# The Roots of the Financial Collapse: Going Way, Way Back

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**Abstract**: The paper is based on a talk given in April 2010. It traces the roots of the recent financial crisis from development of the limited liability corporation, to separation of ownership from control, tax incentives for debt financing, investment bankers moving to the corporate form, government backstopping the lenders, and the failure of the quants. Finally, it considers the Minsky hypothesis, under which financial markets are inherently unstable.

**JEL Codes**: G01, G18

**Key Words**: financial crises, limited liability, leverage, incentives, investment banking, corporate taxation, quants, Minsky hypothesis.

In April 2002 I gave a talk called “Markets are Good,” and I subsequently extended the remarks in a paper with that same title. In early 2002 we were just beginning to recover from the horrors of Sept.11 and I was acutely aware that six of my former students had died in the towers. I began the talk with a little poem in their memory, which I am going to share with you now.

It is called "Six Students," and it is offered in memory of Patrick, Bryan, Welles, Sean, Stacey, and Brad.

> I lost six students on Sept. 11,
> five of them from a course in capital markets
> which sent so many to Wall Street.
> They were all a part of my extended family.
> They were in the towers and then they were gone.
>
> We bowed our heads in a moment of silent prayer
> and I promised my class I would try to tell their story.
> People want to provide a better life for their children
> and people are creative--they have ideas.
> But to bring ideas to fruition they need money.
>
> And that's what capital markets do.
> They bring together people with ideas and people with money
> and they help us to be co-creators with God.
> Markets aren't perfect, just as people aren't perfect,
> but they are good, and what these students were doing was good.

[1] Much of what follows was in an address to the Honors Dinner of Omicron Delta Epsilon at Boston College on April 8, 2010.

I lost six students on Sept. 11.
They took these six and more and they took the towers.
but they cannot take the truth.
The truth survives and thus they survive,
and the truth will make us whole.

I very much believed then, and I still do after some soul searching, that markets are good. They are not perfect but they are more good than bad and in that sense they are good. And they work much, much better if we are careful to get the incentives right.

In light of the financial crisis we have to ask again whether markets indeed are good. A combination of exuberance, leverage, and exotic financial instruments, took us to dizzying heights and then collapse. So did markets do this to us, or did this happen because public policy distortions misdirected the incentives and prevented markets from acting as they should, most particularly in financial markets? Or was it both? That is the question I want to address.

We had a global financial collapse in 2007-2008, which Alan Greenspan says was the most severe, by some measures, in our financial history. We responded with the most enormous government bailouts ever, by far, and with the most massive use of Keynesian fiscal policy that we have ever had. We have accumulated a mountain of government debt and far too many people have suffered from unemployment and loss of their retirement nest eggs.

And the crisis isn't over. We are just entering the second phase, the collapse of governments under the weight of excessive debt and falling tax revenues in the recession. We don't know at this point how severe this second stage will be. But we will recover, and as we do so we will enact new legislation in an effort to prevent it from happening again.[2] It is important that we understand what happened, so that in framing legislation we do it as wisely as we can. It is important, in my judgment, that we go to the roots of the crisis.

What are the roots? Alan Greenspan said early this year in testimony to Congress that the roots go back to the fall of the Berlin Wall in 1989 and the euphoria for capitalism that followed.[3] Sorry, Alan, in my judgment the roots are much deeper than this. I want to go back to the roots as I see them.

The first point I want to make is that a financial crisis is not something that is new. We have had them over and over. What is new, if anything, is first, that it is so long since the last one--almost 80 years since the crash of 1929,[4]

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[2] We did indeed pass the Financial Reform Act of 2010 in July of this year, so the continuing debate may be more about whether this act dealt adequately with the problems.

[3] Testimony of Alan Greenspan before the Financial Crisis Inquiry Commission, April 7, 2010.

[4] Prior to this we had them much more frequently.

second, the severity of the financial collapse as a global crisis,[5] third, the extent to which public policy contributed to the crash, fourth, the extent to which governments have made an effort to contain the crisis, and fifth, the extent to governments are now vulnerable to a second stage of the crisis.

What do financial crises have in common? First, most of us don't see them coming. If we did we would probably not take the actions that make them inevitable. Second, following the crash we find all sorts of reasons why it happened and we berate ourselves for not having seen these things earlier. Third, in virtually all cases they have been preceded by speculative frenzy and a build-up of leverage, or debt, that make the system more vulnerable to a negative shock.

So what are the roots, as I see them? We begin with the limited liability corporation, a legal entity in which it is the firm as distinct from its owners that is responsible for debts. This dates at least to the Limited Liability Act in England in 1855 and, so far as I can tell as of now, to statues of the state governments in the U.S. for fifty years before and after this date. Until perhaps the end of the nineteenth century, there were long debates in the state legislatures of the U.S. over whether profit-seeking corporations should enjoy limited liability. So perhaps it has clearly been a feature of the business corporation for 110 years.[6]

Then we move to separation of ownership from control, as articulated so elegantly by Berle and Means in their 1932 book *The Modern Corporation and Private Property*.[7] Shareholders want diversification and thus hold small stakes in a large number of firms. They don't attend annual meetings and they tend to either throw away their proxies or sign them over to current management. If shares of ownership are widely dispersed, then the key decision makers may be able to maintain control with a very small part of the stock and with little of their own personal wealth at stake. The have little skin in the game.

