Courtesy of the Legislature: the teacher pension debacle

A *LIFER* report

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Introduction

This report is a study of how the investment strategy of the New York State Teachers' Retirement System (NYSTRS) and the actions of the State Governor and Legislature has deleteriously impacted and will impact New York State school property taxpayers.

Thanks to the State Legislature school property taxpayers can look forward to another brutal round of soaring school property taxes.

New York State citizens need no reminding that their school property taxes have spun out of control over the last decade. What they may not realize is that they are about to face another spiral in school property taxes. What is certainly not apparent to them is that the blame for their burden rests on their State legislators.

They are unfortunately unaware that their State legislators serve the interests not of their constituents but of the public sector unions who fund and man their electoral campaigns. This report details how the State Legislature has recklessly expanded teacher retirement benefits and failed to reform an unsustainable teacher plan. The NYSTRS was accordingly forced to pursue an excessively aggressive investment strategy. The NYSTRS investment portfolio inevitably imploded when the recent bubble economy collapsed under its own weight.

As a result the New York State school property taxpayers will have to dig deep into their pockets for many a year to make good the excessively generous pensions the State Legislature has awarded public school teachers and administrators. This will be at a time when their own retirement savings will have collapsed and when they will be postponing their own retirement.

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Executive Summary

New York State legislators have continually enhanced public employee pensions and have delayed reforming an unsustainable State teacher pension system.

The New York State Teachers Retirement System (NYSTRS) was consequently compelled to pursue an aggressive investment strategy that was in itself aggressive and in relation to other state pension funds.

The NYSTRS had a particularly large commitment to equities and had strayed outside the standard pension investment universe of the S&P 500. It also ventured into the risky world of alternative investments in the form of private equity. This was despite the fact that academic research suggested that the returns from private equity would likely be disappointing. It had a particularly low bond exposure. Its investment portfolio was ill-suited to withstand a prolonged period of turbulence in the financial markets.

By December 2008 NYSTRS was a quarter off its summer 2007 high. It was about a third off where it should have been if was meeting its own target. To return to trend growth the NYSTRS portfolio would have to increase by fifty percent. Worse, a good portion of its private equity and real estate portfolios were not being marked to market.

The 2008 financial market collapse was a watershed event. Current times are comparable to the calamitous 1930s and 1970s. It is not unreasonable to think the future promises equity market sub-par performance. In similar historical environments to the present the equity markets have taken as long as fourteen years to regain their former highs. Since the NYSTRS must not only regain its former high, but must earn eight percent a year while doing so it might well be many a year before it returns to trend growth. Financial history also suggests that there will be long stretches of time when the NYSTRS will not achieve its annual return goal. The next decade will probably be one such time.

The NYSTRS will consequently be forced to drastically increase employer contributions. This will mean either severe cutbacks in school budgets or large school property tax increases. School districts have always opted for the latter. Even before the 2008 market implosion the NYSTRS was dependent upon capital gains to pay current benefits. Accordingly, it envisioned doubling the employer contribution rate. Now it must do more than that. In the 1970s, the last time equity markets suffered years of sub-par performance, employer contributions were driven to almost a quarter of payroll.

The great mistake of the NYSTRS was not to increase its bond allocation in the late 1990s when it was twenty percent overfunded. Instead it left money on the table for the Legislature to give away to those who fund and man member election campaigns. In short, the Legislature, forever in thrall to the public sector unions, failed to reform an already unsustainable pension system.

All in all neither the State Legislature nor the NYSTRS has served school property taxpayers well.

SUMMARY

The New York State Teachers' Retirement System

Over the last decade New York State school property taxpayers have been ground down by tax increases that for many years ran in the high single digits. Such was the outcry from the citizenry that the Governor was forced to appoint a commission to study the problem. Nothing came of the commission.

Despite these years of tax increases and stupendous increases in State school revenue aid the finances of school districts are anything but sound. The State itself is groaning under record deficits. The ink was barely dry on the current 2009 – 2010 fiscal year budget when tax receipts were less than those forecast. A substantial deficit for the current fiscal year seems a certainty which hardly bodes well for already deficit laden outer years. Further the current year budget was only balanced with what is presently an only temporary infusion of Federal money from the Obama administration stimulus program.

Little relief, too, can be expected on the revenue side. In the last decade, Albany was twice blessed with tsunamis of revenue from Wall Street. The second bailed it out from the fiscal debacle that followed from the State spending excesses attendant upon the first. It seems very unlikely that there will a third Wall Street boom that will once again float the State Treasury out of the hole in which it now finds itself.

Such structural imbalances in the State budget bode ill for school district finances. School district revenue aid and tax relief in the form of the School Tax Relief (STAR) program constitute the largest part of the State funded portion of the State budget. This is where the cuts in spending will have to come for that is where the money is. Cuts have already been made in revenue aid and tax relief. More, much more, are inevitable.

The budget travails of New York State school districts will soon be compounded by another problem. This problem comes courtesy of the Governor and the State Legislature. Soon school districts will be faced with rapidly escalating employer contribution demands from the New York State Teachers' Retirement System (NYSTRS).

School district professional staff receives their pensions from the NYSTRS. These pensions are paid from three sources: the returns on the NYSTRS investment portfolio, NYSTRS employee member contributions and NYSTRS employer member contrbutions. Presently, school district professional staff contributes three percent of their salary to the NYSTRS for the first ten years of service. The minimal employer contribution is 4.5% of payroll. School districts are required to contribute whatever is required to render the NYSTRS plan fully funded in the event that its investment portfolio underperforms.

Since the early part of the decade school districts have seen a steady rise in teacher retirement expenditure. In the 1990s school district contributions fell rapidly and dramatically to almost nothing thanks to the great 1990s bull market. Then with the millennium bear market they began to climb so that for the present, 2008 – 2009 school year they are eight percent of school district professional salary.

Indeed, much of the run-up in school district expenditure in the beginning years of this decade that occasioned the large property tax increases of those years can be attributed to increases in teacher retirement expenditure. There are three reasons why there was an increase in teacher retirement expenditure.

Firstly, there was an accounting rule change that forced many school districts to make two annual payments to the NYSTRS in one year rather than two. Secondly, there was a change in the investment fortunes of the NYSTRS investment portfolio. Thirdly, the State Governor and Legislature enhanced the benefits of NYSTRS pension plan members such that NYSTRS revenues declined and its outgoings increased. These had to be made good by school districts.

In 2000 mesmerized by the apotheosis of the 1990s bull market and carelessly generous with money that was not their own, the State Governor and Legislature greatly enhanced NYSTRS member benefits. Member contributions were reduced from thirty years to ten years and a cost of living adjustment was enacted. This was but one instance of a general and continual munificence that the Legislature shows to public employees.

In the first week of June, 2005, for example:

> *. . . there were nearly 600 bills before the State Legislature* (*including Assembly and Senate "same-as" introductions*) *dealing with retirement and pensions. Most of these bills seek to enhance benefits or loosen eligibility standards in one fashion or another. This count did not include all of the nearly 200 bills targeted only to individual government employees and retirees.*[1]

Sooner or later the Governor gives his assent to most of these bills. Even now when State finances are in a tail spin, the Legislature seeks to enhance public employee pensions, heedless of the cost this imposes upon already overburdened taxpayers.

Very often these bills increase the cost of teacher pensions. One of the six hundred bills noted above proposed to boost the pension base for teachers hired after 1971. Their pensions were presently based on their final average salary for their last three years in service. The proposed bill would allow them the option of computing final average salary as a five-year average including payments for termination, retirement bonuses, annual leave or unused sick leave. The cost to school districts outside of New York City was estimated to be an additional $189 million a year.[2]

Between 2000 and 2007 thirty-seven laws were enacted by New York State that the New York State Teachers Retirement System (NYSTRS) considered being of significant

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[1] McMahon, *E. J., Legislators Still Aim to Sweeten Public Pensions*, New York State Fiscal Watch Memo, July 15, 2005, Manhattan Institute for Policy Research. Available at: http://www.nyfiscalwatch.com/html/fwm_2005-07.html.

[2] Ibid.

impact for itself or its members. The most active years were 2002 and 2000 when ten and eight laws were enacted, respectively.

The Governor and Legislature also stood idly by as the public employee pension system itself became ever more unsustainable. In the case of the schools staffing was increasing rapidly as were salaries. While retirees were living longer teachers were still typically retiring in their late fifties. However, the incomes of the public who had to pay the ever increasing and now inflation linked pensions of these teachers were not growing at anything like the necessary pace needed to sustain this structure.

The parlous state of school district finances were only papered over by the vast tax revenues thrown off by the mid-2000s bubble economy. These revenues enabled Albany to continue to pump money into the schools and delay the day of reckoning. It also allowed the Governor and Legislature to delay reforming public pensions.

The minimum reform that should have been enacted was the substitution of a defined contribution plan for the present defined benefit plan. Instead there was desultory talk of a further pension tier, the fabled Tier V. Only after the collapse in State finances consequent to the 2008 economic and financial meltdown is the introduction of Tier V being seriously proposed. It will be too little too late. The Tier itself is little more than a watered down version of the original Tier IV.

Over the decades Tier V might save the State tens of billions, but over the next decade its impact will be minimal. The horse has already left the stable. Between 2000 and 2008 fifty thousand new members joined the NYSTRS, pushing up its membership by almost a fifth. They will be weighing on school property taxpayers for many decades.

Continual enhancement of NYSTRS member benefits by the State Legislature and an increasingly unbalanced pension structure pressured the NYSTRS to seek high returns from its investment portfolio. The NYSTRS was also pressured to seek high returns by a great wave of teacher retirements that occurred between 1997 and 2006. Within a decade NYSTRS benefit payments had increased by a factor of three. NYSTRS annual reports also give the impression that the bull markets of the 1990s and mid 2000s also imparted hubris. The System seems to have become enamored of its performance and abilities and was imprudently pursuing high returns for their own sake. Too little thought was given to downside risk.

Compared to its fellow State public pension funds the NYSTRS was an aggressive investor. It had amongst the highest commitment to equities and the lowest to bonds. After the millennium bear market it began to diversify out of equities into real estate and private equity. Unlike a good many other public pension funds its embrace of alternative investments was measured so that by 2008 its actual private equity allocation was six percent and its potential allocation ten percent. The NYSTRS had also strayed beyond the large company investments that have been the mainstay of public pension fund investing. Its target universe was not the S&P 500, but the S&P 1500. Investing in the latter is more risky than investing in the former.

While the returns on its private equity portfolio have been quite spectacular it is not obvious that this venture into alternative investment was prudent. On the whole the academic research does not support investment in private equity on the part of public pension funds. The major problem is that only a minority of private equity funds consistently provide returns greatly in excess of those that can be obtained from public equity. Private equity investors might well find themselves invested with the losing funds rather than the winning ones.

The likelihood that public pension fund managers can both identify the high performing private equity funds before the fact and gain access to them is low. Either the NYSTRS private equity managers were especially skilful in selecting private equity funds in which to invest or they were lucky or they invested in especially speculative ventures in a private equity bubble market.

The latter two alternatives seem the more likely. Individuals who are especially skilled at selecting winning private equity funds are unlikely to tarry long in the employ of public pension funds. They are instead likely to move to the more lucrative world of fund of funds management. In the middle years of the current decade private equity was also in a bubble and returns were likely to be very high especially for the more speculative funds. We can only await reports on how the NYSTRS private equity portfolio has performed in the current down market. If it matches the seeming experience of the private equity market as a whole it will have performed very badly. Investments made in private equity during bubble periods invariably disappoint.

Not surprisingly given its aggressive profile and the fact that the last two decades have until very recently been essentially one long bull market, the NYSTRS investment portfolio outperformed the portfolios of its State public pension fund peers. Aggressive investing in bull markets tends to produce high returns. The unfortunate corollary is that the returns in bear markets tend to be worse than average.

The NYSTRS passively managed equity index funds also managed to outperform their internal benchmarks. However, NYSTRS efforts at active management of domestic and international equity money can only be judged a failure. Invariably, the internally managed active funds underperform their benchmarks. The NYSTRS would have done better to adopt a strictly passive approach to its equity investing.

The NYSTRS investment strategy naturally fell apart when the financial markets collapsed in 2008. It had taken some minor steps to increase its bond allocation in 2007 but it was nowhere near sufficient to compensate for declines of forty to fifty percent in the major domestic and international equity indices and real estate indices.

For years the income generated by the System and employer and employee contributions had been insufficient to fund current retiree obligations. By the mid 2000s these contributions covered only a quarter of System benefit payments. It was dependent every year on capital gains to meet its obligations. Any extended market downturn would

necessitate substantial increases in employer contributions just to meet current obligations. The NYSTRS investment strategy was a disaster waiting to happen. Its very aggressive profile ensured that its losses in a brutal bear market would be severe. For the more aggressive a portfolio the more risk it embraces, and the risk it embraces is of very substantial declines in market downturns.

The fatal flaw of the System was a decade earlier when thanks to the 1990s bull market it became overfunded by twenty percent. It should have taken advantage of this good fortune to have greatly increased its fixed income allocation. Instead it left the money on the table for the State Governor and Legislature to fritter away in greatly enhanced employee benefits in 2000, albeit on the advice of a commission convened by the Governor and on which were represented public employers, public sector unions and other 'interested' parties.

If we compare, as seems not unreasonable, the current economy and financial markets to those of the 1930s and 1970s the outlook for the NYSTRS investment portfolio is far from good. In the 1930s it took the major indices fourteen years to recover their pre-bear market highs. In the 1970s the recovery period was much shorter being only six years for large capitalization stocks, but fourteen years for small capitalization stocks. However, during these years of recovery the NYSTRS is required to earn eight percent on its investment portfolio. This is its self-set investment return target.

Once this requirement is factored in it would take the NYSTRS sixteen years to return to trend growth if the current market decline followed a similar path to that which pertained in the 1970s and 1980s.

It must also be remembered that while the equity markets are treading water or declining the NYSTRS is bleeding money because of its cash flow problems. Since it is dependent upon capital gains to meet its annual pension and other obligations to its members, it will be forced to liquidate at least two billion dollars of its portfolio every year.

The cash flow problem the NYSTRS faces leaves it with two unpalatable choices. On the one hand it can liquidate equities which yield little in the way of dividends but on which it hopes to realize capital gains in the future. However, it will be selling these at deeply discounted prices in a vicious bear market. On the other hand it can sell its fixed interest investments. These will have maintained their original values in the present market. Indeed they might well have appreciated. Unfortunately, in doing so, since its fixed income investments amount to very little, the NYSTRS will be dramatically reducing its current income. Barring a recovery in the equity markets within in a few years the NYSTRS will have exhausted its fixed income assets.

As just noted the NYSTRS actuarial assumptions include an investment return of eight percent on its investment portfolio. Odd though it may sound at the present time an eight percent return on large capitalization stocks in the long run is not an implausible assumption. Over the very long term the U.S. equity markets have provided returns in

excess of eight percent. One should emphasize, though, ‘in the long run’ and ‘the very long term’.

The cost of this return is long periods of less than stellar performance and gut wrenching bear markets of the kind that are presently being experienced. These long-run average returns conceal periods of significant length when the returns to financial assets were far below those required by the NYSTRS. Between 1926 and 2007 the compound annual rates of return for U.S. small stocks was 12.5% and for large capitalization stocks it was 10.4%.

The historical figures are not that reassuring if we look at sub-periods over the last eighty years, in this case annual compound returns for ten years periods between 1925 and 2006. There were seventy-three such periods. For twenty-eight of these periods the annual compound return was less than eight percent. Also to be noted is that these periods of underperformance are not randomly distributed over time. They tend to be clustered with most of them occurring between 1925 and 1948 and 1969 and 1981.

The view is even less reassuring if we look not from the height of the 2006 bull market top but from 1981. Between 1926 and 1981 there were forty-eight ten year periods out of which twenty-six, or more than half, failed to have a compound annual return of eight percent or more. History would suggest that there will significant periods of time when the NYSTRS will fail to achieve its required annual return of eight percent. The coming decade might well be one of them.

In the 1990s knowledge of the high long-term returns available from United States equity markets became known to the general public. Institutional investors had already received the news and had acted accordingly. The general public followed institutional investors into the equity markets in large numbers and with significant proportions of their investment portfolios. Such movements of assets could send the equity markets in one direction only: up, significantly up.

