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Teacher Retirement Ponzi Schemes

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ABSTRACT

This paper is about the funding status of teachers' retirement pension schemes. Its goal is to relate the accounting for the funding of these pension obligations to the endemic, systematic, and fundamentally fraudulent system of accounting our country uses to assess the financial positions of federal, state, and local government as well as many financial and non-financial private enterprises. Indeed, the paper argues that fraudulent accounting and misrepresentation is the defining element of Ponzi schemes and the real reason we find such schemes repugnant. Furthermore, any public or private enterprise that engages in fundamentally fraudulent accounting can fairly be characterized as running a Ponzi scheme. In this regard, it seems fully appropriate to characterize many, if not most, teachers' retirement plans as Ponzi schemes.

Introduction

This paper is about the funding status of teachers' retirement pension schemes. My goal is to relate the accounting for the funding of these pension obligations to the endemic, systematic, and fundamentally fraudulent system of accounting our country uses to assess the financial positions of federal, state, and local government as well as many financial and non-financial private enterprises.

Indeed, I will argue that fraudulent accounting and misrepresentation is the defining element of Ponzi schemes and the real reason we find such schemes repugnant. Furthermore, any public or private enterprise that engages in fundamentally fraudulent accounting can fairly be characterized as running a Ponzi scheme. In this regard, it seems fully appropriate to characterize many, if not most, teachers' retirement plans as Ponzi schemes.

To set the stage for my discussion, I'll briefly consider the recent breakdown in trust in our economy that has been engendered by the realization that Wall Street has spent the last five years conning the public and ultimately itself about the true value of trillions of dollars of assets and insurance contracts. In so doing, Wall Street has followed the examples set by federal, state, and local government in amassing enormous undisclosed liabilities whose repayment is hard to imagine.

My second task will be to examine the definition of a Ponzi scheme, using the Madoff swindle as the template. In this regard, I'll point out that the two noticeable characteristics of Madoff's operation – using new money to pay off old and devising one's own asset valuations independent of market valuations – are routine in the investment world and the world of government finance, including the financing of teachers' retirement pensions.

Task three is pointing out that economics per se passes no moral judgment on running chain letters. Indeed, it endorses chain letters as the socially optimal policy under certain extreme economic circumstances. But these circumstances are far from satisfied in our economy.

What economics certainly doesn't do is endorse lying – saying you are doing X, but actually doing Y. This, I'll point out, has become standard operating procedure of many U.S. banks, quasi-banks, and non-financial corporations. Indeed, it underlies federal fiscal accounting and, to a lesser degree, state and local fiscal policy, including retirement pension policy.

With this background, I will turn to what is known and, more importantly, what is not known about the true funding of teacher retirement pension plans. I'll suggest that if these plans and the governments that explicitly or implicitly back them are in as bad a shape as appears to be the case, then the plans are likely to renege on their commitments to current young and middle age teachers in precisely the same manner that corporate America has been reneging on its obligations to its workers. The reneging falls under the heading "freezing" pension plans. The freezing entails eliminating active plan participants' future pension benefit accrual. Given the back-loaded nature of pension benefit formulas (the fact that accrual rises dramatically with years of service), employers that freeze their pensions are quite simply

swindling their workers out of the old-age carrot they held out to their workers as an inducement for harder work when young.[1]

I'll conclude by discussing the need for honest, intertemporal budgeting in state and local government and the need to, in fact, shut down/freeze teachers pensions for new teachers and pay them what they earn when they earn it. The alternative -- continuing to run Ponzi schemes whose ultimate debacle is only a matter of time, will continue to leave both teachers and taxpayers at great risk.

Trust Busters

Capitalist societies operate largely on trust. We buy stock trusting companies will stick to their business plans. We buy bonds expecting repayment. We work for employers assuming we'll be paid at the end of the month. And we accept pensions and other deferred compensation relying on the receipt of these monies years in the future.

America now faces a crisis not just of confidence, but of trust. We have no confidence that banks know what they are doing, that non-financial businesses know what they are doing, or that governments know what they are doing. And we have no trust that any of these entities is honest.

We've seen huge financial enterprises evaporate almost overnight because no one, including the people running them, understood their assets and liabilities or felt any need to do so. We've seen insurance companies, commercial banks, investment banks, and hedge funds generate a $50 trillion market in credit default swaps – a fancy word for insurance contracts – with precious little documentation, no prudential regulation, and limited provision for reserves. We've seen insider rating by S&P, Moody's, and other venerable rating companies; we've seen the development by America's leading banks of off-the-book, structured investment vehicles, reminiscent of Enron; and we've seen one major financial company after another forced to repay investors or pay huge fines for misleading the public. We've also seen critical valuations made by models, rather than markets, which is to say, we've seen critical valuations be made up. And, to top it off, we've seen the Madoff scandal.