Third, we have the corporate income tax,[8] with interest on borrowed money a tax-deductible expense, which gives an incentive for debt financing. With debt there is less money paid to the government in taxes and thus more returned to investors, provided of course that the pre-tax earnings are

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[5] Alan Greenspan, in a recent paper in draft form, said that " the virtual withdrawal, on so global a scale,, of private short-term credit, the leading edge of financial crisis, in not readily evident in our financial history." Alan Greenspan, "The Crisis," Second Draft, March 9, 2010.

[6] I have been attempting to find out the extent to which shareholders in the Dutch East India Company and the South Sea Company enjoyed limited liability but thus far have been unsuccessful.

[7] Berle, Adolf, and Gardner Means, *The Modern Corporation and Private Property*, 1932.

[8] The corporate income tax as we know it dates to 1909. It had been challenged but with passage of the 16th amendment permitting the personal income tax, it continued. See Roy G. and Gladys Blakey, *The Federal Income Tax, 1940*.

independent of the means of financing. High levels of debt may of course increase the risk of bankruptcy, with attendant costs, and this possibility can be a counter to the tax advantage of debt. We will come back to this.

Fourth, we have had a shift from the partnership form to the corporate form in investment banking. As partners the investment bankers were fully liable for all debts of the firm and this was thought to be a great advantage in raising money and in maintaining relationships with clients. So strong was the bias toward the partnership that prior to 1970 the New York Stock Exchange prohibited the listing of securities of investment banks that assumed the corporate form. The lifting of this ban in 1970 led to a number of investment banks going public and this accelerated over the next twenty years.[9] Another factor was a dramatic change in the brokerage aspect of investment banking. The brokerage business, with a fixed commission structure, had been highly profitable, but the firms were finding themselves under increasing pressure to find ways of giving back some of the profits to large clients. Then on May Day, 1975, the fixed-commission structure was declared illegal, the brokerage business became highly competitive and a huge profit center was gone.[10] The new profit center for investment banks became trading, and it appears that in trading the partners were less willing to risk their entire personal fortunes. There are no doubt additional reasons for the shift to the corporate form. The important point here is that it happened. The shift was made virtually complete with incorporation by Goldman Sachs in 1999, and then finally, Lazard Freres in 2005.

Fifth, government backing of the lenders makes it possible to incur debt at much lower interest rates. This begins with FDIC as established in the Banking Act of1933 and takes a huge leap forward in 1980 with the expansion of FDIC insurance from $40,000 to $100,000. Then we move to the rescue of Continental Bank of Illinois, in which government made good on all the debts of the bank. This was in 1984 and this was big. Then we did the same for a massive hedge fund, Long Term Capital Management in 1998. Then we did it for Fannie Mae and Freddie Mac, first as an implicit guarantee and then explicitly in 2008. Finally, with AIG, drowning as it was in derivative obligations on which it could not possibly make good, we decided in 2008 to make all the counter-parties whole. Granted, we let Lehman Brothers fail, but we have quite a history of bailing out firms judged “too big to fail.”

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[9] For a time line on investment banks assuming the corporate form, see Alan D. Morrison and William J. Wilhelm, Jr., “The Demise of Investment-Banking Partnerships: Theory and Evidence, working paper, May 2004.

[10] On May 1, 1975, the U.S. Securities and Exchange Commission ordered that the fixed-commission structure imposed on brokers by the New York Stock Exchange be disbanded. Henceforth, commissions would be set by a competitive process. This gave rise to the discount brokerage firms and a dramatic reduction in the fees charged for buying or selling stocks.

Sixth, we have the failure of the quants, the mathematical geniuses who were supposed to quantify all the risks and design contracts so as to be sure the risks were contained. They made two huge errors: In looking at probability distributions, they failed to adequately allow for kurtosis, or the elongated tails, or the possibility of losses some five or six or even ten standard deviations out. I would suspect that most of us remember mean and standard deviation from our statistics course, and even have a rough idea of how unlikely it is to be three standard deviations out with a normal curve, but how many of us remember "kurtosis," if it was even mentioned in the text? Most of the quants did not. And it turns out that financial instruments do have elongated tails, with a greater risk of substantial loss than with a normal curve. The second failure was in not appreciating that low correlations based on observations over the past 60 years all go close to one in the event of a complete collapse. The models of the quants were not designed to cope with massive failure. Why did this happen? Why did two Nobel Prize winners in Long Term Capital Management get it so wrong? In forming probability distributions, we look to data on circumstances that seem to be comparable, and in looking for comparable circumstances we tend to put more weight on recent observations. We hadn't had a crash in 60 years.

Seventh, we forgot, those of us who should have known, that financial markets are inherently unstable--that following a period of good times we inevitably start to overestimate returns and underestimate risk. And in really good times we get caught up in such irrational exuberance that the collapse becomes inevitable. My professor in graduate school, Hyman Minsky, wrote about this with both passion and clarity over a forty-year period until his death in 1996,[11] as did Robert Shiller in 2000.[12] And there were others. But no warning by these prophets could deter the frenzied wave that swept through government, the public, and the financial intermediaries as we got more and more distant from 1929.

