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Competition is so Intense, Why
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Reflections on the Current
'Golden Age' of Finance**

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Abstract

In 1997 former Federal Reserve Board Chairman Paul Volker posed a question about the commercial banking system he said he could not answer. The industry was under more intense competitive pressure than at any time in living memory, Volker noted, “yet at the same time the industry never has been so profitable.” I refer to the seemingly strange coexistence of intense competition and historically high profit rates in commercial banking as **Volker’s Paradox**. In this paper I extend the paradox to all important financial institutions and discuss four developments that together help resolve it. They are: rapid growth in the demand for financial products and services in the past quarter century; rising concentration in most major financial industries that makes what Schumpeter called “corespective” competition and the exercise of market power possible (thus raising the possibility that competition is not universally as intense as Volker assumed); increased risk-taking among all the major financial market actors that has raised average profit rates; and rapid financial innovation in over-the-counter derivatives that allows giant banks to create and trade complex products with high profit margins. The last section of the paper discusses the role of moral hazard in today’s financial markets. Has the conventional belief that financial investment strategies formerly considered too risky to adopt have been made safe (and profitable) by modern risk-management techniques increased the likelihood of a future systemic financial crisis?

JEL Codes: E44, G2, G21, G24, L1

Key Words: financial markets, financial profits, competition, financial strategies, systemic financial crises

Introduction

Progressive analysts have produced an impressive body of research on ‘financialization’ - the effects of financial markets on nonfinancial corporations in particular and on national and global economic activity in general - in the past quarter century. By comparison, our collective understanding of why the financial sector has become so powerful and of what dynamic forces are driving present day financial processes is underdeveloped. We might say that we do not have an adequate understanding of the ‘other side’ of financialization. (Needless to say, a full explanation of the evolution of financial markets cannot be constructed unless the contemporaneous dynamics of the nonfinancial sector are taken into account – and conversely.)

There are many reasons why our understanding of financial markets is inadequate, not the least of which is that crucial information is not easily attainable. Publicly available data is more adequate for research work on nonfinancial than on financial firms and markets. For example, it is extremely difficult to calculate a meaningful profit rate for the financial sector as a whole.¹ Most important data on financial firms and markets are proprietary. A researcher would have to have a substantial budget to access even a reasonable subset of it. The sheer size and complexity of financial institutions contributes to non-transparency. There are three US bank holding companies with assets in excess of one trillion dollars. As near as I can tell, not even the top executives of these extraordinarily complex enterprises have a detailed understanding of what goes on in all their subsidiaries. Moreover, many assets and liabilities are off-balance-sheet and thus hidden from the observer. Finally, it is almost impossible to make sense of the oceans of information that giant conglomerates do provide in their income and balance sheet statements. These may run to hundreds of pages with hundreds of complex footnotes. Only someone skilled in forensic accounting and with lots of free time could possibly make any sense of all this information. Thus, the fate of scholars who try to understand these firms and markets without adequate financial support and, typically, without a team of co-workers, is not an enviable one.

Financial markets have undergone dramatic change between the first decades of the post WWII era and the past 25 years. One of the most important dimensions of this change is the substantial rise in financial firm profitability that has taken place since the early 1990s. Whether measured as the return on asset and equity for commercial banks as in Figure 1, as real profits of the financial sector as in Figure 2, as a percent of GDP as in Figure 3, or relative to those of nonfinancial corporations in Figure 4, financial sector profits over the past 14 years have been impressive.² While the so-called Golden Age of modern capitalism is thought to have ended somewhere in the 1970s, since the early 1990s we seem to be living in a new ‘Golden Age’ of finance. (Most of the data used in this paper is for US financial firms.)

In the financialization literature with which I am familiar, no one has adequately explained *why* financial sector profit rates rose in this period when real-sector profits were disappointing. The answer to this question is not obvious, especially because the era is universally believed to be one of fierce competition in financial markets. This ‘cutthroat’ competition is understood to have three roots. First, the regulatory structure put in place in the US in the 1930s, which purposely segmented financial markets to minimize what was seen as destructive competition, collapsed over a two decade process of deregulation culminating in the repudiation of Glass-Steagall in 1999. Many other countries have also moved away from tight financial market regulation. Second, government restrictions on access to their national markets by foreign financial firms have been largely removed. Third, technical change revolutionized financial markets. The combination of almost unlimited computational speed and cheap telecommunication capacity allowed financial markets to be global, opaque and hard (though not impossible) to regulate, and made possible the phenomenal growth and complexity of the derivate markets that dominate financial services. They thus made it technically possible for every financial firm to compete with every other firm no matter where they were located.

We thus confront a paradox: the coexistence of historically high profit rates in most financial industries with what appears to be intense competition. It is normally assumed that the two are incompatible over long periods. While progressives seem not to

have noticed this paradox, important mainstream analysts have been puzzled by it. In 1997 the FDIC held a conference on problems in US banking in the dangerous 1980s, an era with low and volatile profit rates that threatened the viability of major money center banks. Speaking at the close of the last session, Paul Volcker posed a question to the distinguished audience, one he said he did not know how to answer:

“We have reached the magic hour. I had another comment I was going to make. You won’t be able to resolve it for me but I’ll raise it anyway. It strikes me that when one looks at the banking system, never before in our lifetime has the industry been under so much competitive pressure with declining market share in many areas and a feeling of intense strain, yet at the same time, the industry never has been so profitable with so much apparent strength. How do I reconcile those two observations?” (FDIC 1997, p. 118).

George Hanks, writing in the FDIC *Banking Review* seven years later, commented on the same phenomenon. “Operating in a generally favorable environment, banks have responded to intensified competition and the expanded opportunities offered by sweeping legislative and regulatory changes. With some exceptions, they have performed at levels of profitability that would have been regarded as extraordinary in earlier years” (2004, p. 16) I refer to this odd combination of apparent intense competition and high profits in finance as **Volcker’s Paradox**.

I discuss four over-lapping reasons why high profits and lowered barriers to competition have been able to coexist in this period. First, the demand for financial products and services has grown exponentially. Competition is least corrosive of profitability in periods of strong demand. Second, there has been a rapid rise in concentration in most wholesale and global financial markets as well as in several important domestic retail markets. Three to seven firm concentration ratios are now quite high. This has created an important precondition for what Schumpeter called “corespective” competition – an industry regime in which large firms compete in many ways, but avoid the kinds of competitive actions such as price wars that significantly undercut industry profit. Third, there is substantial evidence that large financial institutions have raised their profit rates by taking on greater risk, risk that is partially

hidden from view because much of it is located off-balance-sheet. To adequately assess this proposition requires an analysis of firm, industry and systemic risk. (A complete treatment of rising financial sector profit and risk should include an assessment of the increasing importance of hedge and private equity funds. I do not evaluate these institutions in any detail in this paper.) Fourth, giant commercial and investment banks have turned innovation into a core business. They create and trade ever more complex derivative products in ever higher volume. They have been able to achieve high margins on much of this business by selling the bulk of their products over-the-counter (OTC) rather than on exchanges, thus insulating the profit margin from destructive competition. It should be noted that without frequent large-scale government bailouts of national financial systems, the Golden Age of finance could not have occurred. After discussing some of the reasons to believe that systemic risk has risen, I draw tentative conclusions about likely future financial market developments.

The reader should be clear on what I am and am not trying to accomplish. I will try to explain the market forces that made it possible for many financial industries to sustain high profits in what is assumed to be a regime of intense competition. I make no attempt here to answer the more profound question: “where do these profits come from?” I do not ask whether modern financial markets create extra value and keep a large share of it, whether profits come from manias or “bubbles,” or if they are part of the immense redistribution of income and wealth that seems to be an inherent component of current neoliberal global capitalism. I thus leave Pollin’s important question to Arrighi unanswered. Pollin notes that “Arrighi never explicitly poses the most basic question about [Marx’s] $M \rightarrow M'$ circuit, which is, where do the profits come from if not from the production and exchange of commodities?” (1996, p. 115).

1. Financial Firms have operated in a high growth industry in their Golden Age

Figures 5 through 8 demonstrate that there has been an astounding rate of expansion of financial markets since 1980. For example, Figure 7 shows that credit market debt was 168% of GDP in 1981 and 330% in 2005. Figure 8 shows that financial

assets were about five times larger than GDP in 1980, but nine and one-half times bigger in 2005. Figure 9 shows that the notional value of all derivative contracts rose from about three times global GDP in the late 1990s to 8 times global GDP in 2005. Most of this data suggests that the rapid growth of financial market is coterminous with the onset of the neoliberal era around 1980 or so.

Two *complementary* general explanations of this growth come to mind. First, there were large exogenous increases in the flow of funds into financial institutions (via pension funds, capital account surpluses and so forth) and in the demand for credit (for example, to fund rising government budget deficits and Third World borrowing, to meet secularly rising mortgage demand, and, through a process known as ‘financial deepening,’ to fund the growth of financial firms themselves) and other financial services in this era. These secular flows help explain the rising leverage and recurrent asset price bubbles of the period. (This is a critical part of the explanation of the paradox that I do not discuss in detail here.) Second, after the early 1990s, most financial firms experienced high profits and responded by raising output and innovating new products and services, an endogenous explanation conditioned by the exogenous trends that made rising profits possible. An overview of the history of the period suggests that both factors were at work. Exogenous factors were dominant in the 1980s and early 1990s, while endogenous responses to high profit rates have added to industry growth since then.

Thus, even though deregulation, technical change and globalization created conditions conducive to more intense competition for both non-financial firms and financial firms in the neoliberal era, the deleterious effects of these changes were muted in financial markets by the rapid rise in demand for financial products. This is in sharp contrast to the situation that faced nonfinancial firms in the same era. As I argued in Crotty 2005, sluggish aggregate demand growth after the 1970s raised industry excess capacity and exacerbated competitive intensity, which hit nonfinancial corporate profits hard. Financial profits, on the other hand, were sustained by rapidly rising demand.

However, rapid growth in demand is not a sufficient condition for high profits. As Figures 2 and 3 make quite clear, the 1980s and early 1990s were not prosperous times for the financial sector. Figure 1 shows that commercial banking, the sub-sector with the lion's share of the industry's profits, was in crisis in much of the 1980s. High demand growth was accompanied by large negative "shocks" caused by deregulation and rising competition. Large commercial banks were also hit by inflation-induced disintermediation and the Latin American debt crisis. These caused low profit rates and created serious threats to the solvency of giant banks. These problems were only resolved through dramatic government interventions of various sorts, including large bailouts.³ However, by the early 1990s enough stability had been restored for demand growth to enrich most of the key sectors even with the removal of restraints on competition. Thus began the new Golden Age. In my opinion, rapid demand growth alone cannot adequately explain the historically high profits of the era.

2. The rise of market power sustained high profitability

There has been a substantial increase in the market share held by a small number of the largest firms in important financial markets in the last quarter century. Concentration ratios in these markets are now quite high. The system-shaking problems in commercial banking in the 1980s and early 1990s drove many firms out of the industry. From the end of WWII through 1979 there were only a few years in which the number of failures exceeded single digits. But between 1984 and 2003, 2700 banks failed. Three quarters of these failures took place in the crisis period of 1987-1991. There were more than 15,000 banks at the end of the 1970s and fewer than 8,000 by 2002 (Jones and Crutchfield 2005, p. 33). As can be seen in Figure 10, as late as 1990, the top 3 commercial banks owned just 10.5% of industry assets. A frantic merger process raised that figure to 19% by 1997. Several mega-mergers raised top-3 ownership to 31% of industry assets by 2000. By 2003, the largest seven commercial banks in the US had nearly 50% of total industry assets. The concentration process was not limited to the US. The ratio of the assets of the world's largest 20 banks to the GDP of the G13 was 20% in 1980, 32% in 1990, and 40% in 1998 (Group of Ten, 55).

The US Census Bureau publishes information on concentration every five years. Since the data is organized under a standard industry classification system that changes over time, it is not possible to track a consistent set of categories for all industries. Nevertheless, the data is instructive. Consider four firm revenue (not asset) concentration ratios for 1992 and 2002. In commercial banking it was 21% in 1992, and 30% a decade later. For savings institutions it was 12% in 1992, but rose to 31% by 2002. For investment banking and securities dealing, it was 32% in 1992 and 41% in 2002. Several life insurance categories showed similarly high concentration. Concentration ratios in wholesale commercial banking and in important segments of investment banking are higher yet. For example, the combined net income earned in 2005 by the smallest ten of the top 15 investment banking firms was \$1.9 billion. Goldman Sachs, Merrill Lynch and Morgan Stanley each had more than \$5 billion in net earning that year (S&P 2006: investment banking subsidiaries of bank holding companies were not included). Davis reports that the share of the global M&A market held by the top three US investment banks rose from 15% in 1992 to over 50% by 2000 (Davis 2003, p. 24). The top three commercial banks in the large corporate loan market control at least half the business.

The Group of Ten did a massive survey of available data and research on the causes and consequences of rising consolidation in national and global financial markets and published their findings in a “Report on Consolidation in the Financial Sector” in 2001. The first sentence of the Report’s “Summary” is: “The ongoing consolidation of financial institutions is one of the most notable contemporary features of the financial landscape both within and across many industrial countries” (Group of Ten 2001, “Summary Report,” p. 1). The report presents substantial data to support this claim.

Such high concentration ratios are necessary conditions for the exercise of oligopolistic market power. They make it possible for dominant firms to adopt the partially competitive, partially cooperative behavior Schumpeter called “corespective” competition to create and sustain high industry profit rates. There is evidence that large firms in some key financial markets have used this market power to raise profit rates.

Thus, while certain conditions conducive to intense competition have characterized this era, just as Volcker asserted, they may not in fact have led to a regime of universally intense competition.

