is a necessary condition for the truth of A. In order for A to "happen" it is necessary that B "happen." Think about the following way of saying this which it turns out is logically equivalent: If B is not true (if B does not "happen"), then A is not true (then A does not "happen"). The following is a true statement in the real world (so far anyway): If a chicken lays an egg, then the chicken is a hen, i.e., a female chicken. Thus it is necessary for a chicken to be female in order for it to lay an egg. Can you think of other such examples of "B is necessary for A"?
- (ii) If it is true that $A \implies B$, then we say that A is sufficient for B, i.e., in order for B to be true (for B to "happen"), it is sufficient for A to be true (for A to "happen"). Said another way, if A "happens" then B will definitely "happen." Thus, if a chicken lays an egg, then the chicken is a hen; we have that for a chicken to be a hen it is sufficient to know that the chicken has laid an egg! Can you think of other examples? Hint: look at the examples you came up with in part (i).

Here are four conditions I propose are necessary for a stable economy, i.e., one that reliably works for us for extended periods of time, say, for several generations. They all involve *feedback*, or said another way: mechanisms of *accountability*.

(1) There must be a *transparent* and *honest* evaluation of the *risk*⁴ of any financial transaction. All parties to a transaction should understand it. All parties affected by a transaction should have a representative involved who understands it and can communicate that knowledge to those potentially affected. A regulatory framework (such as existed for about 70 years, characterized by laws such as the Glass-Steagall Act – see Section 2.3.⁵) should always be in place and enforced! This regulatory framework needs to be updated to deal with all financial institutions, including “shadow banks,” hedge funds and the like. Gambling (see Section 2.3), whether in the form of “credit default swaps,” “derivatives,” or any other form, when not outlawed outright, needs to be clearly defined, regulated, and isolated from non-gambling financial activities, also carefully defined. A Tobin tax on financial transactions should be considered, as was originally proposed for currency markets by Nobel laureate, James Tobin. A mechanism should be developed which favors the economically and socially productive functions of financial institutions (such as raising capital to finance innovation, job-creating businesses, loans for shelter, and so on) over financial activities which are, mathematically speaking, games of chance.

(2) We must reinstate laws against *usury*, i.e., there must be legal caps on the amount of interest that can be charged for a monetary loan.

(3) To the extent possible and reasonable, *decision making* processes should be *distributed*.⁶ In any event, we should not easily allow major decisions that affect us all to be made by very few, especially when (1) and (2) are not operating. Corporations “too big to fail,” which concentrate decision-making and political power of global impact in the hands of a few, should be declared economically and socially too potentially dangerously disruptive to exist. Rules for redistributing them into more manageable entities should be enforced.

(4) Any financial operation or collection of operations that is mathematically similar to a Ponzi scheme should be illegal – just as actual Ponzi schemes are. (See the next section.) Barring a legal ban, when inevitable failure ensues Ponzi-like operations shall not be “bailed out” at the public’s expense, i.e., taxpayers’ expense.

At this moment, say, some expert can declare this whole discussion nonsense by saying: Our economy works fine right now and none of the four so-called

⁴The concept of risk is essentially a mathematical one related to the probability or chance of failure. We will discuss probabilities briefly in VI.

⁵Briefly, the Glass-Steagall Act legally separated low risk financial activities from higher risk ones. For example, money put into a simple interest bearing savings account at a bank could not be comingled with activities in the stock market or other speculation. Similarly, the insurance industry is based on very solid actuarial mathematics, and money in this sector was insulated from banking and stock market sectors.

⁶True democracies usually exhibit, perhaps indirectly, this form of decision making via a voting process, cf., Chapter 24.

necessary conditions hold! To such an expert I have only two words: Just wait.

Exercise 2.3 Financial Reform: How Much?

In mid 2010 a legislative package was passed by the U.S. Congress which was touted as the most sweeping financial reform in the United States since the 1930s, cf., for example, the Glass-Steagall Act of 1933.

- (i) Compare the financial sector of the U.S. economy *before* the meltdown of 2008 and *after* the 2010 financial reform. Did the financial sector emerge from 2010 more or less concentrated than it was prior to 2008?
- (ii) To what extent does the reform of 2010 address the four necessary conditions above? In particular, what principles of the Glass-Steagall Act were reinstated, which were not?
- (iii) What aspects of 2010 reform are considered “pro-consumer”? What aspects are considered “pro-Wall Street”?
- (iv) To what extent are whistleblowers within the financial industry (or elsewhere for that matter) protected against retaliation if their claims are true? See Exercise 2.6.

