

Very Rough First Draft
Comments Welcome

**The Costs and Contradictions of the Lender-of-Last Resort Function In
Contemporary Capitalism: The Sub-Prime Crisis of 2007 - 2008**

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I. Introduction

The sub-prime crisis and subsequent intervention by central banks, treasuries and other financial regulatory institutions, once again raise a host of issues concerning the role of the *lender-of last resort function* in contemporary capitalism. These questions go way beyond the normal hue and cry – once again rising to fever pitch – about the dangers of moral hazard and the populist claims of tax payer bail-outs of financial fat cats. It goes almost without saying that both of these are true and highly problematic.

More interesting though is the nature and impact of this contemporary system of financial de-regulation and bailout on the evolution of contemporary capitalism. Are these bailouts a necessary concomitant of financial capitalism? Will they continue to be effective and therefore succeed in preventing a major breakdown of the system or are they becoming less and less effective in staving off the “big one”? In the long run, do they lead to more and more financial fragility in a worsening spiral of crisis and bailout? And perhaps of most interest is a question rarely asked: even if effective and successful, does this system have even more pernicious long run impacts?¹

We look at these issues here in both a longer-term perspective and in terms of the current crisis of financial globalization: the so-called sub-prime meltdown. We argue first, that these periodic crises and necessary financial interventions show that, unlike the claims made in neo-classical theory, financial capitalism cannot survive without intense, nearly constant government interventions of various types. Second, more controversially, we argue that, the current system of financial de-regulation and bail-out serve to underpin a financial system that is not only increasingly fragile, but perhaps more important, is bloated, inefficient, and in-egalitarian. Hence, when critics claim that policies to regulate the financial system will lead it to become “less competitive” and will “stifle innovation” and will lead firms and financial jobs to move elsewhere, our answer is that some significant financial activity may need to be reduced because its social costs outweigh its social benefits broadly defined. The challenge is to restructure the financial system so that it better serves social needs.

¹ Some of the arguments in this paper build on the provocative essay, by Gary Dymksi and Robert Pollin “The Costs and Benefits of Financial Instability: Big Government Capitalism and the Minsky Paradox” (Pollin and Dymksi, 1994). They argue that the costs of the lender of last resort activities have been rising, their effectiveness waning, and therefore the benefits of these actions relative to their costs have been shrinking precipitously. The upshot of their analysis is that what is needed is a new financial structure that is less prone to these crises and more conducive to socially efficient provisions of credit and financial services. We concur with their conclusions, and here elaborate on some of these issues, particularly with respect to the lender of last resort function, with a focus on the current financial crisis. In addition, we emphasize more than do they, the costs of the system, while focusing more on the lender of last reserve function itself.

The prescient work of Jane D'Arista is highly relevant here. In 1994 she published *The Evolution of U.S. Finance, Vols I and II*, which amazingly predicted a number of the problems we are experiencing today, as well as prescribing highly relevant solutions. She noted that "In 1984, changes in the securities laws were enacted to encourage private issues of mortgage backed securities.... proliferation of mortgage backed securities was only a first step in the restructuring of capital markets brought about by a wider trend toward securitizing debt...it could be argued that the rise in securitized debt...constitute the most profound of the many structural changes that have occurred in financial markets.... As a result, its economic impact is likely to be equally pervasive and profound. The most obvious...is that the once central function of capital markets in financing capital formation is in danger of becoming a peripheral activity...The regulatory and structural framework for the financial system is, therefore, a critical factor in ensuring that financial resources are put to productive uses." (D'Arista, 1994, vol II. pp. 272-278.) As our paper suggests, had the financial markets and regulators followed D'Arista's prescient analysis and proposals, we might not be experiencing the destructive boom and bust financial cycle we have experienced since her book was published.

The rest of our paper is organized as follows. We set our story first in the context of Minsky's theory of financial instability. Here we emphasize Minsky's little discussed point that in order to limit the destructive impacts of financial instability, not only must there be large government deficits and lender-of last resort actions, there must also be efforts to limit the expansion of financial assets. We return to this point in our penultimate section where we outline possible regulatory changes to break this destructive financial cycle. In section III, we give a brief history of the role of lender of last resort and its relationship to financial instability. The main points of this section are that the lender of last resort is necessary to the operations of the financial markets, but in the absence of significant and effective financial regulation, they serve to underpin an extensive, inefficient, and often socially costly expansion of financial markets. Section IV briefly presents data on the expansion of financial markets in the recent period and briefly outlines an argument that it has evolved in costly and destructive ways.

The next sections then bring these general arguments into greater focus in the context of the evolution of the current sub-prime crisis. Section V describes the etiology of the current crisis in terms of flaws in the mainstream understanding of financial dynamics and the regulatory structures that structured these dynamics. Section VI describes the evolution of the lender of last resort activities in the current crisis focusing on the role of the three main central banks – the Fed, the European Central Bank (ECB) and the Bank of England (BOE). The main point of this section is that the severity of the crisis required these central banks to evolve new and highly interventionist tools to prevent a total meltdown, that despite their protestations to the contrary, they all had to intervene significantly, and that the jury is still out as to whether these interventions – extensive and as costly as they are – will ultimately prove successful to prevent a collapse. But, even if they are successful in this sense – which given past history is highly likely – they will only serve to write a new chapter of *de-regulation and bail-out* that will ultimately underwrite a greater expansion of an inefficient, costly and dis-equalizing

global financial structure. The penultimate section outlines several possible regulatory reforms that would serve to break this cycle and begin a process of creating a more socially efficient financial system. The final section offers a brief summary and conclusion.

II. Setting the Minsky Problematic

When financial crises erupt in the United States, Hyman Minsky's name often appears in the financial press. This crisis is no exception. References to a "Minsky moment" have been ubiquitous since late 2007. A "Minsky moment" is the point in a financial cycle at which it becomes apparent that the boom has ended and a crisis has broken out. At this point 'risk aversion' and a sense of acute uncertainty sweep the market, followed by a process of reverse leverage. *Wall Street Journal* columnist Justin Lahart noted the widespread use of the term. "Indeed, the Minsky moment has become a fashionable catch phrase on Wall Street. It refers to the time when over-indebted investors are forced to sell even their solid investments to make good on their loans, sparking sharp declines in financial markets and increases in the demand for cash that can force central bankers to lend a hand" ("In Time of Tumult, Obscure Economist Gains Currency," August 18, 2007).

Minsky's main contribution to economic theory was his insistence that financial markets play a far more central role in the dynamics of capitalist development than mainstream theory acknowledges, and that financial markets are inherently volatile, causing capitalism itself to be inherently volatile. Left to themselves, he argues, financial markets can, at times, be so unstable as to threaten the reproduction of the modern capitalist economy and society, one of the central points made by Keynes in the General Theory.

His basic argument is as follows. Periods of stability in financial markets are destabilizing. They eventually lead to speculative bubbles. When financial markets are tranquil and capital losses or loan defaults minimal, investors come to believe that virtually all securities are safe, so money flows to securities with the highest yield, even though these securities were traditionally believed to be risky. Liquidity preference evaporates and risk aversion declines. Borrowers and lenders come to agree that it is sensible to increase leverage, which allows investors to buy more securities. In Minsky's terms, the conventional assessment of adequate 'margins of safety' required in financial transactions diminishes over time. This process raises security prices, which reinforces belief that capital gains will continue to be high and the purchase of high-yield securities will continue to be a safe investment. The financial boom invigorates the real sector. In Minsky's view, real and financial sector movements are tightly connected. Corporations and households can finance on easy terms as the boom takes root. This stimulates investment, consumption and profits, raising the cash flows needed to make financial payments. Rapid real sector growth in turn reinforces the belief that all is well in the financial sector. The longer this rosy scenario lasts, the more convinced people become that what would appear to be aggressive risk-taking if "coolly considered," to use Keynes's

phrase, is actually seen as responsible decision making. Margins of safety between cash flows accruing to agents and their financial commitments become ever smaller.

When the margins of safety become very small, the economy is, in Minsky's words, "financially fragile." Any serious problems in the real and/or financial sectors can cause agents to be unable to meet their financial obligations out of income, which can lead to defaults and the forced sale of financial assets, which causes actual and expected security prices to fall. This becomes a cumulative process in which liquidity in security markets evaporates, collateral for loans deteriorates, and risk aversion rises sharply. In other words, a "Minsky moment" appears and financial markets begin to implode.

Two points about the character of Minsky's theory of modern capitalism markets should be emphasized. First, the dynamic process envisioned by Minsky is not a repeating cycle, but an evolutionary model in which endogenous financial market innovation fueled by the profit motive constantly changes institutional structures and processes in financial markets and the modes of interaction of the real and financial sectors. "Nowhere is evolution, change and Schumpeterian entrepreneurship more evident than in banking and finance and nowhere is the drive for profit more clearly the factor making for change," (Minsky 1993 "Schumpeter and Finance" In *Market Institutions in Economic Development: Essays in Honor of Paulo Sylos Labini*, S. Biasco, A. Roncaglia and M. Salvati, eds. New York: St. Martin's Press. p.). Second, he insists that economic theory must be institutionally contingent and historically specific in order to be useful for economic and policy analysis. Thus, financial market dynamics depend on the evolution of all the major institutions that affect market behavior, including government regulatory institutions.

Minsky argues that there is nothing inherent in free market capitalism that assures that the downward phase of the financial cycle is of limited depth or duration. Financial market chaos from 1929-1933 demonstrates his point. In response to the financial collapse of this period and the threat to the political and social order it created, major innovations in policy were created to make sure that "It" – a financial collapse – did not happen again. The first was the rise of big government, which, through automatic stabilizers and discretionary fiscal policy, can run deficits large enough to counter declining demand in the real sector, thereby blocking the downward multiplier process and the collapse of profit. The second was the creation of a radically more stringent regulatory regime in the 1930s. Under the new regime, investment and commercial banking were separated. Commercial bank deposits were insured by the new FDIC and in return commercial banks were closely monitored and tightly regulated to prevent the development of excessive financial risk. And home financing was put on a more secure footing. Third, the Fed was strengthened. It could now react to a financial crises not only with lower interest rates, but also, in severe crises, through lender of last resort (LOLR) intervention in which the Fed makes collateralized loans to banks, who then share this liquidity with their borrowers. Such actions are designed to stop the reverse leverage process causing the forced sale of financial assets, and thereby put a lower bound on the collapse of security prices. When crises are unusually severe, non-traditional interventions may take place, such as the creation of the Resolution Trust Corporation in

1989 that rescued the Savings and Loan industry (and therefore financial markets in general) by buying their bad loans at a cost to the public of some \$200B. In Minsky's view, these three policy innovations combined to prevent "It" from happening again in the post WW II era.

Minsky was aware of two inherent deficiencies in the post war economic regulatory regime. First, financial institutions have a powerful incentive as well as the ability to 'game' or evade financial regulations through innovation, which leads over time to regulatory inadequacy. "The profit-seeking bankers almost always win their game with the authorities, but, in winning, the banking community destabilizes the economy..." (Minsky 1986, p. 250) This is, in his view, a general problem with all policy institutions and practices. "Economies evolve and with the internal evolution of the economic mechanism the apt structure of legislated institutions and policy operations change." (Minsky 1982 CIHA, pp. 113-14) Unfortunately, he failed to focus attention on a related problem of serious magnitude – the capture of regulatory agencies by financial market elites and/or by the free market ideology that rose to dominance in the neoliberal era. Consider Alan Greenspan's explanation of why he did not use the authority given him by Congress to regulate the mortgage industry. "Mr. Greenspan says he didn't get heavily involved in regulatory matters in part because his laissez-faire philosophy was often at odds with the goals of the laws Congress had tasked the Fed with enforcing" (*Wall Street Journal*, "Did Greenspan add to subprime woes," June 9, 2007). Second, there is a serious problem of moral hazard associated with lender of last resort activities. A commitment by the Fed to rescue financial markets any time they are in crisis creates a strong incentive for financial institutions to engage in innovative high-risk activities not under tight Fed control. The boom years leading up to the crisis always generate high firm profits and huge compensation packages for key personnel. Since the profits and bonuses do not have to be given back in the crisis period, financial institutions have powerful incentives to take high risks as long as the Fed insures that downturns will be short and shallow. "[T]he intervention sets the stage for the financing of inflationary expansions, once the "animal spirits" of business people and bankers have recovered from the transitory shock of the crisis that forced the lender of last resort activities in the first place." (Minsky 1982 CIHA, pp. 198-9) Together these problems create a serious challenge to the theory and practice of financial regulation.

Minsky proposed two ways to deal with the regulatory problems caused by financial innovation and lender-of-last-resort interventions. One was broad and quite radical: the Fed should have the authority to regulate institutional, process and product innovation in financial markets. "Inasmuch as the Federal Reserve System now intervenes whenever a serious debt deflation threatens, the Federal Reserve must broaden its scope and take initiatives to prevent the practices conducive to financial instability. ... The Federal Reserve needs to guide the evolution of financial institutions by favoring stability enhancing and discouraging instability-augmenting institutions and practices" (Minsky 1986, p. 314). The other was more specific. The Fed must impose constraints upon the ability of the financial system to grow rapidly enough to create crises. "In order to contain the destabilizing effects of banking, it is necessary to regulate the amount and the rate of increase of bank assets. The major control device is the permitted capital-asset

ratio and the rate of growth of bank assets” (Minsky 1986, p. 320). These controls were to be imposed not only on commercial banks, but on “the activities of fringe banks and other financial intermediaries” as well – financial market segments currently referred to as ‘shadow banking.’ (Minsky 1986, p. 252). If the government had followed Minsky’s advice and imposed and enforced restrictions such as these, the current crisis would not have taken place. Instead, it radically deregulated financial markets.