Extensive reading of the business press and conversations with financial market practitioners has led me to conclude that inter-firm behavior in these concentrated markets varies, with intense competition in some products and services, but corespective behavior in others. For example, there is fierce competition among investment banks for brokerage business narrowly defined – the buying and selling of financial assets.⁴ Charges for buying and selling securities were fixed at a high level by agreement among large investment banks in the US prior to 1974, but thereafter conditions became more competitive and profit margins declined secularly. When markets were ‘decimalized’ in 2001, margins fell once again. By 2006 it was widely claimed that investment banks were breaking even or losing money on their narrowly defined brokerage business. In late 2006 Bank of America offered free trading to any customer with at least \$25,000 in deposits. “Some observers believe commissions could disappear entirely” (*The Economist*, “Low touch but no soft money,” October 21, 2006, p. 87). This does not imply banks will abandon the trading business. Their customers need this service, and frenetic bank traders must have the constant real-time information that massive in-house trading provides in order to generate profits. Other competitive markets include exchange traded derivatives.

Conversely, practitioners agree that large investment banks do not use price competition to raise market share in traditionally lucrative investment banking businesses like M&As and IPOs, where fee structures are well established. US investment banks face less intense competition than their European counterparts. The *Financial Times* reports that M&A activity in Europe exceeded that in the US for 2006, yet cumulative fees for M&A work were almost twice as high in the US. “Mysteriously, however, European fee rates remain lower than in the US... Despite the fragmentation of the European market, pricing pressures actually appear to be fiercer than in the US... In the US market, indigenous banks have held on to high fees, partly by fending off foreign

interlopers... Higher fee rates mean American deals remain more lucrative.” (*Financial Times*, “Land of the Fee,” December 21, 2006, p. 14).

The fee structures of hedge and private equity funds also clearly reflect a lack of price competition. The general partners in private equity funds charge an annual management fee of one and one-half to two percent of assets under management and a share of the profits of the fund, which is usually about 20 percent, payable after a benchmark rate of return has been achieved. They also charge firms they own considerable ‘fees.’ In a *Financial Times* article written to defend the efficiency of private equity funds, a former president and CEO of Morgan Stanley notes that “private equity’s notoriously high “friction costs” that increase the spread between the rate of return on the funds assets and the return investors receive at 11 percent a year (“Private equity’s halcyon days are not yet threatened,” March 8, 2007, p. 11). According to Froud and Williams, there is “little evidence of any competition on fee levels,” a view that seems widely accepted (2007, p. 10).⁵ Such consistently high fees that earn fund general partners fabulous fortunes (that are taxed at the low capital gains rate) are simply not compatible with the assumption of intense competition. An identical argument can be made about lucrative fee structures in the hedge fund industry – also normally 2 % of assets and 20% of profits. The ability to sustain such non-competitive fee structures over long periods is especially impressive given the mediocre performance of many private equity funds over the past decade, a period in which the average of all funds achieved returns below the S&P 500 and the lower quartile lost 6% annually (*Wall Street Journal*, “Private equity: Hit or miss,” March 3-4, 2007, p. B14).

It is also clear that the sustained existence of numerous shockingly high ‘fees’ to commercial bank customers reflects corespective behavior.

“Bounced-check and ATM fees are setting records. Consumers are paying higher service charges on interest-bearing accounts, Bankrate.com says. And banks that issue credit cards are increasing fees for late payments and over-the-limit charges to as much as \$39 per violations. Make this mistake once or twice and your interest rate could hit 30%. ‘These are not things that are subject to price

competition,” says Greg McBride of Bankrate.com.” (USA Today, “Rising bank fees hit customers,” October 4, 2005).

This corespective fee structure is a crucial source of bank profit. Table 1 shows that service charges on deposit accounts is the largest single source of identified non-interest income for commercial banks, while Figure 11 shows that non-interest income generates more than half of bank revenue.

We find a similar situation on the asset side of the private equity business. Funds, have been accused of forming ‘clubs’ in which members either agree to cooperate to share takeover bids and thereby reduce competitive pressure on price, or in which one firm bids alone, then allocates pieces of the deal to friendly competitors in portions agreed upon before the bid. This raises industry profit. The *Financial Times*’ Lex column asked the question: “Will G-men drag private equity into the public glare? The Wall Street Journal reported on Oct. 10 that the Justice Dept. is looking into potential anticompetitive behavior by top private equity funds.... Do players observe tacit agreements to avoid pushing up deal prices?” (*Financial Times*, “A shadow over buyout firms,” October 23, 2006, p. 32). *Business Week* included “collusion in chasing deals” as one of the main reasons for the success of private equity funds (“In the money,” January 20, 2007, p. 18). The *Financial Times* notes “a growing frustration among boards and shareholders... that they are too often faced with a single bid from a multiple consortium of buy-out firms. As a result, there is little competition to drive up the offer price” (“Coles puts heat on club bids,” March 3-4, 2007, p. 12). As the size of the targets escalates (with the recent takeover bid for TXU priced at \$45 billion), it is inevitable that super buy-outs will involve clubs that inhibit competitive bidding. Since some estimates put the combined buying power of private equity firms as high as \$2 trillion, or 10% of the value of the entire US stock market, it would seem that the sky is the limit. Even now, such collaboration involves the strongest players. The *Wall Street Journal* reported on what they called a “Goldman, Morgan Stanley Tango”:

It might not be on a par with Luke Skywalker joining Darth Vader to rule the universe, but two historic Wall Street firm are combining forces to crack a deal in

the energy sector. The investing arms of Goldman Sachs Group Inc. and Morgan Stanley are quietly collaborating on a massive private equity deal... that could top out at \$15 billion... The collaboration of the two elite securities firms... is an unmistakable reminder of how private equity is changing life on Wall Street. Across the Street, banks are angling to become both competitor to and collaborator with buyout shops. (*Wall Street Journal*, “Believe it: A Goldman, Morgan Stanley Tango,” January 24, 2007)⁶

High concentration ratios in major financial markets along with clear evidence of collusive behavior among the dominant firms in these markets help explain the high profits of this era. Given these facts, it is astounding that so little serious work has been done on the ‘industrial organization’ of modern financial markets. It would appear that a commitment to the assumption of financial market efficiency among mainstream financial economists has become an obstacle to our understanding of how these firms and markets actually operate in an era in which their relative size and their power to affect real-sector outcomes are greater than at any time since the age of the Money Trust.

3. Profit rates have risen because risk has risen.

There is substantial evidence that many financial firms have achieved surprisingly high profit rates in the Golden Age of finance in part because they either want to or have been forced to accept much higher risk than before. It has always been true that taking higher risk leads to higher profit in the absence of an unexpected negative outcome of sufficient magnitude – what the literature refers to as a “tail event.” Corporate bonds have always had a higher yield than government bonds, and ‘below investment grade’ or junk bonds have always carried a higher return than investment grade bonds. As long as the normal and below-normal default rates of recent years persist, they will remain more profitable investments than AAA bonds. I consider several dimensions of this hypothesis.

New Banking Strategies Trade High Risk for High Profit

The high profits in commercial and investment banking in the Golden Age have been due not only to corespective behavior and demand growth, but also to high-risk

strategies adopted primarily by the giant banks that dominate these markets. The returns from most of these strategies appear as ‘noninterest income’ on bank income statements. Figure 11 shows the rise in noninterest income relative to interest income for all FDIC insured commercial banks. Less than 10% of bank revenue in the early 1980s, noninterest income exceeded 50% by 2005. The larger the bank, the larger the noninterest interest income share. For example, Citigroup reported noninterest income equal to 52% of adjusted operating income in 2005, while JPMorgan Chase reported 64% of income in noninterest form. For Citigroup and JPMorgan Chase respectively, trading revenue was 4.4% and 14.7% [1%] of adjusted operating income, investment banking fees and commissions were 15.9% and 10.7% [3.7%], net securitization income was 6% and 5.8% [0.2%], and venture capital revenues 1.3% and 3.6% [0.2%] in 2005 (Federal Reserve Board of Governors 2006). The number in brackets is the average percent for the 69 bank holding companies with more than \$10 billion in 2005. Table 1 shows the total amount of noninterest income earned by commercial banks in 2001 as well its main components. Note that the five largest banks received a hugely disproportionate share. For example, they received 83% of the \$12.5 billion in trading revenue and 64% of the \$16 billion of securitization income that year. As noted, the top five banks received 34% of ‘service charges on deposit accounts,’ a category representing 17% of all non-interest income, the largest source of such income identified on the Table. All told, the top five banks gained 41% of all noninterest income. Their profits are increasingly determined by the more volatile sectors of noninterest income.

Many financial economists predicted that the rise in noninterest income shares would lead to lower risk because they expected noninterest income to be less cyclically variable than interest income and because they expected added portfolio diversification benefits. If interest and noninterest income have zero or negative correlation, increased noninterest income shares could improve the risk-return tradeoff. “As noninterest income trended up during the 1990s, it was generally believed that shifting banks’ income away from intermediation-based activities... and toward fee based activities would reduce income volatility. ...Moreover, it was conventionally believed that expansion into new fee-based products and services reduced earnings volatility via diversification effects” (DeYoung and Rice, p. 109).

However, recent empirical studies suggest the neither assumption is true: noninterest income is very volatile and there is no diversification reward. Work by Kevin Stiroh of the New York Fed, perhaps the most influential researcher on risk-return relations in commercial banks, concludes: “At the aggregate level, volatility of bank revenue growth has indeed declined in the 1990s, but this reflects lower volatility within net interest income growth rather than diversification benefits from increased noninterest income. Noninterest income growth is much more volatile than net interest income growth, largely due to very volatile trading revenue, and the covariance between the two has risen...” His analysis of bank-level data comes to the same conclusion. The cross section correlation between net interest and noninterest income growth is positive and increasing – from .32 in 1979 to .66 in 2000. As a result, indices of risk-adjusted profit rates (Sharpe ratios and Z-scores) declined monotonically across banks as their share of noninterest income increased. “Taken together, these results imply that the move toward noninterest income is actually worsening the risk/return tradeoff...” (2004, p. 855).

Two economists at the Chicago Fed used a different econometric procedure to investigate questions similar to those of Stiroh. They concluded that “marginal increases in noninterest income have been associated with higher profits, more variable profits, and on net, a worsening of the risk-return tradeoff for the average commercial bank during our sample period [from 1981 to 2001].” Moreover, “these findings are consistent with the recent literature that finds that noninterest income is more volatile than generally thought...” (DeYoung and Rice 2004, p. 122). They also find that risk rose substantially between the first and second half of the period, as dependence on noninterest income and on the risky strategies used to earn it accelerated: “our results suggest that the expansion in noninterest income improved the risk-return tradeoff at the average bank during the first part of our sample period, but worsened the risk-return tradeoff during recent years” (DeYoung and Rice 2004, p. 126). These results are quite robust to alternative specifications.

The last conclusion is important. Figure 1 shows that from 1993-1998, commercial banks had a very high ROA with little volatility. But while average ROA and ROE rose somewhat after 1998, volatility increased even more, causing risk-adjusted return to deteriorate. Again, large banks' returns are the most volatile. As shown in Table 2, the coefficients of variation of both ROA and ROE for the three giant commercial banks are much higher than the corresponding figures for all banks for the entire 1993-2004 period. Keep in mind that a substantial part of bank risk is contained in their derivative holdings that are located off-balance-sheet. The risk we see may be just the tip of the iceberg. The fact that banks have lent very large amounts of money to hedge funds and private equity funds itself should raise concerns about risk.

Many analysts believed that the combination of securitization, which enables banks to sell risky assets they originate, and low-cost hedging through the purchase of insurance against default in the credit derivatives market would allow banks to raise profitability without raising risk. I consider securitization first. Fees from securitizing mortgages and other financial assets and from servicing these securitized pools have become much more important to the giant banks in the past two decades. The FDIC reports that in 2006 commercial banks had \$20 billion in net securitization income, which was 11.9% of all noninterest income. Big banks get almost all of it. Fewer than 1% of banks reported any such income at all. The fact that many mortgage-backed securities are guaranteed by quasi-governmental agencies accelerated the growth of the market. In 1996, there were \$770 billion of asset backed securities of all kinds, 37% of which were mortgage-backed. By 2005 the total had reached \$3 trillion, 71% of which were mortgage-backed. Banks thus have an incentive to maximize the flow of mortgages (and other 'plain vanilla' products) into securitization because fee income is substantial and the loans are moved off balance sheet, so return on income and on equity rise with the volume of securitized loans.