The above list of four conditions is clearly not sufficient to guarantee a stable economy. We need to work together in some sort of self-organizing system to come up with such a list. The underlying mathematics of these four “principles” acts inexorably, whether we take the time to understand or not. So let’s study them at least briefly. I believe that the greater the number of citizens who understand the simple mathematics involved in “what is going on” with the financial sector of the economy the greater our chances for financial stability.

2.2 The Mathematical Structure of Ponzi Schemes

If you can multiply by 1.1 or 1.2 or 1.5, for example, you can understand Ponzi schemes, named after Charles Ponzi (1882–1949) who was not the first but one of the most famous practitioners of this particular form of fraud. In the early 20th century he offered his clients a 50% profit (or return) on certain “investments” within 45 days, or 100% within 90 days.

Exercise 2.4 Geometric Ponzi Math

- (i) If you invested \$100 with Ponzi, how much total money does he claim you will have in 45 days? The answer is \$100 plus 50% of \$100. How much is that?
- (ii) Is your answer to (i) the same as $1.5 * \$100$?
- (iii) If you invest \$100 how much does Ponzi promise the total value of your investment will be in 90 days?
- (iv) Suppose you invest \$100 and in 45 days you actually have $1.5 * \$100$, which you then reinvest with Ponzi for 45 days more. How much does Ponzi claim your total investment is worth now? Is your answer to (iv) greater, less than, or equal to your answer in (iii)?

The next crucial step in a Ponzi scheme is for you to “tell your friends” what a great deal you just got. In other words, by some mechanism a new group of investors needs to be recruited – and then another new group is

recruited after that, and so on. This is very much like a “chain letter” which arrives in your e-mail, convincing you to send in \$1 and asking you to resend the letter to 10 of your friends. For each friend that sends in \$1, you will get 15 cents. If all goes according to plan, you will have \$1.50 after this round of the Ponzi scheme – and the person who started it will have your \$1 plus \$10 less the \$1.50 rebated to you – if indeed the rebate is sent. Remember, you are dealing with Ponzi the crook. For this scheme to work, you need lots of gullible investors brought in one “layer” at a time, each layer larger than the layer that went before. In our chain letter example, each layer is 10 times larger than the previous layer, building a *pyramid* of investors. For this reason, Ponzi schemes are often called pyramid schemes. For the scheme to work Ponzi must strike a delicate balance among: (1) paying himself or herself, and (2) paying out enough to investors to keep them convinced the system is legit and keep them recruiting new investors, and (3) getting caught by authorities – or the inexorable march of mathematics, which we look at in the following exercise.

Exercise 2.5 An Ideal Pyramid Scheme

(i) Ponzi is level 0 and recruits 10 investors in level 1 to send him \$1. At this point how much money lies in level 0? level 1? Assume that for each investor in level 1 \$1 is their entire life savings/worth.

(ii) For each investor in level 1, 10 investors in level 2 are recruited, by some means. Each level 2 investor sends in \$1 (still assume here and throughout that this is their life savings) to Ponzi, who rebates \$.15 of each dollar to the corresponding recruiter from level 1. Of course, if a level 2 investor is recruited by Ponzi himself, or hears about the great deal without being recruited, Ponzi can keep the \$.15 as well. How much money (minimum) does Ponzi have at this point, and how many investors are there?

(iii) Repeat, with each investor at level 2 somehow recruiting 10 investors at level 3, each of which sends in \$1 to Ponzi, who rebates \$.15 of each such dollar to a level 2 investor. How much money does Ponzi have now? How many investors are there total?

(iv) How many levels have to be introduced before the total number of investors is greater than the entire human population of the earth? Just before that happens, how much money does Ponzi have?

Of course, in the real world the ideal Ponzi pyramid will have variations; but no matter how complex or convoluted, every Ponzi scheme exhibits *growth of prodigious proportions*.

American financier, Bernard Madoff, one-time chair of the NASDAQ stock exchange, was able to run a Ponzi scheme for 15 possibly 20 or more years without interruption. He was eventually caught and sentenced to 150 years in prison on June 29, 2009. Upon his arrest \$65 billion dollars was missing in his clients’ accounts, and at least \$18 billion of investors’ initial capital was missing. The Madoff example is instructive in many ways.