Minsky thus had a sophisticated understanding of financial market dynamics and the problems they pose to real sector growth when financial markets are not tightly regulated. These problems include excessive volatility and uncertainty, rising inequality, high unemployment, and the threat of depression. He also understood the necessity for strong regulation of financial markets and the challenges involved in creating and sustaining an effective regulatory apparatus. However, there are important questions posed by the evolution of financial markets in the current era that Minsky did not attempt to answer. The most important is: can the cycles of financial expansion, crisis, central banks intervention to prevent collapse, and subsequent renewed expansion go on forever? Is there an end game to the ongoing process of exceptionally rapid financial innovation fueled by quantum improvements in information processing technology, deregulation and globalization within the context of explosive growth in the size and complexity of financial markets?

There has been an astounding rate of expansion of financial markets since 1980. For example, US credit market debt was 168% of GDP in 1981 and over 350% in 2007. Financial assets were less than five times larger than US GDP in 1980, but over ten times as large in 2007. The notional value of all derivative contracts rose from about three times global GDP in 1999 to over 11 times global GDP in 2007. This process of rapid expansion generated myriad financial crises across the globe in the past quarter century, culminating in the system-shaking global financial crisis that erupted in the summer of 2007. It could never have been sustained without numerous, often large-scale, interventions by national governments and international financial institutions. This is the Minsky moral hazard problem in the extreme. Financial markets grow ever larger and more complex, crises break out frequently, state and international agencies cushion every crisis - in part because the collapse of ever-larger financial markets poses ever-greater threats to the real economy, and the process rolls along. But to what end? Is it possible for financial markets to keep growing in size relative to the real economy? Can governments continue to prevent severe crises no matter how large and complex financial markets become? What will happen if they fail?

III. Lender of Last Resort in Historical Context

As we showed in the previous section, Minsky thought that appropriate “lender of last resort” action – along with fiscal deficits were necessary to prevent financial instability from breaking out into a full-blown depression. But he did not believe this was enough. In addition, action to limit the growth of financial assets was also required,

including regulatory actions to intervene in the process of financial innovation and asset extension.. In this section, we discuss very briefly the lender of last resort role in historical context, and then in the pen-ultimate section, return to the issue of reducing the rate of growth of financial assets.²

Lender of Last Resort: A Brief History

Charles Kindleberger, the most reliable source for such history, notes that "Whether there is a theoretical rationale for letting the market find its way out of a panic or not, the historical fact is that panics that have been met most successfully almost invariably found some source of cash to ease the liquidation of assets before prices fell to ruinous levels. An important question is who is responsible to provide that cash." (Kindleberger, 1993, p. 272).

Kindleberger notes that there can often be "stalemate in crisis, generally brief, while large banks, central bank, Treasury and other bodies debate over which of their number has the responsibility to provide the *public good* of needed liquidity." (italics added; Kindleberger, 1993, p. 272). In other words, who will be the lender of last resort?

The doctrine of the lender of last resort is usually ascribed to Walter Bagehot who articulated his "lender of last resort" rule in his *Lombard Street* in 1873 (see more on this below). Kindleberger attributes the term to "Francis Baring who called the Bank of England a 'bankers bank' and used the expression *le dernier* (the last resort) in connection with it in 1797", and a first clear articulation to "Henry Thornton who noted in 1802 that the Bank of England had learned to lend freely in the case of an internal drain" (Kindleberger, p. 273).

The Bank of England may have been intuitively developing lender of last resort actions as early as the middle 18th century, and into the early 19th, and the Bank of France, too, took such actions as early as the first few decades of the 19th century (Kindleberger, 1993 p. 273); but, as Kindleberger notes, not without making numerous "mistakes" or without trying to get others (such as the Treasury) to take the lead role. (See also, Kindleberger, 1978, ch. 9).

The rule laid down by Bagehot is that the lender of last resort rule should be as follows: money should be lent freely at a "penalty rate" to illiquid but solvent institutions on the basis of good collateral. (Kindleberger, 2005, pp. 237, 242.) But as Kindleberger notes, the whole doctrine is riddled with ambiguity, as it must be. "The rule is that there is no rule". (Kindleberger, 2005, p. 239. "One does not lend to insolvent banks except to avoid the mischief that would occur if the Lord Mayor of London were to go bankrupt" (ibid. p. 242). As for collateral, Kindleberger notes that "In the crisis of 1830 the Bank of France discounted royal and municipal bonds, custom receipts, woodcutting receipts, obligations of the city of Paris, and canal bonds repayable by lottery". (p. 239)

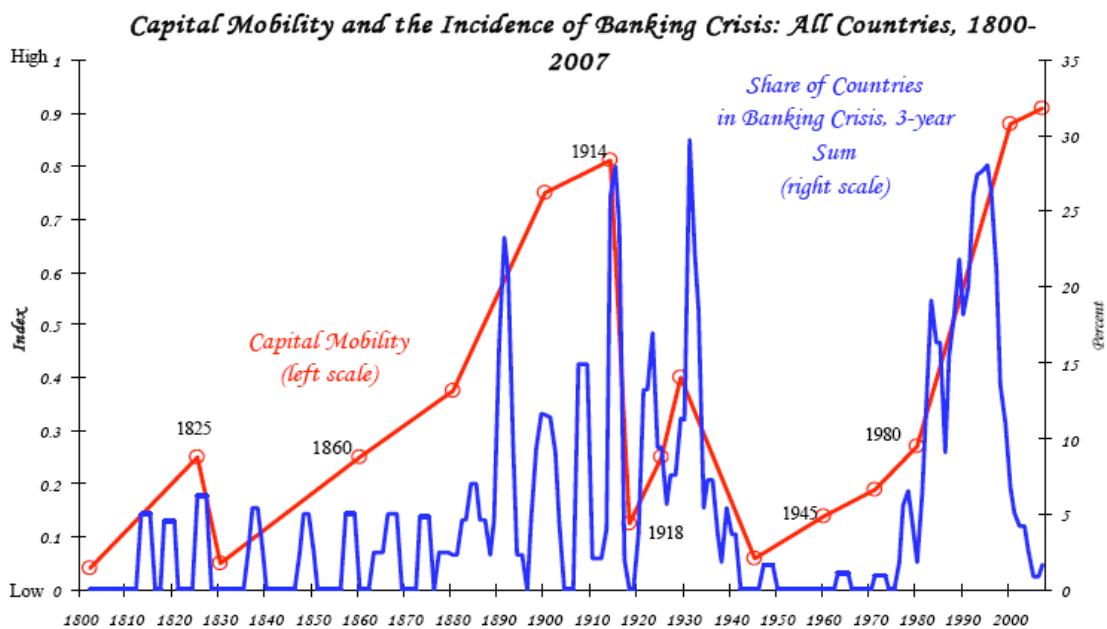
² We will not deal with the role of fiscal deficits which requires a separate treatment.

Kindleberger notes that the lender of last resort activity is riddled this kind of ambiguity, “verging on duplicity. One must promise not to rescue banks and merchant houses that get into trouble, in order to force them to take responsibility for their behavior, and then rescue them when and if the do get into trouble, for otherwise trouble may spread.” (Kindleberger, 1993, p. 275).

This ambiguity of responsibility, scope, and timing pervades the lender of last resort function. In the United States, with the periodic financial crises of the 1970’s, 80’s and 90’s, a doctrine of “Too Big to Fail” developed (see Wolfson, 1994 and Stern and Feldman, 2004) which went way beyond the nice Baghehotian distinctions between illiquidity and solvency and penalty rates. Any financial institution whose failure could lead to significant financial instability, was a likely candidate to be rescued in some way. (See Wolfson for a good discussion of these rescues).

The lender of last resort actions are so pervasive because, as Kindleberger puts it, financial crises are a “hardy perennial” (Kindleberger, 2005). Recent data by Reinhart and Rogoff make this quite clear. The Figure 1 , taken from their recent study, shows how perennial it is.

Figure 1



Sources: Bordo et al. (2001), Caprio et al. (2005), Kaminsky and Reinhart (1999), Obstfeld and Taylor (2004), and these authors.

Notes: As with external debt crises, sample size includes all countries, out of a total of sixty six listed in Table 1 that were independent states in the given year. On the right scale, we updated our favorite index of capital mobility, admittedly arbitrary, but a concise summary of complicated forces. The smooth red line shows the judgmental index of the extent of capital mobility given by Obstfeld and Taylor (2003), backcast from 1800 to 1859 using their same design principle.

Source: Rogoff and Reinhart (2008)

As Rogoff and Reinhart suggest, increases in capital mobility, themselves associated with financial de-regulation, are highly correlated with financial crisis. This underscores – in combination with Kindleberger’s work - that this system of de-regulation and bail-out has been in play for several centuries.

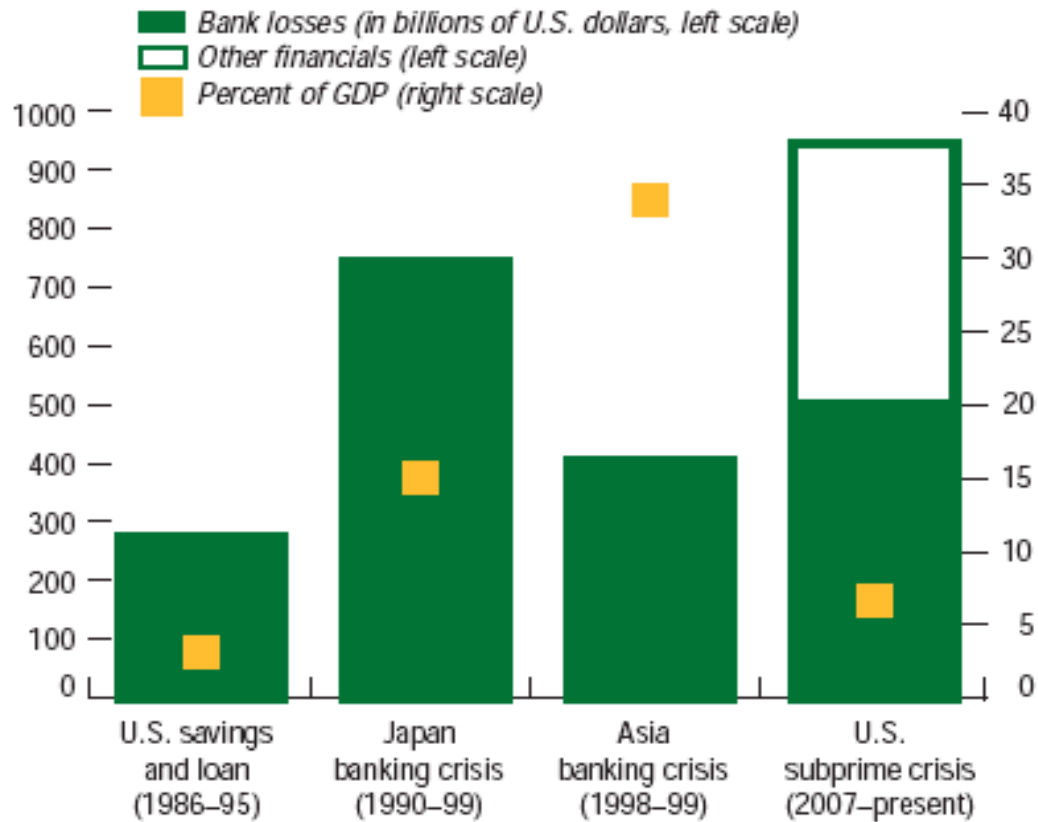
Note, however, that there was a significant period in the post Second World War (the so-called “Golden Age” period), when both capital mobility and financial crisis were severely abated. As Jane D’Arista has written so eloquently, serious financial regulation apparently can interrupt this cycle.

The Costs of Crisis

The fiscal and financial costs of this dynamic of de-regulation and bailout is very hard to measure. A narrow estimate focuses on the costs of the crises and the rescues themselves. The costs of the rescues can be highly significant. Claessens, Klingebiel and Laeven (2003) report that fiscal costs as a share of GDP can be as high as 55% of GDP (Argentina, 1980-82, Indonesia, 1997-2002) over 30% (Turkey, Jamaica, Chile and others). The U.S. savings and loan bailout by contrast cost over 3% of GDP, but of course, remember that the US GDP is much higher than that of these other countries. Costs of the crisis in terms of GDP lost (discussed more below) can be as much as 50% of GDP (Chile, 1982-1983).

As Figure 2 shows, the financial costs can also be very significant. The IMF estimates that the financial costs in the US of the current crisis can be as much as 7% of GDP. This is greater than the S&L crisis.

Figure 2



Sources: World Bank; and IMF staff estimates.

Note: U.S. subprime costs represent staff estimates of losses on banks and other financial institutions from Table 1.1. All costs are in real 2007 dollars. Asia includes Indonesia, Korea, the Philippines, and Thailand.

Source: IMF, 2008.

These costs do not fully take into account the costs to the real economy of the crisis and bailout. World Bank economists have attempted to estimate the output losses associated with these crises and they range from quite small to over 100% of GDP (Claessens, Klingebiel and Laeven (2003)).

An open question is whether and under what conditions these lender of last resort activities reduce the output losses and fiscal costs associated with financial crisis. Claessens, Klingebiel and Laeven (2003), and Bordo and Schwartz (2000) argue that bailouts only pro-long the crisis and raise the costs. They insist that transparency and

proper regulation are better options. Of course, this must be true. But as we will argue below, the standard neo-liberal approach to financial de-regulation leads to a system in which sufficient prudential regulation and transparency are impossible. At that point, as Kindleberger insists, the option is to engage in lender of last resort actions or do nothing. The long sweep of history shows that central banks, treasuries and governments, in the end, despite protestations to the contrary, intervene to stave off much larger crises.

However, staving off worse crisis has significant costs. Most economists stress the cost in terms of moral hazard and the ratcheting up of risk taking. Minsky and his followers also tend to emphasize these costs – and for good reason: the dynamic of de-regulate and bailout does tend to ratchet up the cycle of risk taking and financial fragility. The current sub-prime crisis, discussed in detail below, is a telling example of this increasing cycle of risk brought on by the cycle of de-regulate and bail-out, making the next round of bail-outs more difficult and less effective.

But there is another equally if not more profound effect of this cycle on the trajectory of capitalism. The cycle under-writes a profound expansion of the financial sector, and one that, arguably leads to a bloated, inefficient and dis-equalizing set of financial markets and institutions. We turn in the next section to some quantitative dimensions of this expansion.