These are seven factors and there are others. The list is a long one. But let me illustrate these with some examples:

Suppose I gain control of a financial corporation with $10 million of assets, $1 million of equity and $9 million of borrowed money. This would be considered an adequate capital ratio for a financial firm--10% equity and 90% debt. I myself have a one percent stake with $10,000 invested, which is not a large share of my personal wealth. The remaining 99% of the shares are widely held, with no single shareholder risking a large share of his/her wealth. The lenders are promised 10% interest, which seemed reasonable to them when they put up the money. Now I take the 10 million to a casino and bet it all on one play of red or black.

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[11] Minsky, Hyman. *Stabilizing an Unstable Economy*, 1986.

[12] Shiller, Robert. Irrational Exuberance, 2000.

I bet on red and if red comes up I have a net gain of 10 million, or 9.1 million after interest. (See Figure 1 below.) This means I could repay the lenders completely, including interest, set aside my own initial 1 million, and still have 9.1 million left. I take out 4.1 million as a bonus, because I was the one smart enough to place the bet, and I pay a corporate tax of 2 million on the remaining 5 (40%). This leaves 3 million for the shareholders, if red comes up. If black or neutral come up I lose it all, as do the lenders. The probability of red is 18 out of 38 on a two-zero wheel, so the expected net return to shareholders is .9 mill.

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**Figure 1. Red or Black on a Bet of 10, with 1 from the owners and 9 from lenders**

| | Outcome | EBIBT | - Int. | - Bonus | - Taxes | = Profit | x Prob. | | |
|---|---|---|---|---|---|---|---|---|---|
| 18/38 | Red | +10 | -.9 | -4.1 | - 2 | = 3 | x 18/38 | = | +1.42 |
| 2/38 | Neutral | -1 | -0 | -0 | -0 | = -1 | x 2/38 | = | -0.05 |
| 18/38 | Black | -1 | 0 | - 0 | -0 | = -1 | x 18/38 | = | -0.47 |
| | | | | | | Expected Gain to the Player | | = | +0.90 |
| | | | | | | Standard Deviation | | = | 2.0 |

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This is an expected return of 90% and is highly attractive to any shareholder who is not risking a large share of his/her personal wealth. It is a lottery ticket loaded in the shareholders' favor. My own position is even better as a shareholder and a potential bonus recipient. I could perhaps take an even larger bonus and still keep the shareholders happy.

The lenders have an expected loss of 4.3 (we weight the +.9 of interest by a probability of 18/38 and the -9 if we lose by a probability of 20/38), or a bit less if they have other income against which to offset the losses for tax purposes. They are not too happy.

Now it might be argued that lenders would not put up the money for such a venture. But with exotic derivative instruments they may not know the nature of the risks they are taking. And with a change in control of the firm, the risk to lenders may have changed without notice. Of if I have been running an ordinary bank that starts to lose, this might be the only hope I see to turn things around. The lenders might not know I am taking the money to the casino. If we hit red all they know is that we won and they got their 10%. They will likely leave the $10 million with us and let us play again. (Think Bernard

Madoff but without any violation of the law.) So we continue to play until we lose and then we walk away.

Now make everything billions, or even trillions, instead of millions. Now the firm will be "too big to fail" and government will bail out the lenders in the event of failure. Now the lenders will be happy to put up the money, and government will be at risk for most of the losses.

And then in might be argued that no casino would take a bet that would threaten to "break the bank." But the casino would take the bet on red if someone else were betting on black at the same time. And that someone else might be another firm with a similar motivation. Two firms, both of which are "too big to fail" have every incentive to take on huge amounts of debt and to place it all on such a bet. For a fee I might even arrange for another firm to bet on black at the same time I am betting on red. We would both be holding a winning hand.

Finally, it might be argued that the example is irrelevant since no large financial institutions have been taking the money to the casino, and no regulators would let them do so. But financial derivatives are very much like "red and black." Many of them are very close to zero-sum games in which parties make a wager on currency, interest rates, or almost anything else. They differ from red and black in that they almost all have a legitimate hedging purpose, through which one can reduce risk, but they are nearly all open to massive speculation in which the betters can take on risk. And it was not unusual in the past few years for the exposure by speculators to be far greater than the protection to hedgers.

Throughout early 2010 financial firms were betting huge sums on a very simple proposition--whether Germany would bail out Greece--and this is not all that unlike a bet on red or black.

All of this is made a bit more likely with the limited liability corporation, separation of ownership from control, and the shift from partnership to the corporate form by investment bankers.[13]

Now let's look at how the corporate income tax, with tax deductibility of interest, further encourages leverage. Let' look at this in terms of a firm taking ordinary business risks (no casino bets) but with some chance of failure. (The reader who does not care for probability distributions or does not wish to work through the numbers can skip quickly through the next four pages.)

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[13] We have always had entrepreneurs who have been willing to risk their entire personal fortunes in pursuit of a dream, but it is my impression that his has been less common in banking and finance than in manufacturing or the non-financial service sector. I hope to make this a subject of future research. At any rate, we would expect such risk-taking to be less likely if the decision-makers had their own and their family's entire personal wealth at stake.