Madoff was able to get away with this fraud because of his social position and connections, his impeccable reputation, investors who believed, and the extremely lax oversight of such bodies as the SEC, Securities and Exchange Commission, which was created in 1934 to enforce federal securities laws and regulate the securities industry. In addition, Madoff’s activities, being totally

illegal, also fell under the jurisdiction of the FBI, the Federal Bureau of Investigation. But in 2001, the division of the FBI that deals with white-collar crime was weakened by the transfer of (and never replaced as of 2009) 500 agents to “anti-terrorism,” i.e., Homeland Security. Note that even in prosperous times annual losses due to ordinary white-collar crimes are far, far greater than losses due to ordinary property crimes, [584, 583].

It turns out that mathematics can play a very interesting role in uncovering securities fraud. For example, the stock market exhibits certain mathematical behaviors that have been studied a great deal. The market does not behave like an interest bearing bank account, especially over a period of years. Yet Madoff offered nearly constant rates of return. He did not even find it necessary to introduce a little “randomness” as a disguise. Hundreds probably knew, e.g., no large Wall Street institution “invested” with Madoff; but financial analyst, Harry Markopolos, tried to act. He said: “It took me 5 minutes to know that it was a fraud, it took me another almost 4 hours of mathematical modeling to prove that it was fraud.” He went to the Security and Exchange Commission in: May 2000; Oct. 2001; Oct., Nov., Dec. 2005; June 2007 and April 2008, without result.⁷ As this and the surfacing of the many “Mini-Madoffs” reveals,⁸ the watchdogs were asleep – mathematically and otherwise. Madoff might have gone on for a few more years if the downturn in the economy had not led a number of his clients to ask for their money simultaneously – with no new “investors” to cover the scheme. Every Ponzi scheme ends badly for some, it is mathematically guaranteed.

Exercise 2.6 Whistleblowing and Other Forms of Feedback.

(i) I define a *whistleblower* as one who speaks truth (about and) to the powerful. (As opposed to a *snitch* who speaks truth or falsehoods to the powerful about those less powerful.) Whistleblowers often provide an essential form of feedback about system function, in this case, about the functioning of our financial system. Research what happened to whistleblowers in the financial industry during the lead up to and during the meltdown in the first decade of the 21st century. You can start with [320], or Michael Hudson’s articles on “Silencing the Whistleblowers,” posted on May 9 and May 13, 2010 at www.thebigmoney.com. See also interviews with Michael Hudson and Ed Parker, a former mortgage fraud investigator, www.democracynow.org (May 20, 2010).

(ii) Ratings agencies, such as Standard & Poor’s, Moody’s and Fitch are supposed to give accurate assessments of the risk associated with financial instruments that they rate. How did they do in the first decade of the 21st century?

(ii) The Security and Exchange Commission (SEC) is supposed to regulate Wall Street and financial activities therein. How did they do in the first decade of the 21st century? For example, if they did not act on Markopolos’ mathematical proof of impropriety, did they act on anything less obvious?

(iv) What is the role of the Federal Reserve regarding America’s financial industry. Though it is really a private entity, despite the name, which operates in secret, looking back at the first decade of the 21st century, how was their performance?

⁷Harry Markopolos, *interview*, “The Man Who Figured Out Madoff’s Scheme,” CBS 60 Minutes, <http://www.cbsnews.com>, March 1, 2009.

⁸See pages B1 and B4, Leslie Wayne, “The Mini-Madoffs,” *The New York Times*, January 28, 2009

2.3 Dishonest Assessment of Risk

A little history goes a long way in understanding the economic instability of recent times, which is a recurring pattern! I claim that a way to stop this recurring pattern, which I am about to discuss, is for a politically effective number of people to educate themselves just a little bit about the mathematical notion of *risk*, and then act when necessary. Thus, every citizen should be able to detect whether a financial transaction is: very risky (a Ponzi scheme, gambling, a combination of a Ponzi scheme and gambling in disguise); an investment with reasonable risk; or a more stable financial activity such as an interest bearing savings account or an insurance policy based on solid actuarial mathematical models. This task has recently become more difficult, so I suggest adopting the principle of *caveat emptor*. Assume you are being lied to until proven otherwise. Your life savings may be in the balance.