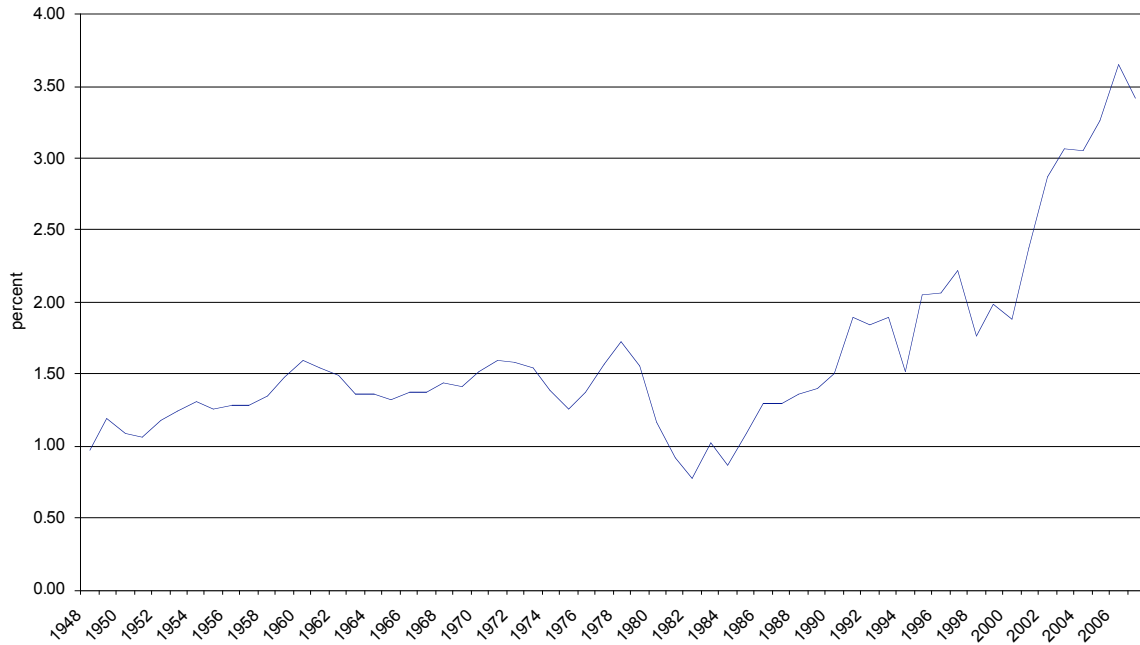
IV. The Expansion of The Financial Sector Under the System of De-Regulation and Bailout

In this section we present some illustrative data that describe the large expansion of financial activities over recent years, and some indicative data showing some of the inequalizing impacts of these trends. The first set of figures show the explosion of financial activity in the U.S. over the last seventy-five years or so as well as some information on the expansion of finance in a select few other countries. This section is meant to be illustrative and obviously falls far short of a systematic accounting of these trends, much less a full assessment of their nature and implications.

The first set of figures (Figures 3 – 5) shows the explosion of financial activity, assets and profits in the U.S. over the period since the Great Depression. As is consistent with the argument of this paper, these trends took over after the early 1980's, when the neo-liberal period that initiated the recent era of de-regulate and bailout really took hold.

Figure 3

Financial Sector Profits as a Percent of GDP, 1948-2007



Source: NIPA Table 6.16, Table 1.1.5. Corporate profits are adjusted for inventory valuation and capital consumption. Since 1998, definition of the financial sector comprises finance and insurance and bank and other holding companies.

Figure 4a

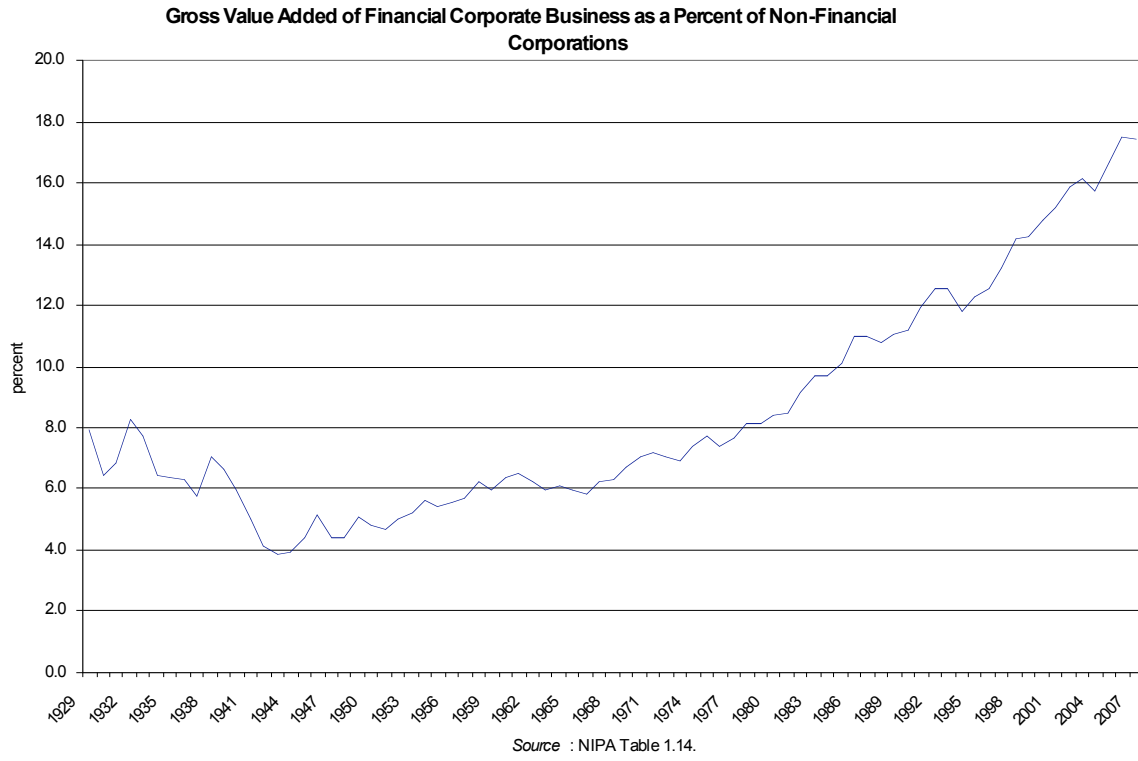
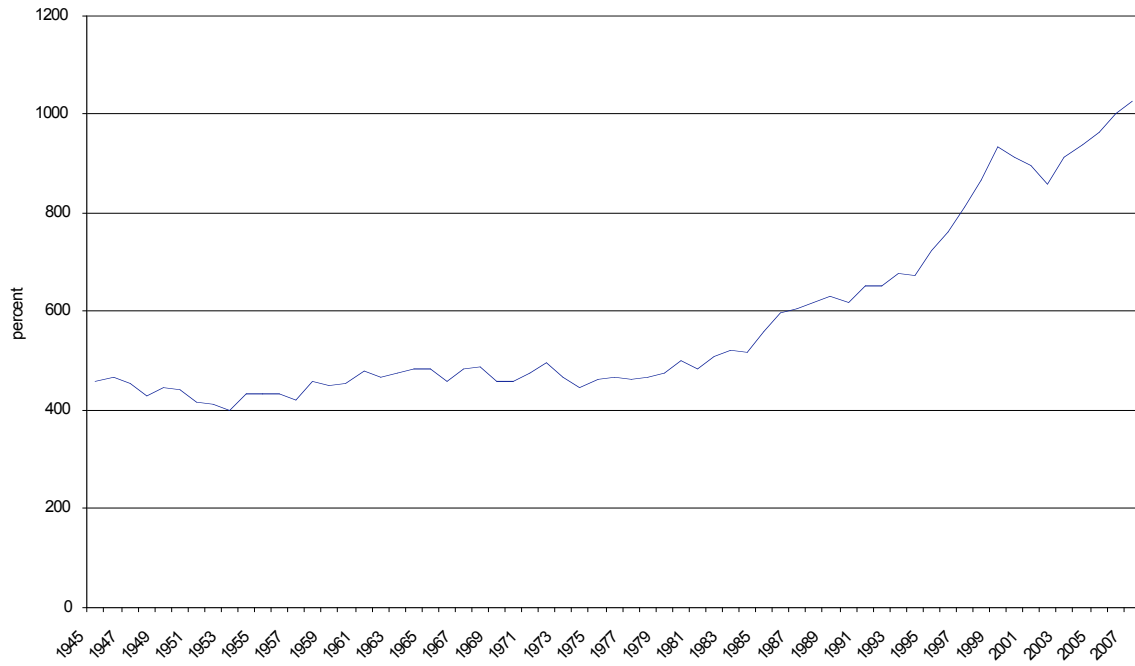


Figure 4b

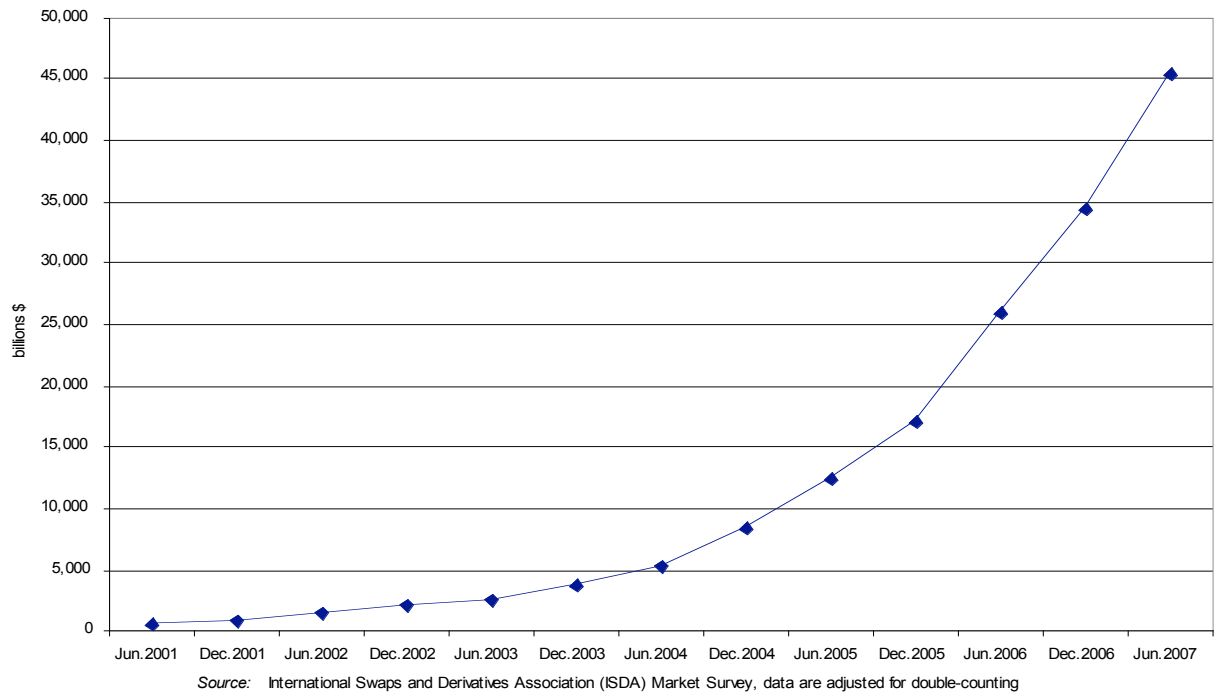
Total Financial Assets as a Percent of GDP



Source : Flow of Funds Table L5, NIPA Table 1.1.5.