Consider first **Firm A**, an all equity firm. (See Fig. 2 below.) The firm starts with $100 and at the end of the year could lose it all or could more than double its money. Suppose we visualize this as a normal distribution with a mean of +20 and a standard deviation of 30. We could lose it all, but that would be -100% and that is four standard deviations down, with a probability of less than one in a million. (Of course if the distribution has elongated tails, the chances are higher than that.)

Consider now **Firm B**, financed half through debt of $50 and half through equity of $50. Assume initially that we have no corporate income tax and no impact of bankruptcy on these pre-interest earnings, or on EBIT.[14] On the debt we promise 10% interest. So the debt holders are promised $55 at the end of the year, provided the firm has $55 to give them. If the firm is insolvent at the end of the year (below -45 EBIT in the diagram and thus not enough to fully pay the lenders) then the debt holders get whatever there is. Thus far we have no taxes.

The debt holders have a very high chance of being paid in full (.985) but some chance of a loss, perhaps even a loss of 100%, but bear in mind this was four standard deviations down. They have an expected return of about +4.8 on 50 loaned, or 9.6%, with a maximum of 10% and some very slight possibility of losing it all, or -100%.

The owners, who get what is left, have some small chance of losing it all (.015) but also have a higher expected return and a pretty good chance of a much higher rate of return. They have a median return of 15 but because the distribution is now skewed slightly to the right they have an expected return of 15.2 (what the bondholders don't get), or 30.4% on their $50 invested. So is this more attractive to investors or less attractive?

There is a famous theorem from Modigliani and Miller[15] that says that A and B are equally attractive to investors in a tax-free world. Anyone who holds 20% of A and likes it could get the same thing by going to B and buying 10% of the debt and 10% of the equity. He or she would get a proportionate share of the payments to bondholders and stockholders and get the same thing as before. So B must be just as good. Or consider someone who happens to own A but prefers the leverage associated with B. The owner of A could put that leverage in by borrowing on his own account. So A must be just as good. Investors would be indifferent as to how the package is taken apart, since it can be easily put back together, or separated as the case may be, by the individual

[14] Earnings before Interest and Taxes.

[15] Modigliani, F. and M. H. Miller (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment." American Economic Review.

investor. So there is no advantage to leverage but no disadvantage either in a tax-free world.

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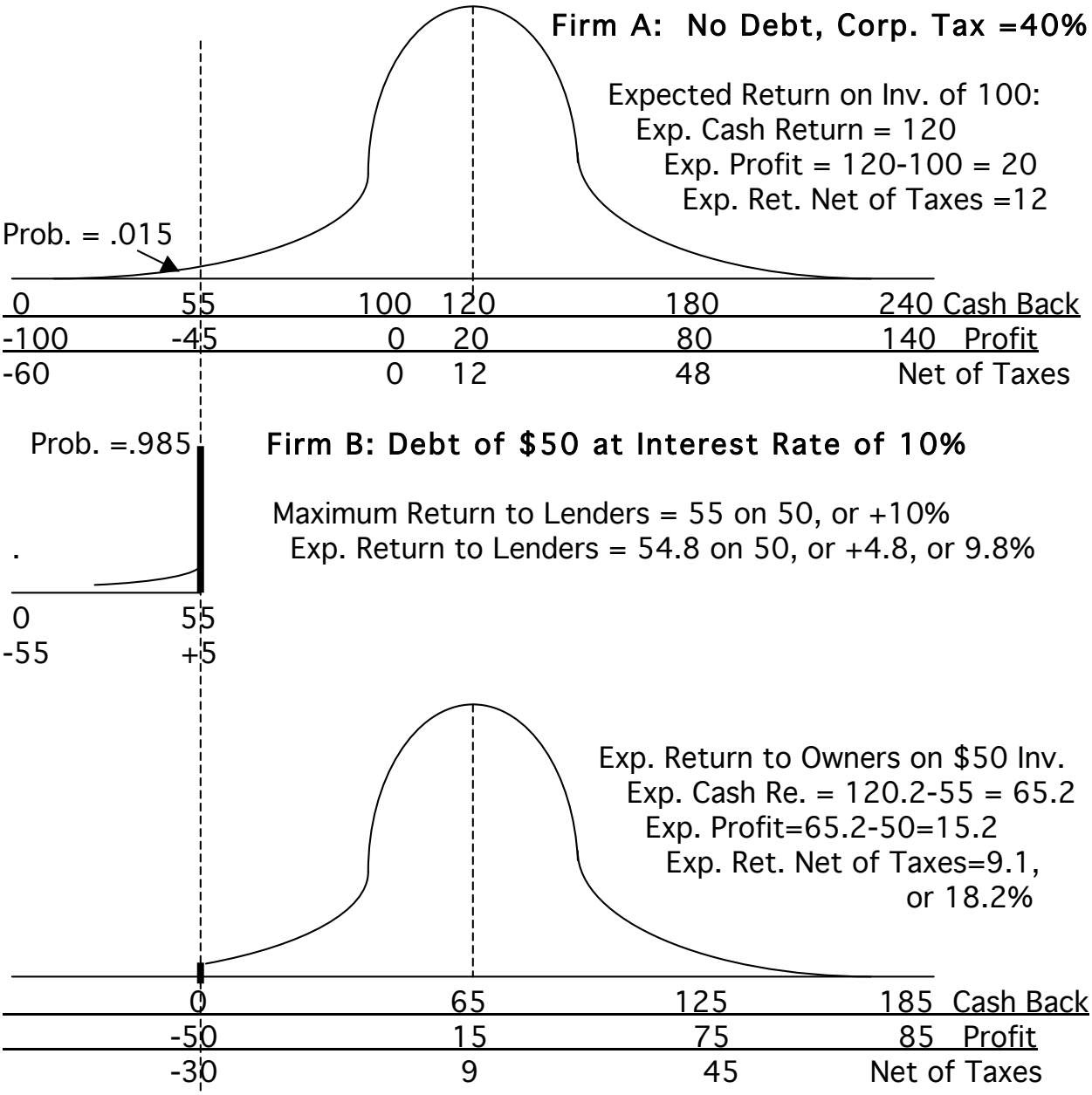
**Figure 2. A More Usual Corporate Experience**