Incompetence is one thing. Irresponsibility is one thing. But outright theft, best described as – *Take the cash flow and* run. – is something else. The Madoff scheme entails pure theft. But much of what has happened in our economy in recent months and years is little different. When major mortgage companies initiate "liar mortgages" and sell them as fully documented, this is pure theft. When top managers parachute from their failing businesses with pockets full of gold, this is pure theft. When major banks take government bailouts and use the funds to pay outlandish bonuses, this is pure theft. When corporate assets of declining automakers or nationalized insurance companies are spent on private jets and spa vacations, this is pure theft. When companies freeze their pension plans just as their older workers are about to accrue significant pension benefits, this is pure theft. And when

[1] See Kotlikoff, Laurence, "The Great Pension Swindle," *The Boston Globe*, October 22, 2006, posted at http://people.bu.edu/kotlikoff.

municipalities and states make promises to teachers, firemen, police, and other civil servants that they know full well they won't be able to keep, this too is theft.

Now we know that the vast majority Americans are honest, hard-working, law-abiding people, who are horrified by these transgressions. But the problem has become not knowing whom to trust. Restoring trust is going to be a long and difficult road, on which the government must take the lead. But government, state and local as well as federal, has a long history of misusing public trust, particularly when it comes to accounting for its long-term fiscal liabilities. Indeed, the failure of government to disclose its long-term fiscal problems has provided the private sector with an abject lesson in deceit and non-disclosure.

Defining a Ponzi Scheme – The Madoff Example

The fact that Bernard Madoff described his enterprise as a "Ponzi scheme" is, not, in of itself evidence that it was a chain letter. Indeed, Madoff is the last one anyone should trust about anything.

So let's play devil's advocate and ask what it was the Madoff did that constitutes a Ponzi scheme and whether what he did is different from what other supposedly honest entities, including Citigroup, General Electric, Uncle Sam, and teachers' pension funds, are doing on a routine basis.

Let's start with the fact that Madoff used new investor money (new contributions) to pay off old investors (cover withdrawals). This fact, per se, is not evidence of anything untoward. Every mutual fund in the country, and there are some 10,000 of them, do precisely this. The same holds true for all of our nation's pension plans, private and public (i.e., Social Security). They all use contributions to cover withdrawals. This practice is simply described as "managing cash flow."

Next consider Madoff's failure to mark his participants' holdings to market? Does this constitute evidence, per se, of a Ponzi scheme? Again, the answer is no. Essentially all financial institutions, non-financial corporations, and governments hold and value assets, many, if not all of which, they fail to mark to market because there is either a) no market in these assets or b) the market in these assets is viewed as too thin to be reliable. As I write, Citigroup, Bank of America, and other large and small banks throughout the country are sitting on trillions in "toxic" assets, which they are not valuing at market. These "toxic assets" include plain vanilla mortgages that are in arrears, exotic mortgage-backed securities that have unique properties, credit default swaps, etc., not to mention real estate holdings (including millions of foreclosed homes) for which there are no thick markets. These banks are making up the valuations of these assets based on their own, arbitrary assessments. Every major company in the country is doing much the same thing when it reports its earnings, which includes its own assessment of capital gains and losses on its often highly illiquid assets and liabilities. Even mutual funds are in this boat. TIAA-CREF has two funds that are routinely valued on a non-marked-to-market basis. These are the TIAA fund, itself, the return on which appears to be based on a hidden formula that pools risks across cohorts, and the CREF Real Estate Fund, which is valued, in large part, based on appraisals.

Social Security as well as state and local pension plans, including teachers' retirement plans, are also playing this game. In devising their annual assessments of their financial conditions, these systems/plans are valuing both their assets and liabilities using procedures that have little connection to market valuation. For example, Social Security's Trustees specify a path of nominal interest rates as well as inflation rates, which are used to discount protected future benefits and tax payments to form what Social Security calls its open and close group liabilities. This procedure makes no attempt to discount for the riskiness of these inflows and outflows or even to connect its interest rate assumptions to the prevailing term structure of nominal and real rates.

Most teachers' pension plans use very high interest rates to discount their future net payments. And since these plans are, generally, underfunded, meaning the "measured" present value of their benefits exceeds the market value of fungible assets on hand, the use of higher than appropriate discount rate leads to statements of financial condition that are grossly misleading.

Now if everyone is soliciting contributions to cover withdrawals and if everyone is making up, to a large extent, their net asset values, what is it that Madoff did differently that makes his enterprise a Ponzi scheme?

The answer is that Madoff used a valuation scheme that was so clearly different from the market valuation of his enterprise, that it constituted prima facie evidence of fraud. To be specific, Madoff allegedly told his investors their assets were worth $50 billion, but, at the time of his arrest, he had less than $1 billion in marketable securities.

Note that Madoff could have claimed that the present value of his future trading profits would cover the remaining other $49 billion, but he made no such claim. Nor did he claim he had suffered huge trading losses over the years and had lost in the market all but $1 billion of what he felt was an appropriate collective asset valuation of $50 billion given the future excess returns he was going to provide his clients. Instead, Madoff spoke the words "Ponzi scheme." In so doing, he, not doubt, made absolutely sure he'd spend his remaining years in jail.

Economics' Take on Ponzi Schemes

For its part, economics places no moral stigma on the words "Ponzi scheme." Indeed, there is a significant economics literature concerned with the question of whether Ponzi schemes – chain letters -- are preferred investments *for everyone*. How could a Ponzi scheme work for everyone? Here's an example. Suppose the population grows at 5 percent year in and year out for sure and forever, so that each age group is 5 percent larger in size than the next oldest age group. Also assume that the economy's return to investing in real assets, on a safe basis, is only 2 percent per year.