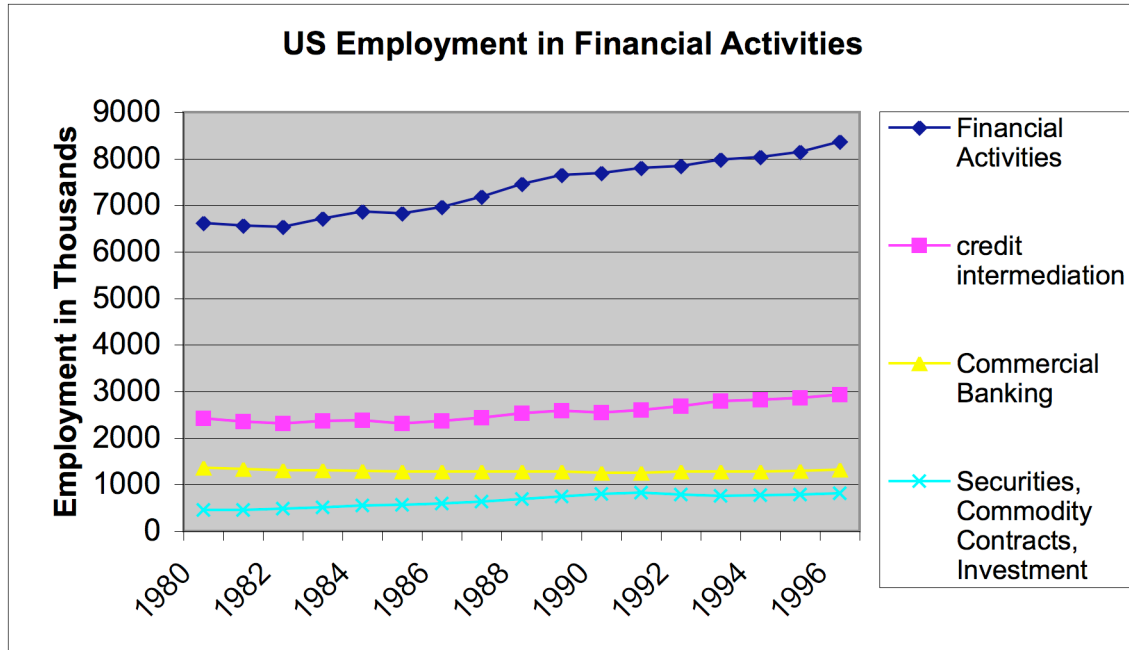
Figure 5

Notional Amounts Outstanding of Credit Default Swaps



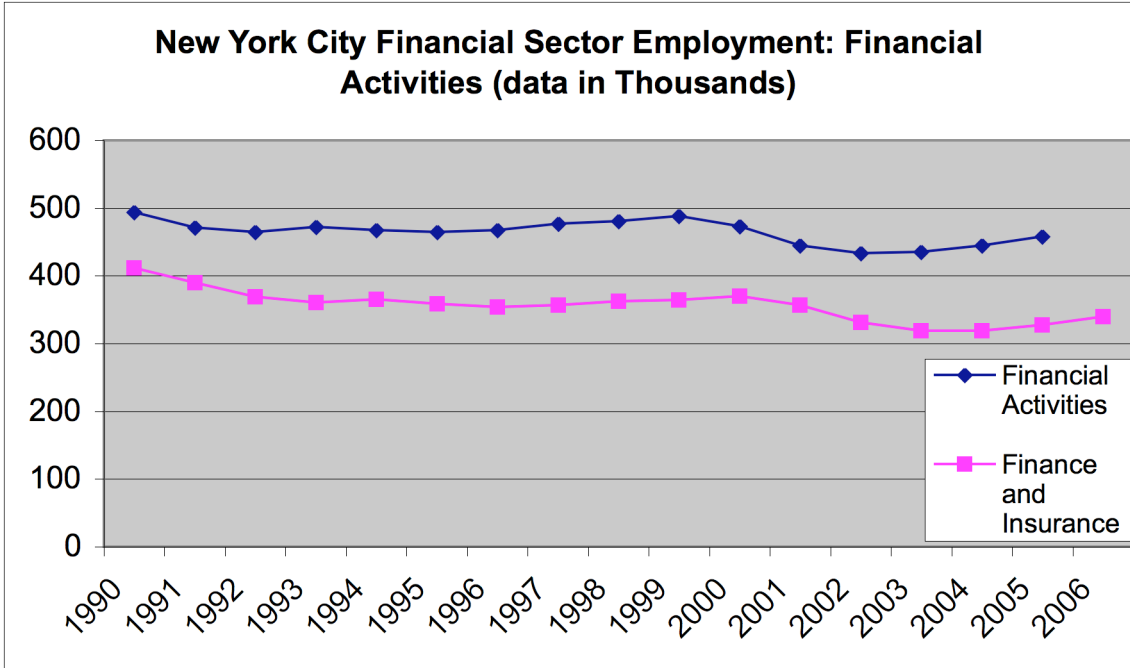
Employment has grown, but much more slowly relative to profits and incomes. This is due to the technological innovation that has characterized the financial sector and reflects the enormous incomes that a small number of financial “rain makers” are receiving.

Figure 6



Even in New York City, there has not been a major explosion of employment in finance in recent years. Quite the contrary, as Figure 7 shows.

Figure 7



In some financial centers, there has been more employment creation. Figure 8 reports on the UK for example and Figures 9 reports on China.

Figure 8

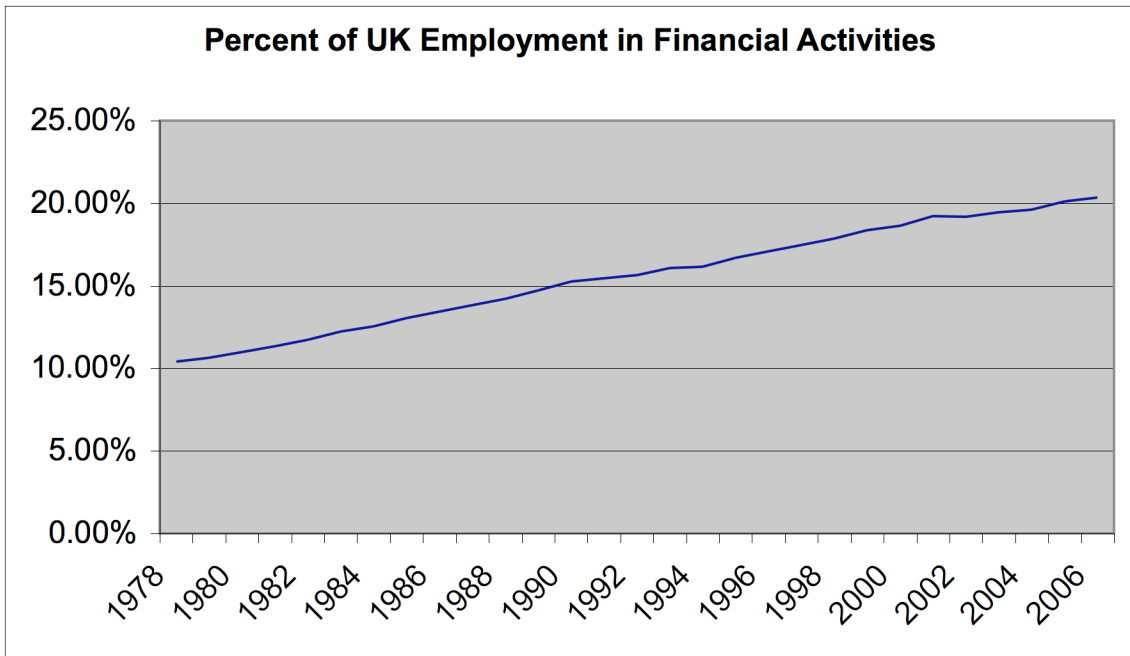
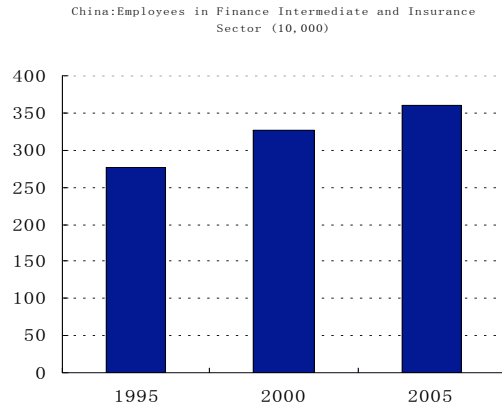


Figure 9
China: Employees in Finance, 1995 -2005
(10,000)



Incomes have grown much more rapidly than employment, reflecting the enormous salaries and bonuses often received in the financial sector. Figures 10 and 11 show data for San Francisco and Shanghai.

Figure 10

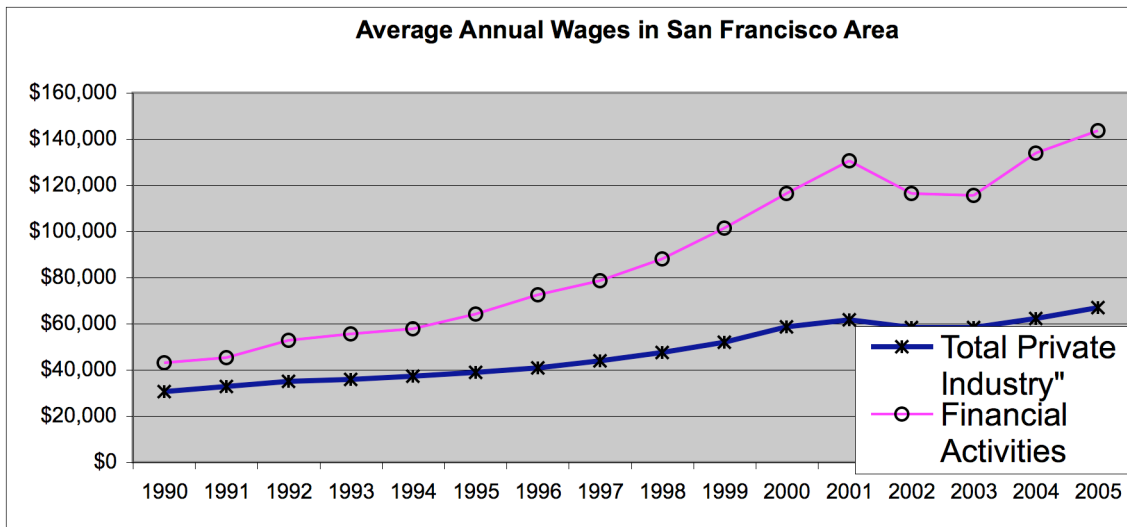
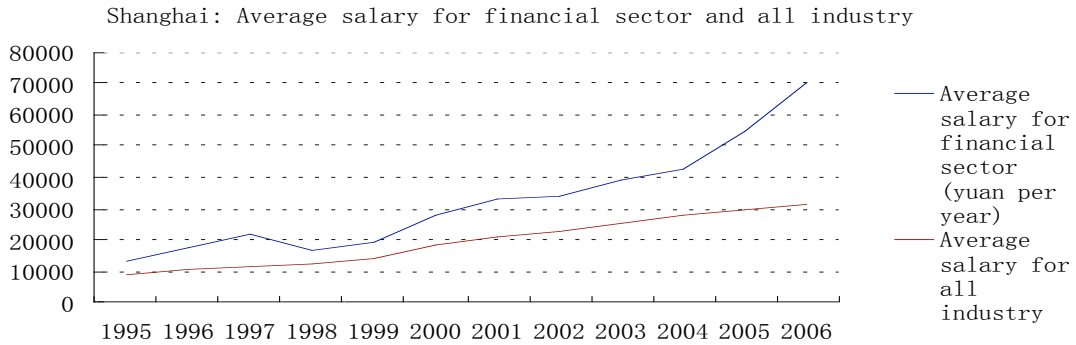


Figure 11



More broadly, as Jayadev and Epstein (2007), there has been a general increase in “rentier incomes” in the OECD countries that has been associated with the system of financial de-regulation and bailout.³ (Also see Dumenil and Levy’s research on these issues.) Figure 12 and econometric analysis in Jayadev and Epstein (2007) have shown that these increases in real rentier incomes are associated with financial de-regulation, which, as we show here, are followed by bailouts.

Table 1: Real Rentier Income

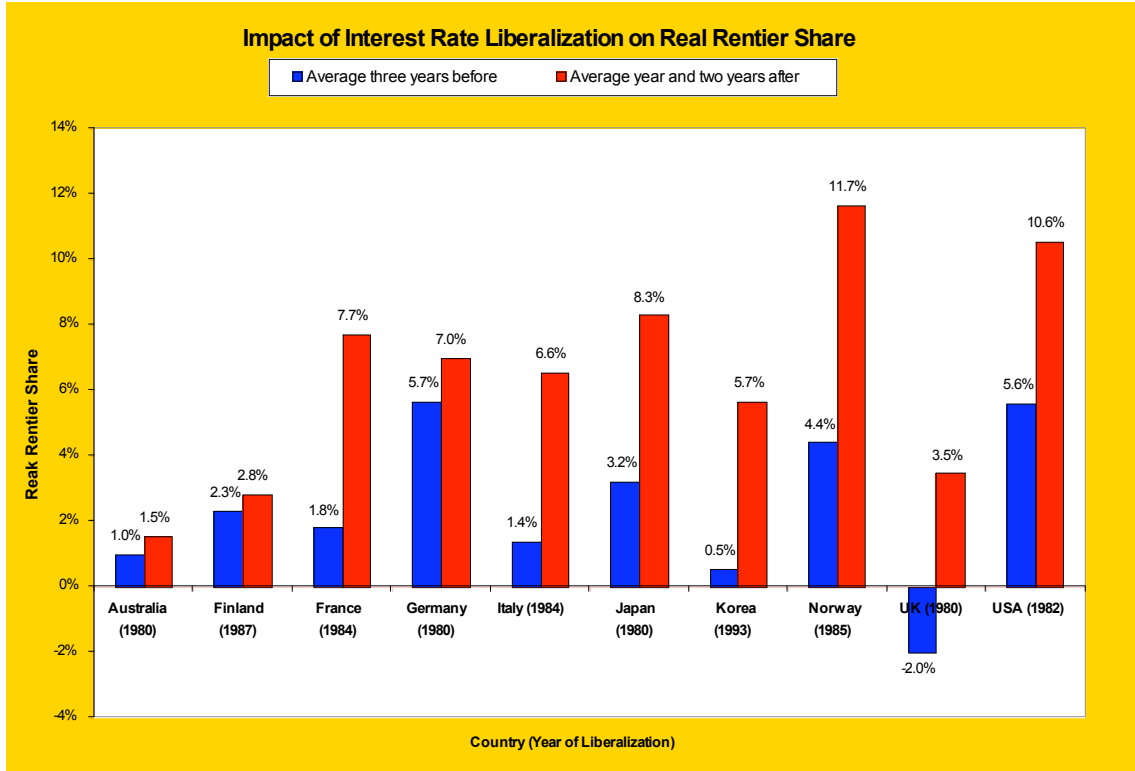
³Jayadev and Epstein define rentier income as income accruing to holders of financial assets plus the profits of the financial system.

Table 2: Real Rentier Fraction of Income 1960s-1990s

| Country | Years | 1960s | 1970s | 1980s | 1990s | Difference 90's-70s | Difference 90's-80's |
|---------------|-----------|-------|--------|-------|-------|------------------------|-------------------------|
| Australia | 1975-1996 | | 0.1% | 5.6% | 10.2% | 10.1% | 4.6% |
| Belgium | 1985-1997 | | | 7.8% | 9.0% | | 1.2% |
| Finland | 1977-1996 | | -0.2% | 1.4% | 6.2% | 6.4% | 4.8% |
| France | 1971-1996 | | -0.4% | 5.6% | 14.3% | 14.7% | 8.7% |
| Germany | 1978-1993 | | 3.1% | 6.6% | 6.9% | 3.8% | 0.3% |
| Great Britain | 1971-1997 | | -4.2% | 4.9% | 8.6% | 12.7% | 3.7% |
| Italy | 1978-1996 | | 0.4% | 4.2% | 9.6% | 9.2% | 5.4% |
| Japan | 1971-1996 | | -0.6% | 8.1% | 8.7% | 9.2% | 0.6% |
| Netherlands | 1978-1996 | | 7.5% | 11.9% | 13.8% | 6.3% | 1.8% |
| Norway | 1979-1997 | | 5.4% | 6.3% | 8.1% | 2.8% | 1.8% |
| Portugal | 1977-1995 | | -11.4% | 3.5% | 10.6% | 22.0% | 7.1% |
| Spain | 1981-1996 | | | 3.3% | 9.3% | | 5.9% |
| United States | 1961-1996 | 3.6% | 1.8% | 9.7% | 10.2% | 8.4% | 0.5% |

Source: Jayadev and Epstein, 2007.