Expected Return to All investors, to Lenders and Owners

Firm A: 20 Before Taxes, 12 After Taxes (all to the Owners)
Firm B: 20 Before Taxes (4.8 to Lenders plus 15.2 to Owners),
13.9 After Taxes (4.8 to Lenders plus 9.1 to Owners

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But now suppose the possibility of bankruptcy imposes additional costs on firm B and thus reduces possible earnings across the distribution. What might these costs be? If there is a substantial chance of bankruptcy, then suppliers won't sell to you unless you pay in advance. Key employees will demand higher salaries as compensation for the greater chance of losing their jobs. Customers would be aware that you might not be able to deliver on warranties or follow-up service. These are real costs and they bring the total returns to investors in B down below those of A. Thus with full information and rational expectations there is a check on leverage as soon as the possibility of bankruptcy becomes real. Bear in mind that just the chance of bankruptcy, not the actual event, imposes these costs. Firm B, if levered to the point of bankruptcy risk, is now less desirable than firm A. Lenders would not lend beyond this point of bankruptcy risk except at very high interest rates, and owners would not see it as rational to push risk to that point.

Now introduce the corporate income tax. In the example assume a tax rate of 40% (35% at the Federal level and 5% at the state level.) First take a look at Firm A. Earnings are taxed at 40% but any losses stay intact. The right side of the distribution crowds toward the middle and it turns out that the expected return goes down a good deal more than 40%. The median would be 12 (a drop of 40%) but the mean in this case would be about 10.8.

If the possible losses could be offset against other income, as they could if Firm A were a division of a large and profitable firm, then all returns would be reduced by 40% and the investment would still be moderately attractive, with an expected return of 12%. Whether the investment is attractive depends at least in part upon whether losses can be offset against other income, or perhaps tax-loss carry-forwards can be easily sold to another firm. This in itself provides a competitive advantage to the large, well-diversified firm over the small start-up firm.

That is a big distortion of the corporate income tax in and of itself. But for now I want to focus on leverage. In doing so assume that losses can be offset against gains elsewhere so that gains and losses to equity are all reduced by 40%. We see that with the leveraged firm interest is a tax-deductible expense. The government now gets 40% of the earnings after interest, so investors (owners and lenders together) get higher returns by an amount equal to 40% of this tax-deductible interest. On $50 of debt at 10%, this is a reduction in taxes of $2. What does this do to the return to investors?

In firm A the median outcome of $20 would go as $8 to government and $12 to shareholders. In firm B, with debt of $50, and interest as a tax-deductible expense, the median return of $20 goes as $5 to bondholders and $15 to shareholders, pre-tax, and $9 to shareholders after tax (at a tax rate of 40%). The combined return on debt and equity is higher by $2 ($14 vs. $12),

or by 40% of the tax-exempt interest. In terms of expected returns, we now have $4.8 to bondholders, $6.1 to government, and $9.5 to shareholders. The combined return to investors is higher by $1.9. Firm B is now more attractive, absent any serious threat of bankruptcy. Moreover this gain to investors, at the expense of the treasury, is even greater with more debt, even with a very high interest rate to compensate lenders for the risk.

Consider **Firm C**, with debt of 96 and promised interest of 24, or 25%. (See Figure 3 below.) If all goes well the bondholders get back 120 on their investment of 96 and the stockholders get what is left on their investment of 4. The debt of course is now pretty risky. Its distribution is highly skewed to the left and investors don't like negative skewness, other things being equal.[16] It has an expected return of 108 on an investment of 96, or plus 12. This is 12.5% on the 96 invested. The shareholders have an expected return of 12 on an investment of 4, or +8, before tax and +4.8 after tax. Government has an expected return of 3.2. The combined return to bondholders and stockholders, after-tax, is now 16.8 (12 to bondholders and 4.8 to stockholders) and is now quite attractive.

But now of course there is a substantial threat of bankruptcy--the firm would now be bankrupt if the EBIT return were below the median, and the chances of that happening are 50%. Suppose those costs of bankruptcy are as high as 12, meaning that all possible values of EBIT are reduced by 12 and the expected return is reduced by 12. Then the expected return to owners is zero. Given rational expectations and even reasonable projected costs of bankruptcy, high leverage is just not attractive, even with tax deductibility of interest. Thus there will be a market check, assuming full information and rational expectations, that will keep firms from levering so high as risk a substantial chance of bankruptcy.