In April of 1998 Citicorp, i.e., Citibank, merged with Travelers Insurance Company, and I had a modest retirement account with Travelers at the time. This merger was illegal, violating the Glass-Steagall Act of 1933, but regulators gave them a technical exemption for two years. During the Great Depression of the 1930s firewalls, such as Glass-Steagall, were erected between “gambling,” e.g., the stock market/speculation, and banking activities like checking and savings. Actuarially based insurance activities were similarly isolated from speculation. An expensive campaign (which continues, for example, \$5.1 billion was spent by Wall Street in Washington D.C. on lobbying and campaign contributions from 1998–2008) was launched to make the Citicorp-Travelers merger legal, culminating in the passage of the Gramm-Leach-Bliley Act (November 1999), which set off a wave of mergers among banks, securities and insurance companies. (Then Senator Phil Gramm from Texas was instrumental in the repeal of Glass-Steagall and other regulatory legislation.) Financial collapse was predictable; in fact, at least as far back as 1966,⁹ economist John Kenneth Galbraith said:

The financial bubbles that led to the Depression will return as soon as America is led by politicians who didn't live through it. Capitalism has no permanent memories, but one of its permanent vices is gambling with other people's money. So a post-Depression generation politics will dismantle the safeguards the New Deal put in place, and another financial collapse will then be inevitable.

I moved my retirement account. For more relevant data see [210, 715, 716].

Exercise 2.7 Are Financial Bubbles Created?

(i) I will define an economic or financial bubble to be a period of economic trading in ever increasing volume of an entity at ever increasing prices not based on the intrinsic value of that entity. I want you to look up, at least briefly, at least 10 financial bubbles, cf.,

⁹Carl Pope, “Some Questions on the Bailout,” www.huffingtonpost.com, September 22, 2008.

[350, 48, 79]. I will start you out by listing a few: Tulip mania (about 1637); South Sea Company bubble (1720); Railway mania (1840s); American economic bubble of the 1920s; dot-com bubble (1995-2000); U.S. housing bubble (ending in 2008). Bubbles, it turns out, are very common. Why do you think this is?

- (ii) Do all of these, and other bubbles, manifest relatively rapid growth?
- (iii) Are bubbles just examples of self-organizing systems? Are bubbles created? Is their formation knowingly facilitated? Pick a bubble and try to decide if it was created, facilitated or just self-organized (or a mixture)?
- (iv) Do bubbles behave mathematically like Ponzi schemes?
- (v) Define *leverage* as making (often risky) investments with borrowed (that is, somebody else's) money. What role did increasing leverage have in the latest financial collapse? (Leverage went from 12:1 up to 30:1 and 40:1 before the collapse of 2008.) In earlier financial collapses? To understand leverage see the section on fractional reserve banking and the exercises therein, cf., page 503.
- (vi) Why do bubbles always burst, i.e., come to an end?
- (vii) Author Edward Abbey said that growth for the sake of growth is the ideology of the cancer cell. A mathematician might say that planning for perpetual (prodigious) growth is one of the mathematical defining properties of a Ponzi scheme. What relevance, if any, do such comments have about "mainstream" economic thinking?
- (viii) In [668], Joseph Stiglitz gives a readable and detailed analysis of the causes (and possible remedies) of the 2008 and beyond meltdown. At the time you read this has there been a credible "counteranalysis" given by those who disagree with Stiglitz?
- (ix) On page 488 there is a footnote that discusses the total value of derivatives (an invented type of financial instrument) in 2001. To wit: "... in 2001 the total value of derivatives contracts traded approached one hundred trillion dollars, which is approximately the value of the total global manufacturing production for the last millennium." Is this an indication of a "Ponzi-like" financial venture?
- (x) Investigate the "food bubble of 2008." You might start with Frederick Kaufman's article in the July 2010 issue of *Harper's Magazine*, "The Food Bubble: How Goldman Sachs and Wall Street Starved Millions and Got Away with It," pp. 27-34. . These activities of Wall Street have direct consequences in the lives of people throughout the world, cf., the food riots of 2008. See also Chapter 5 and Chapter 6, and Exercise 6.7, page 168.