Then if I or you or anyone else invests in the real asset, we'll earn a 2 percent annual return, whereas if we invest in the Ponzi scheme, we'll earn a 5 percent annual return. The Ponzi scheme would entail everyone at the beginning of the year taking a fixed amount, say $1,000, and giving it en mass to the

cohort that is one year older. Since the cohort that is one year older is 5 percent smaller in size, each member of that one-year older cohort gets $1,050. A year later, each person who contributed $1,000 receives $1,050 from the cohort that's one year younger. This beats getting $1,020 from investing for a year in the real asset.

Can this go on forever? Yes, provided the economy's population always grows at 5 percent. Indeed, we don't need population growth to make a Ponzi scheme work and beat regular investing. If the economy's population growth is zero, but each cohort experiences a growth of 5 percent each year in its labor productivity, we can also generate the same welfare improvement from running a Ponzi scheme.

For economists, then, the issue is not whether Ponzi schemes are morally good or bad. The issue is whether the conditions for their use are actually satisfied. Here, the evidence appears clear; the conditions are not satisfied, particularly when one takes into account that neither population nor productivity growth nor real asset returns are sure things.

Moreover, it's one thing for a government that will be around, potentially forever, to try to make a Ponzi scheme work for society over time. It's another for a private party that may find itself unable to continue running the scheme and that has no ability to compel participation even if such participation were in everyone's interest.

Had Mr. Madoff been forthcoming from the start and claimed to be running a Ponzi scheme, he would have had few takers because of concern that the scheme would end soon after one "invested."

The Real Crime in a Ponzi Scheme

The real crime with a Ponzi scheme, then, is not that chain letters per se always violate economic feasibility or notions of morality. They do neither. The real crime is that people running Ponzi schemes don't admit that they are running chain letters. Their accounting isn't honest. They don't show that the present value of what each contributor will take out exceeds the present value of what each contributor will take in, where the discounting is done at market rates of return appropriate to the risk of the return being advertised. The people running Ponzi schemes don't show this, because they can't. Chain letters that make all participants better off, while feasible in theory, aren't feasible in practice given the economy we know and record in our data.

In Madoff's case, he wasn't telling investors that the present value of their safe, above-market future returns would be covered by the contributions of new investors, and that the new investors would receive above-market returns from subsequent new investors, etc. It he had, his gig would have been up immediately. Instead, he told his investors that their streams of future withdrawals would come from safe, above-market returns that he would earn based on his proprietary investing strategy. For investors in his fund – people who knew little about finance, but were aware that there were financial wizards out there, like Peter Lynch of Fidelity and David Swenson of Yale, who had the Midas touch – what Madoff promised and reaffirmed in monthly statements seemed completely on the up and up.

Is the U.S. Banking System a Ponzi Scheme?

On February 2, 2009, the NY Times ran a front-page story detailing how a major bank (not named) was valuing a mortgage-backed security it owns.[2] The security represents a proportionate claim to the receipt of all payments of a collection of 9,000 second mortgages packaged together into a single financial instrument. The Times reported that the market price of the security was currently 38 percent of par value, but that the bank was using a valuation equal to 98 percent of its par value. The Times also indicated that Standard & Poor's valued the security at between 53 cents and 87 cents of par value. The bank justified its valuation based on the argument that the market was temporarily depressed and would come back over time and that the current market was too thin to be reliable – this despite the fact that a quarter of the 9000 loans were delinquent

This is one huge discrepancy. The bank, in effect, is telling the public that it will be receiving 2.6 (98 divided by 38) times more income from this security than the market price indicates will be the case.

The NY Times did not report this case as an exception to the rule. It reported it as the rule, suggesting that large parts of the banking industry have failed to book their losses on their mortgage-backed securities and were, consequently, grossly overstating a key component of their future profits.

How does this differ from running a Ponzi scheme, which, recall, entails engaging in false/misleading/economically heroic accounting? It doesn't. Indeed, it differs from Madoff's scheme only in degree. Madoff's overvaluation was 50 to 1, whereas this bank's overvaluation is 2.6 to 1.

Stated differently, Madoff was, at the end, telling his investors that for every dollar the market would say he could earn for his investors, he'd be able to earn $50. The bank in question was telling its investors that for every dollar the market says it can earn on these securities for its investors, the bank will earn $2.6.

Non-Disclosure

The mortgage-backed securities crisis began in June 2007 with the failure of prominent hedge funds that were heavily invested in mortgage-backed securities. It's now February 2009, and we've seen the failures/absorption/nationalizations/quasi-nationalization/bailouts of a host of major financial companies due to their direct or indirect holdings of these instruments. The list includes Fannie Mae, Freddie Mac, AIG, Bears Stearns, Lehman Brothers, Country Wide Financial, Merrill Lynch, MBIA, Citigroup, Wachovia, Wells Fargo, and Bank of America.