Now suppose that government agrees to make good on any losses to lenders, as with "too big to fail." The firm now will be able to borrow large amounts of money at very low interest rates, provided it attains the status of too big to fail. It will have every incentive to get sufficiently large and interconnected with others so as to become "too big to fail." Such a firm would have a huge competitive advantage over firms not deemed too big to fail. It would be able to raise more money from lenders and at a much lower interest rate than would firms not deemed too big to fail. Let's explore how this would

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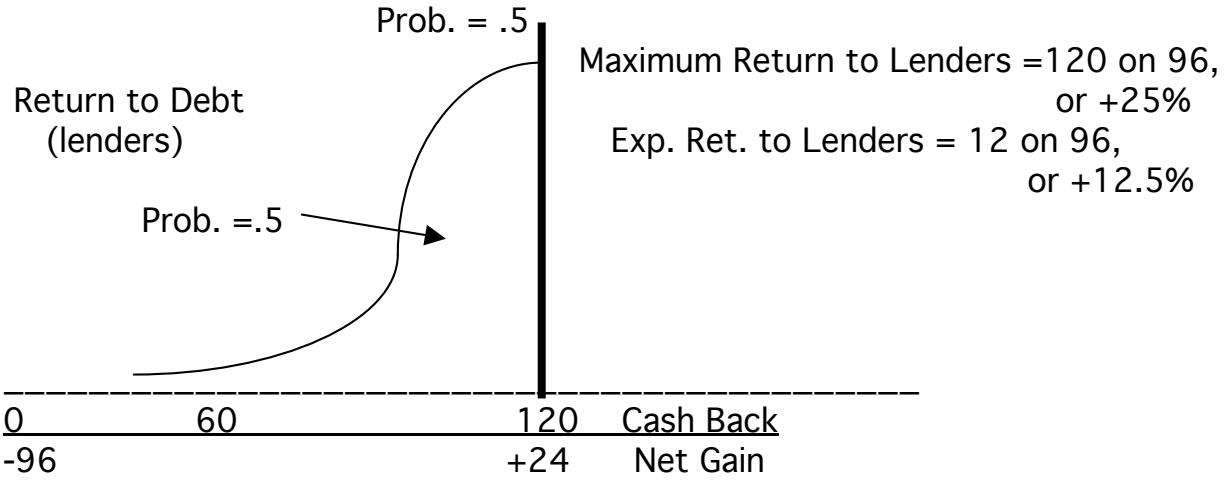
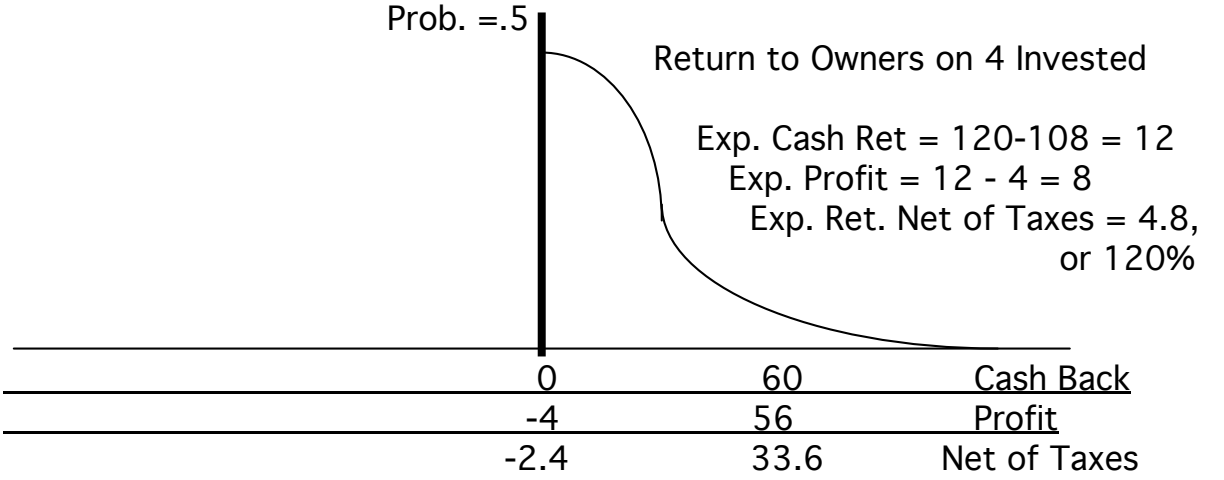
[16] The evidence for this is that nearly all of us routinely will pay an insurance premium to avoid the possibility of a large loss. There is further evidence from research by W. Braddock Hickman showing that high-risk bonds were priced so as to yield premiums that seemed to be more than justified by their standard deviations. Such bonds have limited gains and the possibility of a very large loss. (Hickman, *Corporate Bonds: Quality and Investment Performance*, NBER Occasional Paper 59, 1857.) This premium was only lessened substantially when Michael Milken showed that putting them together in portfolios made the returns nearly normally distributed.