Simultaneously, a confluence of forces conspired to create an almost perfect environment for financial assets. Market friendly administrations, the triumph of free market economics over interventionism and planning, the collapse of communism and socialism throughout most of the world, the advance of free trade, deregulation of financial markets, generally loose monetary policy, the willingness of the Federal Reserve Bank to bail out the markets with great geysers of liquidity when crisis struck, disinflation, a tolerance of the Federal Reserve Bank for financial asset inflation and last, but not least, a most peculiar mercantilism on the part of Asian counties that consisted of the accumulation not of gold, but the debt obligations of the United States and its agencies all served to create a hot house for financial assets.

Trees alas do not grow to the sky and bubbles eventually burst and the great credit bubble of the mid 2000s was no exception. The investing public was now reminded why equities have higher returns than bonds: they are a riskier asset. The holder of equities has to watch his stock holdings collapse by anything up to ninety percent if he holds the

smallest capitalization stocks. He then has to wait years before they regain their former value.

The NYSTRS failed to pay attention to financial history when it devised its investing strategy. It has now left itself high and dry. If financial history repeats itself it will have to make substantial financial calls on school districts to make good the losses on its portfolio. It would have served its employer members and their taxpayers better by pursuing a less aggressive policy through having a greater proportion of bonds in its portfolio.

Throughout the 1990s thanks to stellar NYSTRS portfolio returns courtesy of the 1990s bull market, non-large city school district teacher retirement expenditure plummeted until by 2002 it was next to nothing. This was false economy. It would have been better if NYSTRS returns had been lower and non-large city school district teacher retirement expenditure higher. Undoubtedly, these school districts used the savings they enjoyed from the NYSTRS investment strategy to expand their programs and staffing. The problem is that they turn to their taxpayers to support these programs and staff when the resources to support them have disappeared.

Even if the current market downturn fails to be a repeat of those of the 1930s and 1970s there is every reason to think that some time there will be savage bear markets similar to these bear markets. The basic point therefore remains, the NYSTRS investment portfolio is ill designed from the standpoint of financial history. During booming financial markets it keeps school district teacher retirement expenditure artificially low. This enables school districts to expand their staffing and programs more than they otherwise would do. Then during down markets when the NYSTRS has to substantially raise school district employer contributions, school districts push up property taxes rather than roll back staffing and programs. The argument they advance is that rapidly rising NYSTRS employer contributions are outside their control and is something property taxpayers just have to live with.

New York State and its public school have led a charmed fiscal life of late. Several times it has seemed that the structure would collapse like the walls of Jericho. Yet the dot com debacle was followed by the great credit bubble of the mid-2000s that filled Albany coffers as never before. Then when this went puff there was the Obama administration with its billions of ‘stimulus’ dollars to keep the show on the road. So now the denouement is moved two or three years hence when the stimulus dollars are retired.

Then, finally, perhaps, barring another miracle, New York State will have to deal with its multi-billion dollar structural deficit. A huge part of this deficit is its bloated spending on public education. As something like almost a third of State funded expenditure, State school revenue aid and School Tax Relief (STAR) are where the axe will have to fall. It is simply where the money is.

A collapse in State school revenue aid will not be the only charge to their revenues that school districts can expect to take in the next couple of years. We can make the

reasonable prognosis that the NYSTRS faces a difficult investment environment for the next several years and will not revisit its 2007 high for a good many years. As of December 31, 2008 the NYSTRS portfolio had declined by 27.9% from its June 30, 2008 value.

This understates its predicament. Based on its expressed target of an annual return of eight percent on its investment portfolio the NYSTRS portfolio should have been twelve percent higher in December 2008 than it was in June 2007. In other words the NYSTRS portfolio was about a third less than it should have been at the end of 2008. To return to trend it would have to increase by about slightly over fifty percent. There is also reason to think that the value of its private equity and real estate holdings were exaggerated. The values they were being carried at were not those they would realize if they sold.

At the present time, July 2009, the NYSTRS portfolio value is probably similar to what it was in December 2008. This assertion is based on the performance of the equity markets over the last six months.

The collapse of the NYSTRS investment portfolio will mean ever increasing demands for retirement contributions from school districts by the NYSTRS. So far the NYSTRS has only reported that the increase in employer contributions for the 2010 – 2011 school year will be 'significant'.

For what this might mean in practice we can look at the last brutal bear market the NYSTRS passed through. This was the 1970s. After the collapsing equity markets of these years NYSTRS employer contributions climbed to a high of twenty-four percent of professional staff payroll in the early 1980s. A repeat of this experience would devastate school district budgets. As of the 2005 - 2006 instructional salary expenditure accounted for about forty-five percent of total non-large city school district expenditure. Presently, employer contributions to NYSTRS are running at about seven to eight percent of payroll.

Even before the implosion of the NYSTRS investment portfolio in 2008, the System was projecting a doubling of the employer contribution rate. As was previously noted the System was dependent upon capital gains to meet its current obligations. The NYSTRS was very much aware of this and in 2005 was anticipating that the employer contribution rate would have to eventually settle in a range of between ten and fifteen percent as a consequence. So at a minimum the NYSTRS employer contribution rate will be doubling.

The New York State sister fund of the NYSTRS, the New York State Common Retirement Fund, which has experienced similar losses to that of the NYSTRS, has projected that employer contributions to the Common Retirement Fund will triple over the next six years from a current rate of 7.4%. This projection rests on the dubious assumption that the financial market implosion of 2008 is similar to that of 1987. Nineteen-eighty-seven was the result of a technical problem – portfolio insurance – rather than structural weaknesses in the financial system and economy, while 2008 was the result of years of reckless credit expansion finally reaching its limits and imploding.

On this flawed comparison the New York State Comptroller, who directs the Common Retirement Fund, assumes Common Retirement Fund returns of 1.5% in the current fiscal year and annual returns of thirteen percent in the following two years and then annual returns of ten percent in the next three years. Even under this extremely optimistic scenario the employer contribution rate will be 30.3% in 2015.

Imagine then what the contribution rates will be if the financial markets fail to rebound.

The policy response from Albany has been what one would expect: kick the problem down the road. The Legislature, at the instigation of the New York State Comptroller and the urgent prompting of the Governor, has considered, but narrowly failed to pass legislation that would allow State pension fund members to borrow from the State pension funds if contribution rates exceed certain caps. The caps would grow from 9.5% for the 2010 – 2011 fiscal year to 14.5% by the 2015 – 2016 fiscal year. Loans would be repayable over ten years.

For the NYSTRS such a plan would at best spread out the pain.

We might conclude by saying that the future for school property taxpayers would seem to be an unhappy one.

For this New York State school property taxpayers can thank their State legislators.

The New York State

Teachers' Retirement System

I. The New York State Teachers' Retirement System

The teachers, administrators and other professional staff employed by New York State public schools outside of New York City receive their pensions from the New York State Teachers' Retirement System (NYSTRS). The NYSTRS is also referred to as the 'System'. While the NYSTRS also provides retirement benefits for employees of Boards of Cooperative Educational Services (BOCES), the State University of New York, charter schools and a small number of other institutions, school district employees constitute the overwhelming number of members. BOCES are regional state agencies that provide services to school districts within their region.

In 2008 out of 274,901 active members 90.2% were school district employees and another 6.1% were BOCES employees (*Table III.1*). BOCES, themselves, are funded by their local school districts. Almost ninety-seven percent of active NYSTRS members were, therefore, employees of institutions directly or indirectly funded by local property taxpayers.

NYSTRS funds its pensions from three sources: employee contributions, employer contributions and the returns on its investment portfolio. The employee contribution to NYSTRS is three percent of salary for the first ten years of membership in NYSTRS. It was only in 2000 that contributions were limited to the first ten years of membership. Since 1978 the employer contribution has ranged from a high of 23.49% between 1980 and 1982 and a low of 0.36% in 2001 and 2002. In 2008 the employee contribution was 7.63% and will fall to 6.19% in the 2009 - 2010 fiscal year (*Table III.10*).

The NYSTRS has one of the largest institutional investment portfolios not only in the United States but in the world. In 2006 the NYSTRS was the twentieth largest pension fund in the world.[3] As of June 30, 2008 the net value of the NYSTRS investment portfolio was $94,148,080,000. This was an 8.9% decline from the prior fiscal year value of $103,370,451,000 (*Table III.16.c* and *Table III.19.a*). By December 2008 the portfolio had declined to $74,501,538,000 which was 27.9% below its June 30, 2007 value (*Table III.19.b*).

Active membership of the System as of June 30, 2008 was 274,901. The number of retired members was 136,706 for a total membership of 411,607 (*Table III.4*). In 1992 retired members were 28.4% of the total membership. By 2008, sixteen years later, this proportion had climbed to 33.2% (*Table III.4*).

The NYSTRS invests member contributions in various financial assets in the hope of earning enough of a return to fund its pension, disability and other member obligations. The investment goal is an annual return of eight percent. If the assets held in the NYSTRS investment portfolio become insufficient to meet its obligations, then NYSTRS participating employers are called upon to fill the gap.

[3] Watson Wyatt Worldwide, *The World's 300 Largest Pension Funds*, Year End 2006, p. 22. Available at: *http://www.agingsociety.org/agingsociety/publications/public_policy/300largest.pdf*.

As might be expected, since the returns on financial assets are volatile, the annual returns of the NYSTRS investment portfolio are anything but stable. Accordingly, school district teacher retirement expenditure varies with the performance of the financial markets in general and the equity markets in particular. This is because, as we shall see, the NYSTRS investment portfolio has a very high exposure to equities. Of financial assets, equities are amongst the most volatile.

The variability in school district teacher retirement expenditure has increased over the years because the NYSTRS has pursued an investment strategy that has ensured ever greater volatility in its annual returns. Essentially, the NYSTRS has sought higher returns by increasing the proportion of assets in its portfolio that have high returns even though these higher returns come at the price of higher volatility.

In pursuing this policy the NYSTRS became a victim of what might be called the diversification delusion. This delusion consists of imagining that most financial assets are largely uncorrelated. In other words when some are performing poorly others will be performing well. This is indeed generally true. Assets with the exception of commodities and perhaps art and residential real estate tend to appreciate in value over time, but at different rates and with different periods of decline.

The implication of this is that an investor who holds a diversified portfolio of assets should generally see his assets rise over time with but the briefest and shallowest actual losses. Alas, as the years since 2007 have shown events have not unfolded in that fashion. There are in fact periods when virtually all assets decline in value and cash alone maintains its value.

The NYSTRS has also increasingly sought capital gains rather than current income. It has pursued this policy to such an extent that its actual income from its investments is insufficient to cover its current obligations to its retirees. If all markets head south as they are doing in the current financial crisis the System is forced to make asset sales into a declining market in order to meet its current obligations. This is anything but responsible financial management.

II. New York State Teachers' Retirement System Investment Portfolio Performance and Non-large City Teacher Retirement Expenditure 2001 – 2005

A significant proportion of the increase in non-large city school district total expenditure that occurred between 2001 and 2005 was accounted for by teacher retirement expenditure.

It would be interesting to know how much of this increase was due to the performance of the New York State Teachers' Retirement System (NYSTRS) investment portfolio and how much was due to the limitation of member contributions to the first ten years of service and the 2003 to 2005 retirement surge. Unfortunately, the statistics published by the NYSTRS are insufficiently detailed to enable such an estimate to be calculated with any degree of confidence.

However, it must have been considerable. As the NYSTRS itself explained in 2005:

> *The most significant economic factor for NYSTRS is the investment return earned in the capital markets. Investment performance has a direct impact on the amount participating employers must contribute to fund current and future member benefits . . . The equity returns are smoothed (averaged) by NYSTRS over a five-year period for purposes of computing the actuarial value of assets. In spite of recent gains, substantial losses in prior years have resulted in a progressive rise in the employer contribution rate from a low of 0.36% on 2002-2003 member salaries to 7.97% on 2005-2006 salaries.*[4]

The annual report for the subsequent year was even more pointed:

> *Continuing to meet or exceed our investment goal is critical as our liabilities continue to grow. Annual benefit payments, for example, have grown from $1.5 billion in 1995 to 4.4 billion in 2006. With baby boomers reaching retirement age at ever-increasing rates, this figure will grow sharply in the coming years. In addition, the Retirement System continues to pay out legislatively mandated cost-of-living adjustments (COLAs) to about 85,000 eligible retirees annually. With member and employer contributions combining to cover about one-quarter of all benefit payment costs, continued strong returns in the capital markets are critical to the System's ongoing success.*[5]

[4] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2005*, p. 28.
[5] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2006*, p. 44.

In other words the NYSTRS was living off capital gains rather than income. Any prolonged downturns in the "attractive asset classes" in which the NYSTRS was overwhelmingly invested would visit prolonged pain upon the school district taxpayers.[6]

Between 2000 and 2007 the NYSTRS investment portfolio had two years of significant losses, one year of definitely subpar performance and one year of very slight underperformance of its investment goal of an annual return of eight percent. All of these years of poor performance occurred between 2000 and 2003. These were the years of the post-millennial bear market. Thereafter, the portfolio enjoyed quite spectacular returns with 2005 and 2006 showing gains of just over ten percent, 2004 seeing gains of just over fifteen percent and 2007 witnessing gains of almost twenty percent.[7]

The spectacular returns the NYSTRS investment portfolio enjoyed from the great 1990s equities bull market carried the System through to 2002. In 2001 non-large city school districts saw their teacher retirement expenditure decline by 18.4%. The following year it increased by 15.8%. This was the first increase in eight years, but it was no great hardship: after so many years of decline teacher retirement expenditure accounted for only 0.6% of total school district expenditure.[8]

The next year was more brutal and the following one even more so. In 2003 teacher retirement expenditure increased by 68.1% while 2004 showed an increase of 133.6%. Two-thousand-and-five was more merciful, but the increase was still 36.6%. A gain of just over fifteen percent in the NYSTRS investment portfolio was offset by a change in how school districts had to account for pension payments in their budgets.

The Governmental Accounting Standards Board (GASB) had revised the accounting standards for public financial reports. One of the consequences of these rule changes was that school districts now had to use the accrual method of accounting for pension payments in their budgets.

Prior to this change school districts could have used an alternative method of accounting for their pension payments known as the 'cash method'. The change to the accrual method would be a problem for those school districts using the cash method because of how New York State school districts actually paid their pension contributions to NYSTRS.

These payments were made in the school year after they were incurred. School district payments to NYSTRS for 2004 – 2005, for example, were actually made between September and November of the 2005 – 2006 school year. As a consequence of this school districts who had to switch from the cash method of accounting for pension

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[6] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2006*, p. 15.

[7] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2007*, p. 52.

[8] These statistics are calculated from the New York State Education Department Fiscal Profile reports. Data, tables and charts are available from the author by request.

payments to the accrual method would find themselves having to make two years worth of pension contributions to NYSTRS in 2005 – 2006 rather than one. As a proportion of teacher salary expenditures pension contributions for cash method school districts would increase from 2.52% in 2004 – 2005 to 7.97% in 2005 – 2006.[9]

School district teacher retirement expenditure was also impacted by retirement incentives. These incentives were particularly significant for the large increase in NYSTRS 2003 employer contributions.[10]

[9] *A New York School Retirement System Primer*, Burnt Hills-Ballston Lake School Central School District, February 2005. Available at: www.bhbl.org/pdfs/retirementprimer2005.pd

[10] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2003*, p. 26.

III. New York State Teachers' Retirement System Employer and Member Contributions 1998 – 2007

In 2000 the State Government limited employee contributions to the New York State Teachers' Retirement System (NYSTRS) to the first ten years of service. The obvious consequence of this decision was a drastic decline in member contributions.

In the year immediately following the enactment of the limitation, member contribution collapsed by 31.4%. In the following three years member contributions saw annual increases of between six and eight percent. However, the trend was definitely down. In 2005, 2006 and 2007 the increases from the previous year were 1.6%, 2.1% and 4.2%, respectively. Only in 2008 was this trend broken when employee contributions increased by 5.6% (*Table III.5*).

This upturn probably reflects the rising salaries of the large numbers of teachers hired around the turn of the millennium. However, these teachers will soon have been in the System for ten years and their contributions will cease. As it seems very unlikely that school districts will be hiring in the next few years, employee contributions to the NYSTRS should soon decline precipitously.