Each of these institutions saw their market valuations evaporate based on virtual overnight changes in beliefs by the market that assets previously worth tens of billions were worth next to nothing. The most disturbing part of these developments is that as they transpired none of these institutions offered to

[2] Bajaj, Vikas and Stephen Labaton, "Risks Are Vast in Revaluation of Bad Assets," NY Times, February 2, 2009, pages 1 and 11.

disclose publicly fully and precisely the nature of the assets they held. Full and precise disclosure means divulging every detail that the institution in question has available about its holdings short of violating the privacy of its customers.

Worse still, Uncle Sam, in taking over or effectively taking over AIG, Fannie Mae, and Freddie Mac, and other institutions, has maintained the policy of non-disclosure. In the case of AIG, for example, there is currently no way to determine the precise nature of the over $400 billion in credit default swaps it has issued. Again, these are insurance policies, which now represent contingent obligations of American taxpayers. Yet American taxpayers have no ability or right to learn precisely what they may owe and when they may owe it.

The fact that the NY Times, which has been covering the housing/mortgage/financial crisis in very close detail, took over one and a half years to actually focus in on the precise degree of pretense in the valuation of what may be trillions of dollars of financial assets and liabilities is testimony to the "don't ask cause we won't tell" culture of Wall Street and Uncle Sam. Indeed, the above-referenced NY Times article states "Most banks provide only a very general description of their holdings, because they consider the information privileged."[3]

We've also reached the point that voluntary disclosure of the details of the holdings of financial institutions would not be believed. According to the Times, "Many analysts do not trust what they are told about the quality of the securities and loans held by banks and other financial firms."

When one considers the above, it's no wonder so many financial firms vaporized so quickly. Imagine how much a bottle of Tylenol would fetch if suddenly its potential buyers were told the Tylenol pills inside might have been poisoned and that the company knows which ones are poisoned, but that the company isn't going to say which bottles are contaminated because the information is privileged.

The choice of Tylenol in this example is not, of course, accidental. Some of its pills were poisoned back in 1992, killing seven people. But the company – Johnson and Johnson – didn't leave the bottles undisclosed on the shelves. Instead, it recalled all its 31 million Tylenol bottles and replaced them with safety-sealed containers. In so doing, the company made clear to the public what it was selling. In the case of our nation's major financial institutions, the public no longer knows what they are selling when it comes to buying their stock. And the public can no longer look at past histories of reported profits for assurance, because we've learned that these past profit reports are likely to be tainted as well.

In effect Wall Street has asked us to value its firms based on trust. But there is no trust, particularly given the 800 pound gorilla looming in the background, namely the fact that no one is disclosing the precise location or nature of the $50 trillion or more in credit default swaps out there in the market. We do know that for every seller of a CDS, there was a buyer. Hence, every dollar of potential insurance payout by one institution is a dollar that would be received by another. So we know that the net liability across the institutions is zero, but any given institution, in the U.S. or abroad, may be terribly exposed depending on how events play out. AIG is in this position. It sold credit default insurance to the tune of

[3] Ibid, p. 11.

roughly $430 billion, and AIG (i.e., Uncle Sam) is now having to make good on many of these claims or post collateral to assure potential claimants that it will be able to pay up if the redemptions of the CDSs are triggered by defaults.

Uncle Sam's Ponzi Scheme

Unlike Madoff, the U.S. government hasn't been claiming to beat the market. But like Madoff, Uncle Sam hasn't provided an honest accounting of how different citizens will fare over time with respect to the present value of what they contribute and what they get back. In particular, Uncle Sam hasn't shown how its policy toward current adults will affect future generations. The reason is simple. Such generational accounting would show that future generations face lifetime net tax rates (lifetime tax payments less lifetime transfer payment received divided by lifetime labor earnings, with all variables measured as present values to age zero) that are roughly twice as high as those facing current adults.

Generational accounting is a well established methodology. It was developed in the late 1980s and has been applied to roughly 35 countries around the world. It was included in last budget of President George H. Bush and the first budget of President Clinton. But even though the analysis, which was produce by the Office of Management and Budget with the assistance of myself, Alan Auerbach (now at UC Berkeley), and Jagadeesh Gokhale (now at the Cato Institute), was tucked safely away in the appendix to the enormous federal budget, it received lots of press attention. Indeed, it received so much attention that it began to threaten the status quo practice of fiscal policy, namely taking from the young and giving to the old. Hence, when it came to including generational accounting in President Clinton's second budget, it was censored two days before publication.[4]

Fiscal Gap Accounting

If you add together the present values as of today of all the generational accounts of all current and future generations, *assuming no change in fiscal policy* (i.e., you measure the accounts assuming stable policy), you arrive at what all current and future citizens are going to pay, on net, in taxes to the government, measured as a present value. Call this amount *A*. This amount has to cover the amount *B* – the sum of the government's official debt plus the present value of the government's future purchases of goods and services (its discretionary spending).

[4] The chief censurer here was Gene Sperling, then head of the President's National Economic Council. Sperling now claims to be concerned about the nation's long-run fiscal health, but when he had to choose between politics and the next generation, he chose politics.

If you now take the difference between *B* (what the government intends to spend plus what it owes its bond holders) -- and *A* (what it will be collecting in net taxes), you arrive at a measure called the *fiscal gap*.