**Figure 3. Firm C: Debt of 96 at interest Rate of 25%, Equity of 4**




Expected Return to All investors, to Lenders and Owners

Firm A: 20 Before Taxes, 12 After Taxes (all to the Owners)
Firm C: 20 Before Taxes (12 to Lenders plus 8 to Owners),
16.8 After Taxes (12 to Lenders plus 4.8 to Owners)

After-Tax Returns per Dollar Invested

Firm A: 12% (12 on investment of 100)
Firm C: 16.8% (16.8 on investment of 100)
12.5% to Lenders (12 on investment of 96)
120% to Owners (4.8 on investment of 4)

work. Lenders might now be willing to put up 96 with a promised return of 102, or a return of 6.25%. The expected return on the debt, absent a bailout,

would be 96.9 on an investment of 96, or plus just 0.9%. That to equity would be the remaining 23.1 on an investment of 4, or plus 19.1 pre-tax, or 11.46 after tax. This of course would be very appealing to stockholders. Given the bailout protection, the return to investors would be the certain return of 6 to the lenders and the expected return of 19.1 to the owners, or a total of 25.1 prior to the corporate income tax, or 19.64 after tax. It is appealing to the lenders and to the owners and to anyone who has an equal share of both. It is far superior to Firm A, which has no debt, and to Firm C above, which had not attained the stature of too big to fail.

And what about government? Now government has an expected gain from the owners of 7.64 and an expected loss on the debt of 5.1 (the 102 promised the bondholders less an expected return on the debt of 96.9), or a net expected gain of 2.54.

This may seem like a win-win situation. Bondholders get fully paid, shareholders get very handsome returns, and government has a positive expected return even as it has a policy in place to prevent financial collapse.

The problem is that the potential returns to owners are too good. Managers of the firm will be able to take out more as a bonus, and this is a tax-deductible expense, while still leaving adequate returns to shareholders. This reduces the take to government. And managers, with shareholders' support, will be induced to take on greater risks, both by increasing leverage even further and by undertaking more risky investments. With even simple derivatives, this is easy, and it is in the interest of shareholders. And if some of them are competing against each other, they will bid up asset prices until returns come down. They will come down to the point where firms whose lenders are not protected will not be able to compete.

If "too big to fail" means that lenders are protected but not the stockholders, as it did with Fannie Mae, Freddie Mac, and AIG, then it might be argued that no rational investor would risk all he/she has on such a venture. And indeed this kind of trading would not be so likely to occur with investment bankers as partnerships, for then the people in charge would be risking everything they own. But with a limited liability corporation, with many stockholders, the shareholders with a small stake are risking only a small part of their wealth. The shareholders have a lottery ticket with a huge expected gain. Who would not like that?

None of these horror-story scenarios would come to place with rational expectations and without the public-policy distortions of the limited liability corporation, the corporate income tax and the policy of "too big to fail." The costs of possible bankruptcy, combined with the high interest rate on risky debt, would prevent firms from taking on excessive risk.

So let's get rid of the distortions and all will be well? Not quite. Bear in mind that I said, "with rational expectations." Do we always have rational expectations? Or do people get carried away in a boom in waves of irrational exuberance? If we have had a long period of good times, just by chance, do people begin to overestimate returns and underestimate risk? Do they operate on the basis of subjective probability distributions in which they put more weight on recent experience, all of which has been favorable?

If they do, and if the irrational exuberance pervades the entire society, then the market check from the chance of bankruptcy is substantially lessened. The potential gains from leverage are seen as much greater, at least with tax deductibility of interest, and the possibility of bankruptcy seems remote. Firms take on more debt and they place more risky bets. If estimates of returns have been biased upward and those of risk biased downward, then at some point reality will hit and failures will ensue.

My old Professor from 50 years ago, Hy Minsky, said that is exactly what will happen. And bearing in mind that we had financial crises well before "too big to fail," this may be what happened. Minsky said this is in our human nature, that when all has been going well we begin to believe we are "on a roll" and nothing can go wrong. The only real check on this is our collective memory of financial panics in the past, and this check is only effective if we have a vivid personal memory of the distress that followed. Reading about it or learning about it in class is just not the same. He said it is like a smallpox epidemic. We have one and many people are wiped out. The survivors are immune, but then a generation passes and the immunity is gone. Then it will break out again.

People who survive a financial panic are immune to taking on too much debt. But then a generation passes, or perhaps two generations, for the collective memory to be gone, and it will happen all over again. As time passes since the last one, and fewer and fewer people are immune, the chances increase that it will break out again.

It doesn't matter what regulations we put in place. In the good times we will relax them, believing we don't need them. For those controls that remain, financial innovators will find ways to get around them.

So what do we do? I don't know, but I would have preferred we not push through new legislation without a bit more time to think it through. Where would I lean, at this point?

I would say, first get rid of the distortions. Eliminate the corporate income tax and make it up with higher taxes elsewhere, perhaps on dividends and capital gains so as not to provide a windfall to recipients of investment income. Or we could seek taxes elsewhere, in whatever form is deemed least distorting and least offensive. We could get rid of the distortion.