Second, banks can buy insurance against loan loss from insurance companies, pension funds, hedge funds and other large banks in the credit derivative market. Thus, they can simultaneously make a large corporate loan and buy insurance that covers all or

part of their loss should the loan default. The growth of securitization and the emergence of credit derivatives have led many commentators to conclude that the banking system has become less risky in recent years. In 2004, Alan Greenspan concluded that credit derivatives and other complex financial instruments led “to the development of a far more flexible, efficient, and hence resilient financial system than existed just a quarter-century ago” (Greenspan 2004)

However, there are reasons to be suspicious of this conclusion. First, there is a lemon’s problem with securitized loan sales. Securitized loan pools can be sold directly, or claims to cash flows from the pool can be sold. If the bank sells all the loans in the pool, prospective buyers might be suspicious that the bank had no incentive to screen out very risky loans and no incentive to monitor risk after they have been sold. To assure investors that the loans have been screened, banks usually keep the most risky loans themselves. Cash flows from the pool are usually sold in ‘tranches’ with different risk characteristics. To assuage investor concern about excessive risk, banks usually keep the most risky tranche or first-loss position, the one often referred to as “toxic waste.” So while banks sell lots of loans, the loans and tranches they hold are extremely risky. The IMF’s Raghuram Rajan puts it this way:

Banks cannot sell all risks. They often have to bear the most complicated and volatile portion of the risks they originate, so even though some risk has been moved off bank balance sheets, balance sheets have been loaded with fresh, more complicated risks. In fact, the data suggest that despite a deepening of financial markets, banks may not be any safer than in the past. Moreover, the risk they now bear is a small (though perhaps the most volatile) tip of an iceberg of risk they have created. (2005, p. 3)

In a similar vein, the *Financial Times* observed that securitization “does not mean the bank has shed all its risk. Usually a lender remains liable for any initial wave of losses (say, for the first 10 percent decline in a mortgage values)” (*Financial Times*, “A tale of low rates and high technology,” January 15, 2007, p. 9). Thus, the greater the flow of mortgages through the bank and into asset backed securities, the larger the buildup of risky holdings on and off balance sheets.⁷

Second, very few banks actually use credit derivatives, so they can't be the universal panacea they are made out to be. There is surprisingly little information available on this important matter. The most thorough study of bank use of credit derivatives to date is by Minton, Stulz and Williamson 2006. They report that in 2003, only 19 of the 345 large bank holding companies they studied used any credit derivatives. "The use of credit derivatives is limited by the lack of liquidity of the credit derivatives market for the credits that banks would most like to hedge" (2006, p. 21). Liquid credit derivative markets exist, but only for the loans of the largest corporations, and this is a market in which only giant banks can compete. Even so, the net notional amount of credit protection held by the 17 banks that were net buyers of insurance only amounted to 1.83% of all bank loans and 3.6% of the loans of these 17 banks (2006, p. 3). But the credit derivative market is more highly concentrated than this fact alone would suggest. Only JPMorgan Chase, Citigroup and Bank of America were major users of credit derivatives in 2003, three other banks were moderate users, while the remaining 13 held small amounts. The total notional amount of credit derivatives bought and sold by JPMorgan Chase in 2003, at \$578 billion, exceeded the value for all other large bank holding companies combined! JPMorgan Chase's net purchase of insurance was \$26 billion, while Citigroup was a net seller of \$17 billion of insurance.

The authors' analysis of the data leads them to conclude that "the typical position in credit derivative is taken for dealer activities rather than for hedging credit exposure from loans" (2006, p. 21) This may suggest that giant banks primarily use credit derivatives for trading on behalf of others and gambling with their own capital to create profitable risk – not reduce or hedge risk at the cost of lost potential profit. Another conclusion of the paper is that credit derivatives make it possible for big banks to do the most business possible on their capital base – in effect maximizing leverage. They thus "do not increase the soundness of banks as much as their purchases of credit derivatives would imply" (2006, p. 22). It thus appears that securitization and derivative creation and trading have raised big-bank profits, but simultaneously raised big-bank risk. Table 2 shows that the largest banks have lower risk-adjusted profitability than the average bank.

It would appear that the claim by Greenspan and others that they have made banks safer and more efficient is based on hope rather than hard facts.

Figure 12 shows that investment bank profit rates have always been much more volatile than those of commercial banks. Investment banking is “a sector distinguished by revenues which seem to collapse with some regularity every three of four years” (Davis 2003, p. 1). The main source of investment bank income has recently shifted from traditional activities such as advising on M&As and bringing IPOs to market – a volatile business, to trading assets for customers and on their own account – an even more volatile business. This change has taken place in spite of the fact that revenues from traditional activity have been high because of the recent boom in the global M&A market. The larger the investment bank, the more pronounced the strategy shift driving this change. The proportion of trading income generated by trading stocks, bonds, commodities and derivatives with the firm’s own capital has risen substantially. Davis notes that “Investment banks – at least in the US – are increasingly relying on proprietary trading – essentially risking the firm’s own capital – to sustain revenue. ... The good old days when an investment bank made most or all of its profits from providing advice or executing transactions as agents are long past” (Davis 2003, p. 82). The potential risk involved in this part of the business is enormous, and is heightened by the growing importance of in-house hedge and private equity funds. For example, Goldman Sachs Asset Management is reported to be the world’s largest hedge fund, with about \$21 billion in capital. Its private equity arm is one of the world’s biggest, involved in \$51 billion in private equity deals in 2006 (S&P 2006, pp. 13 and 14).

2006 was a gala year for M&As. Global M&As were worth \$3.8 trillion in 2006, 11% higher than in the super year of 2000. Goldman Sachs, the largest investment bank and the number one bank in the league tables that year, achieved record investment banking profits in 2006. Yet an astounding 70% of net income came from gambling with the firm’s own capital, an unprecedented dependence on this source of income (*The Economist*, “Streets ahead of the rest,” December 23, 2006, p. 111). When Davis 2003

expressed concern over the trend toward gambling with the firm's capital, it contributed less than 30% of net income.

The spectacular gains associated with these high risk strategies triggered equally spectacular compensation gains for the top executives and rainmakers in the investment banking world. Unlike most commercial banks, whose compensation is a modest percent of net income, investment banking is a business dependent on teams of high-powered high-priced 'rainmakers' to generate profits. Compensation is normally 50% of net income in investment banking. The 2006 bonus pool at industry giant Goldman Sachs was \$16 billion, divided very unequally among 26,500 employees for an average of \$622,000 per worker. Indeed, though Goldman's compensation expense exploded in 2006, profits rose by so much that compensation as a percent of net revenue actually fell slightly. Meanwhile, the average employee bonus at Lehman Brothers was \$334,000, at Bear Sterns \$320,000, and at Morgan Stanley \$265,000 (*New York Times*, "Goldman chairman gets a bonus of \$53.4 million," December 20, 2006).

The Center for Labor Market Studies at Northeastern University recently reported that the top-five Wall Street firms were expected to award \$36 billion to \$44 billion to their 173,000 employees in 2006. It also noted that the combined real earnings of the 93 million production and nonsupervisory workers in the US rose by \$15.4 billion from 2000 to 2006, which "is less than half of the combined bonuses awarded by the five Wall Street firms for just one year" in 2006 (*New York Times*, "Working harder for the man," Jan 8 2007). Top investment bankers got \$20 million to \$25 million in bonuses, while top traders took home as much as \$50 million.⁸ Perhaps a third or more of these gigantic bonuses come in the form of stock and stock options rather than cash. Goldman's CEO received almost half of his \$53 million bonus in this form. This compensation structure provides key employees with powerful incentives to sustain the current rapid income growth through high-risk strategies. This will maximize current bonuses and, by raising the stock price, makes the shares and options they received in previous years more valuable.

Of course, legitimate hedging activity to reduce risk does take place in giant banks. This is what allows them to adopt what would have been seen in earlier periods as foolishly risky strategies. But no bank wants to hedge all risk because the cost would normally eliminate the potential gain that induced the bank to make the risky investment in the first place. Cost is not the only problem. Hedging strategies by banks often involve sophisticated, complex, dynamic derivative trading strategies. This form of hedging relies on the existence of liquid continuous markets with low to moderate transactions costs. A typical dynamic hedge involves shorting the risky asset held and investing in a risk-free asset.⁹ The hedge adjusts whenever the asset price or interest rate or volatility changes in the market, which they do continuously. Every time the asset price declines or volatility increases, the risky asset must be sold; this is what makes the hedge ‘dynamic.’ When problems hit an asset market, price falls and volatility rises. Banks with dynamic hedges must sell their risky assets, which accelerates the rate of price decrease, which in turn forces more hedged-asset sales. If many investors have made similar dynamic hedges and are selling, liquidity dries up and prices can free-fall. In ‘normal’ times, dynamic hedging can lower risk, but under conditions of market stress, it can prove dangerous for large banks and therefore for the entire banking system. Automated dynamic hedging systems are especially dangerous, as the fiasco with automated ‘portfolio insurance’ schemes demonstrated in the stock market crash of 1987.

Rajan notes that:

As originators of credit risk, banks hold first loss positions. A downturn in the economy... would result in actual losses being borne by bank balance sheets. Of course, banks hedge some positions through dynamic options-like strategies. As liquidity falls and [asset] prices move more, they will have to make larger and larger trades to offset those initial losses, thus demanding liquidity from the market precisely when it has little to offer. Losses could widen.” (2005, p. 26)

It is now virtually impossible to make a reliable estimate of the degree of risk undertaken by large banks. As Jean-Claude Trichet, president of the European Central Bank commented recently: “There is now such creativity of new and very sophisticated financial instruments that we don’t know where the risks are located” (*Financial Times*, ‘Derivatives boom has created instability, says ECB president,’ January 29, 2007). It

does seem clear that standard estimates of risk are excessively optimistic. Today's giant banks are extremely complex, opaque institutions operating in ever-changing global markets, as well as in derivative markets that exist in cyberspace. National regulatory agencies have concluded that they cannot control these institutions in traditional ways, by inspecting their financial statements and placing restrictions on their balance sheets. Most of their risky positions are off-balance-sheet, risk estimates are out of date shortly after they are made because derivative positions change daily, and it would be almost impossible to accurately estimate firm risk even if all derivative contracts were accessible.

Regulators thus “began allowing financial institutions to use their own version of [statistical] models to assess whether they were complying with rules that required them to reserve a sufficient cushion of capital based on the risks they took” (Partnoy 2003, p. 265). Giant banks now essentially regulate themselves through sophisticated statistical models, the most popular of which is VAR (value at risk). “Widespread agreement has been reached on the measurement of market risk through so-called VAR (value at risk) models” (Davis 2003, p. 82). VAR is an estimate of the highest possible loss in the value of a portfolio of financial assets and liabilities over a fixed time interval with a specific statistical level of confidence. The Basle Committee's 1996 Accord set large banks' capital requirements in relation to its estimated VAR.

There are two important shortcomings of this approach to risk assessment: it fails to take appropriate account of highly unlikely severe negative shocks to the financial system; and it's assessment of asset price correlations based on historical data does not capture the actual correlations observed in financial crises. First, the models normally do not ask what might happen to the bank if an extremely unlikely negative event were to take place. VAR models thus “cannot deal with what concerns users most, namely the rare occurrence of major market disturbances. As some risk managers have pointed out, the assumption of normal distribution of returns (no “fat tails”) implies that events such as the stock market crash of 1987, the EMS debacle of 1992, or the Asian, Russian and Brazilian crises are not apprehended by such models” (Steinherr 2000, p. 114). Consider

the February 27, 2007 market ‘scare’ that caused financial asset prices around the world to drop sharply. This caused the VIX (a measure of stock market volatility) to rise by 8 standard deviations from its average. “If conventional models are correct, such an event should not have happened in the history of the known universe” (*The Economist*, “Grey Tuesday,” March 3, 2007, p. 78).

Second, VAR estimates the risk attached to the firm’s entire portfolio of assets and liabilities. Thus, the asset-price correlation matrix is a key determinant of measured VAR. The lower the correlation among asset and liability prices, the lower the portfolio’s risk. Most VAR models assume that asset prices are jointly normally distributed and that future asset price correlations will be identical to those of the relevant past. Such correlations change over time. For example, in the past few years, asset prices have become more positively correlated than before for two reasons. First, asset managers have adopted similar strategies in search of high returns, so ever more money poured into the same risky assets. The fact that diversified portfolios were considered safe probably made investors feel justified in pursuing riskier assets, which raised the correlation of their price movements. Second, the universal quest for low correlations may have destroyed them. “By deliberately investing in assets that have shown little correlation in the past, investors may be making these assets more correlated” (*Wall Street Journal*, “Bets for safety only left many at greater risk,” March 1, 2007, p. C1).

Moreover, we know that in crises, the historical correlation matrix loses all relation to actual asset price dynamics. In ‘scares’ and in crises most prices fall together as all investors run for liquidity and safety, creating a positive correlation unaccounted for in VAR calculations. An editorial in the *Financial Times* on the February 27, 2007 global asset price drop made the following observation. “The price of almost every risky asset fell everywhere in the world.” It continued: “It is a reminder that, in a correction, and especially in a crisis, apparently unrelated assets suddenly start to do similar things: portfolios that look diversified may not be” (“A timely reminder about market risk,” March 3-4, 2007, p. 6). Partnoy summed the problem up as follows.

VAR was dangerous. It gave firms a false sense of complacency, because it ignored certain risks and relied heavily on past price movements. In some markets, VAR actually increased risk, because every trader assessed risk in the same flawed way. In other markets, traders calculated VAR measures that varied 'by 14 times or more.' ... LTMC's VAR models had predicted that the fund's maximum daily loss would be in the tens of millions of dollars, and that it would not have collapsed in the lifetime of several billion universes. (2003, p. 263)

VAR models create an irresolvable problem for their users. If the model uses many years of past data to construct the price correlation matrix, the extraordinary pace of recent structural change will immediately render it obsolete. But if the model uses data only from the past year or so – as most do, the accuracy of the price correlation matrix will depend heavily on whatever special circumstances exist at present and thus not be generally representative of financial market dynamics.¹⁰ I have stressed the problem caused by the spike in positive correlations in a crisis. However, if the past year was profitable and serene, as in 2006, then a VAR assessment using only one year's data will also grossly underestimate the likelihood of a serious crisis and thus stimulate excessive risk taking. There is no solution to this problem.

New York Fed President Timothy Geithner expressed concern about these models.

The foundation of modern risk measurement rests on a framework that uses past returns to measure or estimate the distribution of future risk. The stability of the recent past, even if much of it proves durable, probably understates potential risk. The parameters used to estimate value at risk can produce large differences in predicted exposures, especially at extreme confidence intervals. Estimating the potential interactions among these exposures in conditions of stress is even harder, due to the uncertainty about the behavior of investors and other market participants and because of the potential effects of financial stress on overall economic activity (2006).

We thus appear to be in a situation in which neither the big banks nor those who are obligated to regulate them can reliably estimate how risky they have become in their pursuit of high profits. But there is evidence that the risk indices commonly used seriously underestimate the true risk created by their new strategies.

In sum, current bank strategies have raised profitability but probably at the cost of greater individual as well as systemic risk. Value-at-risk “a standard measure of potential losses on a bad trading day – has risen steadily” (*The Economist*, “Streets ahead of the rest,” December 23, 2006, p. 111). Moreover, the stock market has been signaling concern over rising risk in financial firms for years. Bank price-earnings ratios tend to be lower than those of nonfinancial corporations because their earnings have historically been more volatile. However, the trend of the price-earnings ratio of banks in the S&P 500 index as a percent of this ratio for the whole index has been falling since the early 1980s. Starting the period at over 80%, it was below 60% in 2005 in spite of record profits and relative low profit volatility at that time (Rajan 2005, p. 14). Should we assume financial markets are ‘efficiently’ forecasting future financial storms?