Note that the fiscal gap and the generational accounting analyses incorporate all of the government's fiscal activities; i.e., both are comprehensive analyses. This means that all of the government's fiscal liabilities, both implicit and explicit, are being put on the same footing in assessing the overall sustainability of current fiscal policy.

The U.S. fiscal gap is currently about $70 trillion dollars – roughly 5 times current GDP – an absolutely enormous sum.[5] Indeed, were we to try to raise $70 trillion in present value by raising the FICA payroll tax, we'd have to double the employer plus employee rate, which is now 15.3 percent, to 30.6 percent. And we'd have to do this immediately and permanently!

Back in 2002, the fiscal gap was much smaller – only $45 trillion. This figure was generated by the U.S. Treasury, which measured the fiscal gap very carefully over the course of a year's study.[6] The fiscal gap measurement project was authorized by then Treasury Secretary Paul O'Neil with the goal of including the analysis in President George W. Bush's 2003 budget. The study was completed in early December 2002, but on December 7th of that year, Secretary O'Neil was summarily fired, leaving Washington the same day. Two days later the Bush administration, which was keen on passing Medicare Part D and more tax cuts, censured the study.

The reason for detailing these acts of censorship by both Democratic and Republican administrations is to clarify that if misleading the public about a financial enterprise defines a Ponzi scheme, then Uncle Sam's fiscal policy certainly fits the bill.

Why Is the U.S. Fiscal Gap So Large?

Can the true measure of our federal red ink really be $70 trillion? This amount, to repeat, is a present value, meaning we are short $70 trillion not sometime in the future, but right now. Think of the $70 trillion as Uncle Sam's credit card balance. If he doesn't pay it, it will grow with interest.

The answer is yes, and the quick way to see why it's yes is to consider the fact that there are now roughly 33 million elderly in the U.S. When the 78 million baby boomers retire, we are going to have more than twice the number of oldsters, but only 18 percent more workers to help pay their Social Security, Medicare, and Medicaid benefits. These programs' benefit levels are already sky high. Indeed, if you calculate today's total spending on the elderly by these three programs and divide by the number of elderly, you arrive at an average Social Security, Medicare, and Medicaid benefit payment per oldster of $30,250, which is 80 percent of per capita U.S. GDP. In 20 years when the baby boomers

[5] The $70 trillion figure is my extrapolation of the fiscal gap reported in Gokhale, Jagadeesh and Kent Smetters, "Measuring Social Security's Financial Problems," NBER working paper 11060, January 2005.

[6] The team that produced the analysis was headed by two economists -- Jagadeesh Gokhale and Kent Smetters.

are fully retired, the average benefit per oldster will be $50,000, measured in today's dollars, and will represent roughly 110 percent of per capita GDP! [7]

This $50,000 estimate, by the way, is based on very optimistic assumptions about growth in Medicare and Medicaid age-specific benefit levels. Between 1970 and 2002, the average level of real Medicare plus Medicaid age-specific benefits grew at a 4.6 percent annual rate. In contrast, real per capita GDP grew at a 2.0 percent rate.[8] Since 2002, the growth rate in real age-specific Medicare and Medicaid benefits appears to have been even higher thanks primarily to the introduction of Medicare Part D. Nonetheless, the $50,000 estimate assumes that the Medicare plus Medicaid real average benefit will grow at only 3.6 percent year.

So here's the point. If you take $50,000 per boomer and multiply by 78 million, you arrive at an annual sum that is close to $4 trillion; i.e., we are, under highly optimistic assumptions, on our way to handing out some $4 trillion per year in today's dollars to retired baby boomers.

Social Security's Unfunded Liability and Its Analogy to Teachers' Pensions

According to the Social Security Trustees Report, Social Security is, by itself, some 20 percent underfunded; i.e., achieving long-term solvency requires an immediate and permanent increase by one fifth in the 12.4 percent employer and employee payroll tax rate financing Social Security. This calculation treats the Social Security trust fund as an asset of the system – a questionable assumption, discussed momentarily. And, like the aforementioned generational and the overall federal fiscal gap accounting, the calculation of Social Security's fiscal gap fails to adjust for the riskiness of the system's cash flows. Instead, an arbitrarily selected, roughly 3 percent, real discount rate is used in these analyses.

In a recent study, Alex Blocker, Steve Ross, and I showed how one can use Arbitrage Pricing Theory to risk-adjust Social Security's fiscal gap -- i.e., to properly attempt to mark Social Security's future benefit payments and tax receipts to market.[9] Our analysis indicates that Social Security's failure to risk adjust its cash flow is leading to an understatement of its long-term fiscal gap by more than one fifth.

Much of this understatement, incidentally, arises from Social Security's failure to properly risk-adjust its safe/sure benefit obligations to current retirees. When a benefit obligation is safe (a sure thing), risk adjustment simply means discounting at the prevailing risk-free discount rate. In the U.S., the risk-free discount rate is given by the term structure of yields on U.S. Treasury Inflation Protected (Indexed) Securities (bonds), also known at TIPS. Social Security makes no use of these yields in its valuations. Instead, it uses the same arbitrarily chosen real rate to discount its safe/sure obligations to current retirees as well as it's a) unsafe/unsure tax receipts payable by current and future workers and b) its

[7] http://people.bu.edu/kotlikoff/Is%20the%20US%20Going%20Broke,%20Forbes%209-29-08.pdf
[8] http://people.bu.edu/kotlikoff/Who%20is%20%20going%20Broke,%20August%2029,%202006.pdf
[9] Blocker, Alexander, Stephen A. Ross, and Laurence J. Kotlikoff, "The True Cost of Social Security," NBER working paper, 2008, posted at http://people.bu.edu/kotlikoff.

unsafe/unsure benefits payable to these workers. The discount rate that Social Security is now using and has been using exceeds the real yield on TIPS of all maturities.