Now I know that we are not going to do this directly. So we would have to do it indirectly. We could make dividends tax deductible at the corporate level and fully taxable at the personal level. We could permit the immediate expensing of all investment in new plant and equipment. Thus firms could avoid the corporate tax for so long as they put all their retained earnings into either research, which is already immediately expensed, or new plant and equipment. And with any earnings for which did not have good investment opportunities, they could pay dividends and thereby still escape the tax.

Second, I would force investment bankers to return to the partnership form, or at least for the decision makers to have much more of their personal wealth at stake. Investment banks thrived for years as partnerships. Many of the large ones survived one financial collapse after another and they did so without government bailouts. Making the key decision-makers, or the people they report to, responsible for losses is in my judgment the best insurance against the risk of systemic failure. And how would I do this? It wouldn't be smart simply to tell them they have to go back to being partnerships. I would institute incentives under which the C.E.O is paid primarily in stock that cannot be sold for three years and then only with thirty days public notice.[17] To give the C.E.O. cash to live on in the meantime, I would let the firm lend the C.E.O. an amount equivalent to the value of the shares, but with a promissory note fully secured by the C.E.O.'s personal wealth.

This may not be so far-fetched as it might seem. If the lenders to the firm were fully at risk, they would insist on something like this as a condition of making the loans. The markets would find a way to ensure that borrowers have more skin in the game.

Third, I would stop "too big to fail" dead in its tracks. We should place a high priority on a plan for orderly dissolution of large enterprises that have become insolvent. Here I would point out that it is necessary not only to let huge banks fail, but to let their lenders fail as well. Letting the equity holders fail but not the lenders, as we did with AIG, is not sufficient. We would still be encouraging "red or black" type lottery wagers. We need for the lenders to impose market discipline on the risk-taking of large firms.

To do this credibly, we may well have to permit some big failures. It is not clear that even legislation that prohibits bailouts would be credible. The question is what we would do when we are on the brink of a financial collapse. Would we give in and make good on promises to all the counter-parties, as we did with AIG, or would we let them all take a serious haircut if such a haircut would threaten the entire system?

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[17] The time restriction of three years is a bit arbitrary—the important point is to make sure the key decision makers not only reap the gains but also realize the losses due to decisions they make.

So what would I have us do, if we got rid of the public policy distortions but we still found that a wave of irrational exuberance brought us to the brink of collapse?

We could first do what central banks were originally designed to do--provide massive liquidity to all solvent banks but let the insolvent ones fail. Solvency of course depends on the value of the assets and asset values can fall in hurry if everyone is selling at once. The entire system could be insolvent in a hurry. So the central bank would need to do more. It might need to buy distressed assets, perhaps at a maximum of 80 to 90% of what we might call "holding-to-term value," or the discounted cash flow of what they might be expected to eventually yield, absent a huge depression. The banks that held the worst of the sub-primes would still lose, for their assets would have little value even if held to term. The ones that had taken less risk would come out intact and would be stronger as they assume the market share of the failed institutions. That is what market discipline is all about.

Another option would be to pick out a few firms and a few lenders, and let them fail, hopefully those that have taken on the most egregious risks. The survivors would be given support as needed to ensure that banking services are provided. This would be a bit like the solution for a dictator who has a completely corrupt civil service and wants to clean it up. You know you cannot shoot them all, for then you would have no one to do the work. And if you did threaten to shoot them all they would rise up against you. So you pick out a few of the most corrupt and you shoot them, with the understanding that all the others will have amnesty provided they clean up their acts. It just might work.

One more option would be to endure the collapse and hope that it will eventually pass. We did this for years and suffered from the panics and depressions that followed. But over the long term we had enormous economic growth and we had pretty good market discipline. And if the collapses were more frequent perhaps they would be less severe. The collective memory of the last one would be a continuing check on the excesses of the boom.

It could well be that we would be better off today had we let Continental Bank fail, or barring that had at least let Long Term Capital Management fail. We don't know the answer to that question but it is one worth asking.

Let's assume we don't want government to risk a systemic failure. But then if we provide complete insurance to lenders, we will need to place controls both on the amount of leverage that firms can take on and on the kind of investments they are allowed to make. Then we face the question of what the limits should be. Ideally we should permit leverage up to the point where losses

to government become a meaningful threat. But this can't possibly be the same limit for all firms, and the problems of applying a different ratio across firms becomes a regulatory nightmare.

Wouldn't it be far better to stop socializing the losses and then to also drop the corporate income tax, and thus let the market prevent excessive leverage? Wouldn't it be far better to design a system in which the key players are responsible for the damage they do to others? Bear in mind this includes both the lenders who lend "other peoples money" and the owners that play with "other peoples money."

So what are we left with? Can we say that markets are good, not perfect but more good than bad and thus good? Financial markets may in fact be inherently unstable, and if so we can expect the pain of collapse from time to time. I would argue that the pain would be less if we allowed market discipline to work, because the excesses of asset bubbles would be less extreme. And even with their inherent instability, financial markets are essential to bringing together those with ideas and those with money, so that creativity can flourish. Financial markets, for all their failures, have been enormously important to economic growth. And over the past two hundred years, for all our failures, we have had enormous growth. On that basis, I would still say markets are good. We just need to get the incentives right.