Let's look at the "housing bubble" which burst in 2008, followed by further deflation. How one refers to this bubble provides an interesting lesson in the art of "determining the frame of debate." In a *Columbia Journalism Review* article¹⁰ the use of the two terms "predatory lending" and "subprime lending" are studied in detail. The number of times each term is used each year by "mainstream media" is graphed. Between 2000 and 2004 they are used somewhat equally, neither being used more than 1000 times a year. From 2004 to 2006 usage of subprime gains on usage of predatory, but in 2007 usage of predatory peaked at a little over 1,000 then proceeds to fall, while the usage of subprime exploded to over 75,000 in 2007, falling to 55,800 in 2008. The term predatory conjures up a certain image of the lender, while subprime tends to emphasize the borrower (as being less qualified). I will leave it to the reader to decide which term is most honest. In any event, some lenders have been criminally prosecuted, while most have not. Fooling someone who owns their

¹⁰Elinore Longobardi, How 'Subprime' Killed 'Predatory' and what it tells us about language, business journalism, and the way we think about the economic crisis, *Columbia Journalism Review*, September/October 2009, pp. 45-9.

home into taking out a loan on their house which they cannot repay is not necessarily illegal, but it is a tactic worthy of a Ponzi scheme artist who needs to recruit more “players.”

I recommend the reader study this subject in a great deal more detail than I have room for here, but I would like to quote¹¹ former bank regulator and author, [40], William Black. Black starts out recounting the events/mathematical structure of the Savings and Loan scandal of the 1980s, cf., VII, and then states that the 2008 and on crisis has the same structure: “What happened then was an epidemic of what we call in criminology ‘control fraud.’ And that means what happens when the fraud is led by the person who controls a seemingly legitimate corporation or government agency. In this case, they were savings and loans. And these frauds were growing at an annual rate of over 50 percent. Their weapon of choice is accounting fraud. So it’s real easy. It’s a three-part optimization. First thing you do is grow like crazy, Ponzi-like scheme. Second thing you do is deliberately make really bad loans, because they have a higher interest and higher expenses associated with them, so you report more profits. And the third thing you do is have extraordinary leverage. Leverage is simply lots of debt compared to your equity. And the point of this is, if you do those three things, you are mathematically guaranteed to report not just profits, but record profits. ... At that kind of growth rate, with people concentrating on whatever the optimal area is for the fraud, you produce financial bubbles. In the case of the savings and loan crisis, we re-regulated the industry in the face of opposition from the Reagan administration, the House of Representatives and the Senate. And we looked for the Achilles heel for this kind of scheme, which is growth. And so, we restricted growth. And this kind of fraud also creates a distinctive pattern of operations, and we used that to triage and to go after these institutions while they were still reporting they were the most profitable savings and loans in America. People thought we were crazy, contemporaneously, who were conservative economists. But it turned out we were right about every single one of these institutions. What does it mean for today? The same thing. We have another epidemic of accounting fraud. In this case, it’s not commercial real estate, which it was in the savings and loan crisis. It started out with, in the United States context, with home mortgages.”

Further on in the same interview Black says: “To add to your point about appraisers, the only reason you inflate an appraisal is for fraud. There’s no other purpose in the world. And we have survey information that’s quite good on appraisers. In 2003, 70 percent reported that they had been the subject of an attempt to intimidate them to inflate appraisal values in that year alone. When we did the same survey in 2007, that percentage was up to 90 percent. So we have horrific, endemic fraud, and it’s coming out of the lenders, not the poor people who can’t pay the mortgages. And that is what brought this crisis.”

Derivatives and Gambling. Though not as simple as an ideal Ponzi-pyramid, the housing bubble shares its essential mathematical structure of constant recruiting of players with the infusion of their money. Things broke down when the price of housing started to decline and infusions of fresh cash slowed/stopped.

¹¹The quote is taken from an interview on www.democracynow.org, Oct. 15, 2009

There is an additional elementary mathematical aspect to the crisis of 2008 and on: dishonest evaluation of risk. A number of innovative financial instruments were created such as credit default swaps, derivatives, etc., which in retrospect a lot of people did not understand. True innovation is usually welcome, but a “new” financial instrument that was not an actual investment in, say X, but rather a bet as to whether the price of X would go up or down, is clearly a form of gambling. The gamblers knew what they were doing, however, since they lobbied the passage of the Commodity Futures Modernization Act (of 2000) which exempted derivatives from being regulated as gambling – by state or federal agencies.¹² When insurance giant AIG insured such gambling activities, it surely had abandoned rigorous actuarial mathematics in doing so. The credit rating agencies of up-til-then good repute, such as Standard & Poor’s, Moody’s and Fitch,¹³ that gave AAA-ratings to gambling infused securities (the owners of which paid the rating agencies for doing the rating!) completed the near perfect storm (making profits along the way).¹⁴ Perfection was realized when “educated guesses” were substituted for required data in decent risk models.