Institutional Investor Compensation Incentives Induce Risk Taking

Non-bank institutional investors have grown in importance in recent decades. Mutual funds had 2% of financial sector assets in 1974, but 18% in 2004. Pension funds held 14% of these assets in 1974 and 21% a decade later. (They dropped back to 18% in 2004.) Hedge and private equity funds have grown in importance in recent years. Compensation for those who run institutional investment companies rises with assets under management, and is positively related to the excess of fund returns over some yardstick (such as the S&P 500 stock price index or a risk-free interest rate). This encourages firms to seek both maximum growth and maximum yield. Incentives for hedge and private equity firm executives create even stronger incentives for risk-taking. Since high returns both directly raise compensation and help increase the size of assets under management, there are strong reasons to pursue them. This is especially the case in periods in which financial asset prices have been rising for some time, because the longer the boom, the more likely that investors will believe that high-returns chasing is not a risky strategy. Empirical evidence shows that institutional investors suffer smaller percentage losses in their client base in years in which they achieve below average returns than the percentage gains they earn in years with above average returns – inflows

are convex in returns (Rajan 2005, p 18). This clearly motivates higher risk taking. In addition, there is an incentive to take risks that are not easily observable to clients – such as in derivatives markets. Hidden risk raises income but not assets, thus increasing return on assets and equity.

Consider the behavior of pension funds and insurance companies. In recent years they have become prime players in the credit derivatives market, where they provide insurance against loan default to other agents. This market experienced explosive growth since the early 1990s. In recent years the incidence of default has been low, so insurers have received a constant flow of premium payments. These constitute an addition to revenue and profit flows, but do not increase balance sheet assets or perceived risk. Thus, it is quite tempting for these firms to load up on these risky assets - as long as an unexpected outbreak of defaults does not occur. Or consider hedge funds. They adopt aggressive trading strategies that can be relied on to produce large positive returns most of the time, and they get one and one-half to two percent of the fund's assets and often receive 20% of the returns. The downside is that risky strategies lead to disasters from time to time. This is a very asymmetric reward structure because they do not have to pay back upside compensation in the event of losses. "They are encouraged to [take high risk] by a fee structure that does not require the fund managers to pay back their earlier profit share to investors if an extreme event strikes and wipes out the fund" (*Financial Times*, "After the flood: how central banks fret about failures once liquidity dries up," January 30, 2007, p. 13).

Many institutional investors must achieve a high return on assets: if this cannot be done with safe assets, they must move to high-risk assets

Many individual and institutional investors believe they must attain a return on assets high enough to avoid serious financial problems. In the US, fewer than 50% of full-time private workers have a pension of any kind, defined contribution plans now outnumber traditional defined benefit plans, and most workers have relatively small savings in their plans. Thus, many households believe they have to achieve a relatively

high return on their modest assets to attain the minimum income needed to sustain an acceptable retirement life style. The same is true for many pension plans. They face rising payout demands as society moves from a preponderance of young savers to a rising percent of older dis-savers. Required payouts are actuarially determined. If their assets are insufficient to achieve the necessary income flows at lower-return safe investments, pension funds *must* increase risk to earn higher returns. This is widely recognized in the financial press. “American pension funds have analysed their liabilities. They need more than 6% to make up the shortfalls in their funds. .. They have to roll the dice to get it” (*The Economist*, “Alpha betting” September 16, 2006, p 84). “The collapse in returns is prompting more mainstream investors to enter the derivatives world for the first time. While many pension funds have traditionally been nervous of using these instruments, they are being pushed into their use from their clients and competitors.” (*Financial Times*, “New products grab the imagination”, January 18, 2007, p.11)

Insurance companies face similar problems, especially in periods of low interest rates following periods of high interest rates. Life insurance policies and annuities sold in a high interest era become less profitable if the returns the companies receive on their assets decline substantially over the life of the policy. Insurance companies are thus pressured to seek higher returns even at the cost of higher risk. This is one factor that has motivated them to invest rising shares of their assets in hedge funds and private equity funds: such “investors may be willing to gamble, despite the higher fees [in hedge funds] because they desperately need high return” (*The Economist*, “Alpha betting” September 16, 2006, p 84).

Institutional investing is a structurally conducive to herd behavior. Contracts to manage large portfolios can be lost by a firm if its returns fall below the industry average for as little as six months. When asset bubbles take hold, institutional investors have a strong incentive to follow others in pursuit of capital gains even at the risk of absorbing losses when the bubble bursts. If many companies are making high returns by investing in bubble-driven assets with very high short-term capital gains, then even managers who are convinced the bubble will deflate in the near future must follow the herd. If they

don't, they will show sub-par returns and lose business. If they follow the herd and the bubble bursts, all firms will suffer losses, so no firm will lose its competitive advantage. In their drive to meet or exceed average industry returns, a growing number of mutual funds are investing serious money in private equity and hedge funds. If these investments continue to pay high returns, other companies will be forced by competition to follow. "Most mutual funds limit their holdings to widely traded stocks and bonds. But as private financiers – from hedge funds to buyout firms – increasingly reshape the world of corporate finance, more mutual fund managers are getting in on the action. These managers say they are willing to take on the greater risks of private equity, including the difficulty of unloading them in a pinch, because of the higher returns" (*Wall Street Journal*, "Mutual funds delve into private equity," August 2, 2006).

Consider, for example, the 'junk' or 'high-yield' corporate bond market. The rush into risky but high-return investments has driven the spread between Treasury bond and junk bond yields, which exceeded 8% in 2002, to 3% or less after 2003. One reason a low spread has been maintained is that the default rate on such bonds, which was 16% in 2002, fell back to its historic average 5% in 2003 and was 1.5%, 3.1% and a record low 0.8% in 2004-2006 respectively. The low spread suggests that markets have built a projection of continued low default rates into the pricing of these bonds – a precarious situation. One reason for low default rates is that even the lowest rated firms - whose median (profit - capital expenditures)/(interest expense) ratio was well below 1.0 in 2006 – have been able, a la Ponzi, to borrow money to avoid default. As a report by *Fitch Ratings* put it: "The insatiable demand for yield product among traditional and nontraditional investors clearly helped these [junk bond] issuers to get access to external capital with unprecedented ease in 2006 and that enabled them to avoid default" (*Fitch Ratings* 2007, p. 7).¹¹ The report concludes that "the very low default rate experienced in 2006 is unsustainable..." (p. 10).

Under current conditions, the riskier the bonds, the more desirable they are to investors.

You have an incredible amount of liquidity sloshing around the [bond] market... Much of that money is seeking higher returns, and is thus willing to pay higher risks. That willingness to buy has meant that borrowers with dubious credit end up paying relatively little for their money. ... (*New York Times*, "Are high credit ratings just a thing of the past?" November 11, 2006)

But if the market senses that falling profits and/or rising interest rates will again push default rates above average, we will see a rush to exit the junk bond market and a big spike in the spread.

The hunt for high returns by investors in turn drives investment banks to create ever more complex derivative products, with the greater leverage and higher risk that lead to higher returns. This raises bank profits and creates a kind of vicious circle. As long as the process sustain itself, the profits of the financial firms that sell the risky assets, hold them on their own account, and/or trade in these markets can continue to grow. In the present period of low interest rates, high profits and modest average stock price gains in the developed world, large sums of money continue to flow into risky assets such as junk bonds, developing country stock markets, and complex derivative products (with limited liquidity) in search of high yields. The result of this flight-to-risk is an ongoing decline in the risk premiums paid on this class of investments. Declining returns on risky investments only make the problem worse, forcing agents to seek yet riskier assets.¹²

Reinforcing this dynamic, volatility indices such as VIX have fallen to near historic lows, suggesting that market opinion considers these assets to be safe, and thus relatively cheap to partially hedge. (VIX did jump sharply in the February 27, 2007 market 'scare.')

A sharp decline in the implied volatility of global equity markets is encouraging a renewed shift into risky assets as hedge funds and other investors look for higher returns. Market volatility as measured by the Chicago Board Options Exchange volatility index (Vix), Wall Street's 'fear index' was trading just below 12 [a near record low] yesterday... Lower volatility 'favours carry trades and shifts demand towards riskier assets' JPMorgan Chase said in a note to clients yesterday. One sign of this heightened risk appetite is a fall in the cost of insuring risky companies against default, via the derivatives market. (*Financial Times*, "Volatility dip sharpens appetite for risk," September 19, 2006, p. 28).

This would seem to be a situation with a limited life expectancy.

4. Giant banks have become innovation machines that can protect high profit margins on most derivative products.

The business of creating and trading derivatives, dominated by a small number of banks, has become a core profit bank center. The FDIC reports that in late 2006, the seven largest commercial banks held 98% of the industry's derivatives. As noted above, in 2005 trading revenues were 7.85% of Citigroup's and 14.7% of JPMorgan Chase's adjusted operating income. Trading assets were 19.8% of Citigroup's total assets and 26% of JPMorgan Chases', but just 1.5% for all large bank holding companies. These numbers are staggering because both firms have assets of over a trillion dollars. JPMorgan Chase held about \$350 billion in trading assets in late 2006. The notional value of Citigroup's 2005 derivative contracts was 1,476% of total assets (compared to 823% in 2001) while it was 4,426% for JPMorgan Chase. The average share for all bank holding companies with over \$10 billion was only 74% (Federal Reserve Board of Governors 2006).

Derivative creation and trading can only be done profitably by banks with very large investments in the technologies and human capital required to be competitive in this business, and the trades are so large and so risky that only a bank with massive equity capital can afford to take the inevitable large losses associated with holding huge positions in exceptionally volatile assets. It is clear that since the derivative trading market is highly concentrated, market power might enable the core firms to sustain high profit margins on these trades. However, collusion may not be the most important source of high profit in this business.

For some time after a new derivative product is introduced, it has a niche market with high profit margins. However, many such products eventually become standardized and can be sold by any large bank. These 'commoditized' or 'plain vanilla' products end

up being exchange traded, with transparent bid and asked prices available in real time on the Bloomberg website. Exchange traded derivatives are sold in a highly competitive market, with low profit margins. However, since banks are always creating new products with temporary niche markets and high margins, their extra profits are never completely competed away. Thus, the initial challenge to banks was to invent derivative products that were sufficiently complex to resist commoditization for long periods, and the ultimate challenge was to make them so complex that they could not be sold on exchanges at all. These challenges have been met. An increasing portion of derivative products are now exotic, extremely complex, and often created for a small number of customers. As such, they cannot be commoditized and must be sold over-the-counter (OTC) in non-transparent private deals negotiated between the bank and interested customers – “off Bloomberg” as one market observer put it.¹³

Such deals are characterized by very asymmetric information and bargaining power. OTC products suffer from “lack of transparency, of liquidity and of competitive pricing” (Steinherr 2000, p. 151). This allows banks to sell them even to users who do not understand them and would not buy them if they did understand them. The history of the Golden Age is replete with examples of major losses taken by OTC buyers who simply did not comprehend the true nature of their purchase. Orange County California and Gibson Greetings Inc. come to mind. In addition, the complexity and lack of competitive bidding allows banks to charge prices substantially above the ‘true’ value of the product at sale, and in the event that the derivative loses value and must be liquidated, the bank can buy it back for less than its fair value. It is thus primarily the OTC market that generates the high trading profits we see on the giant banks’ income statements. “The importance of derivatives as a profit source reflects both the banks’ creativity in product innovations and the wide spreads enjoyed on the complex... products” (Davis 2003, p. 29).

As Figure 13 demonstrates, OTC derivatives have grown at an astounding pace. In 1992, the notional amount of global OTC derivatives was \$25 trillion; in mid 1998, \$72 trillion; by mid 2001 it was \$98 trillion; in mid 2004 it was \$258 trillion; and by mid

2006 it was \$370 trillion. In 1996 there were about \$180 billion in credit default swaps; in 2002 there were \$2 trillion; in mid 2004 there were \$6.4 trillion; by mid 2006 there was \$20 trillion. In 2000, there were about \$70 trillion in OTC interest rate derivatives; by mid 2006 this had grown to \$262 trillion.¹⁴ The OTC derivative market is currently four times larger than exchange traded derivatives (*Financial Times*, “Pension funds help derivatives market surge to \$370,000 bn” January 18, 2007, p. 11). Thus, banks earn high margins on the bulk of their derivative trades and the volume of OTC trades is exploding, causing a rapid rise in profit. This creates an incentive to increase the rate of innovation. A managing director at a large investment bank explained: “We are nomads, dependent on moving and innovating... What was innovative a few years ago is now being done by junior clerks for just a few basic points. You have to be like a shark – swimming all the time to stay alive” (Davis 2003, p. 20). This perpetual-motion derivative innovation machine may continue to generate high profits for large banks for some time, until unexpected shocks destroy the liquidity of the markets they trade in.

The fact that the big banks make a large and rapidly increasing portion of their profits creating and trading exotic derivative products is one reason for their participation in today’s Golden Age of finance. It also suggests that powerful incentives will continue to drive the ongoing explosion of derivative products. It is the continuous explosion in derivative products that in turn facilitates the rapid structural change we have seen in financial markets over the past decade.