Between 2000 and 2008, employee member contributions to NYSTRS declined by 4.7% (*Table III.5*).

The above figures contrast with annual increases of 5.9% in 1999 and 8.6% in 2000, the last two years before the ten-year limitation was introduced (*Table III.5*).

The obvious converse of declining member contributions was increasing employer contributions. Employer contributions declined by 8.4%, 27.8% and 66.0% in 2000, 2001 and 2002, respectively. These reflected the great end of century equity bull market. Employer contributions declined between 2000 and 2002 even though these years were down years for equities because employer NYSTRS contributions reflect the stock market performance with a lag of several years. Employer contributions then shot up by 324.4% in 2003, 39.4% in 2004, 126.8% in 2005 and 43.3% in 2006 (*Table III.5*). The nightmare seemed to have ended in 2007 when contributions rose by 10.7% (*Table III.5*).

If employers had to contribute the actual cost of enrolling new members in NYSTRS the employer contribution rate would have been twelve percent.[1] This contribution rate assumes a fairly constant investment return of eight percent.

[1] *New York State Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2003,* p. 14 and the NYSTRS website at *http://www.nystrs.org/main/employers/contribution-rate.htm*.

Contributions per member

The above numbers are for total employer and member contributions and as such are misleading. Between 2000 and 2008 NYSTRS membership increased by 22.2%.[12] Accordingly, the above statistics will overstate the increase in employer contributions and understate the decline in member contributions. In order to better grasp the impact of the limitation of member contributions to the first ten years of service we must examine NYSTRS contributions per member.

In 1999 the average employee member contribution was $1,253. Thereafter there was a steady decline. The following year saw a decrease of 24.6% and the year after that one of 10.6%. These declines no doubt reflected the great teacher retirement wave that was occurring at this time.[13] High-salaried teachers were being replaced with low salaried ones. Two-thousand-and-one inevitably saw a large decline, the actual figure being 23.5% as this was the first year the ten-year limitation went into effect (*Table III.7*).

There was naturally a recovery the following year that left the average NYSTRS member contribution at $773. The next four years were essentially downhill. By 2008 the average employee member contribution had fallen to $647 (*Table III.7*).

Between 2000 and 2008, then, the average NYSTRS employee member contribution had fallen 27.2% (*Table III.7*).

The employer average employee contribution, on the other hand, had soared from $1,165 in 1998 to $4,322 in 2008, an almost four-fold increase. In 2000 the average employee was paying 46.9% of the total contribution per employee. By 2008 this figure had fallen to 13.0%. If we take 2007 as being a representative year in a favorable financial climate for the NYSTRS investment portfolio, then we find that the annual increase in employer average employee contribution was 6.8% (*Table III.7*). In terms of payroll, employer contributions to NYSTRS had rise from being between 1.3% and 1.4% of payroll between 1998 and 2000 to 8.6% in 2007 (*Table III.8*).

Courtesy of the State Legislature the cost of teacher pensions has been passed to the New York State property taxpayer.

[12] Calculated from the statistics in *Table III.5*.
[13] An assertion based on research by the author. For data, contact the author.

IV. New York State Teachers' Retirement System Demographics

The New York Teachers' Retirement System (NYSTRS) was certainly correct in thinking that it faced a future problem from an ever increasing number of retirees. Between 1997 and 2007 the number of retirees and their beneficiaries had increased by almost fifty percent, the precise number being 47.1%.[14]

This figure reflects the great teacher retirement wave that occurred between 1997 and 2006. The annual change in the number of retirees and beneficiaries rose from 2.8% in 1997 to 6.7% in 2003. The latter figure reflects a retirement incentive offered that year. By 2007 the annual change in the percentage increase in retirees had fallen back to 2.9% (*Table III.4*).

As is well known Americans retirees are enjoying ever longer life spans. Americans who retired between 1959 and 1961 at age fifty-five might expect to live another 21.37 years. By 2004 this figure had increased to 26.6 years.[15] This is a twenty-five percent increase in longevity and the trend has probably not yet run its course. It can only spell financial Armageddon for public pension plans which have not revised their age of retirement sharply upwards.

The median age of NYSTRS members who retired in the NYSTRS 2006 – 2007 financial year was fifty-seven years and six months. Their median year of service was thirty-one years and seven months.[16] While longevity has been increasing NYSTRS member retirement age has been declining. In the 1978 – 1979 fiscal year the median retirement age was sixty years and four months.[17] As for revising the age of retirement upwards change is likely to come slowly if at all. The Legislature would seriously seem to be considering a bill that would actually lower the years of service required to receive a full pension from thirty years to twenty-five.[18]

To compound the problem of an ever growing number of retirees, the number of active members, that is employees who had not yet retired, increased by 29.2% between 1998 and 2007.[19] Thanks to the munificence of the Governor and the Legislature in 2000 none of these would be contributing to their pensions beyond the first ten years of their service. As we shall see, however, the Legislature is forever, trying to enhance their pensions.

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[14] Calculated from the statistics given in Table III.4.
[15] Arias, Elizabeth, *United States Life Tables, 2004*, National Vital Statistics Report, Volume 56, Number 9, December 28, 2007. Available at:
http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_09.pdf.
[16] New York State Teachers' Retirement System, Annual Report, June 30, 2007, p. 82. Available at: *http://www.nystrs.org/main/library/AnnualReport/Investments.pdf*.
[17] West Genesee Teachers' Association, *WGTA History –The 1970's*, West Genesee Teachers' Association web site, *http://www.wgta.net/seventyhis.html*.
[18] This is bill S05732C. Details can be found at: *http://public.leginfo.state.ny.us/distsen.cgi*.
[19] Calculated from the statistics given in Table III.4.

The increase in new members reflects the decision of school boards to greatly expand their teacher workforces beginning in the second half of the 1990s.[20]

[20] This assertion is based on research by the author. Contact him for the supporting data.

V. Current New York State Teachers' Retirement System Retiree Pensions

The simple estimate of the lifetime pension payout of the average New York State Teachers' Retirement System member can be stated as follows.

A NYSTRS member who retired in the NYSTRS fiscal year of 2006 – 2007 at the median NYSTRS retirement age of fifty-eight with the NYSTRS median pension of $47,281 and who enjoyed the expected life span of a fifty-eight year-old American in 2006 would have been paid a total of $1,410,760 by 2032, their expected year of death.

However, this figure is almost certainly an underestimate for the average NYSTRS member is not the average American.

The median age of retirement for a NYSTRS member in 2006 – 2007 was fifty-seven years and six months. According to the latest United State life tables the expected life expectancy of a fifty-seven to fifty-eight year-old American is twenty-five years. For an American male the figure falls slightly to twenty-three years. For females it rises slightly to twenty-seven years.

There are further variations by race, income and education. A fifty-seven to fifty-eight year-old black male, for example, has a life expectancy of only twenty years.[21] Life expectancy also increases with earnings and education. The gaps between the more and the less educated and the higher and lower earners have been increasing over time.[22]

The New York State teaching workforce is more female than male, highly educated and highly paid. As a consequence the United States life table life expectancy statistics given above for fifty-seven to fifty-eight year olds doubtless significantly understate the probable life expectancy of NYSTRS retirees.

[21] Arias, Elizabeth, *United States Life Tables, 2004*, National Vital Statistics Report, Volume 56, Number 9, December 28, 2007. Available at:
http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_09.pdf

[22] Manchester, Joyce and Julie Topoleski, *Growing Disparities in Life Expectancy*, Economic and Budget Issue Brief, Congressional Budget Office, Washington, D.C. April 17, 2008. Available at:
http://www.cbo.gov/ftpdocs/91xx/doc9104/LifeExpectancy_Brief.1.1.shtml

VI. The Funding Position of the New York State Teachers' Retirement System

In the past two decades the New York State Teachers' Retirement System (NYSTRS) funding ratio has ranged from virtually fully funded to substantially over-funded, based on its own assumptions.

The funding status of the System increased throughout the 1990s along with the stock market. In 1991 the funding ratio was 94.7%. By 1998 it had climbed to 120.0%. The market troubles of that year caused it to retreat to a ratio of 113.8% in 1999, but it then preceded its upward path to peak in 2001 at a ratio of 125.0%.

For the next several years the ratio followed a downwards path until it bottomed out at 98.8% in 2005. By 2007 the funding ratio had recovered to a value of 104.2%. The 2007 figure is the latest one available. These comparisons over time may not be wholly accurate as the NYSTRS has made changes in its actuarial practices during the years under review (*Table III.32*).[23]

Given that by December 2008 the System was down by about just over a quarter from its summer 2007 value and about a third less than the value it should have been by the end of 2008, one can only assume that the NYSTRS is now considerably underfunded even on its own assumptions.[24]

The actuarial funding method used is the aggregate cost method. In this method gains and losses are smoothed over the average future working lifetime of active members. The actuarial asset valuation method is a five-year phased in deferred recognition of the annual actual gain or loss, above (or below) an assumed inflationary gain of 3.0%. Returns, in other words, are averaged over five years.

Various assumptions are made about the future salaries, mortality, working lives, disablement and plan withdrawal of plan members. The most important plan assumption is the rate of return on System investments. This is a nominal return of eight percent and a real return of five percent. The plan thus assumes a long-term inflation rate of three percent.

The key assumption that has enabled the NYSTRS to report itself as being either very largely funded or over-funded has been its assumption of a long-term nominal return of eight percent.

There are those who argue that since pension liabilities are bond-like in character – relatively certain payouts at particular points in time – then the investments that support these liabilities should consist overwhelmingly, indeed, perhaps, wholly of bonds. It would further be argued that the more a portfolio is skewed towards equities and away

[23] *New York State Retirement System Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2008*, p. 86.
[24] For the current state of the NYSTRS investment portfolio, see Chapter XIV.

from bonds, then the more volatile will be its performance. Accordingly then, it will experience considerable periods of both over-funding and under-funding if portfolio performance is smoothed using averages based on figures in the mid to low single digits.

If, as seems likely given the short-term horizons of all the active parties involved, employer and employee contributions are geared to the short-term performance of the portfolio, then there will be wild swings in these contributions. In the periods when a heavily biased equity portfolio is enjoying stupendous returns employer and employee contributions will tend to collapse to nothing. On the other hand in savage equity bear markets these contributions, especially those of employers will to unimagined levels.

As far as school property taxes and school spending are concerned heavily equity laden school teacher pension plans can have three possible consequences. Firstly, there can be inter-generational injustice. Some generations will contribute relatively little to the cost of school employee pensions while other generations will carry an excessive part of the burden. Alternatively, school boards can hold school property taxes constant and use the savings they enjoy from reduced pension fund contributions to increase school spending. The inter-temporal injustice here would be that some generations of school children would enjoy more education than they would otherwise. Finally, there could be a combination of the two.

Given the forces and pressures in New York State public education the second alternative is likely to have prevailed in New York State in the last two decades.

The case for restricting pension plans to bond investments is a strong one. Unfortunately, the already strained fiscal condition of New York State and its taxpayers renders the issue otiose. It will all but fiscally flay school districts and their taxpayers for the NYSTRS to climb out of its current hole let alone replace its equity holdings with bonds.

As to the impact of a lower assumed annual rate of return on the funding position of the NYSTRS we can turn to the calculations of Adams. This author calculated that if the NYSTRS assumed rate of return was that of a thirty year United States Treasury Bond then for the period June 1997 to June 2006 the median NYSTRS funding level would have fallen by almost a fifth to 88.4%.[25]

The question of the likelihood of the currently composed NYSTRS investment portfolio yielding a long-term compound return of eight percent will be discussed in Chapter XVIII.

[25] Douglas Lee Adams, *Tier V: Two Steps Forward for Property Tax Reform, If . . .*, Property Tax Reform Task Force Stone Ridge, New York, Presented to The New York State School Board Association State Legislative Network Issues Conference: Capping the Right Bottle: Cost Containment for Schools 2-4 March 2008 Albany, New York, p. 12.

VII. Post-war Public Pension Fund Portfolio Asset Allocation

Before we can examine the role of the New York State Teachers Retirement System (NYSTRS) in the school employee benefit debacle we need to compare it to its public pension peers and trace the history of public pension fund investing. Only in this context can the performance of the NYSTRS be judged and its impact on school district expenditure and property tax levies evaluated.

The history of public pension funds has been the acceptance of ever greater risk and therefore volatility in the pursuit of ever greater returns. This history has probably been driven by four forces. Rapidly increasing longevity for public retirees combined with static public employee retirement ages and contribution rates. Public employees, depending on if they are firemen, policemen, school teachers or engineers still retire at fifty, fifty-five or, at the latest, sixty-two. Now, however, instead of living into their seventies or eighties they now live into their eighties or nineties. The implications for the returns required of public pension funds are rather obvious.

Secondly, there is the influence of modern portfolio theory which suggests that the risk of holding risky assets can be substantially reduced by holding a portfolio of minimally correlated risky assets.

Thirdly, public employees have increasingly formed unions. These unions in turn have become ever more politically active to the extent that there is now a virtually unstoppable ratchet effect.

This ratchet effect is two-fold. Firstly, the more powerful public sector unions become the easier the public authorities make it for these unions to recruit new members. Secondly, the unions push for a larger public sector: universal kindergarten means more teachers. One of the side effects of the ever increasing power of the public sector unions is the power to press for ever better pension benefits. This naturally pressures the pension funds to increase their investment returns. Unfortunately, as we shall later argue, it also burdens them with a Sisyphusian labor.

Initially public pension funds were wholly risk adverse. In the immediate post-war years they were wholly invested in cash and bonds. It is only very recently that equities have become the predominant investment of choice of public pension funds. Until 1959 bonds accounted for over ninety percent of public pension fund assets (*Table III.53*).

Equities did not register as an asset until 1951 and did not constitute more than ten percent of total portfolio value until 1968. This was also the first year that equities exceeded mortgages as a percentage of public pension fund assets. At this date bonds accounted for three-quarters of public pension fund portfolios (*Table III.53*).

Henceforth the story was of a steady rise in equities as a proportion of public pension fund assets and an equally steady decline in bonds. Still, as late as 1990 bonds amounted

to 51.2% of public pension fund assets and equities only 39.0%. However, 1990 marked the last year of bond predominance (*Table III.53*).

In 1991 bonds collapsed, falling to 43.3% of public pension fund assets while equities jumped to being 46.4%. The great 1990s bull market propelled equities to ever greater heights so that by 1999 equities accounted for 60.5% of public pension fund assets. Bonds, meanwhile, had fallen to 27.6% (*Table III.53*).

At the same time as they were increasing their equity allocations public pension funds were also diversifying into other asset classes. 'Miscellaneous' assets first registered as a public pension fund asset in 1980 when they accounted for 0.1% of fund assets. By 1990 this figure had risen to 1.1%. By 1999, however, it had fallen to only 0.3% (*Table III.53*).

Like the public, public pension funds had also discovered mutual funds. In 1985 mutual fund investments constituted 1.7% of public pension fund assets. By 1999 this figure had risen to 6.1% (*Table III.53*).

It is also worth noting that by the 1990s cash positions had risen significantly. In the 1960s and 1970s cash had usually amounted to little more than one percent of public pension fund assets. Thereafter it began a steady ascent so that by 1992 it hit what was to be its peak of 7.0%. By 1999 this figure had fallen to 4.5% (*Table III.53*).

The equity bear market that marked the start of the new millennium reduced the proportion of equities in public pension funds to 54.7% by 2002 and raised that of bonds to 29.5%. However, neither this setback nor the sight of the NASDAQ losing about three-quarters of its value dimmed public pension fund enthusiasm for equities as opposed to bonds. The mid-decade bull market seemed to confirm this preference and equities hit an all-time high as a proportion of public pension fund assets of 63.2% in 2006 (*Table III.53*).

Bonds, on the other hand, hit their all time low of 23.4% the following year. Equities had slipped a notch to 62.9% as the public pension funds were about to enter a bear market that looks to be a repeat of those of the early 1930s and mid 1970s. Mortgages had fallen to a mere 0.4% of assets while mutual fund holdings had risen to an all time high of 9.4%. Miscellaneous holdings amounted to 0.5% of total assets while cash was 3.4% (*Table III.53*).