Thus, Social Security can be said to constitute a Ponzi scheme in that it is misrepresenting its long-term funding gap. But two things may be said in Social Security's defense. First, the valuation mistake is relatively small compared to the overall fiscal gap that it reports. Second, it does attempt, in its infinite horizon liability calculations, to measure its fiscal gap. Indeed, Social Security's fiscal gap analysis is the only such analysis being done by the federal government for any of its programs.

Risk-Adjusting Fiscal Gap Analyses

The method used to value risky government cash flows is to treat these cash flows as implicit financial securities and then determine how they would be priced on the market. Take the Social Security benefits now promised to current workers. Assuming no change in current policy, these benefits will depend on two things – a) how the economy-wide average wage evolves (since the Social Security system, including its benefit formula, is indexed to economy-wide average wages) and b) the worker's average ratio, over her career, of her covered earnings to the economy-wide level of average earnings.[10]

Thus, there is an idiosyncratic component and a macro component involved in determining a worker's future benefit. Financial markets are good at pooling risks that can be fully diversified. Hence, the market value of the idiosyncratic component of the worker's future benefit can be based on its expectation – it's mean. The economy-wide average wage, on the other hand, is a non-diversifiable process – a process involving aggregate shocks.

Hence, what a worker receives in benefits will depend, in large part, on where this random process ends up at the time she reaches retirement. The value of the average wage at the time the worker reaches retirement is its current value cumulated up to that date at the growth rate of the economy-wide average wage. Thus the worker can be thought of as holding a financial asset for a fixed term whose return depends on her own past and future relative earnings and on the performance of a security whose annual return is the economy-wide average wage growth.

Thinking of workers as holding claims to this wage-growth security, which vary in amount depending on their age and expected relative earnings, leads to the next question. How does one value the wage-growth security? The answer, given by Arbitrage Pricing Theory, is simple. Relate, via an OLS regression, the growth rate in economy-wide average wages to the returns on different marketed securities and use the regression coefficients to determine the portfolio of marketed securities delivering the same expected return on the market.

Thus, investing $1 (or having $1 invested for you) for one year in the wage-growth security might be equivalent to investing 65 cents in large cap equities and 40 cents in a short-term government bond

[10] This statement abstracts from the actual benefit formula, which considers, in determining Average Monthly Earnings, the 35 highest covered earnings years after wage indexation has been applied.

fund. In this case, the $1 claim for one year – the ability to invest $1 at the average wage growth rate for one year -- would be worth $1.05. A claim that allows you to do this investment for N years would clearly be worth more. Under simplifying assumptions, the claim is worth $ (1.05)^N, i.e., 1.05 raised to the power N.[11]

Although Social Security has a clear, individual-specific/micro structure imbedded in its determination of taxes and benefits, this isn't the case for all government expenditures and receipts. But they too can be valued using Arbitrage Pricing Theory. Take discretionary government spending. One can ask how the market would value a claim to discretionary spending growth and proceed to value discretionary spending at each future date, *t*, as equivalent to a the value of current discretionary spending times the value of a discretionary spending growth security that matures at time *t*.

S cial Security – Too Big to Fail

Like many large U.S. financial institutions, Social Security is too big to fail. Hence, it's fundamentally misleading to calculate Social Security's fiscal gap as if the program is independent of the rest of the federal government's finances. Indeed, drawing the line between which cash flows and assets belong to Social Security and which belong to the remaining federal operations is, from the perspective of economic theory, entirely arbitrary. Any accounting distinctions that are drawn represent, from the perspective of economic theory, arbitrarily chosen language/labeling conventions.[12]

The fact that Social Security is too big to fail means that regardless of what the government says are the system's resources, the rest of the government's actual and potential resources are callable if needed to cover Social Security's financing needs. But just as Social Security is too big to fail, so is the rest of the federal government's operation. Hence, if the rest of the federal government's programs, be they establishing national defense, paying for Medicare, or retaining the services of Supreme Court justices, are unable to cover their costs, Social Security will likely be tapped. This may take the form of raising the system's taxes, cutting the system's benefits, or expropriating "its" trust fund.

The failure of Uncle Sam to do comprehensive, marked-to-market, fiscal gap accounting is, thus, the real reason that Social Security can be described as a Ponzi scheme. Social Security is a system that, like Madoff's fund, has implicit commitments, which potentially go far beyond its "own" benefit obligations – commitments that are not being disclosed.