Moral Hazard, Systemic Risk and System Resilience

Conditions in financial markets in recent years have been such that high profits have rained on almost everyone operating within them. Those adopting the riskiest strategies have been the most blessed. Analysts stress that ‘liquidity’ – a concept with no consensus definition – has been in excess supply for years. The cost of capital has thus been unusually low, while asset prices have been rising most of the time. Meanwhile, no significant negative ‘shocks’ have disturbed high-yield high-risk markets in the last few years. As 2006 ended, volatility indices were at or near historic lows. The President of the

New York Fed put it this way. “Long-term interest rates have remained relatively low in nominal and real terms. Equity and other asset prices have moved higher. Credit spreads have declined to quite low levels. Market participants report exceptionally high levels of liquidity. And volatility, both realized and expected, has remained low across many different types of financial assets, markets and economies” (Geithner 2006). In the US in the same period, corporate profit as a percent of national income rose to post-war highs. By the end of 2006, corporate profits had increased by double-digit percentages for 19 consecutive quarters. Moreover, private equity fund takeover bids and pressures on nonfinancial corporations by hedge funds to increase stock buybacks have helped keep stock prices rising, fueling the boom. *Business Week* reports that hedge funds “helped compel 29 of the 30 members of the Dow Jones industrial average to repurchase shares in recent years,” and “that a record \$600 billion in US shares were removed from the public market just in the first nine months of 2006” (“What the market is telling us,” March 12, 2007, p. 37).

The conventional wisdom says that the widespread use of complex derivative products has made it possible to hedge almost any gamble. Meanwhile, the cost of hedging is lower than ever, a result of the prosperous and stable conditions of the recent past. It also says that the widespread diffusion of risk across markets and agents has greatly reduced systemic risk. Convinced that markets are now and will continue to be robust, agents seem to believe they can safely make what would have previously been considered very risky gambles, perhaps buying some risk protection in derivative markets that have adequate liquidity under normal conditions. If excessive risks have built up in sections of the market, they are hidden off-balance-sheet and/or do not have to be publicly reported, so we cannot see them. Lured by the prospects of high returns at little risk, by the widespread and accurate perception that millions of people are getting fabulously rich by making or managing financial investments, by the incentive structure and competitive pressures in the institutional investment business, or by the necessity to achieve higher returns than can be obtained on safe investments, individuals and financial firms have been making unusually risky investments. In other words, moral hazard permeates today’s financial markets. The belief that new structures and new financial

instruments have greatly reduced individual risk seems to have led to a substantial increase in actual systemic risk.

The fact that so many financial market ‘insiders’ have expressed serious concern about systemic risk is telling. New York Fed President Timothy Geithner recently gave a talk on the impact of hedge funds and derivatives on financial markets. After citing their potential for helping reduce individual risk and expressing his belief that markets were now less vulnerable to small and moderate shocks, he concluded that they may have increased the likelihood of a really severe systemic crisis. “The changes that have reduced the vulnerability of the system to smaller shocks may have increased the severity of the large ones.” Impressed by the size and speed of structural change in global financial markets, he urged practitioners and regulators to pay “more attention to assessing potential exposure in extreme events that lie outside [all] past experience, not just outside recent past experience.” He also noted that the complex new financial system made this task extremely difficult: “Understanding and evaluating ‘tail events’ – low probability, high severity instances of stress – is a principal, and extraordinarily difficult, aspect of risk management. These challenges have likely increased with the complexity of financial instruments, the opacity of some counterparties, the rapidity with which large positions can change, and the potential feedback effects associate with leveraged positions” (2006).¹⁵

Alfred Steinherr, General Manager of the European Investment Bank and author of an excellent book on derivatives, offers a similarly nervous forecast.

In recent years, financial disturbances have on several occasions turned into full-blown crises that became magnified in derivatives-connected domestic and international markets, and spread around the globe with more violence than had been imaginable before the 1990s. ... The growth of derivative finance has contributed to the risk of crisis contagion in several ways. Foremost among these are the undefinable and unlocalisable nature of the OTC market, the derivative-induced lack of transparency, the breakdown of hedging and valuation of derivative positions in the face of major breaks in asset prices, the growing concentration of the derivatives industry and the operational risks of the large players. (2000, pp. 183 and 190)

Even Alan Greenspan, so badly burned by his ‘irrational exuberance’ comment in 1996 that he became a perpetual cheerleader for the market, joined the chorus. “Risk is no longer perceived as major risk, at least as it was in years past, and that, I must say, I find disturbing” (*Business Week*, “How Alan helped Ben,” March 12, 2007, p. 40).

Individual and market risk, on the one hand, and systemic risk on the other, are co-dependent. Agents must make some assessment of systemic risk before selecting an investment strategy. Assets that are attractive at the moment may turn out to be losers if a crisis breaks out in somewhere in the system and spills over to other market segments, destroying liquidity in the markets it hits. Conversely, systemic risk is greatly affected by the decisions of agents; conservative investment strategies normally underpin financially robust financial systems. The aggressive investment strategies of the moment assume a robust, safe financial system. They may well continue to be successful - until a significant unexpected problem hits important financial markets. However, these high risk strategies make the outbreak of such a ‘tail event’ more likely.

Tail events will eventually take place and test the fragility of the new financial system. They always have. For example, the severe 1980s commercial banking crisis was triggered by events thought at the time to be almost impossible - until they happened. The tail event was the Latin American repayment crisis triggered by Mexico’s default on its sovereign debt in August 1982. In the absence of intervention by the Fed and FDIC, it is likely that most US money center banks, which had become technically insolvent because defaulted loans to Latin America were much larger than their equity, would have failed. Yet when these loans were being made, the unanimous opinion on Wall Street was that sovereign debt was as good as gold, a conclusion that seemed consistent with the facts at that time. Latin American sovereign debt defaults were virtually non-existent in the 1970s. However, by the end of the 1980s sovereign debt in default from this area was over \$300 billion (*The Economist* “Sovereign debt in default” October 7, 2006, p.113). The Asian financial crisis of 1997 and Russian bond defaults in 1998 could also be considered tail events.

It took costly intervention by government and international financial institutions to prevent a global financial system meltdown in the aftermath of these tail events. Indeed, such interventions (along with rising market concentration and aggressive monetary policy at key points such as the early 1990s and 2001-05) help explain why financial firms have been able to profit from high-risk strategies for so long without suffering the full consequences of these risks. However, these interventions only reinforced the widespread belief that even a severe tail event would not be allowed to trigger a systemic crisis. Thus, they increased the moral hazard infecting financial markets. The IMF noted in September 2005 that “recent economic and market developments have reduced risks in the near term, but they are storing up potential vulnerabilities for the future.”¹⁶

Who will absorb risk and create liquidity if a tail event takes place and a systemic crisis develops? Letting commercial banks absorb most risk - the traditional approach - is now seen as old fashioned. It is safer, mainstream analysts argue, to disperse risk widely around the system- even if we don't know how much risk there is, or where it is, and are not sure if those who hold risk will be able to handle it in a crisis. In the quarter century following World War II, commercial banks dominated US financial markets, and their top managers received a relatively fixed salary. Since compensation was not packed with cash, stock and stock option bonuses as it is today, there was little incentive for banks to take high risks. The restrictions on competition contained in Glass-Steagall regulations put in place in the Depression made it easier for banks to sustain conservative strategies. It is hardly surprising that banks exhibited few signs of excessive risk-taking in the early post WWII years. There were virtually no commercial bank failures in the 1950s and 1960s, and only a modest number of failures in the 1970s. Solid balance sheet positions allowed banks to be the liquidity supplier of next-to-last resort to nonfinancial and other financial firms during periods of stress, with the Fed and the FDIC committed to back them up when necessary.

In recent decades, banks have lost substantial market share as financial asset holdings spread more widely across institutions. Commercial banks saw their share of financial sector assets fall from 45% in 1952 to 24% in 2005. And compensation structures in commercial banks have changed dramatically, leading to more aggressive and risky strategies. Moreover, the rise in large off-balance-sheet obligations and in banks' use of complex dynamic hedging strategies make it harder to assess their ability to supply the liquidity needs of other financial institutions in the event of a serious crisis. But it does appear that this ability has declined, perhaps substantially. If a giant bank were to become insolvent, the economic spillover would be extremely dangerous.

The *Financial Times*' respected analyst John Plender recently assessed systemic risk in today's financial markets. He noted a virtual consensus among leading practitioners and central bankers that "another major shock is likely and that the potential damages could be greater" than those caused by previous shocks. New York Fed chair Geithner is said to be worried that banks, the traditional supplier of liquidity in financial crises, may themselves be too illiquid to perform this task. "Credit risk in the OTC derivatives market is large relative to more traditional forms of credit and is also quite large relative to the capital cushions and earnings of the major banks and investment banks." Geithner noted that these risks are opaque because they do not appear on balance sheets. Risk is "harder to measure because investments in credit derivatives contain 'embedded leverage' where one's exposure to profit or loss is multiplied many times compared to the same investment in the underlying conventional security." Plender concluded that the dangers of systemic risk are quite high and that most central bankers know this. Everyone is worried that if a serious crisis were to break out in today's opaque and global financial market, it is likely that no central banker could bring all the key players into a room and organize a market rescue as was done with Long Term Capital Market in 1998. (*Financial Times*, "After the flood: how central banks fret about failures once liquidity dries up," January 30, 2007, p. 13).¹⁷

Harvard's Kenneth Rogoff, a former chief economist of the IMF, also expressed concern about systemic risk. He noted that while many plans for improving the global

financial architecture were proposed and discussed awhile back: “Over the past couple of years all introspection appears to have vanished” as a firm belief that “macroeconomic stability at the national level combined with continuing financial innovation... have obviated any need to tinker with the system.” In its place has found a smug assurance that “there is no problem that markets cannot solve.” To which he responded:

Really? How well would markets handle the fallout from a sharp slowdown in India or China? How would they react to a dirty nuclear bomb in a US city that triggered a retreat from US assets, and a sudden reluctance on the part of global investors to keep financing America’s 800-plus billion dollar current account deficit?

After listing other possible global tail events, Rogoff went on to argue that central banks might not be able to rescue the financial system as they did so many times in the past: “contrary to market perceptions, global central banks have only very limited instruments for dealing with a genuinely sharp rise in global volatility, particularly one that is geopolitically induced” (Financial Times, “No grand plans, but the financial system needs fixing,” February 8, 2007, p. 10).

I give the last word on assessing the state of systemic risk and the ability of financial markets to deal with a systemic crisis to Raghuram Rajan, the Director of Research of the International Monetary Fund. His view is as follows. Risk has indeed been made more diffuse today through complex derivative transactions, but the belief that hedging will reduce the dangers associated with objectively risky actions has, in effect, led agents to be more risk loving, and this has increased systemic risk.

Even though there are far more participants today able to absorb risk, the [systemic] financial risks that are being created are indeed greater. And even though there should theoretically be a diversity of opinion and actions by participants and a greater capacity to absorb the risks, competition [for yield] and compensation [incentives] may induce more correlation in behavior than desirable. ... It is possible these developments may create more financial-sector-induced procyclicality than the past. They may also create a greater (albeit still small) probability of a catastrophic meltdown. (2005, p. 3)

Can we count on commercial banks to rescue the financial system from disaster in the event of a systemic crisis, as we have in the past? Rajan's answer is surprisingly cautious.

One reason banks functioned effectively in 1998 as liquidity providers of next-to-last resort was because they were not perceived as credit risks, so they attracted spare liquidity. This need not be the case in future crises. As originators of credit risk, banks hold first loss positions. A downturn in the economy, perhaps caused by, and causing asset price realignment, would result in asset losses being borne by bank balance sheets. Of course, banks hedge some positions through dynamic options-like strategies. As liquidity falls and prices move more, they will have to make larger and larger trades to offset those initial losses, thus demanding liquidity from the market precisely when it has little to offer. Bank losses could widen. (2005, p. 26)

To complete this nightmare scenario, Rajan suggests that if some banks face serious losses in a crisis and there is uncertainty about how these are distributed across banks, only a few "unimpeachable" banks will receive the liquidity fleeing all risky markets. The 'safe' banks may refuse to lend to more vulnerable banks, "the inter-bank loan market could freeze up, and one could well have a full blown financial crisis" (2005, p. 26).

Conclusion

In the body of this paper I propose a number of possible explanations of Volcker's Paradox. I do not know how important each has been to the creation and reproduction of the new Golden Age of finance, but together they probably have substantial explanatory power. It might be interesting to speculate about the likelihood that these factors will continue to sustain high financial sector profits and growth in the coming years. Of course, such prognostication is perilous. The structure of financial markets continues to undergo mutation at an unprecedented pace, and it is now so complex and opaque that I am not sure anyone fully understands it. This gives the asset price correlation matrix that is the foundation of risk assessment and hedging behavior a phantasmagorical quality. Moreover the standard models of financial market systems found in the mainstream

literature have no probative value because while they are equilibrium models, the structure of the global financial system is constantly evolving and thus is never in – and perhaps never near - equilibrium. Having stressed my lack of faith in predictions about future financial developments, I offer some here.

First, it is likely that financial markets will – in the absence of system-shaking crises – continue to grow, though not at the same speed as in the past. Second, concentration ratios seem likely to increase, though not at the amazing rate undergone in US commercial banking between the early 1990s and 2000. These two trends should continue to make it possible for coresponsive dimensions of competition to continue. Third, I argued that one important reason many financial firms have high profit rates is because incentive structures, competitive pressure and the need to achieve high yields to survive have induced high risk strategies that can, in normal times, increase profits. There are several reasons why it is hard to make the case that this situation will be sustained indefinitely. One is that the rush to traditionally high-risk high-return assets has reduced risk premiums substantially, so the extra return that can be purchased by accepting higher risk is smaller than it was a couple of years ago, and it now takes higher leverage to raise returns. If the incidence of defaults should substantially rise in some of these markets, the rush to get out could cause serious financial distress. Another is that a prudent person would not bet the ranch on the likelihood that global markets will continue to provide investors unlimited capital at low interest rates or that the profit share of income will remain so high. The ideal conditions of the last few years will certainly end soon. Yet another is that a serious tail event is out there somewhere waiting to announce its presence.