The millennium equity bear market had a significant impact on public pension fund investment philosophy. Public pension funds became less optimistic about the returns they might expect from equities and more concerned about their downside risk. The rise in equities as a proportion of the total value of public pension fund investment portfolios in the middle years of the current decade reflected the equity bull market of those years rather than any renewed enthusiasm for equities by the public pension funds

Bonds were not an attractive long-term alternative. While they had performed extremely well in the course of the equity bear market, their yields had fallen to levels not seen in

several generations. Reasonably rated bonds could in no way deliver the investment return of about eight percent to which public pension funds had committed themselves.

Instead, they began to consider alternatives as in the word itself. Public pension funds in other words, began to invest in 'alternative investments'. Such investments are typically defined as investments other than cash, bonds and equities. The latter, not surprisingly go by the name, 'traditional investments.' By this definition public pension funds had long been alternative investors through their real estate investments. However, public pension funds had something very different in mind than real estate when their thoughts turned to alternative investments in the aftermath of the dot com bust. What the term typically evoked at this time was investments in hedge funds, private equity and commodities.

It was on the former two investments rather than the latter that public pension funds were to lavish their billions in pursuit of high returns that were uncorrelated with their traditional investments.[26]

[26] Business Week, *Can Retirees Afford This Much Risk? Public pensions may have grown addicted to high-risk alternative investments*, September 17, 2007 and United State Government Accountability Office, *Defined Benefit Pension Plans. Guidence Needed to Better Inform Plans of the Challenges and Risks of Investing in Hedge Funds and Private Equity*, August 2008, pp. 20-21. Available at: *http://www.gao.gov/new.items/d08692.pdf*

VIII. Public Pension Funds and Alternative Investments

The case for including private equity and hedge funds in a public pension fund investment portfolio was far from evident.

Private Equity

To begin with the academic research was generally not supportive. Some studies suggested that public pension private equity investments performed poorly and questioned the supposed diversification benefits of private equity. One study even suggested that pension fund managers were naïve investors. As such they were as susceptible as the little regarded mutual fund investing public to chasing past performance and ungrounded euphoria and pessimism. They thus tended to buy at the top and sell at the bottom. A casual reading of the business press would over the last few years would seem to substantiate this interpretation.

There was also the problem that alternative investment was at the time when it became popular an active investment strategy rather than a passive one. In line with their embrace of modern portfolio theory public pension funds are very largely passive investors. Rather than trying to achieve above average returns they tend to invest in market indices and settle for the market return.

Research study after research study has shown that virtually all active investors fail to outperform the market averages over long periods of time. The likelihood that a pension fund manager could firstly identify an investment manager who would in the future outperform the market; secondly recognize largely before the fact when this investor would fail to outperform the market; thirdly continually repeat this exercise is absurdly low.

Until very recently there have been no private equity indices by means of which public pension funds could reap the market return to private equity investing. Instead, public pension funds had to choose between the very many private equity funds. The returns for choosing correctly were very high. On the other hand, the losses for choosing wrongly could be catastrophic.

The range of returns between the best performing private equity firms and the worst performing was very large. It was much larger in fact than the range between the best and worst performing mutual funds. Clearly, half of private equity investors were going to have below average returns and many of these below returns were going to be very below average. Private equity investing seemed to require as much hubris as confidence.

If the median or average private equity fund significantly outperformed the S&P 500 and the Russell 2000 the wide spread between the best and the worst performing private equity funds would be irrelevant. This, however, is, as we shall see, not the case.

If we look at the Venture Capital private equity database we find that for the bottom quartile of the United States venture capital private equity universe for all but five of the fifteen years 1990 to 2004 the internal rates of returns were decidedly negative. The median rate of return were quite positive between 1990 and 1998 but were negative for the remaining six years of the period under study. Even the upper quartile had four years of negative returns and two years of zero returns. The years of negative and zero returns were those of the millennium bear market (*Table III.62*).

United States buyout private equity shows a more promising picture, at least for median and upper quartile returns. As with venture capital, the bottom quartile of buyout private equity firms performed poorly, showing negative internal rates of return for all but four years. However, the median rate of return was negative for only three years and the upper quartile saw only one year of negative internal rate of return (*Table III.62*).

It should be noted that the above statistics are for quartiles by year. The same fund could be in the top quartile one year, the third quartile the next and the bottom quartile the following year. While there is considerable consistency in private equity fund performance it is only that: considerable. Even the best known and best performing managers have funds in the third and second quartiles.[27]

The above analysis speaks only to the comparative performance of private equity funds to one another. There is also the question of the performance of private equity vis-à-vis public equity. If we use the Cambridge Associates Private Equity index we find that for the period 1987 to 2007 private equity outperformed the S&P 500 for thirteen of these twenty-one years (*Table III.58*). However, four of these years include the 2004 to 2007 private equity bull market which skews the comparison.

Another comparison we can make is for long-term performance at the end of 2004. This is the first year after the end of the private equity millennial bear market and two years after the end of the public equity millennial bear market. Before we proceed, though, it should be noted that we are using a different private equity database, that of Venture Economics.

From this perspective private equity investing shows little advantage over public equity investing. The twenty year annualized rate of return for private equity was 13.8% which was a mere six basis points above that for the S&P 500. The returns for venture, buyout and mezzanine private equity were 15.7%, 12.8% and 9.3%, respectively (*Table III.59*).[28]

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[27] Pension & Investments, *What's in a name? A-list private equity firms not giving top-of-the-line returns; Report: well-known firms have many funds in 2nd or 3rd quartiles*, February 9, 2004.

[28] Kaplan and Schoar also found no difference between private equity and S&P 500 returns. See, Steven N. Kaplan and Antoinette Schoar, *Private Equity Performance: Returns, Persistence and Capital Flows*, MIT Sloan Working Paper No. 4446-03; AFA 2004 San Diego Meetings, November 2003. Available at: *http://ssrn.com/abstract=473341 or DOI: 10.2139/ssrn.473341*. See also, Steven N. Kaplan and Per Stromberg, *Leveraged Buyouts and Private Equity*, NBER Working Paper No. 14207, July 2008, p. 22. Available at: *http://www.sifr.org/PDFs/KaplanStromberg(JEP2008).pdf*.

As an absolute return strategy private equity would appear to have little to recommend it. Its benefit would seem to rest wholly on its correlation or rather lack of correlation with public equity. There is indeed a very low correlation between public and private equity.[29] Yet as Manyem aptly remarks:

> *. . . it is important to note that the standard deviation of private equity is the highest among all asset classes according to Venture Economics with standard deviation as high as 28% for an equivalent return of 18%. This high standard deviation indicates the high risk associated with this asset class and the importance of due diligence in manager selection.*

It should not be hard to spot the flaw in this argument or at least in any argument that counsels public pension funds to invest in private equity with the proviso that they must only do so if they can invest with a skilled manager or a manager in the top quartile of fund performers. Skill by the very meaning of the term is a scarce resource. There is only so much of it. The number of public pension funds and the investment dollars at their disposal must surely exceed by a very large factor both the number of skilled managers and the number of funds in the upper quartile of private equity fund performers. The sums pension fund managers would like to commit to private equity are also likely to exceed the sums that can profitably be invested.

The rush of public pension fund money into private equity, and hedge funds, too for that matter, is nothing more than an all too familiar financial story. Like all too familiar financial stories it too ended in tears.

There was indeed evidence of a bubble forming in private equity in the mid 2000's. The private equity headline news was of spectacular returns. The top quartile of private equity funds had delivered annualized returns of 39.1% between 1980 and 2005. Inevitably, then:

> *. . . capital has continued to flow into these firms and the best ones have been able to raise larger funds, which, in turn, enable them to acquire larger companies than in the past. Five years ago, a $6 billion fund would have been among the largest around. Today, the top firms routinely raise more than that. These firms include Apax Partners, Apollo Management, Bain Capital, the Blackstone Group, the Carlyle Group, Hellman & Friedman, Kohlberg Kravis Roberts (KKR), Providence Equity Partners, Silver Lake Partners, Thomas H. Lee Partners and TPG Capital (formerly known as Texas Pacific Group). Together these 11 firms, and a handful of others, rapidly are emerging as the industry's winners, delivering superior*

[29] Sridhar Manyem under the direction of Professor Steven Kaplan, *Effect of Investment Focus and Manager Selection in Private Equity Returns*, October 8, 2002, University of Chicago Graduate School of Business, pp. 4 and 6. Available at:
http://www.altassets.com/pdfs/GSB_Private_Equity_Study.pdf.

> *returns while deploying half or more of all private equity capital invested in the last five to seven years.*[30]

The question would be if these firms would be able to deploy the vastly larger sums they now enjoyed as profitably as they had the much smaller ones in the past. The money seeking profitable private equity opportunities might well come to exceed the number of profitable private equity opportunities. A casual reading of the recent press suggests that the answer to the question just posed was no.

The industry mouthpiece itself explains the matter nicely in its attempted refutation of the charge that private equity returns flow from financial rather than managerial engineering:

> *Recent data from SDC, Factiva and Auction Block show that there are, on average, more than four bidders for each transaction valued between $1.5 and $2.5 billion and more than five bidders for larger ones. These "auctions" between multiple buyers are now the way in which 80 percent of all companies valued at more than $500 million are bought and sold. In this new and intensely competitive environment, the use of efficient capital structures is still important. However, whatever upside there may be in financial engineering is fully known and fully priced into every player's initial bid. In other words, a strategy of simply adding more debt to an "underleveraged" balance sheet—which once might have allowed PE firms to realize substantial gains from a company with only modest performance improvements—no longer works. This is analogous to the value of a good school district being well-known and already priced into the home values in a neighborhood.*[31]

In other words in efficient capital markets such as those of the United States excess returns are quickly eroded by competition leaving nothing but risk. Just as the returns from leverage became known, copied and priced into the values of private equity target companies such that the excess returns due to leverage would vanish, so too would the excess returns in private equity itself. Ultimately, it is difficult to see why private equity should have any higher return than public equity especially give the high fee and expense structure of private equity funds.

As they increased their private equity allocations in the 2000's public pension funds were assuming increased risk with diminished prospect for reward. The denouement was as inevitable as it was brutal.

By 2007 the private equity market was awash in money. The debt markets were lending to private equity firms and funds at lower rates, allowing more leverage and virtually eliminating conditions. In effect they were giving their money away and seemed to care

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[30] *Public Value: A Primer on Private Equity*, Private Equity Council, 2007, p. 12. Available at: *www.privateequitycouncil.org/wordpress/wp-content/uploads/pec_primer_layout_final-1.pdf*

[31] Ibid, p. 13.

little if it was returned.[32] Shareholders soon realized that they did not have to sell to the first leveraged buyout firm so company prices were bid up to large premiums. Soon private equity firms were trading companies between themselves.[33]

In 2006 the value of leveraged buyouts was about eight times what it was only four years previously. Similarly, the ratio of cash purchase price to cash flow had risen by a factor of three.[34].The numbers were no longer adding up. Private equity companies metamorphosed into public companies. The irony was lost on a gullible investing public. Unkind people suggested that private equity firms like Fortune and Blackstone were very much aware that a bubble was forming. Their issuance of shares was simply a way of extracting value while they could.[35] Still, the institutions, public pension funds included, continued to throw money into what was rapidly becoming a funeral pyre built of hope and delusion.

Public pension funds have the misfortune of being the eight hundred pound gorilla or rather the stampeding elephant herd of the investing world. Wherever they herd they perforce drive down yields and returns. As they throw money at an asset class that has experienced above average returns either historically for that asset class or as risk adjusted returns for that asset class compared to other asset classes they drive down returns.

For it is a fundamental of competitive markets, and the United States financial markets are nothing if not competitive, that excess returns are competed away. Indeed they are more than competed away as the Gardarene like rush into fashionable asset classes inflates values to bubble levels. The stage is thus set for a price collapse.[36] The unfortunate fact is that investments in private equity in boom periods have below average returns.[37]

Hedge Funds

What has been said about private equity investing is even truer of hedge fund investing. As the example of Long Terms Capital Management proved hedge funds are inherently speculative whether their métier is quantitative arbitrage or directional bets based on suppositions about government reactions to economic and financial events. The relevant concept is not so much volatility as risk of ruin.

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[32] Boston Globe, *Private Equity Debt Bubble*, May 1, 2007. Available at: *http://www.boston.com/business/articles/2007/05/01/private_equity_debt_bubble/*.
[33] Fortune, *The Private Equity Bubble*, August 7, 2007. Available at: *http://money.cnn.com/2007/08/06/markets/privateequitybubble.fortune/index2.htm*.
[34] Ibid.
[35] Financial Times, *Why the Blackstone offer may signify a Bubble*, March 27, 2007.
[36] For examples of excess returns being extinguished through competition see, Hilary Till, and Jodie Gunzberg *Survey of Recent Hedge Fund Articles. Version: 9/5/05*, p.2 . Internet version of an article that appeared in the *Journal of Wealth Management*, Winter 2005 edition. Available at : *http://fmg.lse.ac.uk/upload_file/514_H_Till.pdf*.
[37] Steven N. Kaplan and Per Stromberg, *Leveraged Buyouts and Private Equity*, NBER Working Paper No. 14207, July 2008, pp. 27 - 28. Available at: *http://www.sifr.org/PDFs/KaplanStromberg(JEP2008).pdf*.

At the purely speculative end of the hedge fund world, hedge fund investing is very clever men battling other very clever men. Or, as we now know from the recent Madeoff affair, crooks running Ponzi schemes. There are of course academic studies that suggest that hedge funds are appropriate investments for prudent and rational investors such as public pension funds.[38] Yet public pension funds hedge fund investing raises the same problems as does public pension fund private equity investing.

To the extent that public pension funds invest in fund of funds either because they seek market returns or cannot afford the in-house staff needed to screen hedge fund managers, they are forced into the sub-standard fund of funds strategy.[39] Hedge fund investing is essentially what is called an 'alpha' strategy. The returns should derive from the skill of the hedge fund manager rather from the market or the hedge fund strategy being pursued. The latter is described as a 'beta' strategy or return.

The confusion of beta returns with alpha returns is common enough in hedge fund investing for it to have a specific name: selling beta as alpha.[40] Stripped of their quantitative sophistication some hedge fund asset classes are no more than such classic investment strategies as borrowing short and lending long. The hedge fund contribution to this strategy is the liberal use of leverage. In other words the hedge fund investor is being paid to bear risk, in the case of a short-long strategy, for example, that the hedge fund manager can exit the market before short term interest rates rise sufficiently to erase his position.[41]

The problem with investing in the innumerable hedge fund asset classes is that their strategies admit of easy replication with the result that their excess returns are soon competed away.[42] Often losses result as too many players pursue too few opportunities.[43]

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[38] See, for example, Peng Chen, Barry Feldman and Chandra Goda, *Portfolios with Hedge funds and Other Alternative Investments. Introduction to a Work in Progress*, July 16, 2002, Ibbotson Associates. Available at: http://www.edge-fund.com/ChFG02.pdf.

[39] The Wall Street Journal, *Yale's Investor Keeps Playbook*, January 13, 2009.

[40] Greg Jensen, Noan Yechiely and Jason Rotenberg, *Hedge Funds Selling Beta as Alpha (An Update)*, Bridgewater Daily Observations, May 24, 2005. Available at: *http://www.bwater.com/Uploads/FileManager/Bridgewater_Daily_Observations/bwpm052405revised.pdf*.

[41] This analysis is derived from the discussion in Greg Jensen, Noah Yechiely and Jason Rotenberg, *Hedge Funds Selling Beta as Alpha (An Update)*, Bridgewater Daily Observations, May 24, 2005. Available at: *http://www.bwater.com/Uploads/FileManager/Bridgewater_Daily_Observations/bwpm052405revised.pdf*

[42] Edwards and Gaon report twenty-four types of hedge fund strategies. See, Franklin R. Edwards and Stav Gaon, *Hedge Funds: What Do We Know?*, Journal of Applied Corporate Finance, Volume 15, April 2005. Available at: *http://www.docstoc.com/docs/13400/Hedge-Funds-What-do-we-know*. The MSCI database is now said to maintain over 140 hedge fund indices. See, Hilary Till, *On the Role of Hedge Funds in Institutional Portfolios*, p. 15. Internet version of an article that appeared in the Spring 2004 issue of *The Journal of Alternative Investments*. Available at: *http://www.premiacap.com/publications/HedgeFunds_0903.pdf*.