Figure 12



Conclusion:

As these and much other data that one could muster show, there has been an explosion of financial activities and incomes associated with them, and, to a lesser extent, an increase in the amount of employment in the financial sector. This expansion is both the cause, and the effect of the system of de-regulation, crisis and bailout. De-regulation leads to expansion, expansion leads to crisis, and bailouts allow the system to continue to expand even more in the future. This dynamic underlines the crisis we are currently facing, the so-called “sub-prime crisis”.

V. The Etiology of the Sub-Prime Crisis: The Role of the New Financial Architecture in Promoting Financial Sector Growth and Creating Crises

The regulatory regime put in place in the aftermath of the Great Depression was designed to prevent repetition of both the speculative excesses of the late 1920s and the failure of thousands of banks in the early 1930s. Regulators tightly monitored and controlled commercial bank activity, while the SEC forced investment banks to provide more complete and dependable information about securities to the public. Commercial banks originated and held consumer and commercial loans and provided liquidity to other financial institutions in times of market stress. Their ability to provide liquidity was protected by government restrictions on the risk they could take. Banks thus acted as lender of next-to-last resort to other financial institutions, while the Fed was lender of last

resort to banks in serious crises. This system worked quite well into the mid 1970s. It then was buffeted by rising inflation, deregulation and the Third World debt and Savings and Loan crises. The elimination in 1999 of the 1930s Glass-Steagall legislation that segregated commercial and investment banking was the culmination of two decades of radical deregulation that created what is often called the ‘New Financial Architecture’ (NFA). The NFA is founded on the belief that capital markets are ‘efficient’ – the sine qua non of modern financial market theory - and, therefore, need minimal monitoring, regulation or lender of last resort bailouts by government regulators.

A number of core assumptions used in the canonical mainstream models of security pricing inform the celebratory ‘narrative’ associated with the NFA. For example, investors are assumed to know the true ‘fundamentals’ about likely future security returns and the risks associated with them. Since markets are assumed to be at or least near equilibrium at all times, security prices always reflect the ‘true’ risk-return characteristics of securities. Indeed, one of the strongest tenets of the NFA is that markets price risk correctly. These models also assume that capital markets have perfect liquidity. Securities can be always be sold quickly at their equilibrium price – an assumption that makes the downward spiral of complex derivative product prices seen in the current crisis impossible. The NFA celebrates financial innovation because it allows risk to be decomposed into its component parts, such as interest rate or counter-party risk. Investors are able to buy only the kinds of risk they are most comfortable with. Thus, a modern capital market based financial system is assumed to have minimal systemic risk.

According to the narrative, banks still originate loans, but financial innovation allows them to securitize and sell them to institutional and individual investors via capital markets assumed better able to price them correctly. This removes loans from bank balance sheets, which frees up bank capital, allowing banks to make more loans at lower interest rates than before. Thus, the risk associated with these loans is no longer concentrated in banks; banks are seen as safer than ever. Instead, risk is distributed widely and lightly around the global financial system, so no individual institution would be expected to hold excessive risk.

Under the NFA, large commercial banks are integrated into giant financial conglomerates that include investment banks and mutual, hedge and private equity funds. They are so complex that regulators no longer have the capacity to effectively monitor them or regulate their behavior. Equally as important, regulatory agencies are now largely in the hands of people who believe modern financial markets should be largely self-regulating. They therefore let large banks monitor and regulate themselves through ‘modern’ risk management techniques such as value-at-risk (VAR) and stress tests. As George Soros put it: “Since 1980, regulations have been progressively relaxed until they have practically disappeared. The super-boom got out of hand when the new products became so complicated that the authorities could no longer calculate the risks and started relying on the risk management methods of the banks themselves” (*Financial Times*, “The worst market crisis in 60 years,” January 23 2008).

Belief in the narrative about the efficiency of financial markets permeated global financial markets during the past 15 years. Individual and institutional investors, financial institutions of all kinds, and government regulators were guided by it, and the business press filtered almost all discussions about financial markets through its lens. The conventional wisdom embedded in the narrative helped individual and institutional investors throw caution to the wind and take on what would previously been thought to be excessive risk in the stock market boom of the second half of the 1990s, and in the financial bubble from 2003 – mid 2007. The latter years were a ‘perfect calm’ in financial markets. Interest rates, risk spreads, volatility and default rates were exceptionally low, and levels of liquidity - even for complex derivative products such as mortgage backed securities and collateralized debt obligations not traded in markets - were high, as were corporate profits. These conditions, assumed to be permanent in the narrative, led almost everyone to believe that no investment was excessively risky, which encouraged risk taking.

However, the outbreak of the crisis clearly demonstrates that every strand of the narrative was wrong. The contours of the crisis that began in mid-summer 2007 and continues to this day are well known. A housing market bubble began in the late 1990s and accelerated in the early-mid 2000s. Banks and mortgage brokers earned fees in proportion to the volume of mortgages they wrote, and banks earned large fees securitizing mortgages and selling them to capital markets in the form of mortgage backed securities and collateralized debt obligations (CDOs). Investors demanded these complex, risky derivative products because they were given high – often AAA - ratings by credit ratings agencies. They had higher returns than equivalently rated corporate bonds and other safe products whose yield was held down by the low interest rates of the era. (Different returns on product with identical ratings should have signaled that something was wrong with market pricing.) Demand was so great that banks and brokers began to sell mortgages to those who could not afford them, under terms that were bound to trigger large defaults when the housing price bubble evaporated and/or interest rates rose. Home sales peaked in late 2005 and home construction spending peaked in early 2006. When the subprime mortgage crisis erupted in mid 2007, the entire edifice began to collapse. The crisis began in the US, but since shaky mortgages had been dispersed around the world, we soon had a global financial crisis.

Though the subprime mortgage market triggered the crisis, its deep cause is to be found in the profound structural flaws of the NFA. The combination of the ‘perfect calm’ and widespread belief in the NFA narrative led to aggressive risk taking (not perceived as risky), rapidly rising leverage, and inflated security prices. Given the structural flaws of the NFA, a serious crisis was all but inevitable. (See Crotty 2007 for a prescient analysis of the likelihood of a systemic crisis.) We consider here some of the more important structural flaws in the NFA. Our goal is to show how they encouraged the boom, facilitated the creation of unprecedented financial market complexity and opaqueness, led to a secular rise in the size of financial markets relative to the rest of the economy, and caused the systemic crisis that began in mid 2007.

First, the NFA is founded on the patently unrealistic core assumption of neoclassical financial market theory - that investors know the true distribution of the future cash flows associated with every security; they have 'rational' expectations. This is appropriate for situations of 'risk' – as in roulette, where probabilities of outcomes do not change over time. But it is totally inappropriate for conditions of fundamental uncertainty, in which the mechanism that generates future outcomes is always changing in ways that can never be known in the present. In real world financial markets, agents have to guess what future financial conditions will be. Expectations and the degree of confidence investors place in them change over time. In a Keynes-Minsky world of uncertainty, it is natural to assume – in contrast to mainstream theory - that expectations and risk aversion are endogenous. Investors get more optimistic and less risk averse as the boom rolls along, accelerating its pace. When a crisis breaks out, pessimism sets in and risk aversion spikes, causing investors to sell risky assets and rush into safe assets such as US treasury bills. This destroys liquidity in troubled markets. Mispricing of 'risk' follows a cyclical pattern, with under pricing in a boom period such as 2003 to mid 2007 and, eventually, over pricing in the crisis that follows. That investor expectations and risk aversion in fact follow such pro-cyclical patterns is demonstrated in a recent paper by two Federal Reserve economists (Amromin and Sharpe 2008). The NFA's conventional wisdom that risk is always priced correctly reinforced investors' natural tendency toward confident optimism during the recent boom, causing them to take unsustainable risks that accelerated financial expansion.

Second, the current financial system is riddled with perverse incentives that induce key personnel to take excessive risk. Banks get large fees to originate, securitize and service mortgages and distribute mortgages to capital markets - whether these mortgages later default or not. Top investment bank traders and executives receive giant bonuses in years in which risk-taking behavior generates high profits. In 2006, Goldman Sachs' bonus pool totaled \$16 billion. Wall Street's top traders received bonuses up to \$50 million that year. When a crisis generates losses, these 'rainmakers' do not have to give the money back. Hedge and private equity fund principals typically charge 2 percent of assets managed plus 20% of profits, and don't return this money in bad years. Mutual fund managers' pay rises with the size of assets under their control, which is maximized in a boom by the high returns associated with risky investments. Such asymmetric reward structures make it rational to take excessive risk in the bubble even if 'rainmakers' understand that a crash will take place in the intermediate future. Since credit rating agencies are paid by the investment banks whose complex derivative products they evaluate, it is hardly surprising they gave high ratings to dangerous products during the bubble. The NFA operated with an incentive system designed to generate rapid financial growth fueled by excessive risk taking and dangerous levels of leverage.

Third, the narrative claimed that banks were no longer risky because they sold loans to capital markets (the new 'originate and distribute' model of banking) and hedged whatever risk remained through credit default swaps. Both these propositions turned out to be myths. Rather than slim down as in the narrative, large global banks more than doubled their assets between 2000 and 2006. As Fed Vice-Chairman Donald Kahn remarked: "A good part of the risk associated with the securitization of subprime

mortgages was not distributed into the market but was retained by banks (“The Changing Business of Banking,” <http://www.federalreserve.gov/newsevents/speech/kohn20080417a.htm>). Banks kept risky derivative products like mortgage backed securities for several reasons. First, to convince potential investors that these securities were safe, banks often retained the riskiest part – the so-called ‘toxic waste.’ Second, the flow of these securities was so great that at every point in time banks ‘warehoused’ large quantities of them. When demand collapsed in the crisis, banks were left holding large amounts of mortgage backed products they could not sell. For example, CDO issuance fell from \$225 billion in the first quarter of 2007 to \$25 billion one year later. Third, given their incentives to seek risk, they wanted the high yields associated with the riskiest products. Fourth, when banks found the safest or ‘super senior’ tranches of mortgage backed securities hard to sell because their yield was low, they kept them themselves. But the crisis slashed even the prices of the ‘safe’ securities. The onset of crisis found banks holding about \$1 trillion of these securities. As of the end of the first quarter of 2008, they had taken over \$200 billion dollars in capital losses in mortgage related securities. Moreover, claims that risk was hedged through credit default swaps were equally shaky. Since the value of credit default swaps hit \$43 trillion in mid 2007 while the maximum value of debt that might conceivably be insured was \$10 trillion, it is evident that massive speculation by banks and others, not just hedging, was taking place.

Fourth, financial innovation has proceeded to the point where important derivative products such as mortgage backed securities and CDOs are so complex and so opaque that they are inherently non-transparent. A single CDO may own hundreds of mortgage backed securities (each with its own large pool of individual mortgages) and even other CDOs. The risk associated with them cannot possibly be priced correctly. Because they are so complex, such derivatives are illiquid. They do not trade on markets: 80 percent of all derivatives are sold over-the-counter. Indeed, the value of securities not sold on markets exceeds the value of securities that are. Thus, claims that capital markets price risk optimally do not apply even in principle to these securities. Borio calls attention to “The wide margin of error or the uncertainty that can surround the valuations of instruments for which a liquid underlying market does not exist (or may evaporate in times of stress)” (Borio, BIS WP 251 March 2008, p. 15). Institutions are forced to price them using complex mathematical models universally understood to be easy to manipulate and often wildly inaccurate. In market parlance, they are marked to ‘magic’ or to ‘myth.’

In the ‘perfect calm,’ with optimistic credit ratings provided by rating agencies paid to be optimistic, the yields on these securities grossly underestimated the probability of capital loss. The under-pricing of risk helped create a rising demand for them. Who would not want to buy a high-return low-risk security – a product that financial theory correctly assumes cannot exist? When the crisis hit these markets, liquidity dried up – a problem the mainstream canonical models assume cannot happen. They could be sold, if at all, only with massive losses. Rating agencies belatedly slashed rating scores for these products, exacerbating the problem. These securities were usually purchased with borrowed funds, so losses triggered margin calls, which forced the sale of safer assets, the

only ones the market would accept. Thus, the crisis spread across markets. Since no one knew how much these assets were worth or who held them, credit dried up everywhere. Note that since banks are obligated to value their securities at their estimated current value, bank equity evaporated along with the price of these securities. In response, banks tightly restricted credit, first to non-bank investors and then to each other in the inter-bank market. This exacerbated the crisis and frightened regulators who had not fully appreciated the dangers embedded in the NFA.

Fifth, it was claimed that in the capital-marked based NFA, complex derivatives would allow the risk associated with any class of securities to be divided into its component parts. Risk segments would be distributed around the globe to which ever investors were best suited to bear them. Since markets also priced risk correctly, no one would unknowingly hold excessive risk. Systemic risk would thus be minimized. What happened instead was that securitization and funding via global capital markets created channels of contagion in which in a crisis originating in one location (the US subprime mortgages) spread throughout around the world, triggering systemic risk. The IMF estimates financial institution losses over the next two years at \$1 trillion. The capital-market based system turned out to be much riskier than the bank-based system that preceded it.