So predatory lenders collect commissions on mortgages of questionable value, which are then sliced, diced and bundled and, along with their risk, passed up the financial chain¹⁵ – creating paper profits and real executive bonuses. This behavior dissociates risks and rewards and is destined to fail, and it did!

The response to collapse continued to show willful mathematical ignorance. No less an authority than economics *Nobel laureate*, Joseph Stiglitz points out that Lehman Brothers, the first big casualty, should not have been let go *in toto*. The U.S. treasury secretary should have distinguished between the solid systemically important parts of Lehman and its gambling.¹⁶ The resulting

¹²Ms. Brooksley Born was the head of the Commodity Futures Trading Commission (CFTC) in the late 1990s. When the rather secretive business in over the counter derivatives came to her attention, she studied them and came to the correct conclusion that they needed to be regulated. The then Federal Reserve Chairman, Alan Greenspan, Treasury Secretary Robert Rubin, Assistant Treasury Secretary Larry Summers, and colleagues stopped her efforts and ultimately prevailed on Congress to limit regulation of derivatives, cf., www.pbs.org/frontline/warning.

¹³James Surowiecki, “Ratings Downgrade,” *The New Yorker*, Sept. 28, 2009, p.25

¹⁴Maria Hinojosa, David Brancaccio, *Credit and Credibility*, NOW on PBS, www.pbs.org, week of 12.26.08

¹⁵Interestingly some folks have managed to save their homes from foreclosure by demanding that someone document ownership of the mortgage in question. When such documentation can not be produced, people have sometimes kept their homes, cf., Judge Robert D. Drain, federal bankruptcy court in the Southern District of New York; Judge Arthur Schack of the New York Supreme Court; Judge Randolph Haines, based in Phoenix, a U.S. bankruptcy judge for the District of Arizona. It came to light in Sept. 2010, see “Bank’s Flawed Paperwork Throws Some Foreclosures Into Chaos,” by Gretchen Morgenson, October 4, 2010, The New York Times, p. A1, that the foreclosure processes of the banks were (are?) not only questionable, but in some cases illegal.

¹⁶Joseph Stiglitz, *interview*, “Nobel Prize-Winning Economist Joseph Stiglitz: Obama

widespread fear following the collapse of Lehman, possibly useful to some, was historically predictable. The bailout came.

The number most often associated with the bailout is \$700 billion plus of TARP, Toxic Asset Relief Program, money. Besides the fact that this could just as easily be called the Toxic Liability Relief Program, there are many **trillions** of dollars left out of this picture. Journalist and former managing director at Goldman Sachs, Nomi Prins, has shown that the bailout is at least \$17.5 trillion! (Note: The Special Inspector General set up to oversee the bailout estimates that government agencies, including the Federal Reserve, will ultimately put out more than \$23 trillion in various programs and supports related to the financial crisis. In adjusted dollars, this total is almost three times what was spent on World War II.¹⁷) And it is not clear where a lot of the bailout money is at the moment. If this were widely appreciated, the political consequences would be interesting. All the details can be found in [554, 555]. This is the largest transfer of wealth from the many to the few in world history (so far). By the way, and as an example, over the past 80 years how many times has the United States government engineered rescues of the institution now known as Citigroup?¹⁸

There is likely something powerful going on here with a basis in anthropology and biology, cf., Dunbar Number, Chapter 9. The lessons of the first Great Depression are being ignored. While unemployment remains high, foreclosures mount, as do enormous profits in the financial industry. A political-economic system that does not adequately, honestly regulate (give feedback to) risk and fraud is mathematically questionable. The system must make clear legal distinctions among such activities as fraud, gambling, actuarially-based insurance, and simple savings accounts. Gamblers (which can be mathematically defined) cannot expect and must not be allowed protections from society even remotely similar to those afforded a person with a simple interest-bearing savings account. Bailouts for gamblers will eventually bankrupt the entire system. We must return to the days when it was illegal to gamble with other people's money; otherwise future collapse, to quote John Kenneth Galbraith, is inevitable.

Exercise 2.8 What is Your Family's Share of the Bailout?