[43] Hilary Till, *On the Role of Hedge Funds in Institutional Portfolios*, p. 21. Internet version of an article that appeared in the Spring 2004 issue of *The Journal of Alternative Investments.* Available at: *http://www.premiacap.com/publications/HedgeFunds_0903.pdf*; Hilary Till, and Jodie Gunzberg *Survey of Recent Hedge Fund Articles. Version: 9/5/05*, p.2 . Internet version of an article that appeared in the *Journal of Wealth Management*, Winter 2005 edition. Available at:

As with private equity the range between the best performing and the worst performing hedge funds is large.[44] It is all well and good for the proponents of 'pure alpha' like Bridgewater Associates to argue that:

> *The other way to make money in financial markets is by taking it away from other market participants. This is known as* ***alpha****.* ***Alpha is a zero-sum game****. For every buyer there is a seller, and so for every alpha trade, there is a winner and loser . . .* ***Only investors who are smarter than the markets will be able to reliably provide alpha***
>
> *Finding managers who can consistently beat other market participants is certainly a daunting challenge, but in our view, it is necessary and unavoidable. The skill is rare, and therefore, the price of alpha is reasonable high* (emphasis in the original).[45]

Yet since the skill is rare there will undoubtedly be many who will fail to avail themselves of its purveyors. One cannot but feel there will be many losers and few winners. One must also wonder if skill has it limits. For it surely requires opportunities and opportunities might well be limited. Skilled managers may only be able to invest so much money. As the money under their management grows their performance might wane. Fearing this they may set limits on the money they are willing to manage.[46] There is certainly evidence that hedge funds that pursue alpha strategies have problems maintaining performance as the money they manage grows larger.[47]

A public pension fund seeking a skilled alpha manager would seem then to face not merely a daunting task, but a near impossible one. On the one hand there are the known skilled managers. Here there are two possibilities, neither of which is good for the public pension fund manager. The skilled hedge fund manager who can deliver alpha returns has

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http://fmg.lse.ac.uk/upload_file/514_H_Till.pdf; Oliver Weidenmuller, *Capacity Constraints in the Hedge Fund Industry Revisited*, March 3, 2008. Available at: *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1101741*.

[44] Jackson Chan, *Hedge Fund Seminar. The Use and Selection of Hedge Funds (fund of funds in particular)*, October 5, 2002, Watson Wyatt Worldwide. Available at: *http://www.actuaries.org.hk/upload/File/HF02_UseofHF.pdf* and Watson Wyatt Worldwide, *Investment Quarterly*, Ireland, Spring 2007, p. 7.

[45] Greg Jensen, Noah Yechiely and Jason Rotenberg, *Hedge Funds Selling Beta as Alpha (An Update)*, Bridgewater Daily Observations, May 24, 2005. Available at: *http://www.bwater.com/Uploads/FileManager/Bridgewater_Daily_Observations/bwpm052405revised.pdf*

[46] For this argument see, Hilary Till, *The Capacity Implications of the Search for Alpha*. Except from an article that originally appeared in the Spring 2004 issue of the *Journal of Alternative Investments*. Available at: *http://www.premiacap.com/publications/AIMA_0604.pdf*. Note also the comments in Hugh Cutler, Gareth Derbyshire, Craig Gillespie, Robert Howie, Shyam Mehta, Michael O'Brien,Thomas Paxton, Greg Wright, *Hedge Funds for Pension Funds*, The Applications of Institutional Investments Working Party, 2001 Investment Conference, Faculty of Actuaries and the Faculty of Actuaries Institute of Actuaries, p. 33 Available at: *http://www.actuaries.org.uk/__data/assets/pdf_file/0016/26314/cutler.pdf* and Alexander M .Ineichen, *Absolute Returns. The Risks and Opportunities of Hedge Fund Investing*, 2002, pp. 402 – 405.

[47] Oliver Weidenmuller, *Capacity Constraints in the Hedge Fund Industry Revisited*, March 3, 2008, p. 20. Available at: *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1101741*. See also,

decided that he can only manage so much money and has decided to take on no new clients. Alternatively, he cannot resist the lure of six percent administrative fees and twenty percent of any profits he might generate from any new money he accepts. The public pension fund now has access to a skilled hedge fund manager but now runs the risk that this manager may be unable to invest the much larger sums he now manages as profitably as the much smaller sums he previously managed.

On the other hand the public pension fund must identify the skilled manager before his skills are widely recognized. All one can say to this possibility is good luck with that. Public pension fund managers who have such skills will not long be employed by pension funds. They will soon be working for hedge fund funds of funds either as employees or principals.

Generally, one can conclude that the likelihood that the majority of public pension funds can successfully gain alpha returns by investing in hedge funds is extremely low. Some of course will do it. Then again, someone will win the lottery. That someone might even use a computer to make complex calculations about past lottery winning number combinations. For both the public pension and the lottery winner computer users all that will have been displayed is what goes by the term 'luck'.

As with private equity, hedge funds were in a bubble by the middle years of the current decade. To quote the New York Times, by 2005 hedge funds were "sprouting like weeds" as a "flood of money" poured into the sector and "small groups of very young people made eye-popping sums of money."[48] Between 1998 and early 2007 the number of hedge funds tripled from three thousand to nine thousand while the money under management grew from two hundred billion dollars to two trillion dollars.[49] It seems doubtful than the opportunities for investing this much money successfully had increased by the same degree. More likely the exploding number of hedge funds was competing away the very market inefficiencies upon which many of them depended for their profits.

It could only end in tears.

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[48] The New York Times, *How This Boom Differs From the Dot-Com Days: Hedge Funds Make Money*, July 6, 2007. Available at: *http://www.nytimes.com/2007/07/06/business/06insider.html?_r=1&ex=1184299200&en=00b54a5424ea7685&ei=5099&partner=TOPIXNEWS*. Amazingly the Times determined there was no bubble. Then again The Times is famous for misinterpreting its stories, most famously as in, "Prison population keeps rising even as crime falls", or words to that effect.

[49] United State Government Accountability Office, *Defined Benefit Pension Plans. Guidence Needed to Better Inform Plans of the Challenges and Risks of Investing in Hedge Funds and Private Equity*, August 2008, p. 8. Available at: *http://www.gao.gov/new.items/d08692.pdf*

IX. Alternative Investments in the Real World

The academic studies and considerations that suggested a commitment to private equity were, well, academic when considered against the real world success of several university endowments that had taken large positions in alternative investments. Institutional investment in alternative investments had been pioneered by university and college endowments led by Yale, Harvard, Princeton, Williams and Amherst.

They were soon followed by their peers. By 2001 university and college endowments with assets of one billion dollars or more had allocated twenty-nine percent of their portfolios to alternative investments. Those with between half a billion and a billion dollars had allocated eighteen percent.[50] By 2006 endowments had committed thirty-nine percent of their portfolios to alternative investments.[51]

For some endowments the returns had been nothing short of spectacular. The Yale University Endowment which was directed by a manger famous for his espousal of non-traditional investments, not only enjoyed a return of 41.0% in 2000 when the equity markets entered into what was to be a vicious three year bear market. In the next three years when the S&P 500 was suffering double digit losses it had returns of 0.7% and 9.2%.[52]

By the middle years of the decade Yale could boast of a ten year annualized return of 17.2% while the Harvard University endowment had enjoyed a 15.2% ten year annualized return. Nor were alternative investments the exclusive prerogative of the Ivy League universities. The University of Virginia sailed through the millennium market meltdown thanks to its alternative investments. A 43.8% return in 2000 was followed by returns of 2.0%, and -0.1% in 2001 and 2002, respectively.[53] The comparable returns on the S&P 500, beginning with the year 2000 were -9.1%, -11.9% and -22.1% (*Table III.58*).

At the end of 2000 the University had only forty percent of its endowment in bonds and equities.[54] By 2003 about seven out of every ten endowment dollars were being committed to alternative investments.[55] In 2006 the University had the largest

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[50] The Chronicle of Higher Education, *Agency Urges Caution on Risky Investments*, August 10, 2001.
[51] Yale Daily News, Univ. leads in investing, January 19, 2007. For the lemming like rush to the cliff see, The Chronicle of Higher Education, The Boom in Alternative Investments. Charities and colleges put more of their money into hedge funds, private equity, and other assets once considered esoteric, June 2, 2006, available at: *http://chronicle.com/weekly/v52/i39/39b00101.htm*
[52] For Yale University, see, Yale University endowment reports for 2000 to 2007 at: *http://www.yale.edu/investments/*.
[53] The Chronicle of Higher Education, *$2-Billion Is No Longer 'Icing on the Cake'*, May 28, 2004. Available at: *http://chronicle.com/weekly/v50/i38/38b01801.htm*.
[54] University of Virginia Financial Report 1999–2000. University Endowment. Available at: *http://www.virginia.edu/president/report00/endowment.html*.
[55] The Chronicle of Higher Education, *$2-Billion Is No Longer 'Icing on the Cake'*, May 28, 2004. Available at: *http://chronicle.com/weekly/v50/i38/38b01801.htm*

commitment of any endowment to hedge funds: 51.7% of its portfolio was now committed to this asset class.[56]

The University had come a long way in a decade. In 1997 the President was reporting that:

> *The finance committee of the Board of Visitors has determined that an investment mix of 75 percent stocks and 25 percent bonds strikes a good balance between the prospects for stability and growth. Capital market history suggests that, over the long-term, this mix will produce a real, inflation-adjusted average annual return between 4 and 5 percent. The spending policy set by the board adopts the notion that this long-term expected real return is the sustainable spending rate, and expects distributions from the endowment to fall between 4 and 5 percent of the previous year's ending market value. To provide predictability, the board has set the growth rate in distributions at 4 percent per year, but will consider making an adjustment if the spending rate produced by the 4 percent increase falls outside a range of 3.5 and 5.5 percent of the previous year's ending market value.*[57]

If a historian wants to chart the financial mania of the early twenty-first century the University of Virginia endowment would be a good place to start.

Overall, as of June 2006 endowments with assets greater than one billion dollars had a ten year annualized return of 11.4%. For those with assets of twenty-five billion or more the return was even higher being 14.8%.[58] The comparable figure for state pension funds with one billion dollars or more in assets was only 8.3%. The average alternative investment allocation of the endowment funds with more than one billion dollars in assets was 41.4%. For those with more than twenty-five billion dollars in assets the commitment was 52.5%,[59]

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[56] Dow Jones news report. Available at: *http://www.cgml.co.uk/blog/archives/industry_news/index.html*.

[57] University of Virginia, President's Report 1996-97, *Endowment Spending Policy*. Available at: *http://www.virginia.edu/president/presidentsreports/97/Spending.html*
It inevitably ended in tears and recriminations. By the end of 2008 the University of Virginia was reporting not merely large losses in the third and fourth quarter 2008 financial meltdown. It also faced the prospect of selling equities at a loss to meet commitments it had made to its alternative investments partners. Local newspapers and bloggers were penning critical pieces on the University investment strategy that quoted 'Wall Street observers' as saying the University had a fetish for risky investments. The University President tersely rejected what he termed "ill-informed stories in the press and in blogs" about the University of Virginia investment strategy. See, The Chronicle of Higher Education, *U. of Virginia Takes Heat for Its Investment Strategy*, November 28, 2008. Available at: *http://chronicle.com/weekly/v55/i14/14a01804.htm*.

[58] Frontier Capital Management, *Investing Like the Harvard and Yale Endowment Funds. A Research Article by Frontier Capital Management LLP*, April 2007. Available at: *http://www.seasholes.com/files/Frontier_-_Investing_like_Harvard_and_Yale.pdf*

[59] Ibid.

Equally significant for the public pension funds had been the performance of alternative investments during the turn of the century bear market. They had not emerged unscathed from the millennium collapse. The actual performance of endowments that had made significant commitments to alternative investments had actually been quite mixed.[60] However, as an asset class alternative investments had fared much better than equities.

In 2000, 2001 and 2002 the S&P 500 had suffered losses of 9.1%, 11.9% and 22.1%, respectively, before recovering with a performance of 28.7% in 2003. The total bear market decline between 1999 and 2002 was 37.6%. The strong 2003 recovery still left the index down by 19.7%. Private equity, on the other hand, saw a gain of 46.7% in 2000 followed by losses of 13.9%, 6.3% and 7.4% in 2001, 2002 and 2003, respectively. Its overall performance between 2000 and 2003 was a gain of 9.6%.[61]

The other major alternative investment, hedge funds, turned in an even better performance during the dot come meltdown. The 2000 performance of the CISDM equal weighted hedge fund index was far from stellar being only 8.8%, but it did follow a 1999 return of 36.8%. However, unlike private equity hedge funds as a whole saw no down years between 2001 and 2003. The actual returns were 5.7% in 2001, 0.4% in 2002 and 20.6% in 2003. Between 2000 and 2003 the CISDM equal weighted hedge fund index had appreciated in value by 28.0%. The CISDM fund of funds index had not done as well but it was still up 17.2%, a return that far surpassed the 11.7% loss that the S&P 500 experienced in these years (*Table III.68*).

The conclusion must have seemed obvious to state pension funds. A substantial alternative investment portfolio allocation could significantly reduce downside risk as well as significantly increase returns.

Ironically though, one of the pioneers of institutional alternative investments had effectively cautioned against it. David Swenson was the chief financial officer of the Yale University endowment. This had made him something of a superstar in the world of institutional investing. In 2000 he published a widely praised book on investment management.[62]

Amongst the topics he discussed was private equity investment. He made the point that risk adjusted private equity returns were not that impressive. It was only the top-tier funds that outperformed the large capitalization funds in which institutional funds usually invested. If pension fund managers read his book they certainly did not grasp the implications of his analysis of private equity investing.

Instead public pension funds entered into a fatal embrace with alternative investments. In 2005, just 13 percent of all public pension funds invested in hedge funds. By 2008 this

[60] The Chronicle of Higher Education, *Wealthiest Colleges Lost Billions in Endowment Value in Last Year. Average return is likely to be negative for first time since 1984*, October 19, 2001
[61] The statistics quoted in this paragraph are calculated from the figures in Table III.58.
[62] David F. Swenson, *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment*, New York, 2000.

figure had in increased to forty percent.[63] The epitome of march of folly and probably the sign that the denouement was at hand was the decision of the South Carolina retirement system to invest as much as forty-five percent of its twenty-nine billion dollar investment portfolio in hedge funds, private equity, real estate, and other non-traditional pension fund assets. Only eighteen months before adopting the policy the South Carolina retirement system had made no investments in these non-traditional pension assets.[64]

> *There are ways for us with some legislative help to have an even more flexible and smarter strategy of investments that we think in the long run will help us to grow the fund in the right kind of direction.*[65]

The sign that madness had gripped the public pension funds was this report:

> *The Houston Firefighters' Relief & Retirement Fund faced a dilemma familiar to pension funds across the country. With benefit costs rising, the fund was being forced to pay out more money than it was taking in. To ease this problem, the Houston Firefighters' Relief & Retirement Fund's chief investment officer, Christopher Gonzales, made a move last year he hadn't seriously considered before: He decided that the $2 billion fund would bet on the currency markets. "We needed extra income," Mr. Gonzales explains.*[66]

As for the future one recent, 2008, prognosis for leverage-buyout private equity is that:

> *at least 20 percent of the 100 largest leveraged-buyout (LBO) private-equity firms – and possibly as many as 40 percent – could go out of business within two to three years. More disturbingly, most private-equity firms' portfolio companies are expected to default on their debts, which are estimated at about $1 trillion.*[67]

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[63] The New York Times, *Public Pension Managers Rethink Hedge Fund Ties*, April 15, 2009.
[64] Ibid.
[65] Newsday, DiNapoli says NY pension fund down 20 percent, February 3, 2009
[66] Nicole Gelinas and E. J. McMahon, *The Biggest Public Pension Investment Policy Shift You've Probably Never Heard Of*, fn. 5, Fiscal Watch Memo, Manhattan Institute Empire Center for New York State Policy, June 13, 2005. Available at: *http://www.nyfiscalwatch.com/html/fwm_2005-06.html*.
To date Mr. Gonzales would still seem to be searching for that "extra income". As of June 30, 2008, the three-year annualized return on the Houston Firefighters' Relief and Retirement Fund alternative investments was a measly 5.4%, ill reward given the risk involved. See: *Houston Firefighters' Relief and Retirement Fund 2008 Report to Members. Fiscal Year – June 30 2008*, p 7. Available at: *https://www.hfrrf.org/HFRRF/uploadedFiles/Administration/2008%20Member%20Report%20-%20Production%20Final.pdf*.
[67] Heino Meerkatt and Heinrich Liechtenstein, *Get Ready for the Private-Equity Shakeout. Will Be the Next Shock to the Global Economy?*, NP, December, 2008, Boston Consulting Group and IESE Business School, University of Navarra. Available at: *http://www.bcg.com/impact_expertise/publications/files/Get_Ready_Private_Equity_Shakeout_Dec_2008.pdf*

Two public pension funds even managed to find themselves invested with Bernie Madoff, the hedge fund Ponzi king.[68] Once again the New York State funds controlled by the State Comptroller showed how the appointment of outside money managers which was inevitable with alternative investments gave rise to corruption and pay-to-play schemes. Alternative investment managers were being hired not so much for their investment acumen as for the campaign contributions and payoffs they made to the Comptroller and his consultants.