Sixth, in the NFA banks were allowed to hold risky derivatives off their balance sheets, with no capital required to support them. Since capital had to be held against on-balance-sheet assets, the regulatory system induced banks to move as much of their assets off-balance-sheet as possible. Off-balance-sheet special investment vehicles (SIVs) and conduits borrowed short-term in the commercial paper market and invested in long-term, illiquid but highly profitable securities such as CDOs. Borrowing short to fund long-term illiquid assets was a dangerous game. The crisis destroyed the value of the derivative assets and triggered an exodus from asset-backed commercial paper. US asset-backed commercial paper outstanding fell from \$1.2 trillion in August 2007 to \$750 million by year's end. This forced banks to move the SIVs back on their balance sheets. The combination of asset write-downs and increased balance sheet assets worsened capital inadequacy, which in turn worsened the systemic credit squeeze.

Seventh, giant financial conglomerates have been allowed to become so large and complex that neither insiders nor outsiders can evaluate their risk accurately. Conceding that outsiders can't do the job, in 1996 the Bank for International Settlements sanctioned the idea that regulators should let banks evaluate their own risk through statistical exercises such as Value at Risk (VAR). In a VAR analysis, security price movements from the past year or two (which are assumed to follow a joint normal distribution) are used to ask the question: assuming that the prices of securities in our portfolio moved against the bank in threatening conditions likely to occur less than 5 percent of the time, what would be the maximum loss? This method of risk management is inherently flawed for three reasons. First, if, in a bubble, only one or two years past data is used (as is common practice), the data will reflect the 'perfect calm' and show little volatility or capital loss: risk will be severely under estimated. But if the data period is extended to cover past crises, financial innovation will have changed the system substantially: data from many years or decades in the past are a very bad predictor of future financial market

performance. There is thus no time period that can make VAR an accurate risk measure. Second, normal distributions make the threats to stability that appear every 3 to 6 years so improbable they can't effect the VAR calculation. This is the so-called "fat tail" problem. When Goldman Sachs had to invest \$3 billion to rescue two hedge funds in mid 2007, its CFO explained that no one could have foreseen the problem. "We were seeing things that were 25 standard deviation moves, several days in a row." (*Financial Times*, "Goldman pays the price of being big," August 14, 2007, p. 25) Three consecutive 25 standard deviation events in normal distributions would be unlikely to occur in the life of the universe. Use of normal distributions means that VAR risk estimations are based on the assumption that crises cannot occur. Third, when a crisis hits, liquidity dries up and most security prices fall together: the price correlations from the bubble used in the VAR exercise bear no relation to those that now confront the investor. The use of VAR guarantees that risk will be under estimated in a boom. This enables banks to minimize required capital and maximize lending, which adds fuel to the boom. It also leads investors to under estimate bank and financial sector risk, which sustains aggressive investor risk taking.

Eighth, as noted, the structural flaws in the NFA created dangerous leverage throughout the financial system. Financial market debt nearly doubled between 2000 and 2007. Prior to the crisis, large investment banks had asset to equity ratios of 30 or more and some hedge funds were more highly levered. It is estimated that half of the spectacular rise in investment banking return on equity in the past four years was attributable to higher leverage (*Financial Times*, "Worst period for investment banking in 30 years," April 2, 2008). Commercial banks appeared adequately capitalized, but only because a high percent of their assets were kept off their balance sheets. A respected association of international accountants recently estimated that off balance sheet rules "allowed trillions in assets to escape close scrutiny" (*Financial Times*, "Off-balance sheet rules for banks 'irretrievably broken' say experts," April 10, 2008, p. 15). When the crisis hit, the value of these assets plummeted, causing a frantic global search for new capital. The increase in leverage helped push the size of financial markets relative to the real economy to unsustainable heights. To use Minsky's term, it made the financial system itself exceptionally financially fragile. The decline in security prices caused by the crisis triggered a de-leveraging process in which price declines led to margin calls which led to forced assets sales and more margin calls in a dangerous downward spiral. "The turmoil represented a sharp repricing of risk that, given the leverage built up in the system, led to, and was exacerbated by, an evaporation of liquidity in many markets, including in the interbank markets" (Borio, BIS WP 251 March 2008, p. 9). The forceful intervention of central banks to provide liquidity to frozen markets by massive loans to commercial banks and, for the first time since the Great Depression, to investment banks as well, was motivated by a perceived need to stop this dangerous de-leveraging process. In the Bear Stearns case, the Fed in effect bought the devalued securities from the failing investment bank.

The NFA was created in response to the financial market chaos that took place in the 1980s and the rise to power of right-wing governments and free-market ideology in the US and UK in that decade. Financial assets began to grow more rapidly than the real

sector in the US starting in the early 1980s, a process accelerated by the explosion of derivative products after 2000. Following a recovery from the chaos of the 1980s, financial sector profits relative to GDP grew rapidly from the early 1990s through the end of the decade, then took off after 2002. From 1.5% in 1994, this ratio grew to 2% by 2000 and 3.7% by 2006. Thus, the NFA facilitated a tremendous increase in the size of financial markets and the profits of financial agents. Its structural flaws helped drive this growth process beyond safe boundaries, leading time and time again to serious financial crises in both developed and developing countries, crises with serious negative economic consequences. The incidence of banking crises (measured by the proportion of countries affected) has been as high since 1980 as in any period since 1800. Governments were forced to intervene to prevent serious systemic financial breakdowns on many occasions.

These events demonstrate that the NFA is so flawed that it cannot reproduce itself over time without frequent government bailouts. But after every such 'rescue,' financial markets become larger, more complex, more opaque, and more highly leveraged. Thus, every rescue eventually leads to the need for yet larger and more aggressive future bailouts, because the potential cost of nonintervention keeps rising. As recent crisis showed, this ratcheting secular process calls not only for larger state rescue operations, but more complex and creative interventions as well. Moreover, the increasingly opaque character of financial institutions poses dramatic new challenges for rescue operations. Key institutions hold large amounts of illiquid derivative securities that cannot be properly priced, but regulators do not know who holds these securities or what they are worth. Some institutions, such as hedge funds and investment banks, hold large volumes of these securities, but are not (yet) subject to serious regulation. The analyses of the causes of the crises published by regulatory bodies put the blame on the kinds of structural flaws in the NFA discussed here. But thus far at least, regulators have proposed mild palliatives clearly incapable of correcting the flaws that caused the crisis. They have yet to demonstrate a willingness to meet the challenge posed by the new era of Finance Capital.

VI. The Evolution of Lender-of-Last Resort Actions During the Sub-Prime Crisis

The previous section described the evolution of the crisis in terms of the ways in which the financial markets violated neo-classical principles and regulatory presumptions. This section describes the same period but this time from the perspective of lender of last resort actions (LLR) actions led by the Federal Reserve (Fed), and undertaken by the European Central Bank (ECB) and the Bank of England (BE) as well. We also briefly mention several other major interventions undertaken by other institutions. Throughout this discussion we will refer heavily to Table 2 and Figure 13 which give a picture of the instigating factors, nature and impacts of the interventions as they evolved over time. The dynamic of the story reveals that the authorities first greatly mis-diagnosed and then under-estimated the severity of the problem, and eventually were forced to design more and more radical interventions to contain the problem. Despite protestations to the contrary, all three central banks eventually were forced to intervene in unexpected ways. The jury is still out, of course, as to where this will all lead.

A second theme is the expansion of LLR reach demanded by the creation of the “shadow banking system”, perhaps the most egregious aspect of the “de-regulate/bail-out” dynamic. The Fed has no authority to regulate these shadow institutions, but is forced to bail them out to prevent systemic collapse. These institutions include hedge funds, private equity funds, derivatives traders, and so on. They also include a set of off-balance vehicles, such as structured investment vehicles (SIVs) associated with banks but not subject to the same degree of regulation.

A third theme is that this process of de-regulation and bail out which has led to an explosion of complex financial markets and instruments, has in turn made the lender of last resort actions much more complex and much less effective. This has led, as we will see, to the need for significant widening of lender of last resort reach and the need for significant innovation in how it is carried out.

A fourth and related theme is the obvious impact of globalization on interventions. Because of the globalization of international financial markets, the major central banks were required to cooperate and coordinate interventions in an attempt to manage the crisis. Such cooperation and coordination occurred, however, on an ad-hoc basis, even though finance has become significantly more globalized. This has complicated the LLR activities tremendously.

Chronology of a Death Foretold

A number of analysts, including one of the authors of this paper (James Crotty) foresaw the crisis, but many of the financial regulators, apparently did not, not until it was well underway, that is.

August 9, 2007 is increasingly seen as the date the “crisis” became painfully obvious (eg, Borio, 2008)⁴ (see Figure 1 and Table 1). On that day, BNP Paribas suspended three investment funds worth 2 billion Euros, saying it could not value their assets. This brought to the surface the valuation problems of CDOs and other investment vehicles, sending shock waves through the system. Of course, even before this, there were plenty of signs of a gathering storm, with the bankruptcy of several large sub-prime mortgage originators in the U.S., (New Century (April 3)) and American Home Mortgage (August 6). Foreshadowing major difficulties were the failure of two Bear Stearns hedge funds, which had filed for bankruptcy several days before on July 31, while investors were stopped from withdrawing funds from a third. The market turmoil generated by this chain of events is evident in behavior of interest rates. One “representative” indicator, the spread of 3 month LIBOR over the rate on 3 month U.S. Treasury bills), exploded in early August, 2007. (See Figure 1). This is a useful indicator of financial turmoil because it indicates on what terms, banks are willing to lend to each other on “uncollateralized” debt. A major increase in the libor rate over the relatively safe U.S. Treasury bill of the same maturity indicates a problem: banks have less trust in each other, a problem that will spread as banks have difficulties borrowing short term from each other to fund temporary short-falls in liquidity.

⁴ Annex 1 in Borio (2008) contains a very useful chronology of events.

Initially, the big three central banks responded rather gingerly, but over time, led by the Federal Reserve and as described in Table 2 below, they were forced by circumstances to make their lender of last resort actions larger, bolder and more innovative. Even a quick glance at Figure 13 makes clear how the central banks' responses were forced by circumstances to evolve over the period: as they responded to financial distress (as represented by the increase in the 3 month libor spread over the 3 month U.S. treasury spread), the distress would appear to abate, but only temporarily. Each spike of distress seemed to call forth a broader and more intense response, culminating, as of this writing, with the March 16, emergency Bear Stearns operation and a second 75 basis point drop in the Federal Funds (FF) target on March 18. Even these dramatic operations have not restored the spread to that prevailing during the "perfect calm" prevailing before spring of 2007 (see Figure 13).

Figure 13



TAF: Term Auction Facility
TSLF: Term Securities Lending Facility
PDLF: Primary Dealers Lending Facility

Sources: Economagic, Wall Street Journal, New York Times, Financial Times

In Table 2 we have organized the responses of the three major central banks – the Federal Reserve (Fed), European Central Bank (ECB) and the Bank of England (BE) - into five categories: changes in interest rates, unusually large open market operations, emergency financing through normal channels, the creation of new emergency financing channels and special rescues of specific institutions. We have also added a column for key actions of other public institutions engage in lender of last resort actions.

Table 2

The Evolution of Lender of Last Resort Actions by the Federal Reserve (Fed), European Central Bank (ECB) and Bank of England (BE) in the Sub-Prime Crisis

| Date | Changes in interest rates | Unusually Large open market operations | Emergency Financing through Normal Channels | Creation of New Emergency Financing Channels | Special rescues of specific institutions | Other Institutions |
|-------------|---|---|---|---|---|--|
| 6/13/07 | <u>ECB</u> raises interest rate to 4.00%, where they remain | | | | | |
| 7/5/07 | <u>BE</u> raises rates by 25 bps to 5.75% | | | | | |
| 8/13/07 | | <u>ECB</u> injects ~ €200 Billion in open market operations | | | | |
| 8/17/07 | <u>Fed</u> decreases the spread of the discount window over the fed funds target from 100 to 50 bps (inter-meeting) | | Around this time several large banks take ~ \$2 Billion in loans in an attempt to reduce the stigma associated with discount window borrowing | | | |
| 8/31/07 | | | | | | Borrowing from the federal home loan bank surges ~ \$180 Billion in August |
| 9/14/07 | | | <u>BE</u> provides liquidity support to Northern Rock | | | |

| Date | Changes in interest rates | Unusually Large open market operations | Emergency Financing through Normal Channels | Creation of New Emergency Financing Channels | Special rescues of specific institutions | Other Institutions |
|-------------|--|---|--|---|---|---------------------------|
| 9/18/07 | Fed lowers interest rate 50 bps to 5.25% | | | | | |
| 10/9/07 | | | | | BE guarantees all new and existing deposits at Northern Rock . superceding the normal guarantee of up to £31,700 | |
| 10/31/07 | Fed lowers interest rate 25 bps to 5.00% | | | | | |
| 12/6/07 | BE lowers rates 25 bps to 5.50% | | | | | |
| 12/11/06 | Fed lowers interest rate 25 bps to 4.75% | | | | | |
| 12/12/07 | | | | Fed along with partnering central banks announce creation of the TAF | | |
| 1/4/08 | | | | Fed increases size of TAF from \$40B to \$60B | | |
| 1/22/08 | Fed lowers interest rates by 75 bps to 3.5% (inter-meeting) | | | | | |
| 1/30/08 | Fed lowers interest rates by 50 bps to 3.00% | | | | | |
| 2/7/08 | BE lowers interest rates 25 bps to 5.25% | | | | | |
| 2/17/08 | | | | | Northern Rock is nationalized | |
| 3/7/08 | | | | Fed increased size of TAF from \$60B to \$100B | | |
| 3/7/08 | | | | Fed initiates a series of 28 day repos that will culminate in 100B outstanding | | |
| 3/11/08 | | | | Fed creates the TSLF | | |
| 3/11/08 | | | | Fed increases currency swap lines from \$24B | | |

| Date | Changes in interest rates | Unusually Large open market operations | Emergency Financing through Normal Channels | Creation of New Emergency Financing Channels | Special rescues of specific institutions | Other Institutions |
|-----------|---|--|--|--|--|--|
| | | | | to \$36B | | |
| 3/13/08 | | | | | <u>Fed</u> lends 30B to Bears Stearns (an investment bank not traditionally eligible for fed assistance) through JP Morgan | |
| 3/16/08 | | | | | JP Morgan agrees to acquire Bear Stearns with help from the Fed | |
| 3/16/2008 | | | | <u>Fed</u> creates of the PDLF which operates as a lender of last resort to any primary dealer | | |
| 3/16/08 | <u>Fed</u> decreases the spread of the discount window over the fed funds target from 50 to 25 bps (intermeeting) | | <u>Fed</u> increases maximum discount window loan length to 90 days from 30 days | | | |
| 3/18/08 | <u>Fed</u> lowers interest rates 75 bps to 2.5% | | | | | |
| 3/20/08 | | | | | | Restrictions eased at Fannie May and Freddie Mac to enable an additional \$200B in funds which could be used to purchase MBS |
| 3/24/08 | | | | | | FHLB authorized to increase investment in MBS by \$100B |

One striking aspect of the central banks' responses is how late they were in initiating substantial lender of last resort actions. Despite early signs of serious problems in the sub-prime markets in June and early July the ECB and BE were still *raising* interest rates. It was not until August 13 that the ECB injected a significant amount of new liquidity into the financial markets, followed a few days later by the Fed lowering the discount rate (August 17) and encouraged large banks to borrow more from the discount window in an attempt to get the banks to use already existing facilities to help provide liquidity. This policy was soon seen as insufficient as the crisis spread and deepened.