Fourth, as Figure 12 shows, investment bank profits have been very volatile, even in the Golden Age. When they are profitable they are very profitable, and when they are not, profits collapse. The rate of acceleration of derivatives markets and the profits investment banks have been making from them recently seem to defy the laws of physics if not finance. Can Goldman Sachs perpetually book record profits 70% of which are from trading on its own account? I am hesitant to suggest that this bonanza cannot

continue for some years to come, because derivatives markets have been growing rapidly for a long time now. M&A profits may hold up for a year or two, but it is highly unlikely they can permanently sustain the pace of the past few years. Moreover, by relying so heavily on gambling with their own money on very risky trading and on hedge and private equity funds, big investment banks have accepted unprecedented risk – as insiders often acknowledge in private conversations. Should serious problems develop in key segments of the derivatives market, investment banks might be in serious trouble. Finally, hedge and private equity fund profits, which have been very high, are vulnerable to any drying up of global liquidity or rise in interest rates or fall in nonfinancial corporate profits.

I conclude that troubles lie ahead for financial firms and markets, perhaps serious trouble in the short run. Catastrophic stress may break out in the intermediate run; if it does, we will see if monetary authorities are still capable of crisis containment. History insists that no financial boom is permanent. I am tempted to say that this Golden Age will end with a bang rather than a whimper. I find it hard to believe that financial markets can continue to grow forever at the rapid pace of the current era, or that giant firms piling up unprecedented hidden risk will never suffer the consequences. No one knows what dangers are hidden off their balance sheets or in obscure footnotes in incomprehensible financial reports.¹⁸ I find it difficult to believe that financial profits will rise indefinitely relative to GDP or those of nonfinancial firms, or that the leaders of financial and nonfinancial firms can get away forever with enriching themselves while jobs and median wages stagnate and inequality soars. The odds probably are that the Golden Age will end with a whimper, but, as Rajan and others have been warning, it is possible it will go out with a bang. But at some point not knowable today, it will end.

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FIGURES

Figure 1

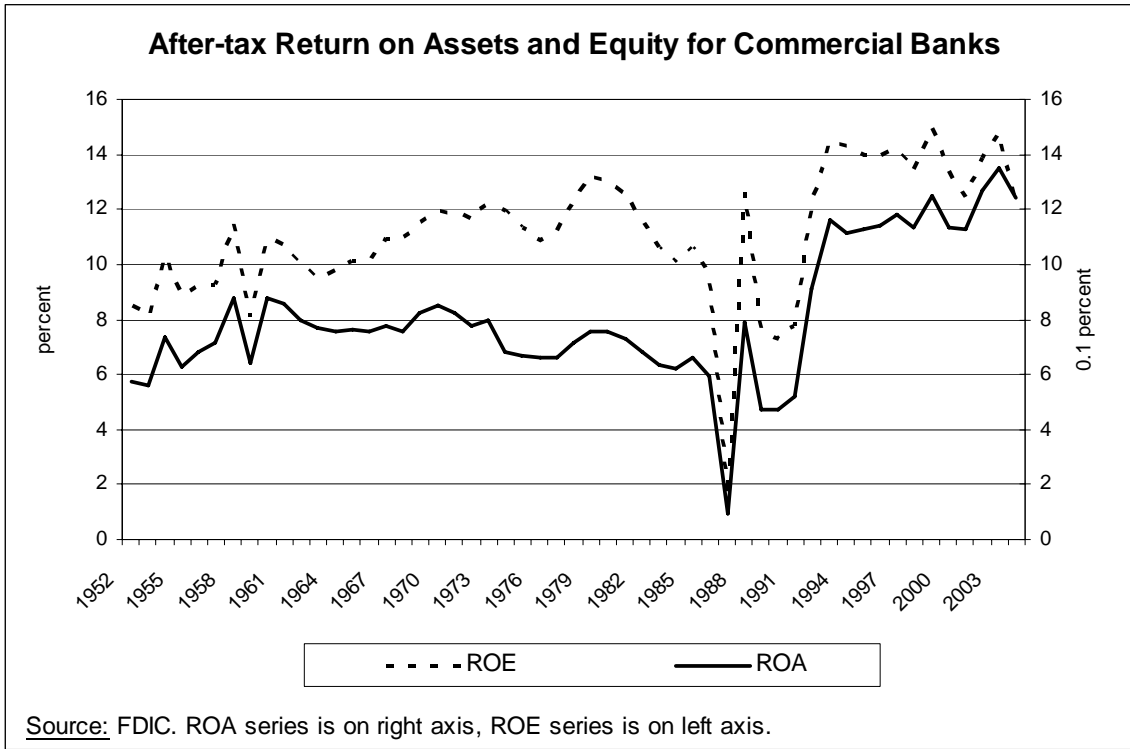


Figure 2

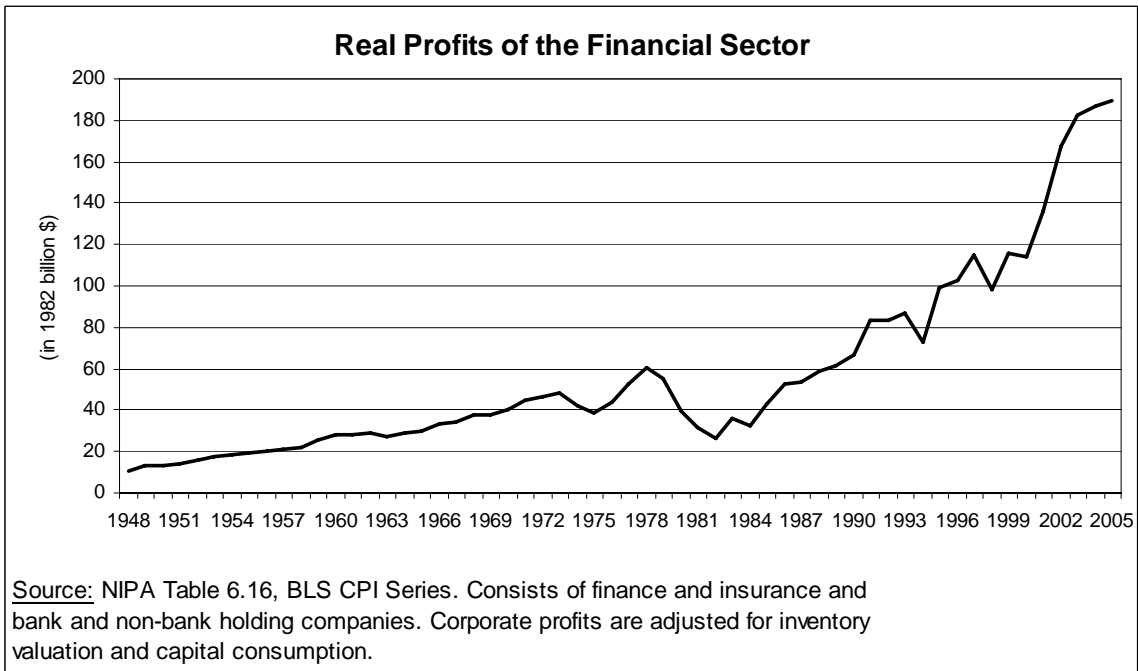


Figure 3

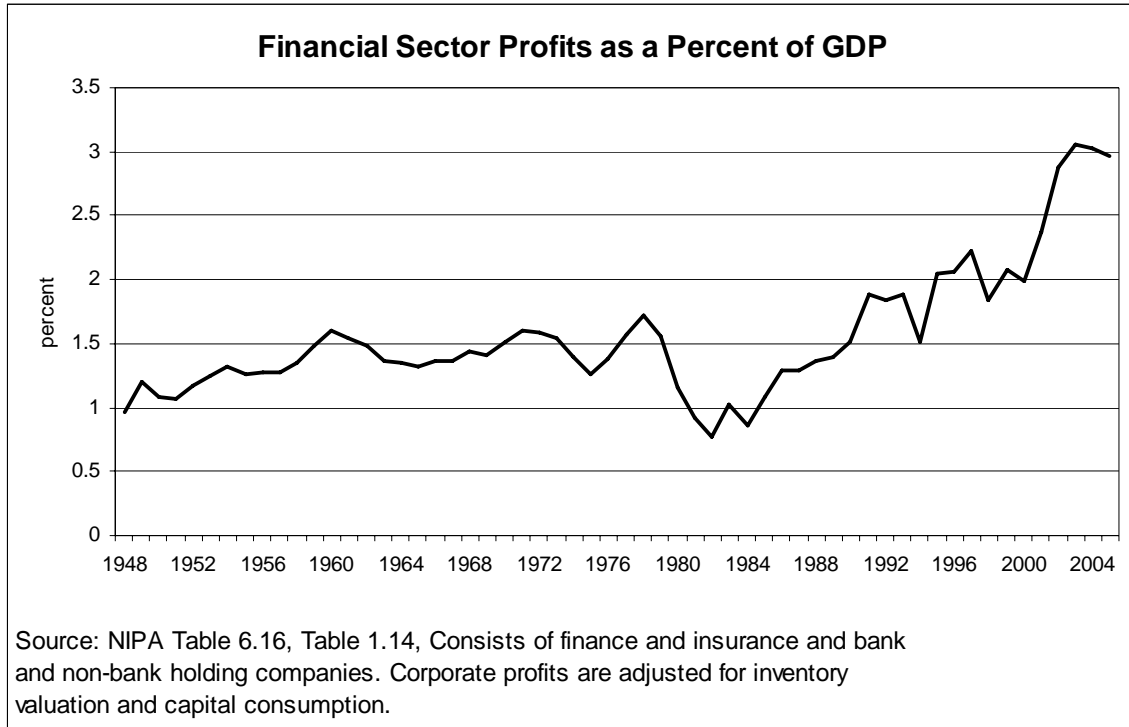


Figure 4

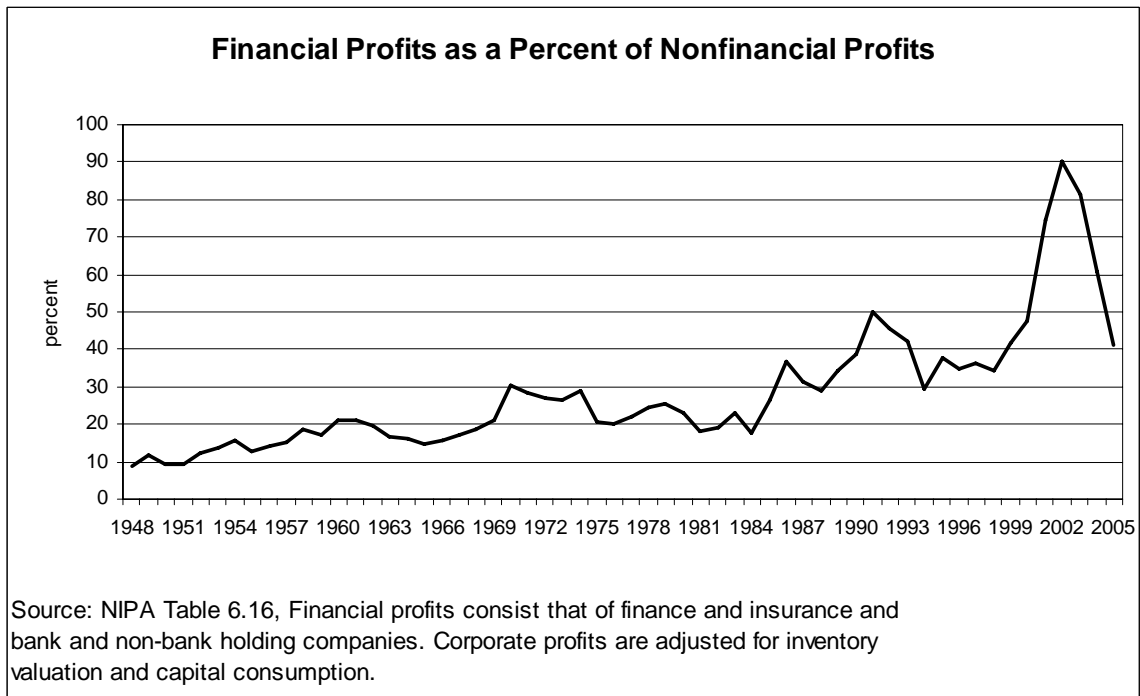


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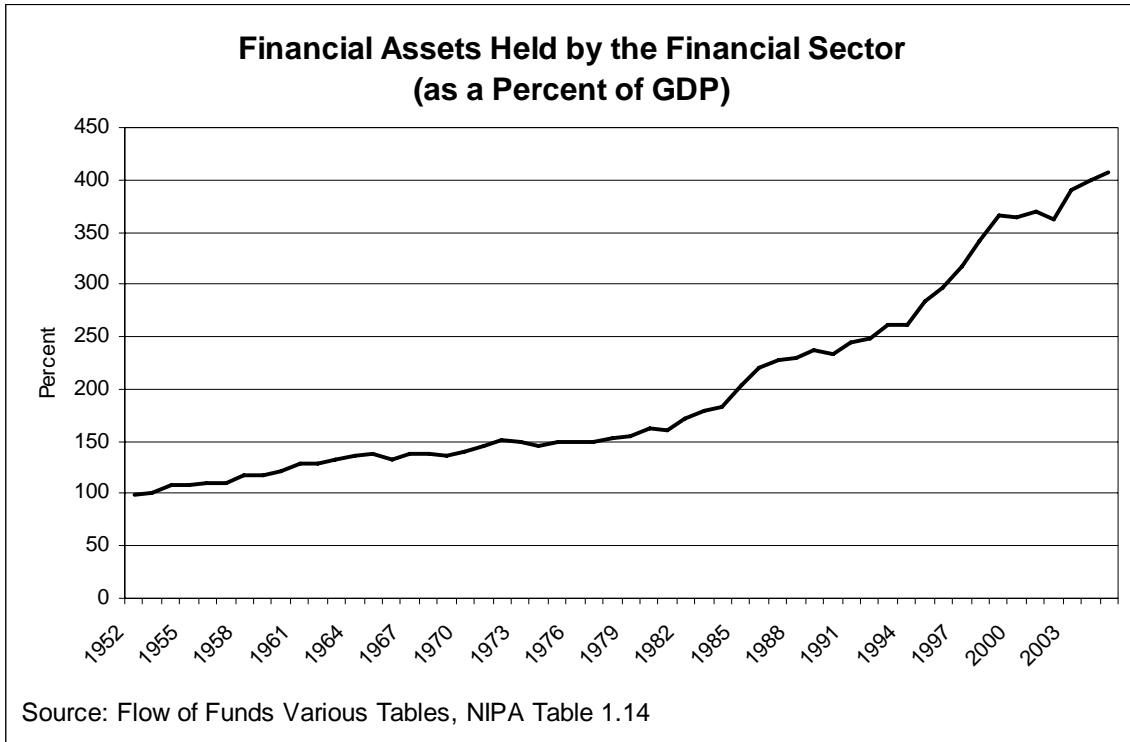