One can expect to hear many more unhappy stories of the failed love affair between public pension funds and alternative investments in the next few years. As one commentator puts it of the 2005 to 2007 private equity boom:

> *It seems plausible that the ultimate returns to private equity funds raised during these years will prove disappointing because firms are unlikely to be able to exit the deals from this time period at valuations as high as the private equity firms paid to buy the firms. It is also plausible that some of the transactions undertaken during the boom were less driven by the potential of operating and governance improvements, and more driven by the availability of debt financing, which also implies that the returns on these deals will be disappointing.*[69]

[68] Reuters, *Two U.S. pension funds see $52 Mln Hit from Madoff*, December 15, 2008. Available at: *http://www.reuters.com/article/governmentFilingsNews/idUSN1552227920081216*.

[69] Steven N. Kaplan and Per Stromberg, *Leveraged Buyouts and Private Equity*, NBER Working Paper No. 14207, July 2008, p. 30. Available at: *http://www.sifr.org/PDFs/KaplanStromberg(JEP2008).pdf*.

X. The New York State Teachers' Retirement System Investment Strategy

In the management of its investment portfolio the New York State Teachers' Retirement System Investment Strategy (NYSTRS) has followed the same basic strategy as its fellow public pension funds. In short it has embraced the two basic tenets of modern investment portfolio theory. Firstly, the markets reward only risk with risk being measured by the volatility of periodic returns. Secondly, the risk of failing to achieve a specified rate of return can be minimized through diversification within and between asset classes.

The main difference between the NYSTRS and its fellow public pension funds is the aggressiveness with which it has pursued this strategy. For at least in terms of its allocation to equities the NYSTRS has one of the most aggressive investment strategies of United States state public pension funds.

In 2006 the median equity holding of these funds was 61.2% while the average was 58.7%. The NYSTRS, in contrast, had 70.4% of its holdings invested in equities. This was but ten percentage points short of the maximum holding of 80.4% and six percentage points higher than the seven-fifth percentile holding of 63.8% (*Table III.31*).

Of its immediate peers – the five largest state pension funds - the NYSTRS had the largest commitment to equities. These funds ranged from the NYSTRS with assets of $91 billion to the California Public Retirement Fund with assets with a market value of $212 billion in 2006. The NYSTRS was the sixth largest state pension fund in 2006. The equity allocation of these funds ranged from a low of 61.2% for the California Public Employees Retirement Fund to a high of 69.9% for the Florida Retirement System (*Table III.31*).

As we shall shortly see the NYSTRS had a noticeably lower commitment to alternative investments than did the five largest funds. Yet even when we combine equities and alternative investments to create a crude measure of investment aggressiveness, the NYSTRS still emerges as the most aggressive of the six largest funds. In 2006 the NYSTRS had three out of every four dollars invested in either equities or alternative investments. Only the Florida Retirement System came close to this. The other four funds had between 66.9% and 70.3% invested in equities and alternative investments (*Table III.31*).

For those state pension funds with assets with a market value of $40,000,000,000 or more in 2006 the NYSTRS had the largest equity allocation. The median equity commitment for these sixteen funds was 62.9% and the seventh-fifth percentile was 65.9% (*Table III.31*).

Conversely, the NYSTRS had one of the lowest bond holdings of state pension funds in 2006. The median bond commitment for these funds was 24.1% with the twenty-fifth percentile being only two percentage points lower at 21.8%. The NYSTRS in comparison committed only 12.7% of its portfolio to bonds (*Table III.31*).

For the universe of large funds – those with assets with a market value of $40,000,000,000 or more – the median bond holding was 22.3%.but the twenty-fifth percentile was only 15.5%. Amongst its immediate peers, the five largest funds, the NYSTRS was again an outlier on the left side of the distribution. The median bond holding was 22.3% for this group while the maximum was 36.8%. As we have previously noted the corresponding NYSTRS figure was only 12.7% (*Table III.31*).

Well might the NYSTRS say of its investment philosophy that:

> *Generally, our liabilities will not be paid for as many as 70 years. Therefore, as a long-term investor, our holdings can withstand some short-term volatility.*[70]

The NYSTRS also stood out amongst state public pension funds for its commitment to real estate. For all funds the median real estate allocation was 6.0% and the average was 6.1%. The seventy-fifth percentile was 8.3%. The NYSTRS allocation of 10.6% was considerably in excess of this. The allocation profile of the large funds, defined as those with assets with a market value of $40,000,000,000 or more was little different from that of all funds for real estate. (*Table III.31*).

Once again, though, as for equities, the NYSTRS stood out from its immediate peers. The real estate asset allocation of the five funds that were larger than the NYSTRS ranged from 0.2% to 7.4%. Two of these five funds had real estate allocations of 4.7% and 4.9%, respectively and another two had allocations of 7.2% and 7.4%, respectively (*Table III.31*). As just noted, the NYSTRS allocation was 10.6%.

Only as far as alternative investments were concerned did the NYSTRS take a moderate portfolio position. The median allocation to alternative investments for all state public pension funds was 5.5% while the seventy-fifth percentile was 8.3%. The NYSTRS allocation, however, was only 3.7% noticeably below the median but still considerably above the twenty-fifth percentile value of 2.6% (*Table III.31*).

The NYSTRS was in fact very much in line with the large pension funds. The median alternative investment commitment for those state public pension funds with assets with a market value of more than $40,000,000,000 was 3.7% a figure identical to that of the NYSTRS. With regard to its five immediate peers the NYSTRS was less out of step for alternative investments than it was for bonds and real estate. Three of these funds had committed between 5.7% and 7.0% of their portfolios to alternative investments. One had an allocation of 3.1% and the other had only 1.7% in alternatives. Clearly size was not the determining factor when it came to alternative investing decisions (*Table III.31*).

It should be noted, however, that by 2008 the NYSTRS target allocation for alternative investments was five percent and its allocation was six percent. The 2006 statistics for the NYSTRS and its state public pension fund peers tend to understate the System commitment to alternative investments.

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[70] From the web site of NYSTRS: http://www.nystrs.org/main/investments.html.

In terms of cash and other short term holdings the NYSTRS allocation of 2.6% is somewhat above that of all state public pension funds, large state funds and its immediate peers. The median cash holdings of all state public pension funds was 1.6% while for the funds with assets of more than $40,000,000,000 the median holding was 1.5%. While the seventy-fifth percentile allocation for the former was 3.3%.the same figure for the latter was only 2.1% (*Table III.31*).

Amongst the five immediate peers of the NYSTRS cash was very much out of favor. Only the New York State Employee Retirement System with a cash position of 4.7% was even remotely prepared for the general asset market collapse that began in 2007. The remaining four had cash positions of between 0.2% and 1.4% (*Table III.31*).

Compared to its fellow State public pension funds the NYSTRS has been an aggressive investor. It had no use for the traditional pension investment of bonds. Instead it made a very large commitment to equities. It further leavened this commitment with a relatively small, but growing commitment to alternative investments in the form of private equity. Compared to its fellow pension funds it also ventured far into the world of real estate investing.

XI. New York State Teachers' Retirement System Asset Allocation 1961 – 2006

In the previous chapter we noted that in 2006 the New York State Teachers' Retirement System (NYSTRS) had, in contrast to other State public pension funds, a very high commitment to equities. While had been a slow evolution it was one that significantly outpaced that of public pension funds as a whole.

In 1961 a mere 1.7% of the NYSTRS investment portfolio was invested in equities. Bonds accounted for 68.9% and real estate for 28.4%. Over the next fourteen years the real estate share slipped to 22.6% while equities climbed to 36.5%. Bonds meanwhile had plummeted 40.9%. Ten years later equities had pulled slightly ahead of bonds with the former accounting for 43.4% of the NYSTRS investment portfolio and the latter 40.4%. The share of real estate had collapsed to only 11.0%. At 0.1% of the portfolio the NYSTRS had made its first commitment to alternative investment (*Table III.16.b*).

By 1995 the transition to equity investing was complete. Bonds had fallen to only 22.1% of the NYSTRS investment portfolio while equities had risen to 70.3%. Real estate had fallen further to 7.5%. Alternative investments remained a miniscule 0.1 while cash was t zero percent. The start of the new millennium and the end of the great 1990s bull market saw equities rise to 73.1% of the portfolio. Bonds had slipped to 19.2% and real estate to 7.0% (*Table III.16.b*).

There had been no rebalancing. The NYSTRS had determined to ride the bull market wherever it might take it which, as it happens was into a brutal bear market. Not surprisingly equities declined as a proportion of the NYSTRS portfolio and the fixed income commitment increased significantly. By 2002 the NYSTRS non-fixed income allocation had fallen to 68.1% and its fixed income allocation had climbed to 31.9%. Bonds themselves had reached a high of 21.0% of total portfolio value in 2002 (*Table III.17*).[71]

Unfortunately, interest rates had continued the long decline that had begun in 1981. Unless the NYSTRS was going to take on far more credit risk than was considered appropriate for a pension fund, bonds were not going to yield the eight percent annual return that the System needed to meet its obligations to plan members. So as its fixed income portfolio matured the NYSTRS found that:

> *The continued low interest rate environment precluded the reinvestment of a significant amount of these long-term bond cash receipts.*[72]

Only the occasional fixed income investment was made on an "opportunistic basis." A revived equity market along with this policy had reduced the bond portfolio to 14.6% of total portfolio value in 2004 and 12.9% by 2005 (*Table III.17*). By 2006 the NYSTRS

[71] In Table III.17 'bonds' are referred to as "Fixed Income Investments".
[72] *New York State Teachers Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2005*, p. 26.

portfolio had recovered enough so that it was liquidating equities each month and investing the proceeds in fixed income "to keep the portfolio properly balanced and provide access to funds used to pay retirement benefits."[73] The policy was still in effect in 2008.[74]

The NYSTRS shift from bonds to equities occurred much earlier and more thoroughly than it did for public pension funds as a whole. In 1975 when public pension funds as a whole had 23.4% of their portfolios allocated to equities, the NYSTRS allocation was fifty percent more at 36.5%. Ten years later the allocation of all pension funds to equities had increased to 29.9% while that of the NYSTRS had grown to 43.4%. By 1995 the NYSTRS had 70.3% of its portfolio committed to equities. Public pension funds as a whole, however, had barely a half, the exact figure being 53.0%. As for bonds public pension funds still had a third of their portfolios in this asset class. The NYSTRS, in contrast had only just over a fifth of its portfolio in bonds (*Table III.16b* and *Table III.54*).

[73] *New York State Teachers Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2005*, p. 13.
[74] *New York State Teachers Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2008*, p. 15.

XII. The New York State Teachers' Retirement System Discovers Private Equity

Even worse for the New York State Teachers' Retirement System (NYSTRS) than the millennium market meltdown was the fact that the actuarial assumptions of the fund had proven horribly mistaken. In 2000 the State Government had restricted member contributions to the first ten years of service and had enacted a cost of living benefit. As if all this were not enough, teachers began to retire in droves so that just as member contributions were drastically declining member payouts were rapidly climbing.

The NYSTRS was acutely aware of the rock and hard place between which it was now firmly lodged. In 2005, for example, it noted that the

> *. . . challenge grows each year as the number of retired members increases in direct proportion to the aging of Baby Boomers. In the recently completed fiscal year, for example, benefit payments exceeded $4 billion for the first time in System history and will likely continue to grow at a rate of a quarter-billion dollars annually. With employer and member contributions totaling only about $870 million in fiscal year 2005, it is easy to see the critical role a strong investment portfolio plays in the System's success.*[75]

Not surprisingly then the fund like its peers sought returns that were both higher than those available from such traditional pension investments as equities and bonds and minimally correlated with these traditional investments. So by the summer of 2007 when the asset markets were generally cresting, the NYSTRS had allocated 4.2% of its investment portfolio to alternative investments and another 9.0% to real estate (*Table III.17*).

These alternative investments consisted almost wholly of private equity. The only other alternative investment in the portfolio was some timberland. This investment accounted for only 0.2% of the NYSTRS portfolio in 2007. The NYSTRS commitment to private equity was anything but precipitous. Funds were committed slowly but steadily. As the target allocation was reached it was increased by a few more percentage points.

By 2008 the NYSTRS private equity target allocation was five percent while the top end of the target range had been increased to ten percent. The 2008 actual allocation was 6.5% percent with the investments being concentrated in buyout, venture capital, international, special situation and real estate funds (*Table III.17*).[76]

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[75] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2006*, p. 44.

[76] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2008*, pp. 60 and 63. The 6.5% includes a 0.5% allocation to real estate private equity which in some NYSTRS asset allocation tables and statistics is classified as real estate investment rather than alternative asset investment.

The NYSTRS along with other New York State pension funds was restricted in the amount of money that could be invested in non-traditional assets. The struggle to raise the limits on alternative investments seems to have been led by the New York State Comptroller who directed the New York State Common Retirement Fund and its sister funds. In its annual reports the NYSTRS lists under its legislative program and achievements only the raising of the limit on real estate investments.[77]

At various times throughout the present decade the New York State Comptrollers have pressed the legislature to raise the limit on New York State public pension alternative investing. Under this prodding New York State has steadily liberalized the rules governing State and city public pension fund investment choices. The proportion of assets that the various State and city pension funds can invest in alternative investments has been steadily increased.

Even in the face of the current market collapse the current Comptroller, Di Napoli continues to seek what he termed "flexibility" through regular reports of steep Common Retirement Fund losses and dark intimations of runaway increases in employer and therefore taxpayer contributions to the Fund after 2010.

In February 2009 Di Napoli reported that the Common Retirement Fund had suffered a twenty percent loss in the 2008 financial market meltdown. Again after assuring the public that employer contribution rates would not be raised in 2009 or 2010 he piteously exclaimed:

> *The concern, though, is after a year like this, what will it mean for the rates in 2011, what will it mean for the rates in 2012?*

and then followed up with the real message:

> *There are ways for us with some legislative help to have an even more flexible and smarter strategy of investments that we think in the long run will help us to grow the fund in the right kind of direction.*[78]

In other words he was pressuring the Governor and Legislature to let him double-down by increasing the proportion of the pension funds under his control that could be allocated to alternative investments.

The man is in over his head.

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[77] *New York State Teachers' Retirement System Comprehensive Annual Report for the Fiscal Year Ended June 30, 2002*, p. *New York State Teachers' Retirement System Comprehensive Annual Report for the Fiscal Year Ended June 30, 2004*, p. 12 and *New York State Teachers' Retirement System Comprehensive Annual Report for the Fiscal Year Ended June 30, 2005*, p. 12.

[78] The Associated Press, *Comptroller Says NY Pension Fund Down 20 Percent.* Reported by MSN money, February 4, 2009. Available at:
http://news.moneycentral.msn.com/provider/providerarticle.aspx?feed=AP&date=20090204&id=9577914

XIII. Into the Storm

In 2007 cash had slipped a notch in the New York State Teachers Retirement System (NYSTRS) portfolio to 2.3% from 2.6% a year before and bonds were barely changed at 12.5% compared to 12.7% in 2006. Equities had fallen by a full percentage point being 69.4% of the NYSTRS portfolio in 2007 as against 70.4% the previous year. Alternative investments had climbed to 4.2% of the investment portfolio. The non-fixed income proportion of the portfolio now stood at a long-time high of 80.9% (*Table III.17*).