This desultory response was probably due to at least three factors: first, the highly complex and non-transparent nature of the risks associated with the securities whose origination and distribution had been made possible by earlier rounds of de-regulation made it extremely difficult for the Federal Reserve and other authorities to properly anticipate the true severity of the crisis, even as it was unfolding. Second, like central banks and financial authorities for centuries before them, the Fed wanted to avoid the moral hazard and concomitant political problems associated with lender of last resort actions if it possibly could. And third, the inflation-obsessed approach to central banking - accompanied by rational expectations based monetary theory - makes the central banker's prestige synonymous with establishing his anti-inflation credibility. This helps to explain the oddly pro-cyclical behavior of the ECB and BE that were raising interest rates just as the financial markets were about to melt down, and also the tepid initial response of rookie Ben Bernanke who was quite reluctant to undermine his hard earned, initial stock of anti-inflation creds.

Throughout the fall of 2007, as the crisis worsened, the Fed - having awakened to the problem -- seemed to believe that standard reductions in interest rates would be sufficient to stem the crisis. Meanwhile the Bank of England, early public proclamations that they were not going to engage in bail-outs, ended up moving closer and closer to bailing out Northern Rock. Reductions in the FF had modest calming effects on the markets (see Figure 1), but by December, it was clear that the crisis was taking a very severe turn for the worse and that the Fed's moderate, standard operating procedure responses were not working.

The central banks' lack luster response to the crisis occurred despite plenty of signs of increased distress. (Borio, 2008, Annex 1; BBC time-line of sub-prime crisis). Housing prices continued to drop, one bank after another was reporting write-downs and losses, rating agencies were down-grading huge quantities of CDO's, financial guarantors announced huge third quarter losses, and banks announced that they were re-intermediating billions of dollars of doubtful debt. Still, the central banks did relatively little other than refrain from raising interest rate (BE, ECB), or continue lowering them. In short, it took quite a while for the lender of last resort function to take hold.

Starting in early December, as the stress in the markets again jumped (see Figure 1) the central banks finally began to respond in significant ways. Notably, the Fed announced its Term Auction Facility (see Table 2 below), and the Banks of Canada and

England lowered interest rates for the first time in years. And most significantly, after a meeting of the G10 central banks, a group of central banks, led by the Fed, announced on December 12 a coordinated set of measures designed to calm the markets. These included putting in place dollar swap lines so that European Central Banks could provide dollar liquidity to banks operating in the euro zone (including subsidiaries of US banks). This was to be the first among a number of coordinated actions taken by central banks to try to ease the crunch.

The reason for these swap arrangements is of interest. The European Central Bank has fewer restrictions than the Fed on the collateral it could take in exchange for loans. Since the objective of central bank interventions was to take from the banks the bad CDOs and substitute good dollar denominated debt (treasury securities) which these banks could then use as collateral for further borrowing, the central banks made an ingenious arrangement that allowed the Fed to lend dollars to central banks in Europe that could then lend them to the European subsidiaries of American banks in exchange for dodgy debt.

While these actions, calmed liquidity fears to some extent, (Figure 13) the underlying problems of the decline in housing prices and asset values continued to put core financial institutions at risk. The Fed responded with an extraordinary inter-meeting reduction of 75 basis points of the FF (1/22), its biggest cut in twenty-five years.

The Fed accelerated in lender of last resort activities tremendously in February and March (see Table 2), expanding its Term Auction Facility (TAF), expanding the maturity of its repo operations, increasing swap lines with foreign central banks.

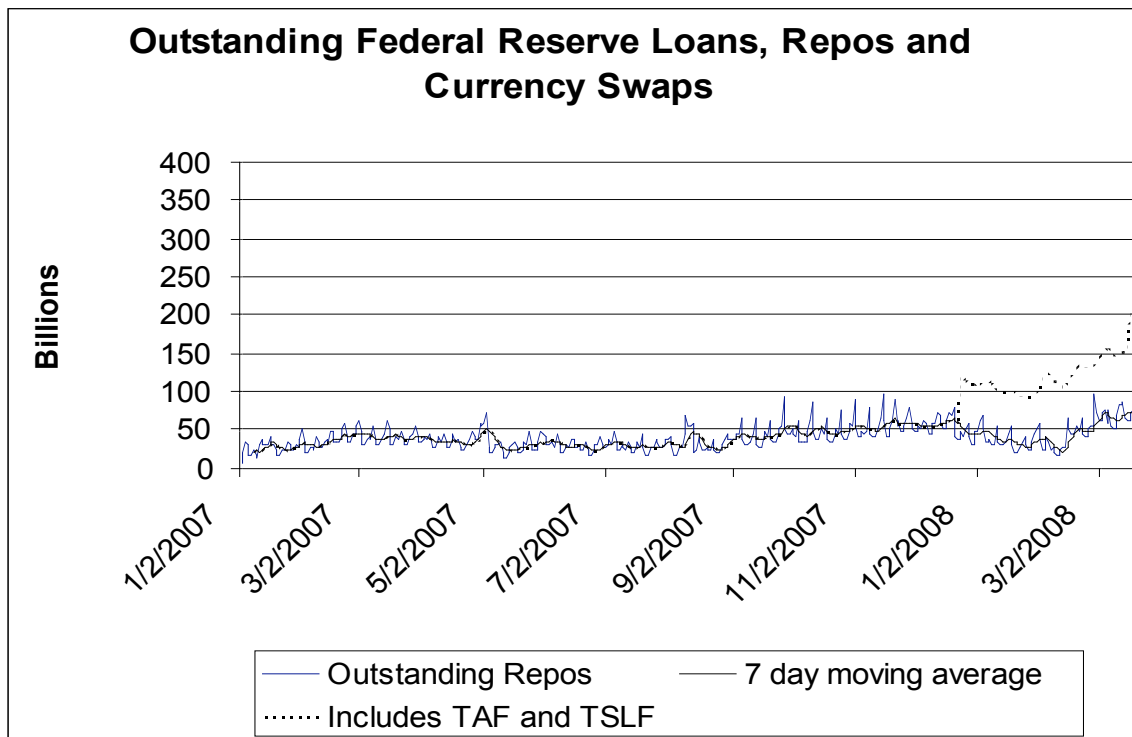
But by early March, even these extraordinary actions were not enough to restore confidence, liquidity and stem the decline of asset prices. As evidenced by the spike in the interest rate spreads in early March (Figure 13), trouble continued to brew. On March 11 the Fed announced the creation of Term Securities Lending Facility (TSLF). This institutes an auction by which the Fed exchanges good securities for bad securities to get them off the books of banks. Still, the flow of bad news was not stopped. (see the Appendix for more information on these special facilities).

All of this culminated with the dramatic rescue of Bear Stearns, and the Fed facilitated take over of Bear by J.P. Morgan Chase on March 17, putting up almost \$30 B in loans to back the arrangement. At this time, the Fed announced the creation of the Primary Dealer Credit Facility (PDCF), a discount window for primary dealers (i.e., investment banks), who can tap into this facility whenever needed (unlike the auctions that are held periodically). The Bear Stearns rescue and the PDCF finally reflected the recognition that the Fed would have to confront directly the “shadow banking system” that had grown up as a result of the previous policies of de-regulation and bailout. They could no longer pretend that the shadow system was someone else’s problem.

Figure 14 shows an estimate of how much is being lent by these facilities.

Figure 14

No

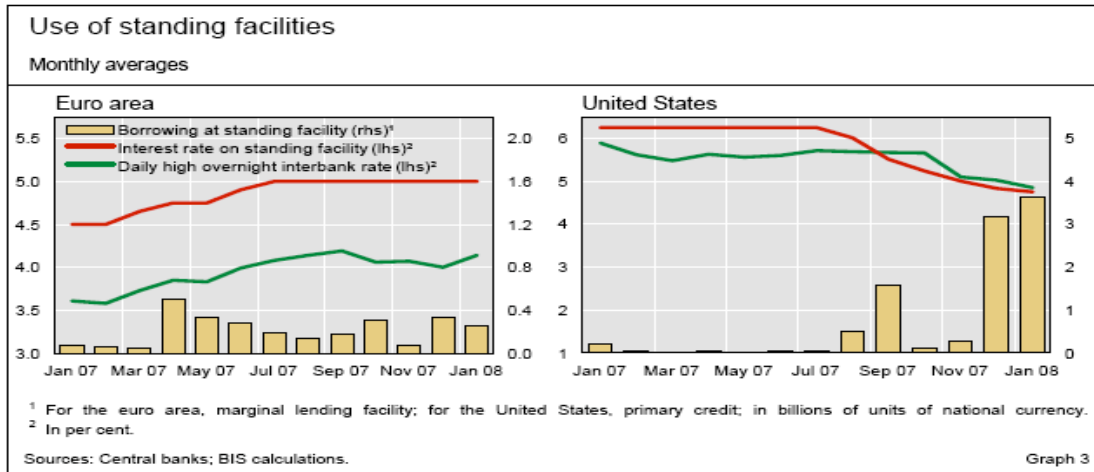


Note the dramatic increase in outstanding loans generated by the TAF and TSLF starting after the first of the year, and dramatically increasing March.⁵

Figure 15 below presents another estimate of the credit given out by these facilities.

⁵ Caution should be exercised in using these figures. As Borio and Nelson (2008) suggest, these facilities might lend money for different terms so simply adding up all the credit issued without care to net out lapsed credit might lead to double counting.

Figure 15



Source: BIS, 2008.

Still, overall the Federal Reserve's operations, like those of other central banks were designed to change their balance sheets and those of the fragile financial institutions by offering them good assets while taking bad assets of their hands. The Fed and other central banks typically mopped the increase in reserves through contractionary open market operations of various types. (Borio and White, 2008; New York Federal Reserve, 2008).

Table 3, taken from the BIS, shows that a number of central banks took some extraordinary actions in order to confront the financial crisis. For a number of them, these involved loosening up on collateral requirements, extending longer-term credit, and/or extending credit to a broader group of actors.

Table 3

| Steps taken during the financial turmoil | | | | | | | |
|---|----|----|----|----|----------------|----------------|----------------|
| | AU | CA | EA | JP | CH | GB | US |
| Exceptional fine-tuning (frequency, conditions) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Exceptional long-term open market operations | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Change in the standing lending facility | | | | | | | ✓ |
| Broadening of eligible collateral | ✓ | ✓ | | | ✓ ¹ | ✓ | ✓ ² |
| Change in banks' reserve requirements/target balances | • | • | | | | ✓ | |
| Broadening of counterparties | | | | | | ✓ ³ | ✓ ² |
| See Table 1 for the mnemonics. | | | | | | | |
| ¹ Entered into effect on 1 October, but not linked with the turmoil. ² The collateral and counterparty rules did not change, but the discretionary operations under the Term Auction Facility utilise the broader lists pertaining to discount window credit compared to those for ordinary open market operations. ³ Only for four auctions of term funding for which, however, there were no bids. | | | | | | | |
| Source: Central banks. | | | | | | | Table 4 |

Source: BIS, March, 2008.

Assessment:

As this brief chronology makes clear, the Federal Reserve – late in the game and reluctantly – was forced to take extraordinary lender of last resort steps to grapple with the unfolding financial crisis. The Bear Stearns rescue and the creation of the Primary Dealer Credit Facility (PDCF) pushed the boundaries (as Paul Volcker in a number of widely quoted speeches) of the authority of the Federal Reserve, and put large sums of taxpayer money at risk. The cycle of de-regulate and bail-out, leading to increasingly complex, opaque and large financial markets, made the lender of last resort action more difficult, less effective, and, as of this writing, one cannot yet say it has been effective in staving off financial collapse.

As Kindleberger has made clear, while extraordinary, this behavior has many historical precedents. That, of course, does not make it efficient or equitable, or desirable. It does make it yet another extraordinary chapter in the recent system of “de-regulation and bail-out” which, in the absence of a regulator sea change, will only serve to rev up the cycle for next time, with long run destructive impacts on the evolution of the economy.

VII. Ending the De-regulation/bail-out Dynamic: Outline of Proposals to Restructure the Financial System

Introduction

As the sub-prime crisis has unfolded, more and more analysts have identified a number of the key flaws in the system we have discussed in section V above. Yet few, - and almost none with any official authority – have proposed any changes in the regulatory structure that can even begin to end the dynamic of de-regulation and bail-out that characterizes the current financial architecture. And certainly none have adopted Minsky’s proposal noted in section II above– despite the widespread recognition of a “Minsky Moment” - that regulators should regulate product and process innovations to restrict the excessive expansion of financial assets.

For example, *The Financial Stability Forum*, an ad-hoc organization at the BIS that includes many of the world’s financial regulators, a major analysis of the sub-prime meltdown was recently published (Financial Stability Forum, 2008). Despite containing an analysis that contained many of the criticisms we discuss above, their regulatory solutions are mostly toothless or irrelevant.