[1111] The intuition is that if each dollar invested for just one year in the wage-growth security is equivalent to (can be traded for) $1.05, $1 invested for, say, two years is equivalent, from an arbitrage perspective, to having $1.05 now, investing it at the risk-free return, r, for one year, and then being able to invest, after the one year, the $1.05 x (1+r) again at the wage growth rate. Since each dollar that one is permitted to invest a year from now in the wage growth security will be worth $1.05, 1.05 x (1+r) dollars will be worth, a year from now, $X, where X equals 1.05 x (1+r) x (1.05). Discounted back to today, this claim is worth simply $(1.05)^2. Extending the example to the case of being able to invest in the wage-growth security for N years leads to the formula in the text.

[12] See Green, Jerry and Laurence J. Kotlikoff, "On the General Relativity of Fiscal Language," NBER working paper, 2006, posted at http://people.bu.edu/kotlikoff.

Social Security and Teachers' Retirement Pension Plans

Social Security is to the federal government's finances what teachers' retirement pensions are to their local or state government sponsors. Like Social Security, teachers' retirement pensions are, as a group, underfunded. Like Social Security, safe/sure future benefit obligations are being discounted using arbitrarily chosen discount rates, which appear to be too high relative to what's needed for mark-to-market accounting and which are likely to lead to overstatements of the degree of funding. And like Social Security, teachers' retirement pensions are too big to fail and also too big to survive untouched if the rest of the larger local or state government operation sponsoring the teaching system in question gets into trouble.

State and municipalities, no less than the federal government, need to do fiscal gap accounting to honestly disclose not just their overall financial condition, but also the true financial condition of their different constituent programs, including teachers' retirement pension programs. In failing to conduct such intertemporal budgeting, state and local governments, like Uncle Sam, are, by definition, running Ponzi schemes and their teachers' retirement pension plans simply represent features of these broader Ponzi schemes.

The suggestion that state and local governments do comprehensive fiscal gap accounting may seem fanciful. It's not. In 2002, Bruce Baker, Daniel Besendorfer, and I produced fiscal gap estimates for all 50 states.[13] Our study showed that

> *State official liabilities are not good proxies for their intertemporal imbalances. Indeed,the correlation between scaled state intertemporal imbalances and gross state debt scaled by state income is essentially zero. The corresponding correlation based on net state debt is negative. Given this, it's not surprising that we find very little correspondence between the ranking of the states based on their intertemporal budget imbalances and the credit ratings published by either Moody's or Standard and Poor's.*

At the time of its writing, the paper attracted considerable attention from state treasurers. Indeed, I was invited to present the study to an annual meeting of state treasurers in 2003. I spoke with a number of the treasurers after the talk. All were quite enthusiastic about doing intertemporal state budgeting, but none actually returned home and initiated the analysis despite my offer to provide them the software for free.

This was disappointing, but not entirely surprising. Doing fiscal gap accounting properly requires state and local governments to develop longer-term fiscal forecasting capacities that incorporate all their operations, not simply their pension systems. At the present time, most states forecast their non-pension finances only a couple of years into the future. Indeed, being situated in Boston, I visited with

[13] Besendorfer, Daniel, Bruce Baker, and Laurence J. Kotlikoff, "Intertemporal State Budgeting," 2002, posted at http://people.bu.edu/kotlikoff.

Massachusetts finance officials in early 2001 to obtain their long-term revenue and expenditure projections. I was astonished to learn that their projections extended for only three years.

State Ponzi Schemes

The year 2001, by the way, was one of the many years of construction on The Big Dig – Massachusett's $15 billion highway and tunnel construction project. The project raised considerable concern because of its huge initial projected cost and subsequent cost overruns. Remarkably, the project was initiated without anyone in state government bothering to estimate for Massachusetts taxpayers the extent to which the project could be undertaken without raising future taxes or cutting future spending. The same is true of Massachusetts' bold *Healthcare Connector* initiative, which compels state residents to purchase health insurance and that mandates state subsidization of the health insurance premiums of low-income, otherwise uninsured households.

Today, Massachusetts finds itself broke. How much of its current financial problem reflects the ongoing burden of paying for the Big Dig, how much reflects the Health Connector, and how much reflects the recession are good questions. But regardless of their answers, the state is now contemplating drastic spending cuts, considering introducing casino gambling, and even discussing taxing what's left of university endowments, etc.

Massachusetts is far from the only state in fiscal crisis. The Center on Budget and Policy Priorities projects that the 50 states will run a collective budget deficit of $350 billion over the next 30 months.[14] These deficits represent some 16 percent of total state expenditures.

California, which faces a $42 billion budget shortfall, appears to be in particularly bad shape. It has ordered all state employees to take 2-day unpaid furloughs each month. It is also withholding payment of state tax refunds. According to Governor Schwarzenegger, the state is close to insolvent. In lieu of making payments, the state is contemplating issuing I.O.U.s. This amounts to California's printing its own currency.

Other states will, no doubt, consider following California's lead. Indeed, cities and even communities within cities are contemplating issuing their own legal tender. On November 22, 2008, Newsweek ran a story describing how Riverwest, a section of Milwaukee, is considering this option.

Printing money to pay one's bills is the ultimate expression of a Ponzi scheme since the entity printing and spending the fresh currency imposes an undisclosed tax on those holding this currency. The tax, called *seignorage*, arises as the new currency issuance leads prices to rise, which waters down the real purchasing power of initial currency holders.