Oblivious to the gathering storm the System continued on its aggressive path. Investments with nine new private equity managers were approved. Along with commitments to two real estate managers the Board of Trustees approved increasing allocations to three existing commercial mortgage backed securities managers. The Board further voted to decrease the U.S. equity allocation to forty-six percent from fifty-one percent and increase international equity to fifteen percent from ten percent.

The following year it further decreased the domestic equity allocation to forty-two percent. This allowed the System to increase the real estate allocation to ten percent and the private equity allocation to seven percent.[79] As if to throw caution to the wind it also authorized the finance committee to invest in real estate and private equity funds without waiting for full board approval.[80]

As late as May 2008 it was still increasing its commitment to private equity and real estate.[81] Indeed, the System seems unfazed by the credit crunch. In the very midst of the market meltdown in the fall of 2008, the NYSTRS Board was approving new investments in private equity and real estate.[82]

The onset of the 2008 collapse in financial asset prices naturally brought large changes to NYSTRS asset allocation. Cash holdings collapsed to a mere 0.6% as the System presumably used cash to meet its current obligations to plan members, rather than sell other assets in collapsing markets. By the same token, bond holdings increased to l6.3% while total equity holdings fell to 60.6%. The fall was especially marked for domestic equity holdings which fell from 54.5% of total holdings in 2007 to 47.7% of total holdings in 2008. For international equities the decline was from 13.2% to 12.9%. This probably reflects the intention of the System to reduce domestic equity holdings in favor of international equities. Finally, real estate holdings fell from 9.0% of total assets in 2007 to 6.0% in 2008 while mortgages increased from 4.8% in 2007 to 6.0% in 2008 (*Table III.17*).

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[79] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2008*, p. 15.
[80] *New York Teachers' Retirement System*, Pensions and Investments, January 21, 2008.
[81] *New York TRS Adds More PE, RE*, imweekly.com, May 7, 2008. Available at: *http://www.imweekly.com/news/181560-1.html*
[82] *New Managers for Empire State Teachers' Plan*. Imweekly.com, November 10, 2008. Available at: *http://www.imweekly.com/issues/2008_43/187273-1.html*

XIV. After the Storm: the New York State Teachers' Retirement System Investment Portfolio at the end of 2008

At the end of 2008 the New York State Teachers' Retirement System (NYSTRS) investment portfolio had fallen by 27.9% from its June 30, 2007 value. This June 30, 2007 value was probably close to its all-time high as the financial markets were peaking around the summer of 2007. Based on its target of an eight percent return a year the System portfolio should have been twelve percent higher in December 2008 than it was in June 2007.

On this basis the System portfolio was something like a third less than it should have been at the end of 2008. To return to trend it would have to increase by something like just over fifty percent.

The System equity portfolios had suffered declines of nearly fifty percent. The domestic equity portfolio was down by 45.1% and the international equity portfolio was down by 43.5%.

Cash and short-term securities had fallen by 46.6% between June 2007 and December 2008. However, this fall had largely taken place between June 2007 and June 2008. Between June 2008 and December 2008 the NYSTRS had more than doubled its cash and short-term security allocation. In June 2008 its short-term holdings amounted to $529,367,000. Six months later these holdings had risen to $1,263,761,000.

Some of this money had probably come from bond sales. Between June 2007 and December 2008 the System bond holdings had increased by 20.7%. Between June 2008 and December 2008 the bond portfolio declined by about $700,000 (*Table III.19.b*).

It should be noted that all of the above changes will have been caused by both capital appreciation and depreciation and System sales and purchases and not capital appreciation and depreciation alone.

The balance of the System portfolio shows some strange trends indeed. Alternative investments appreciated by 25.8%, mortgages by 4.4% and real estate by 1.8% between June 30, 2007 and December 31, 2008 (*Table III.19.b*). Given that the last six months of 2008 saw the collapse of the private equity, mortgage and real estate markets these figures beggar belief.

To understand the issues involved here we can look at private equity which accounted for 81.5% of the NYSTRS alternative investment portfolio in December 2008.[83] In reporting the value of its private equity portfolio, the NYSTRS was probably relying on the valuations of its holdings given by the private equity funds with which it was invested.

[83] Calculated from the statistics given in Table III.19.c.

These valuations would not appear to be market valuations. When the market values of the holdings of private equity funds can be inferred they are substantially less than the valuations at which the funds themselves are valuing them. Sales of stakes in private equity funds are also taking place at substantial discounts to their reported values. Private equity valuations are also reported with a lag. Private equity funds will not have reported the value of their assets as of December 31, 2008 until sometime in the second quarter of 2009.[84] The bottom line is that if the NYSTRS were to have liquidated its private equity position in December 2008 it would not have received the $5,522,928,574 at which it was recording it. It would have received very much less.

One must wonder too if the real estate and mortgage values are also not lagging values that have not been marked to market. Real estate of which mortgages are but an aspect has been at the center of the current financial meltdown. The values of both residential and commercial property have collapsed and the property values underlying mortgages have fallen drastically.[85] As for private equity it is difficult to believe that if the NYSTRS were to have liquidated its real estate holdings in December 2008 it would have realized the values it was listing them at.

At some point the NYSTRS will probably have to make some markdowns in its alternative investment and real estate holdings. This will only add to its funding problems and those of the taxpayers who will be forced to make good its losses. In the meantime the System will probably lose some income from expected profits from its private equity investments. This will probably force it to step up bond sales to meet its current obligations to its members.

On the whole carrying some of its investments at higher than market values will lessen the claims the NYSTRS will have to make on participating employers and the taxpayers who fund these employers.

In the first quarter of 2009 the NYSTRS portfolio followed the equity markets down to their March bottom. By the end of the first quarter the NYSTRS investment portfolio had fallen another 9.2% to $68.3 billion. This further decline represented a fall of 34.9% from the June 2007 portfolio value of $104.9 billion and meant that the NYSTRS portfolio would have to increase by 53.6% to regain its June 2007 value.

Unfortunately for the System, between June 2007 and March 2009 the NYSTRS portfolio value should have earning eight percent per annum. If it had been earning this eight percent its value in March 2009 would have been $119.6 billion. To rise to this figure from its March 2009 value of $68.3 billion the NYSTRS investment portfolio would have to increase by a stupendous 75.1%.

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[84] Barron's, *Ka-Boom*!, February 2, 2009, The Economist, *Get a Grip*, November 27, 2008, Financial Times, *Private equity faces investor exodus*, May 12, 2009, The Wall Street Journal, *Big Investors Face Deeper Losses as Private-Equity Shops Revalue Assets, Institutions Brace for Worst*, March 5, 2009 and Bloomberg, *Harvard-Led Sale of Private-Equity Stakes Hits Values*, December 1, 2008. Available at: *http://www.bloomberg.com/apps/news?pid=20601109&sid=azBqn85_aRXE*

[85] Barron's, *The Other Shoe*, May 4, 2009.

Fortunately for the NYSTRS the equity markets have rallied strongly from their March 2009 lows. At the end of June 2009 the S&P 500 total return index stood at 1,498.94 compared to 1,452.98 at the end of December 2008. The June 2009 figure represents a decline of 35.9% from June 2007.

From this we might conclude that the condition of the NYSTRS investment portfolio as of the time of writing, July 2009, is probably that we painted for December 2008 with one caveat. Since December 2008 the NYSTRS will probably have had to liquidate about two billion dollars of securities to meet its current obligations to its members.

XV. The Investment Performance of the New York State Teachers' Retirement System

The investment performance of the New York State Teachers' Retirement System (NYSTRS) can be measured against a number of benchmarks. Firstly, there is how well it performs compared to its State public pension fund peers. Secondly, there is how well it performs against its own benchmarks. These two comparisons will be the subject of the next two chapters.

Thirdly there is the risk the NYSTRS has embraced in achieving its returns and the risk it imposes on the taxpayers who are its backstop. This is the heart of the matter as far as this study is concerned and will be addressed in a later chapter after a number of other issues have been analyzed.

Before we begin to compare NYSTRS investment performance with that of its peers, we will take a moment to examine its actual performance over the last two decades.

Clearly NYSTRS expects short-term volatility and gains of 19.3%, as were realized in 2007, are not achieved without – and this word should be emphasized - extreme short term volatility. Since 1998 this short-term volatility has been generally positive rather than negative. Only 2001, 2002 and 2008 saw negative returns, with the losses only being in the mid single digits. NYSTRS also fell considerably short of its eight percent target in 2003. However, in six of these eleven years it achieved gains of more than ten percent (*Table III.41*).

There are, one might say, two types of investors. One is wise and one is foolish. In the face of a run of significantly above average returns one type of investor will advise caution and expect mean reversion, typically by a run of below average returns. The other type of investor will indulge himself with bombast and give himself over to hubris. The NYSTRS would unfortunately appear to have been under the direction of the latter type of investor as the System sailed into the current market meltdown.

In his 2007 President's Message the NYSTRS President could barely contain himself so mesmerized was he by the performance of the investment portfolio he oversaw:

> *This is my second message as president of the NYSTRS Board and I am already running out of adjectives to describe the extraordinary job my fellow Board members, the System's management team and their capable staffs do on behalf of New York's educators. How do you describe a group that has — for the first time — grown System net assets to more than $100 billion? Or one which, in a somewhat volatile marketplace, posted double-digit investment returns for the fourth consecutive year? These are just two of the feats this incredible group of people accomplished in this fiscal year.*

He concluded with fateful words that, some thirty odd billion dollars of losses later will surely be quoted back in mocking tones:

> *I cannot predict the future and I cannot guarantee continued double-digit performance figures, but I can assure our members the financial and ethical foundations built here are solid. With such a strong base, I fully expect NYSTRS will continue to grow and prosper.*[86]

The President would have done well to have considered one of the words of wisdom of Wall Street: don't confuse genius with a bull market. To which I would add: risk can take you a long way in a bull market.

[86] *New York State Teachers' Retirement System Comprehensive Annual Report Fiscal Year Ended June 30, 2007*, p. 15. The investment section of the 2007 annual report also took on a more rosy cast and optimistic tone than did the 2006 report.

XVI. The Investment Performance of the New York State Teachers' Retirement Fund and its Peers

As far as its performance vis-à-vis its State public pension fund peers is concerned, there is relatively little cause for complaint.

In all but two of the eight years from 2001 to 2008 the NYSTRS outperformed or equaled its public pension fund peers both overall and in the category of funds with more than one billion dollars or more in assets. However, the two years in which it underperformed were years in which both the NYSTRS and all public pension funds suffered losses. This raises the question of whether NYSTRS outperformance is a function of good management or greater risk taking (*Table III.41*). Any investor who has a disproportionate commitment to equities in an equity bull market is going to outperform.

If we take the median of the differences between the annual performance of the NYSTRS and the annual performance of all state pension funds we find a median outperformance of 0.31%. If we take an average of the differences we find an outperformance on the part of the NYSTRS of 0.12%. For funds with assets of one billion dollars or more the respective figures were a median outperformance 0.30% and an average outperformance of 0.61%. While these differences may seem small, when they are compounded are long periods of time their impact on fund asset growth is enormous (*Table III.41*).

If we focus on the five years of positive returns we find that for all pension funds the NYSTRS median outperformance was 0.52% while the average outperformance was 0.66%. For corresponding figures for those funds with one billion dollars or more in assets were 1.20% and 1.44% (*Table III.41*).

The true measure of an investor, however, is not his short-term performance, but his long-term performance. In its ten year performance records the NYSTRS has just an impressive performance as it has in its annual performance records. For the eight years from 2001 to 2008 the NYSTRS had three years when its ten year annualized performance record was in double-digits. For another three of these eight years, ten year annualized performance was above nine percent (*Table III.41*).

Unfortunately, in 2007 its annualized ten year performance slipped to 8.80% and in 2008 it fell again to 6.00%. This once again raises the question of whether its overall stellar performance was due to good management or overly aggressive investing in bull markets (*Table III.41*).

Again this performance compares well with its peers. With one exception it outperformed both all public pension funds and all public pension funds with one billion dollars or more in assets. The exception was in 2008 when its annualized ten year performance of 6.00% was equal to that of all public pension funds (*Table III.41*).

For annualized ten year performance we can once again get a sense of overall out or under performance by taking medians and averages of the annual difference between the

performance of the NYSTRS and that of its peers. In terms of outperformance the NYSTRS median annualized ten-year outperformance vis-à-vis all public pension funds was 0.68%. For funds with one billion dollars or more in assets the figure was 0.70%. The corresponding average figures were 0.62% and 0.66% (*Table III.41*).

XVII. New York State Teachers' Retirement System Investment Performance Compared to its Own Benchmarks

The investment performance of the NYSTRS can also be judged by comparing the performance of its various sub-portfolios to their individual portfolio benchmarks. In this case the NYSTRS has performed less well than it did when its investment performance was compared to that of its peers. While the NYSTRS passively managed investments have outperformed their benchmarks, the same cannot be said of their actively managed investments.

In the case of its equity investments the NYSTRS has made significant changes to the thrust of its passive investments in the past few years. Consequently, for the July 1, 2007 to June 30, 2008 financial year, only for two of the passively managed NYSTRS portfolios is there a ten year record. In these two cases the two sub-portfolios outperformed their benchmarks by several basis points. One basis point is equal to one hundredth of one percent (*Table III.44*).

All four passively managed equity sub-portfolios for which five year records exist either exceeded their benchmark index by several basis points or tied with them. However, as the time period shrinks NYSTRS performance becomes less impressive. Over the three years prior to 2008 the four NYSTRS sub-portfolios that are benchmarked against the S&P 1500 all trailed this benchmark by a full percentage point or more (*Table III.44*).

It would appear that the electronic trading blotter and quantitative software analysis for domestic equity investments of which the 2002 NYSTRS annual report boasted was anything but a wise investment.[87]

Again, for the latest one year performance these four sub-portfolios seriously lagged behind their S&P 1500 benchmark. While this benchmark fell by 12.7% between June 2007 and June 2008, these sub-portfolios suffered losses of between 12.9% and 16.9%. All the other NYSTRS passively managed domestic equity sub-portfolios lost slightly less than their benchmark indices over these twelve months (*Table III.44*).

As was noticed when comparisons were made between the performance of the NYSTRS and its public pension funds peers, the NYSTRS tends to perform better in rising markets than it does in falling ones.

The picture we have just painted for the NYSTRS passively managed domestic equity sub-portfolios, also holds true of its two passively managed international equity sub-portfolios. As of June 30, 2008, over all time periods these two sub-portfolios either matched or outperformed their benchmark indices (*Table III.44*).

[87] New York State Retirement System Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2002, p. 13.

The same is also true of the NYSTRS real estate, private equity, fixed income and cash sub-portfolios. As of June 30, 2008 the NYSTRS fixed income sub-portfolio outperformed the ten year annualized performance of its benchmark index by two basis points. For its cash sub-portfolio the outperformance was six basis points (*Table III.44*).

The NYSTRS did even better with its real estate investments. The ten year outperformance was 2.4 percentage points while the three and five year outperformance figures were 4.3 and 5.2 percentage points, respectively. Either the NYSTRS was very astute in its real estate investments or it was pursuing a very aggressive and therefore risky investment strategy. Time will certainly tell. On the other hand, the one year NYSTRS real estate portfolio return was 5.2% compared to a return of 4.6% for its benchmark. As with the fixed income and cash sub-portfolios these multi-year periods are anchored on June 30, 2008 (*Table III.44*).

The NYSTRS earned its most spectacular returns from its private equity portfolio. In the three years proceeding June 30, 2008 this portfolio had an annualized return of 24.4%. The five year annualized return was 23.4%. However, as so often what the market gives it so often takes away. The ten year annualized performance falls to 12.5% which is less than the 14.5% of the NYSTRS real estate portfolio. The one year performance is only 4.5%. Once again one has the impression that the NYSTRS was either very astute in its private equity investments or was making particularly speculative investments (*Table III.44*).