If instead of having to pay the bailout, assuming the \$17.5 trillion were equally divided among roughly 300 million Americans, what would be your family's share? What would be that share for \$23 trillion?

Has Confused Saving the Banks with Saving the Bankers," audio archives at <http://www.democracynow.org>, February 25, 2009.

¹⁷ Robert Weissman, "The More Things Change, the More They Stay the Same: One Year Into the Meltdown," *The Progressive Populist*, Vol. 15, No. 18, October 15, 2009.

¹⁸The answer is 4 as of Nov. 1, 2009, cf., Andrew Martin, Gretchen Morgenson, "Can Citigroup Carry Its Own Weight?," *The New York Times*, Sunday Business, November 1, 2009, pp. 1 and 6.

2.4 One Reason Why Usury Should Again Be Illegal

One more mathematically necessary change to heal our economy is this: bring back the laws against usury. In 1950 29.3% of U.S. Gross Domestic Product was due to manufacturing and 10.9% was from financial services. From 1950 to 2005 manufacturing's share gradually dropped to 12.0% while the financial services share rose to 20.4%, [532]. During this same period effective caps on allowable interest rates were removed, allowing financial services to produce – through the miracle of compound interest – much larger percentage profits from other people's debts than say, profits from the manufacture of cars, or just about anything else [219]. Money seeking the highest return on investment thus will tend to expand the financial sector over manufacturing. Capping interest rates is perhaps not sufficient to make most manufacturing competitive with finance again, but it is certainly necessary. (Note that many of the states in the U.S. have laws that would control interest rates, but the financial industry sought and obtained federal legislation that preempts these laws, i.e., the states can no longer regulate the interest rate charged by any institution that has any kind of federal banking connection, which means most of them.)

While not usury, a great deal of innovation went into creating financial instruments, e.g., credit default swaps, derivatives, and others, which were complex enough in details to evade much understanding and regulation, but simple enough in that they involved very high returns while doing little in the way of promoting productive enterprise in the “real economy,” i.e., on “main street.” As an example I cite the March 21, 2010 article in *The New York Times Magazine* by Roger Lowenstein, to wit:

For much of Wall Street, capital-raising is now a side show. At Goldman, trading and investing for the firm's account produced 76 percent of revenue last year. Investment banking, which raises capital for productive enterprise, accounted for a mere 11 percent. Other than that, it could have been a hedge fund.

Amazingly to persons such as I, but not to people inside Wall Street, the following is an example of what can happen and has happened. While a financial institution is brokering a deal with a client, at the same time the same institution *bets against the deal* using, say, derivatives. The short-term profits made possible by the bet usually exceed profits from promoting deals productive from the standpoint of creating jobs and real “stuff.” Thus, for example, money that could have been invested by the financial institution in high speed rail or renewable energy, creating “green” jobs and product, is more profitably employed in making bets. This philosophy is so prevalent that many corporations “hedge bets” on the lives of their employees via *dead peasant* life insurance policies, cf., page 215.

Exercise 2.9 Financial Fallout from Usury and Related High Return Activities

(i) Suppose you have a billion dollars to invest. The automobile company in Detroit will provide 6% return annually if you invest with them. There are limits on how profitable a manufacturing business can be, since they have to deal with many constraints in the real world, not the least of which is the ability of customers to not buy your product. How much money will you have at the end of one year if you invest in the auto company?

(ii) People often find themselves in a position where they must borrow money. In the United States this could happen when a medical emergency occurs and large medical bills must be paid. Also, few people have enough money to pay cash for a house, or a car for that matter. When there are no caps on the amount of interest that can be charged on a loan, it is well possible that you will have to pay 12% annual interest. (In fact, interest rates considerably higher, e.g., 29.99% on credit cards and over 400% on pay day loans, are common as I write.) Suppose the billionaire in part (i) decides to invest his one billion dollars with the financial sector and is promised 12% return annually. How much money does the billionaire make?

(iii) Compare your answers to (i) and (ii) after two consecutive years, then three, then four, finally five consecutive years? Are the answers for part (ii) twice or more than twice the corresponding answers for part (i)?