FINANCIAL STABILITY FORUM

To this end, the FSF proposes concrete actions in the following five areas:

- Strengthened prudential oversight of capital, liquidity and risk management.
- Enhancing transparency and valuation.
- Changes in the role and uses of credit ratings.
- Strengthening the authorities’ responsiveness to risks.
- Robust arrangements for dealing with stress in the financial system.

Source: Financial Stability Forum, (FSF) 2008

Despite the nice sounding phrases, in the end, the FSF proposed no changes that would have any bite.

In this section, we briefly outline some principles and proposals that we believe could dramatically reduce the incidence of financial crises, while enhancing the social efficiency of the financial sector. Obviously, a complete discussion of financial regulatory changes goes way beyond the scope of this paper, but, on the theory that you can’t beat something with nothing, we thought it would be useful to at least provide an outline of some alternatives.

Outline of Regulatory Changes

Earlier, we identified a number of structures and processes in the current financial environment that promoted financial instability and, in particular, played a crucial role in

the current crisis.⁶ These included, the asymmetric pay-off structures facing financial firms and actors, the inherent complexity and non-transparency of financial products and innovations, the moral hazard inherent in the *originate and distribute system* of securitization and off-balance sheet structures, the conflicts of interest facing numerous financial actors designed to identify, monitor and reveal risks, including ratings agencies, post Glass-Steagall investment banks, and financial regulators themselves who are subject to *capture* by the institutions they are supposed to regulate.⁷ Among other fundamental problems this set of structures creates is a profound pro-cyclicality in the financial system.

The calls for reform from the FSF and others amount to little more than pleas for the financial institutions to voluntarily behave better, which ignores the profound incentives they face to not do so.

Particularly doomed are calls for more “transparency”. Modern financial innovations are *inherently* non-transparent because of their complexity and the profound weight of fundamental uncertainty that makes it virtually impossible to predict their value. Likewise, calls for self-regulation, that ignore the powerful incentives facing financial actors to under-price risk on the upside because they make so much more on the upside than they lose on the bust, also involve a great deal of whistling past the grave yard.

In light of these problems, our proposals are designed to reduce these asymmetric pay-off structures, to greatly limit the complexity of financial instruments, to create more incentives for financial actors to internalize the risks they face and to give regulators more authority to implement significant over-sight of process and product innovation and capital requirements.

1. Restrict or eliminate off-balance sheet vehicles

Force all risky investments to be taken on bank balance sheets backed up by the firm’s capital. An anecdote illustrates how this might work. Gilian Tett reported in the *Financial Times*, that several years ago a “clutch” of Spanish banks approached the Spanish central bank asking permission to set up a network of SIV’s presumably to carry CDO’s and other exotic assets. The Spanish Central Bank, however, took a dim view of this and demanded that they post eight percent capital charge against the SIV assets. That essentially killed the innovation in its tracks (FT, January 31, 2008).

2. Due Diligence

Alter the legal obligations facing sellers of CDO’s and other financial assets so that they are required to do “due diligence” on the contents of these securities. This means the issuers will be responsible for telling the buyer what is in the securities and what their risks are. This will reduce the role of the ratings agencies and reduce the incentives of the

⁶ These have also recently been identified and analyzed in excellent papers by Borio (2008), Kregel, (2008), Guttman (2007), and Wray (2008).

⁷ This could be termed the “banks ‘R us” phenomenon.

issuers to originate and distribute toxic assets. Since the issuers of these assets often cannot do due diligence because of the fundamental uncertainty and inherent complexity of these assets, then many of these assets won't be created in the first place.

3. Move Financial Asset Trades to Exchanges

Most CDO's, CDS's and other exotic financial instruments implicated in the sub-prime mess are traded over the counter. This enhances the ability of issuers to create highly complex and non-transparent securities since, if they were traded over exchanges, they would have to be more uniform, more transparent. A powerful way to increase the transparency of securities is to insist that they be traded over exchanges. (see Financial Times, April 15, 2008, for one such proposal).⁸ Of course, traders and investment banks would not meekly accept such a proposal since, as the *Economist* points out, writing complex derivatives to be traded over the counter is one of the big ways these financial engineers make their huge profits (*The Economist*, April 19, 2008).

3. Clawbacks

As we have seen, an asymmetrical pay structure facing issuers of assets has greatly exacerbated the pro-cyclical behavior of financial markets. One mechanism to make the pay-off structure more symmetrical would be to implement "clawbacks" whereby excessive profits during the up turn would have to be repaid in the downturn. This could be mandated in the pay packages of financial actors, or could be implemented through the tax system through a series of escrow funds, and limitations on deductions from losses. Of course, there would be great incentives to engage in tax or restriction avoidance, but that is always the case and is not sufficient reason to give up on such regulations.

4. Extend Regulatory Oversight to the "Shadow Banking System"

Twenty five years ago, Jane D'arista and Tom Schlesinger argued that the "parallel banking system" needs to be brought under the jurisdiction of the same regulatory agencies that regulate banks, that the playing field should be leveled and that the regulatory bar and oversight should be raised for all these financial firms taking on risky positions. (D'Arista and Schlesinger, 1993). Their argument holds with even more force today, especially after the Fed's safety net has been extended way beyond the bounds of its regulatory jurisdiction.

5. Implement a Financial Pre-cautionary Principle

Once the financial regulatory structure is extended, then it would be possible to implement a sort of a regulatory pre-cautionary principle with respect to new products and processes. Just as in the example above where the Spanish banks first had to check with the Bank of Spain before creating SIV's, financial institutions would check with the regulatory authorities before implementing new significant financial innovations. The

⁸ This was brought to our attention by Ben Branch, Isenberg School of Management, University of Massachusetts, Amherst.

issue is whether these innovations – if extended to a broad range of financial institutions – would greatly increase systemic fragility. Typically, the regulatory authority would do as the Spanish authorities do: tell the financial institution that as long as they could raise sufficient capital to put at risk to back the innovation, then they could implement it. But they would reserve the right to continue to monitor the evolution of the innovation to make sure that it is not contributing too much to systemic risk. In some cases, though, the regulatory authority may restrict the implementation of the innovation on the grounds that even with more capital, the innovation has too many negative externalities for the system as a whole.

6. Restrict the Growth of Financial Assets

A number of the previous suggestions could help to restrict the excessive growth of financial assets, a major point made by Minsky as noted earlier. Moving securities to exchanges, imposing stricter capital regulations, forcing assets on balance sheets and imposing due diligence, could all help. But this may still not be sufficient to eliminate the excessive growth of financial assets. For as a number of observers have shown (Ocampo, Akyuz, Kregel, Wray, Adrian and Shin), asset creation is extremely pro-cyclical. As asset prices rise, capital values go up and banks are able to expand their leverage further. In this case, monetary and financial policy needs to behave counter-cyclically, in order to limit the excessive growth of these assets (Adrian and Shin, 2008.)

7. Implement Lender –of–Last Resort Actions with a Sting

Institutions might be too big to fail, but no CEO should be. As long as there is financial capitalism, there will be a need for the lender of last resort and for bailouts, even if all of these policies are implemented. But the key distinction must be made between the financial institution and the agents who made the decisions and stood to benefit from them – the investment bankers, the rainmakers and the stockholders. These groups must be made to pay significantly when their firms are bailout. Otherwise, the problematic asymmetric reward structure is underwritten by the central bank.

8. Eschew Inflation Targeting: Implement Counter-cyclical Monetary Policy

Rather late in the game, even the IMF has now suggested that central banks need to look beyond commodity prices when setting monetary policy: i.e., (commodity) inflation targeting is not a good monetary operating procedure in a world of massive financial speculation. The IMF's protestations are not credible, but the point they are belatedly making is an important one. (For much earlier criticisms of inflation targeting and the development of alternative policies, see Epstein and Yeldan, 2008; Akyuz, 2007; Borio 2007; Ocampo, 2006). Monetary policy must be anti-cyclical and must pay attention to employment, investment, and asset bubbles as well as commodity inflation.

Conclusion:

Note that none of these (or other) good ideas will get implemented unless there is a major change in the orientation of the regulators at the Federal Reserve, the Treasury, and elsewhere. As it is, for the most part the regulators and the financial actors are almost indistinguishable. Only when the regulatory institutions have well-trained, public oriented people with a broad mandate for financial reform and regulation. This will probably take a strong political movement pushing for more fundamental financial reform.

VIII. Conclusion

Hyman Minsky's major claims about financial market behavior have been validated by subsequent history. Left to themselves, financial firms driven by the lure of profit and the fear of competition would relentlessly innovate. Financial innovation in turn would make financial cycles more volatile and would drive the size of financial markets relative to the real economy relentlessly higher – provided governments intervened to rescue financial firms whenever crises threatened their solvency. Governments would have increasing motivation over time to bail financial firms out in times of crisis because with the passage of time, the harm these crashes could do to the real economy would become greater.

Minsky also drew sensible policy conclusions from his theory of financial markets. We could either impose strong and effective regulatory restraints on financial firm behavior, or suffer from the dynamics of ever-larger financial market implosions followed by ever-larger government bailouts. His two main proposals for policy change – regulatory restrictions on permissible financial innovation and counter-cyclical control of the growth of financial assets held by all-important financial institutions – went to the heart of the problem. Unfortunately, the interests of ruling elites in the US and elsewhere, supported by canonical mainstream financial market theory, led to a process of deregulation that culminated in three decades of crisis-bailout dynamics. The costs of both the crises and the bailouts have been enormous. This dynamic led to an explosion of financial markets and financial profits and a rising secular trend of leverage in both the financial and real economies, rather than the constrained financial sector envisioned by Minsky.

In this essay, we have investigated the costs and consequences of this process, and speculated about its end game. Under our current trajectory, the eruption of a systemic financial crisis that wreaks havoc on the global economy at some point is not out of the question. We believe it is imperative that society acting through governments create new regulatory institutions and practices strong enough to reverse the current dynamic and replace it with a regime of tight monitoring and strong regulation of all-important financial institutions. This regime must be capable of eliminating a large percent of the social costs of our current bloated and parasitic financial sector and reducing the frequency, depth and duration of the financial downturns that are inevitable in capitalism.

We have sketched some general principles to guide the re-regulation process, but make no claim that this sketch is more than suggestive.

In making these arguments, we build on the shoulders not only of Hyman Minsky but also on those of Jane D’Arista. Jane anticipated many of the financial problems we now face, and many of the solutions as well. More than fifteen years ago she called attention to the dangers of the parallel banking system – what is now more likely to be called the shadow banking system. She also anticipated many of the problems we now face with some of the more Frankenstein creations of this financial system: highly complex, securitized financial assets that can spread highly complex difficulties far and wide. D’Arista also devised a simple way to deal with these problems: level the playing field and raise the bar. In other words, give all parts of the financial sector equal opportunity to make profits, but make sure they are all under the strict purview of the regulators. It is almost certainly the case that had Jane D’Arista’s advice been followed, we would not now be in this mess.

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Appendix

Forms of Federal Reserve Lending to Financial Institutions

| | Regular OMOs | Single-Tranche OMO Program (announced March 7, 2008) | Discount Window ¹ | Term Discount Window Program (announced August 17, 2007) | Term Auction Facility (announced December 12, 2007) | Primary Dealer Credit Facility (announced March 16, 2008) ² | Securities Lending | Term Securities Lending Facility (announced March 11, 2008) |
|--|---|--|---|--|---|--|------------------------------|--|
| Who can borrow? | Primary dealers | Primary dealers | Depository institutions | Primary credit-eligible depository institutions | Primary credit-eligible depository institutions | Primary dealers | Primary dealers | Primary dealers |
| What are they borrowing? | Funds | Funds | Funds | Funds | Funds | Funds | U.S. Treasuries | U.S. Treasuries |
| What collateral can be pledged? | U.S. Treasuries, agencies, agency MBS | U.S. Treasuries, agencies, agency MBS | Full range of Discount Window collateral | Full range of Discount Window collateral | Full range of Discount Window collateral | U.S. Treasuries, agencies, agency MBS, investment grade debt securities ³ | U.S. Treasuries | U.S. Treasuries, agencies, agency MBS, AAA/Aaa-rated private-label RMBS and CMBS, agency CMO |
| Is there a reserves impact? | Yes | Yes | Yes | Yes | Yes | Yes | No (loans are bond-for-bond) | No (loans are bond-for-bond) |
| What is the term of loan? | Typically, term is overnight–14 days ⁴ | 28 days ⁵ | Typically overnight, but up to several weeks ⁶ | Up to 90 days ⁷ | 28 days ⁵ | Overnight | Overnight | 28 days ⁵ |
| Is prepayment allowed if term is greater than overnight? | No | No | Yes | Yes | No | N/A | N/A | No |
| Which Reserve Banks conduct operations? | FRBNY | FRBNY | All | All | All | FRBNY | FRBNY | FRBNY |
| How frequently are operations conducted? | Typically once or more daily | Typically weekly | As requested | As requested | Every other week | As requested | Daily | Weekly |
| Where are statistics reported publicly? | Temporary OMO activity | Temporary OMO activity ⁸ | H.4.1 - Factors Affecting Reserve Balances | H.4.1 - Factors Affecting Reserve Balances | H.4.1 - Factors Affecting Reserve Balances | H.4.1 - Factors Affecting Reserve Balances | Securities lending activity | Term securities lending facility activity |

¹ Discount Window includes primary, secondary and seasonal credit programs.

² The PDCF will remain in operation for a minimum period of six months and may be extended as conditions warrant.

³ Investment grade debt securities include corporate securities, municipal securities, mortgage-backed securities and asset-backed securities.

⁴ Open market operations are authorized for terms of up to 65 business days.

⁵ 28-day term may vary slightly to account for maturity dates that fall on Bank holidays.

⁶ Primary credit loans are generally overnight. Loans may be granted for term beyond a few weeks to small banks, subject to additional administration.

⁷ Maximum maturity of term increased from 30 to 90 days on March 16, 2008.

⁸ Data only available on days when 28-day term RP operations are conducted.

Source: New York Federal Reserve, 2008.