Figure 6

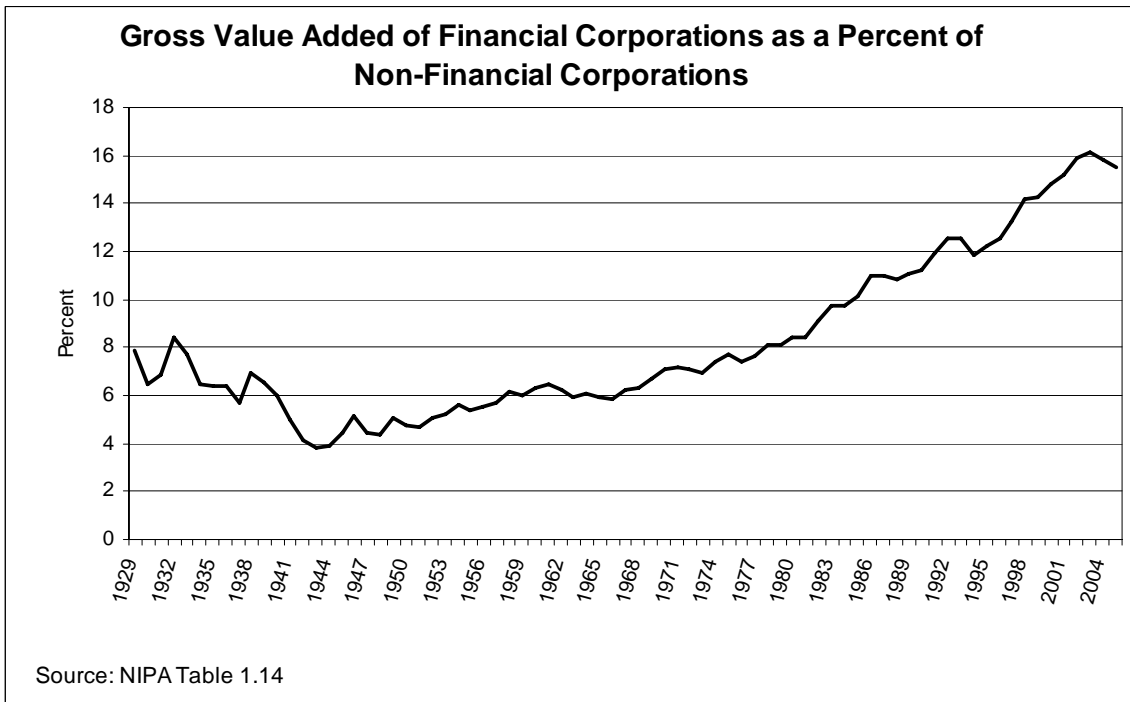


Figure 7

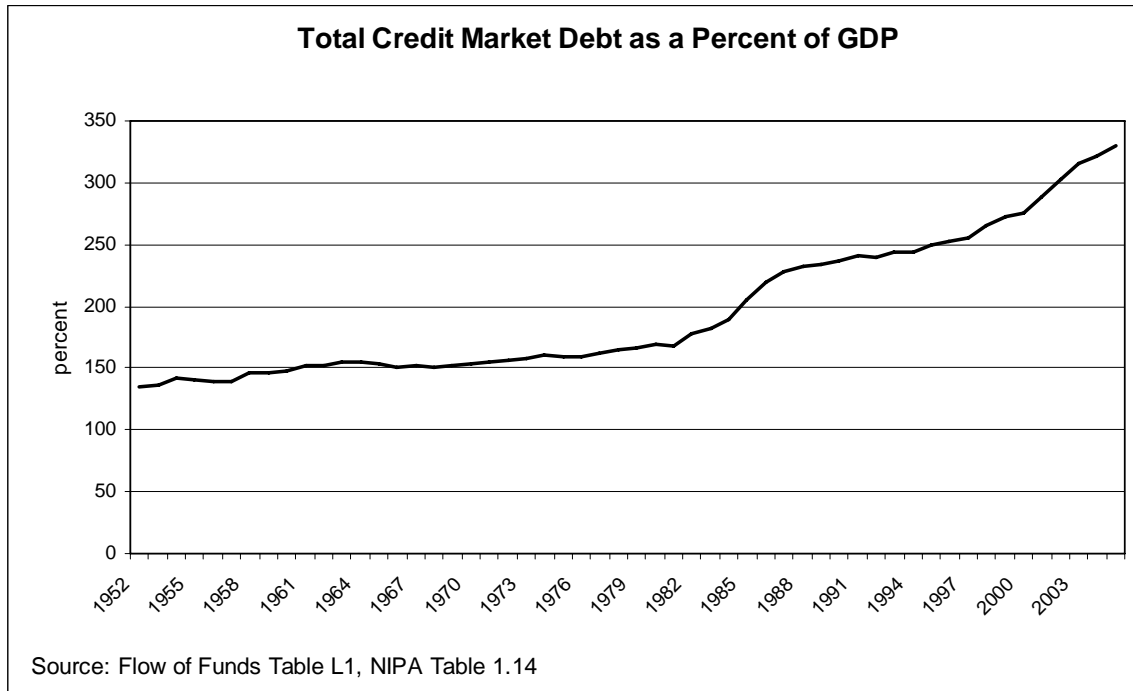


Figure 8

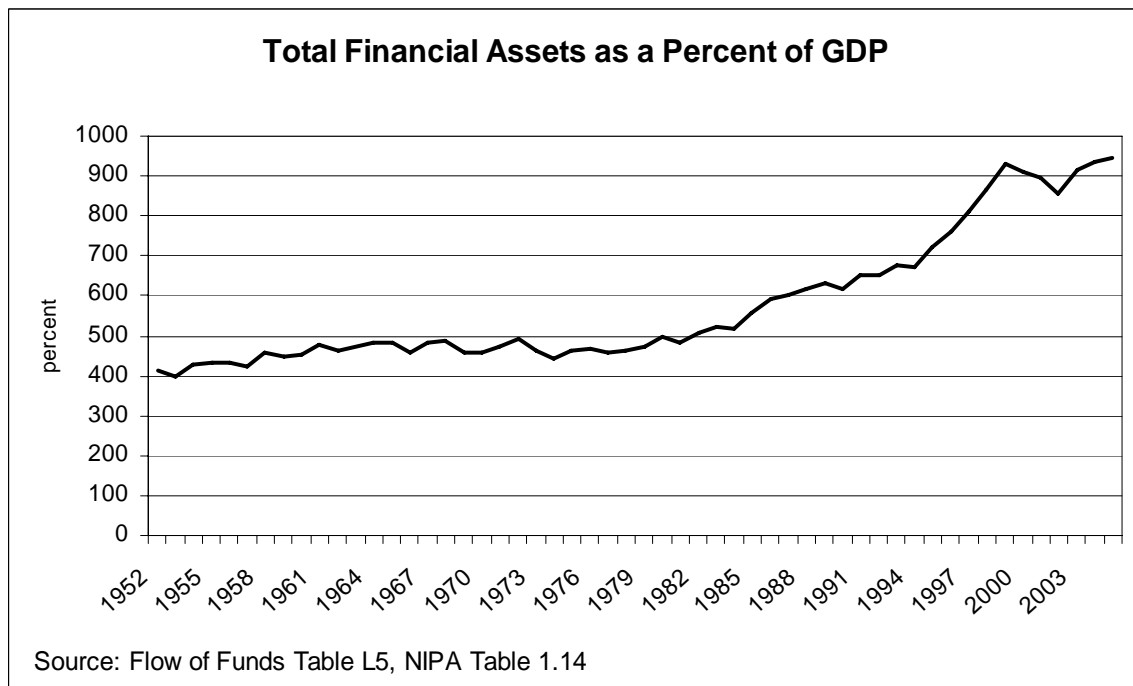


Figure 9

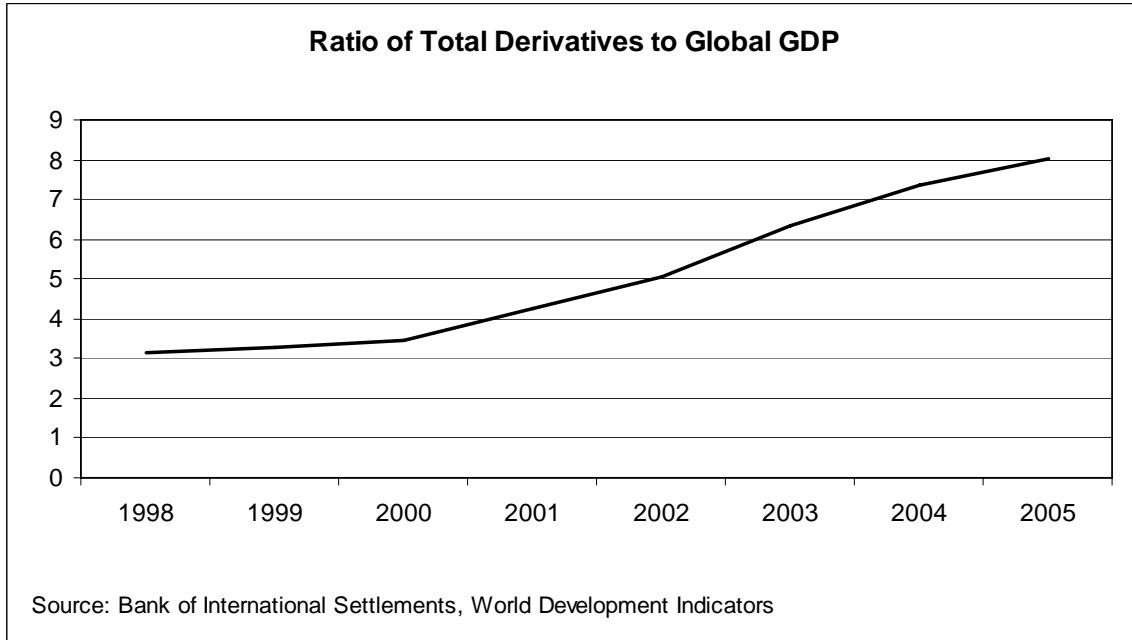


Figure 10

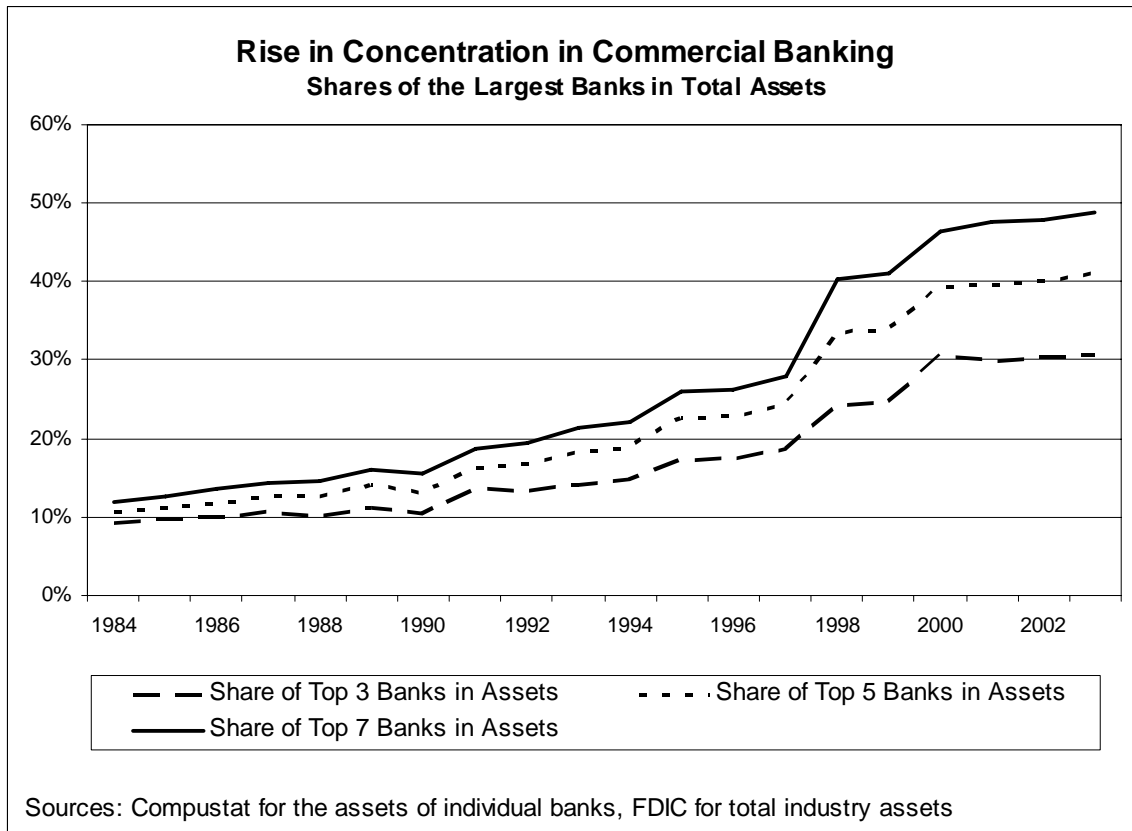


Figure 11

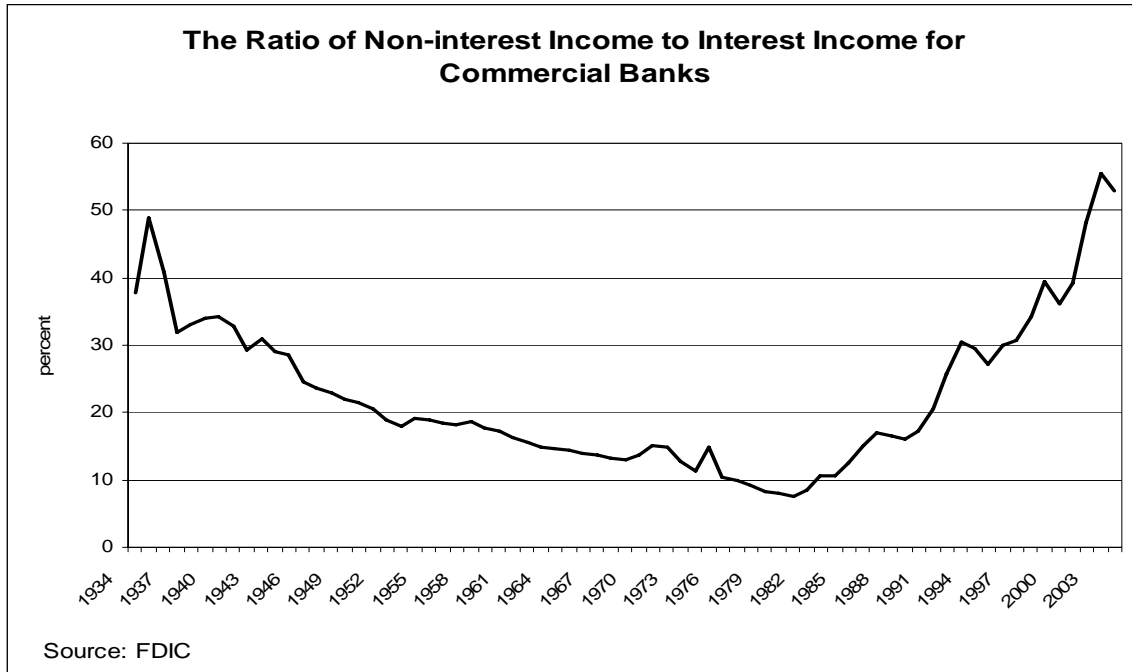


Figure 12

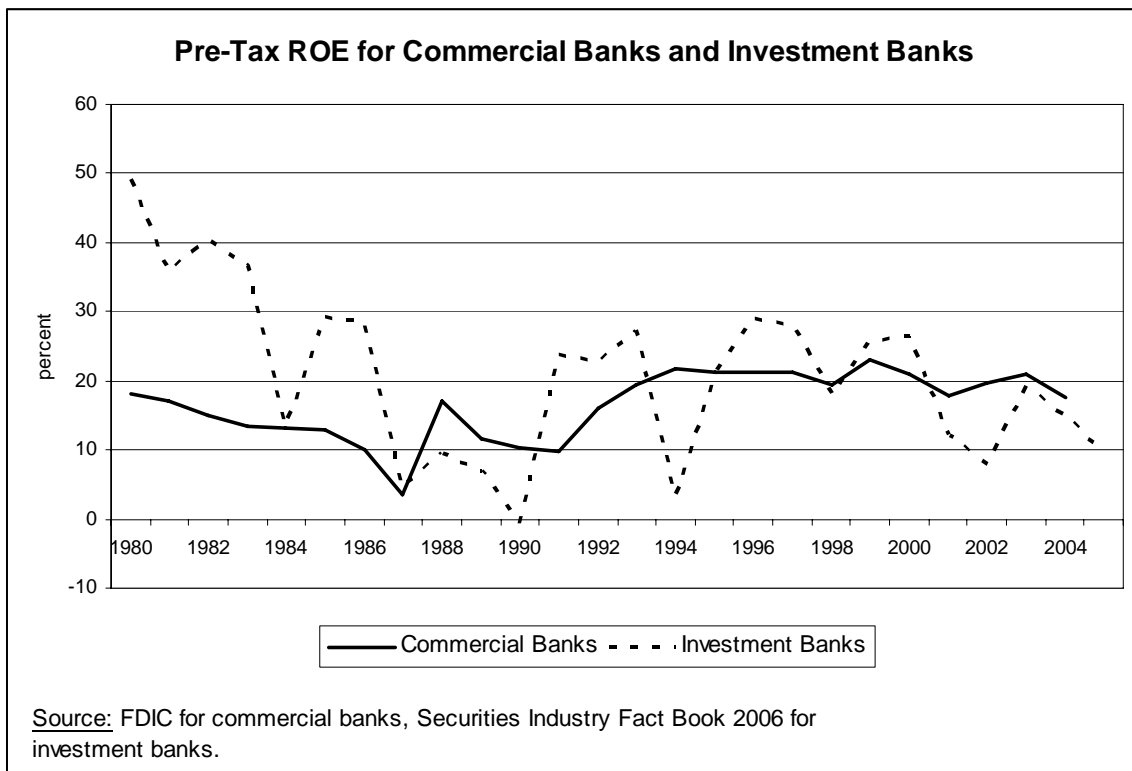
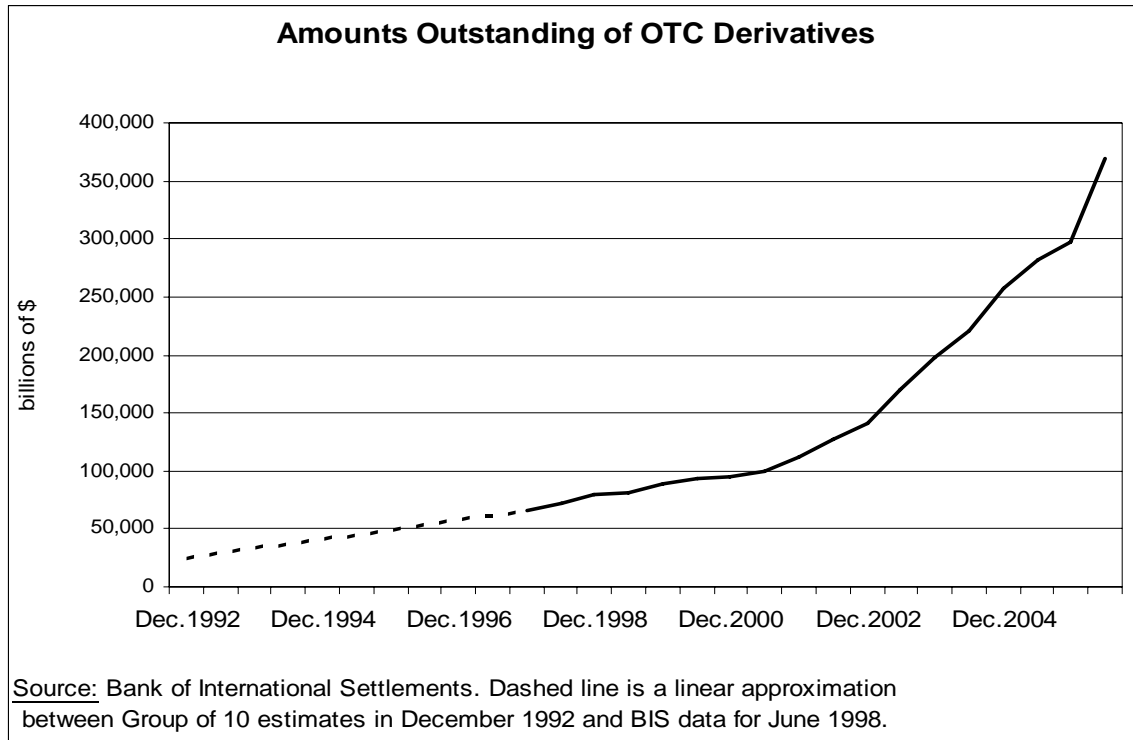


Figure 13



TABLES

Table 1:

Top 5 Banks' Share Of Non-Interest Income Of Insured Commercial Banks In 2001		
Non-interest income category	Share in Total Non-interest Income (%)	Top 5 Banks' Share in the category (%)
Traditional sources of non-interest income		
Net gains/losses on sales of other assets	1.43	84.60
Net gains/losses on loans sales	2.95	47.50
Income from fiduciary (trust) activities	13.20	39.40
Service charge on deposit accounts	16.84	33.90
Trading, investment banking, and insurance		
Trading revenues	7.97	82.60
Investment banking and other fees	5.79	55.80
Venture capital revenue	-0.47	na
Insurance commissions and fees	1.83	38.40
Servicing and securitizing loans		
Servicing fees	7.36	41.50
Securitization income	10.40	64.00
Not identified		
Other non-interest income	32.66	21.20

Source: Bank Call Reports (FDIC Research Information System)

Table 2:

Coefficient Of Variation For Commercial Bank ROA And ROE				
	Top 3 Commercial Banks		All Commercial Banks	
	1984-1992	1993-2003	1980-1992	1993-2004
COV of ROA	1.048	0.168	0.341	0.089
COV of ROE	0.990	0.191	0.330	0.067

Sources: Compustat for individual bank data, FDIC for industry statistics

Note: Coefficient of variation is the standard deviation of the data series divided by its mean.

ENDNOTES

¹ Dumenil and Levy 2004 are, to my knowledge, the only people who have attempted to do so.

² Figures 2, 3 and 4 are based on National Income and Product Market data from the Bureau of Economic Analysis. Following the latest Standard Industry Classification revisions, the definition of the financial sector changed in ways that make the data of the last few years inconsistent with earlier data. For example, the financial sector now includes non-bank holding companies.

³ The history of this period demonstrates once again that it is not possible to have lightly regulated financial markets unless the state is willing to repeatedly step in and rescue the system from endogenously generated disasters and crises. Left only to themselves, unregulated financial markets cannot reproduce themselves over time.

⁴ The ‘prime brokerage’ services that banks provide for institutional clients such as hedge funds are much broader than simple buying and selling and are a major source of bank profits. They include financing, securities lending, and technological and operational support. Their credit exposure to hedge funds includes margin loans, securities lending, reverse purchase agreements and derivatives counterparty risk.

⁵ Smaller investors who invest in ‘funds of funds’ get charged an additional 1% of assets and 5% of profits on top of the huge fees charged by the private equity funds themselves.

⁶ One should note in passing the irony implicit in the way the market understands the transition from the leveraged buyout boom of the 1980s to the private equity boom of the present era. The ‘narrative’ used to support the first boom was that the creation of large conglomerates led to massive inefficiencies that could be remedied by breaking up conglomerates into many free-standing firms. The implicit narrative supporting the current boom is that private equity funds can create large collections of heterogeneous firms – large buyout funds are de facto conglomerates controlling dozens of individual firms - and manage them more efficiently than they were managed when they were free-standing.