(iv) Follow up on Lowenstein's observation in his quote immediately before this exercise, cf., for example, [415]. Simply, might it be said that financial institutions have found a way to use their access to money to make more money more rapidly (for themselves) using "innovations" that have had little positive effect on the real economy and the production of jobs? In fact, more money can be made by financial institutions using these "innovations" than can be made performing the traditional functions of raising capital for productive enterprise. Is this prototypical WACU behavior? (WACU refers to the "We Are the Center of the Universe" pattern of behavior, cf., see page 84.) What are the implications for society at large of this behavior? For you in particular?

Exercise 2.10 Everything is Connected

(i) Consider programs such as the WPA, the Work Projects Administration, and the CCC, Civilian Conservation Corps, during the 1930s and more recently the Peace Corps, AmeriCorps. Can you think of a way of "bailing out America" that would save the financial industry, and lower unemployment, i.e., save working people, at the same time? Consider [194], are there many jobs that need to be done to rebuild America's infrastructure? Could we rebuild an electric rail system throughout the U.S.? Could we build an energy infrastructure based on sustainable/renewable energy? Would this create jobs? How much would this cost, compared to, say just a few trillion dollars, cf., \$23 trillion bailout, page 41? What would be the social and economic "return" on such investments?

(ii) At the start of the 21st century China is serving as "the banker" of the U.S. in that it holds over \$800 billion in U.S. debt (as of 2009, and it does this by buying U.S. treasury bills – thus financing the U. S. government). This gives the Chinese considerable political leverage in the world economy, and the U.S. economy in particular. If global warming plays out as expected, over two billion people who are dependent on the glaciers of the Himalayas and the Tibetan plateau for dependable agricultural water will find themselves on the world market buying grains they would have produced themselves had those glaciers not melted. (In 2009 China was the world's leading producer of wheat, India was number two, the U.S. number three.) Thus the Chinese will likely be buying American grain, and the world price for grain will rise. Does this scenario connect Chapter 1 with the this chapter? See [60].

(iii) The following is a quote from George Lakoff: "Right now we have an economic disaster and an ecological disaster upon us, and those two disasters have the same cause: namely, short-term greed combined with a lack of an understanding of systemic risk, of how systems work both in ecology and in the economy. You put those together, and you have the same cause for twin disasters." (www.democracynow.org, Nov. 18, 2009) Discuss.

(iv) From a special report by Greg Palast covering the World Trade Organization (WTO) meeting in Geneva, November 30, 2009, the 10th anniversary of the first global protest against the WTO in Seattle, 1999, we read: "But we got our hands on a document you certainly won't find on the WTO website; something very confidential: a secret demand of

the European Union and the USA, leaning on emerging nations to open their borders to trade in financial derivatives and exotic, even toxic, financial products.”

These unregulated products are precisely at the seismic center of the financial meltdown of 2008 and beyond! It seems to me that it would be wise for the USA and Europe to have never gone down this road, now they are trying to force developing countries into this mess. Further on in Palast’s report we read about what happens if a country decides that they do not want to get involved with derivatives, toxic products etc., viz., they end up paying hefty “fines.”

“The President of Ecuador told me he’d like to get out of the globalization jungle. But if Ecuador dares to bar US banks, the WTO will let the USA stick a tariff onto every banana imported from Ecuador. If the US tallies those bananas, Ecuador’s economy will go splat!”

Who do you think wrote those rules for the WTO? Why? (The Palast report is available at www.democracynow.org, Nov. 30, 2009.) You might find two books of interest in regard to the 1999 WTO protest: *The Battle of the Story of the Battle of Seattle*, by Rebecca Solnit and David Solnit; and the book by Norm Stamper, the Seattle Police Chief during the protests, *Breaking Rank: A Top Cop’s Exposé of the Dark Side of American Policing*.

(v) Research the role of the *Federal Reserve* in the U.S. economy in general and in the bailouts of 2008-9, cf., [258, 554]. Does this institution have immense economic power with minimal accountability? What are its priorities? Did it execute its duties responsibly leading up to the financial crash of 2008?¹⁹ If Congress creates a financial consumer protection agency, why should it be independent as such an agency is in Canada, cf., page 211, and not housed in the the Federal Reserve as proposed in the financial reforms of 2010?

(vi) What are the G8 and the G20? Who created the G20, why, and when? Are meetings of the G8/G20 reminiscent of the 1999 meeting of the WTO (see part (iv) of this Exercise above)?

¹⁹For example, did the head of the New York branch of the Federal Reserve know that Lehman Brothers was “cooking its books” well before 2008?

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