[14] http://www.cbpp.org/9-8-08sfp.htm

Clearly, states and local governments are facing terrible financial crises due to a recession that is not of their making. But in failing to do any systematic, long-term fiscal analysis and to consider the riskiness of their financial positions, they left themselves exposed to the kinds of problems they now face.

Teachers' Retirement Ponzi Schemes

What the federal government has been teaching state and local governments about running Ponzi schemes has been well learned. According to the Public Fund Survey, in 2007 over two in five teacher pension plans were underfunded by 20 percent or more. And one in five was underfunded by 30 percent or more. The underfunded nature of teachers' pensions reflects a number of factors, including very high pension-benefit replacement rates ranging from 60 to 75 percent for career teachers and retirement occurring at a median age of 58.

Given the huge drop in asset valuations over the past 18 months, there's little doubt that today the majority of pension funds are significantly underfunded. Take New Jersey's pension fund for teachers. One year ago its assets represented only 76 percent of its liabilities. But during the past year it appears to have sustained at least a 20 percent decline in asset values. If this was indeed the case, New Jersey's teachers' pension fund is now 40 percent, rather than 24 percent, underfunded.

Moreover, the true funding story for teachers' retirement pensions appears to be even worse than just suggested. The reason is that these funds are using very high discount rates to value their liabilities. Indeed, according to the Public Fund Survey, virtually all funds are using real discount rates above 3 percent. And one third of the funds are using a real discount rate equal to 5 percent or more. Certainly these discount rates are miles too high for purposes of valuing benefit commitments to current retirees for which there is little or no aggregate risk.[15] Whether they are too high for purposes of valuing benefit commitments to current workers requires the kind of risk valuation adjustments discussed above.

But as the above discussion made clear, the entire analysis of teachers' retirement pension funding is fraudulent because it doesn't tell us about the fiscal gap facing the ultimate sponsor of the pension system – the state or local government. A teachers' retirement pension system could be 100 percent funded and still be at risk with respect to paying its scheduled benefits if the state or local government running the system goes broke and decides to raid the pension fund. Such raids would likely take the form of having the pension fund make loans to the state or local government at a below-market rate of interest. Indeed, California is now considering doing precisely this – forcing CalPERS (the California Public Employees' Retirement System) and CalSTRS (the California State Teachers Retirement System) to lend money to the state.

[15] The primary exception here is cohort-specific longevity risk, the presence of which would suggest using an even lower discount rate.

Robbing Peter to Pay Paul

How will the teachers' retirement pension schemes and their governmental sponsors ultimately deal with their funding problems? One answer is to try to take it out of the hides of general taxpayers. Another option is to go after younger teachers. According to a recent study by Costrell and Podgursky, school districts are so encumbered with pension obligations to retired teachers and teachers about to retire that their pension funds are requiring employer contributions totaling an extra 4.2 percent of pay than would occur in the private sector. [16]

Reducing young teacher's total compensation by making them pay for their older as well as retired colleagues' retirement benefits or by freezing their own participation in their pension plans will, of course, alter who decides to become a teacher in the first place. If, instead, school districts want to maintain the quality of their faculty, they will need to ask their municipal or state governments to bail them out. And if the relevant government complies, we'll end up with higher state and local tax rates as well as lower property values as people realize that there are other places to live – places that don't expect their current residents to pay for prior fiscal malfeasance.

This option of "voting with your feet" is the analogue in the state and local Ponzi scheme context to a chain letter's running out of gas – of finding no new chain letter participants willing to buy the letter from existing participants because those who have not yet participated realize they will have trouble selling the letter once they buy it.

Conclusion -- Stop the Theft

Complexity and non-disclosure in financial settings is never innocent. The underfunding of teachers' pensions, the use of inappropriate discounting assumptions, the failure to do comprehensive fiscal gap accounting, and the arcane and highly backloaded pattern of benefit accrual were all developed for a reason, namely to swindle young teachers and future taxpayers to the benefit of older teachers and current taxpayers.[17] The forces underlying this swindle are not going to change. Today's teachers and taxpayers will always have an incentive to try to expropriate tomorrow's teachers and taxpayers.

The only thing that will really stop teachers' retirement Ponzi schemes is closing the schemes down – once and for all. This means freezing participation in teachers' retirement pension plans and forcing state and local governments to pay new teachers precisely what they earn precisely when they earn it. Terminating, at the margin, teachers' retirement Ponzi schemes will force current teachers and taxpayers – the last purchasers of the chain letter – to accept the full burden of the fraud they entered, however unwittingly. But as the equity holders in Lehman Brothers and the victims of the Madoff Fund can attest, there is a large price to pay for being robbed, namely losing your money.

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[16] Costrell, Robert M. and Michael Podgursky, "Teacher Retirement Benefits: Are Employer Contributions to Teachers' Retirement Higher than for Private-Sector Professionals?" mimeo, 2009.

[17] See Costrell, Robert M. and Michael Podgursky, "Peaks, Cliffs, and Valleys: The Peculiar Incentives in Teacher Retirement Systems and their Consequences for School Staffing," forthcoming *Education Finance and Policy*, 2009.

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