⁷ The mortgage business provides another example of how bank strategies have shifted, in this case from redlining to predatory lending. Banks used to refuse to sell mortgage loans in low income and minority neighborhoods. They now originate or buy very risky but high yield mortgages sold to low income families in poor neighborhoods. In 2005 in the heat of the housing bubble, many of these mortgages required no proof of ability to pay and let borrowers miss interest payments without penalty - missed payments were added onto principal. The default rate on these loans has risen substantially in the past year.

⁸ Data from *New York Times*, “Goldman Chairman gets a bonus of \$53.4 million,” December 20, 2006.

⁹ “Shorting” is the sale of an asset at an agreed price with delivery in the future. If the asset price falls between the sale and delivery dates, the short seller makes a profit.

¹⁰ The same problem will result if longer term data are used, but the weights on recent observations are much larger than those on more distant observations.

¹¹ The *Report* notes that lower rated firms “are generally only able to service their significant debt burdens by tapping external funding and have no cushion to sustain them if business or borrowing conditions soften” (p. 7).

¹² The *Wall Street Journal* put it this way: “High rates of savings around the world combined with open global financial markets have created a flood of investment money seeking higher returns. That flood encourages risk taking and reduces the return on risky investments. The spread between high yield bonds and Treasury securities, for instance, has narrowed to 3.5%, down from a historic average of 5%, according to Moody’s Investors Service. The gap between bond yields in emerging markets and US markets has also decreased, down from 2.3% last year and 4% in 2004.” The article then poses the question: “when will fear return?” (WSJ, “Financial risk: where has it gone?” December 30-31, 2006, p. A9).

¹³ I am indebted to Doug Cliggott for this insight.

¹⁴ British Bankers’ Association, *BBA Credit Derivative Report 2006*. p. 5, Group of Ten 2001, p. 459, and Bank for International Settlements website.

¹⁵ An IMF econometric study of the impact of increased concentration and conglomeration in the US banking system on systemic risk came to similar conclusions. Controlling for an appropriate set of independent variables, the study concluded that increased concentration led to lower risk-adjusted profitability (as measured by a Z-index) and to higher systemic risk. These relations grew stronger over time (deNicolò, Bartholemew, Zaman and Zephirin, 2003, p. 25).

¹⁶ Cited in the Financial Markets Center’s “*Capital Flows Monitor*,” April 27, 2006, p. 4.

¹⁷ An experienced financial market analyst made the following observation to me; “Never before have we seen so many regulators and central bankers swarming around their major financial institutions before an episode of financial instability has erupted. I infer from this that these guys are scared to death about something.”

¹⁸ On the latter point, see the fascinating article by Malcolm Cauldwell on Enron in the New Yorker (“Open secrets: Enron, intelligence, and the peril of too much information,” January 8, 2006, pp. 44-53). To pick just one example Enron had 3000 Special Purpose Entities described in 3 million pages in their internal records. Summaries of these reports by a Duke Law School professor averaged 40 single space pages each.