We should now turn to the performance of the sub-portfolios as of June 30, 2007. This is almost the date when the myriad bull markets of the present decade topped out. The passively managed equity sub-portfolios that are benchmarked against the S&P 1500 now outperform it over three years, but still tend to lag it over one year (*Table III.43*).

As for 2008 what stands out in 2007 is the performance of the real estate and private equity sub-portfolios. In 2007 the real estate portfolio outpaced its benchmark by 8.9 percentage points, its actual return being 25.3%. However, its ten year annualized return was 15.6% which was only 2.3 percentage points above its benchmark index. The three and five year annualized portfolio returns were 25.5% and 20.0%, respectively. The corresponding excess returns over the real estate benchmark index were 6.5% and 4.5%, respectively (*Table III.43*).

This performance pattern would suggest that the skill of NYSTRS real estate managers was increasing very rapidly or that they were placing ever more speculative bets in the real estate markets.

Even more spectacular returns were obtained for NYSTRS private equity portfolios. The one, three, five and ten year annualized returns were 36.1%, 31.8%, 22.0% and 15.3% (*Table III.43*).

For a final perspective on NYSTRS investment management performance we can examine its long-term performance at an earlier date. The date chosen is June 30, 2002.

This was the last year of the millennial bear market and the earliest but one publicly available NYSTRS annual report.

The ten year annualized performances of the various NYSTRS sub-portfolios vis-à-vis their respective benchmarks is remarkably similar to what they were five and six years later. The cash portfolio outperformed its benchmark by five basis points while the fixed income portfolio and passively managed international equity portfolios outperformed their benchmarks by two and three basis points, respectively (*Table III.42*).

Real estate was again the best performer with an excess performance over its benchmark of 1.2 percentage points. Of the passively managed equity portfolios the NYSTRS Index Fund outperformed its benchmark by four basis points on an annualized basis over ten years. The NYSTRS Value Index Fund also outperformed its benchmark by five basis points over five years. This fund had no ten year record as of 2002 (*Table III.42*).

So far we have looked at the record of the passively managed NYSTRS equity portfolios as of 2002. The NYSTRS also has two actively managed domestic equity portfolios and one internationally managed equity portfolio. As one might expect, the long-term performance of these portfolios is mixed.

There is now a very lengthy literature suggesting that in the long-run active managers do not outperform passively managed indices. The possibility of identifying an above average active investment manager ex ante is miniscule. The possibility of continuing to identify overly successfully active money managers is even slighter.

For the ten year periods ending on June 30, 2002 and June 30, 2007, the NYSTRS actively managed large capitalization portfolios underperformed their benchmarks by 3.0 and 0.9 percentage points respectively. For the ten year period ending June 30, 2008 the actively managed large capitalization portfolio outperformed its benchmark by one percentage point (*Table III.42, Table III.43* and *Table III.44*).

The NYSTRS experience with small equity capitalization active management was equally disappointing. In both 2007 and 2008 the NYSTRS actively managed small equity capitalization portfolio trailed the ten year annualized performance of its benchmark. For the former year the underperformance was 1.5 percentage points and for the latter year it was 0.7 percentage points. In 2002 there was an excess return of four basis points (*Table III.42, Table III.43 and Table III.44).*

The track record of the actively managed international equity portfolio was again on the negative side. For the ten year period ending in June 30, 2008 this portfolio underperformed its benchmark by five basis points and in 2007 it underperformed by four basis points. On the other hand in 2002 its ten year performance showed an excess return of one basis point (*Table III.42, Table III.43 and Table III.44).*

All in all, then, the NYSTRS venture into active equity management cannot be considered a long-term success and it can only be judged by its long-term record. As we

have seen, more often than not the NYSTRS actively managed equity portfolios underperform their benchmarks sometimes by a considerable amount. On the other hand when they do provide an excess return it is at most by one percentage point. Underperformance, though, was as high as three percentage points.

The verdict would seem to be clear. The NYSTRS would be well advised to abandon its search for higher returns through active management. It would do better to adopt plain vanilla indexing. It would also be well advised to resist the temptation to seek higher returns through various kinds of index tweaking. The research on which this tweaking is based is recent and far from conclusive.

XVIII. The Plausibility of the New York State Teachers' Retirement System Assumed Annual Return of Eight Percent

The New York State Teachers' Retirement System (NYSTRS) assumes an annual return of eight percent. It has more than achieved that return in the last two decades. The question is can it expect to receive it in the next decade or so.

The historical data to some extent support this assumption. The two main sources for historical financial market returns are the Ibbotson SBBI stocks, bonds, bills and inflation annual yearbooks for the United States capital markets and the ABN-AMRO global investment returns annual yearbooks. Both of these yearbooks were preceded by publications that analyzed historical capital market returns.[88] The yearbooks merely extended the historical data series given in these original publications.

The Ibbotson SBBI Yearbook series provides data on the monthly returns on United States equities, bonds and money (thirty day United States Treasury bills).[89] The more recent publications have included real estate investment trust performance since 1972. Summary statistics on the nominal annual returns on United States financial asset classes along with their volatility as measured by the standard deviations of these annual returns are given in the following table:

Summary statistics of annual returns on US financial asset classes 1926 – 2007

	Large stocks	Small stocks	Corporate bonds	US Government bonds	US Treasury bills	Inflation
Average	12.3	17.1	6.2	5.8	3.8	3.1
Median	13.4	18.4	4.8	3.7	3.4	2.9
Volatility*	20.0	32.6	8.4	9.2	3.1	4.2
Minimum	-43.3	-58.0	-8.1	-9.2	0.0	-10.3
Maximum	54.0	142.9	42.6	40.4	14.7	18.2

** As measured by the standard deviation of annual returns*

Source: R.G. Ibbotson Associates, Ibbotson SBBI 2008 Classic Yearbook. Market Results for Stocks, Bonds, Bills, and Inflation 1926-2007, Chicago, 2008

[88] Ibbotson, Roger G., and Rex A. Sinquefield, *Stocks, Bonds, Bills and Inflation: Year-by-Year Historical Returns (1926–74*), Journal of Business, vol. 49, no. 1, 1976 and Dimson, E., P. Marsh, and M. Staunton. (2002). *Triumph of the Optimists: 101 Years of Global Investment Returns*. Princeton, NJ: Princeton University Press.

[89] The current issue is R.G. Ibbotson Associates, *Ibbotson SBBI 2008 Classic Yearbook. Market Results for Stocks, Bonds, Bills, and Inflation 1926-2007*, Chicago, 2008.

For the eighty-one years from 1926 to 2007, the compound annual rates of return were 12.5% for small stocks, 10.4% for large stocks, 5.5% for long-term Government bonds and 3.7% for Treasury Bills. Inflation rose at an annual rate of 3.1%. Since 1972 real estate investment trusts have compounded at an annual rate of 14.0%.

The standard work on international asset class performance shows similar long-term performance for equities, bonds and cash. However, to judge from snapshots of the world financial markets as they were in 1900 and 2001 investing outside of the United States is likely to be less rewarding than investing within it if history is to be any guide.

In terms of inflation adjusted dollar returns the United States had the third best equity returns of sixteen national equity markets between 1900 and 2001. For bonds it ranked second and for cash it ranked sixth. [90] It should be noted, however, that at the end of 2001 the United States dollar was near the top of one of its periodic upswings. The long-term trend of the United States dollar against its major trading partners had been downwards.[91]

For portfolios of various combinations of financial assets we can turn to a study by the National Association of Real Estate Investment Trusts (NARIET) for the period 1972 to 2004.

The best performing portfolio would have had the following composition: forty percent equities, thirty percent bonds, twenty percent real estate investment trusts (REITs) and ten percent United State Treasury bills. The annual return on this portfolio was 11.6%. The standard deviation was 10.1%.

A portfolio composed of forty-five percent equities, thirty-five percent bonds, ten percent REITs and ten percent United States Treasury bills would have had an annual return of 11.2% and a standard deviation of 10.3%. A portfolio void of REITs and composed of fifty percent equities, forty percent bonds and ten percent United States Treasury bills would have returned 10.9% annually with a standard deviation of 10.6%.[92]

All of the returns exceed the return achieved by the NYSTRS investment portfolio between 1998 and 2007. More importantly the NAREIT simulations begin just prior to the second worst twentieth century United State bear market. They end one year after another prolonged equity bear market.

An assumption of an eight percent return is not, then, wholly implausible for the very long term. The Ibbotson statistics are less reassuring for the immediate and near-term

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[90] Dimson, Elroy, Paul Marsh and Mike Staunton, *Triumph of the Optimists. 101 Years of Global Investment Returns*, Princeton, 2002, p. 103.

[91] *The Fall in the US Dollar and its Status as a Reserve Currency*, Macroeconomic Review, April 2008, Economic Policy Department, Monetary Authority of Singapore. Available at: *http://www.mas.gov.sg/resource/publications/macro_review/2008/MRApr08_Special%20Feature%20A_USD.pdf*

[92] National Association of Real Estate Investment Trusts, *Reason to Invest. Diversification Benefits of REITs*. *Available at: http://www.investinreits.com/reasons/diversification.cfm*

future as far as the New York State Teachers Retirement System (NYSTRS) is concerned. For these average returns conceal periods of significant length when the returns to financial assets were far below those required by the NYSTRS.

The Ibbotson figures are not that reassuring if we look at annual compound returns for ten years periods between 1925 and 2006. There were seventy-three such periods. For twenty-eight or 38.4% of these periods the annual compound return was less than eight percent. Also to be noted is that these periods of underperformance are not randomly distributed over time. They tend to be clustered with most of them occurring between 1925 and 1948 and 1969 and 1981 (Table III.46.b).

The view is even less reassuring if we look not from the height of the 2006 bull market top but from 1981. Between 1926 and 1981 there were forty-eight ten year periods out of which twenty-six, or more than half, failed to have a compound annual return of eight percent or more (Table 46.b).

A significant proportion of the NYSTRS investment portfolio must be invested in bonds and other fixed income assets that will be earning considerably less than eight percent. The returns the NYSTRS needs on its equity investments must be considerably more than eight percent. Consequently, the above figures understate the likelihood that the NYSTRS will fail to meet its eight percent return target for significant periods of time.

The question for the NYSTRS is if the next decade will be a return to the sunny 1990s and 2000s or the depressive 1930s and 1970s. This question will be taken up in a later chapter. For now we might note that financial market history suggests that the NYSTRS must expect in the course of time to experience many years during which it fails to achieve its target return of eight percent per annum.

There are also reasons for thinking that the bond and real estate returns realized in the NARIET portfolios will not be available to the NYSTRS in future years. By the end of the 1970s bonds were coming to the close of what in retrospect was to be a forty year bear market. United States interest rates topped out in 1981. Thereafter they began a long decline that has continued to the present day as inflation trended steadily downwards.

Long-term bonds naturally generated large returns in such an environment. These returns are unlikely to be repeated. Interest rates have fallen to record lows. The next step would be a repeat of the 1930s when United States Treasury bill rates were actually negative. Accordingly, bonds will not be generating large capital gains in the next decade or so. Besides, the NYSTRS has little in the way of bond investments.

As to REITS their returns seem remarkably high and one must wonder if they are not the result of institutional buying. The same might be said of private equity. Pension funds are the eight hundred pound gorilla of the asset markets or rather the stampeding herd of the Serengeti. Wherever they herd or stampede they force up asset values and, therefore, returns, by their very buying. Once they have achieved their desired asset allocation returns must fall as the buying ceases.

Public pension funds have very obviously been making very large commitments to real estate and private equity over the last decade. One must wonder how much of the outsized gains these two asset classes have returned can be attributed to the changing asset allocation preferences of public pension funds.

It is also difficult to see how in competitive markets particular asset classes such as private equity and real estate can provide returns that when adjusted for risks are greater than those available from public equities. We have already seen how private equity returns depend heavily on the ability to consistently choose able managers. It was also concluded that the likelihood of a pension fund being able to accomplish this was low.

There is also the question of the composition of the investment portfolio. To achieve the returns in the high single digits that the NYSTRS requires necessitates holding volatile assets. These volatile assets can underperform their long-term averages for significant periods of time. The problem for the NYSTRS is that during these periods of underperformance it is still required to not merely generate a return in the high single digits, but to meet its payout obligations to its existing members. In other words it needs to generate current income. As we shall see in the next chapter the NYSTRS has adopted the extremely irresponsible and dangerous practice of relying upon capital gains to meet current obligations.

One assumes that in the future the NYSTRS will abandon this practice of relying upon capital gains to meet current obligations. In which case its commitment to cash and short-term bonds will need to be much higher than it was in the past. This, however, will reduce the proportion of high return assets in its investment portfolio and consequently lower its overall return. One further assumes that the NYSTRS will plan for longer and deeper market downturns than it has in the past.

There is also another way in which the NYSTRS strategy of relying on capital gains to fund current obligations precludes Ibbotson like returns. To gain the Ibbotson it is necessary to constantly be investing in the market. The compound return of 12.5% earned on small capitalization stocks between 1926 and 2007 disappear if the investor was not investing during the calamitous collapse in small capitalization values between 1928 and 1932 and 1968 and 1974.

Unfortunately, for the NYSTRS it will not have the funds to invest in equities and other assets in the current bear market. Whatever money it receives in employer and employee contributions will have to be paid out in benefits and other obligations. Rather than investing in assets at bargain prices, it will have to liquidate its assets at depressed prices to meet its current obligations.

This is not a winning investment strategy.

XIX. The Immediate Prospects of the New York State Teachers' Retirement System Investment Portfolio

The prospects of the New York State Teachers' Retirement System (NYSTRS) investment portfolio depend upon two things. Firstly, there is the question of how well designed the portfolio is to withstand a prolonged downturn in the financial markets. Secondly, and rather obviously, its fortunes depend upon the future state of the financial markets.

The NYSTRS certainly took steps in 2007 to prepare for a turndown in the financial markets. As we have previously noted, despite its overall commitment to passive indexing the System seems to be something of a market timer. As the just demised asset bull market advanced the NYSTRS allowed its bond portfolio to decline in both absolute and relative terms. In dollar terms its low point was 2005 when its value was only $11,251,834,000. The following year, the penultimate year of the asset bull market saw little change with the dollar value of the bond portfolio increasing to only $11,465,423,000 (*Table III.27*).

Then in 2007 when the asset markets topped out the NYSTRS increased its bond portfolio by $1,467,203,000 or 12.8%. This was largely achieved through purchases rather than any appreciation in its bond portfolio. However, the large gains realized in its public equity, private equity and real estate portfolios reduced the NYSTRS bond portfolio to a record low for the decade of only 12.5% (*Table III.27* and *Table III.28*).

The bursting of the asset bubble had the opposite effect so that in 2008 the bond portfolio had soared to 17.2% of the portfolio (*Table III.28*). The bond portfolio itself increased by a quarter or, to be exact, 25.4% (*Table III.19*), between 2007 and 2008. Again, this would appear to be largely the result of purchases rather than capital appreciation.

While the NYSTRS was augmenting its bond portfolio between 2007 and 2008 it was burning through its cash holdings. These fell from $2,368,777,000 at the end of June 2007 to only $529,367,000 at the end of June 2008. This was a fall of 77.7% (*Table III.19*). It now becomes apparent that the NYSTRS was not that well prepared for a prolonged downturn in the financial markets. The NYSTRS has essentially been meeting its retirement and other obligations to its members out of capital gains. This is not a recommended financial practice.

Two thousand and seven was the NYSTRS banner year. In this year the NYSTRS investment portfolio appreciated by 19.4% (*Table III.41*). Yet this stellar performance masks a fundamental weakness in the NYSTRS financial position. In this year its actual net income earnings were $2,141,382,000. Employer and employee contributions were $1,104,010,000 and $168,462,000, respectively for a total of $1,272,472,000 (*Table III.11*).

When administrative expenses and money transferred in are subtracted from the mix the NYSTRS income for the 2006 - 2007 fiscal year was $3,520,283.000**.** Unfortunately, the retirement and other benefits disbursed by the System amounted to $4,678,484,000 which makes for an income shortfall of $1,158,201,000. This sum amounted to 1.3% of net assets and 95.3% of employer contributions (*Table III.11*).

The gap between NYSTRS retirement and other benefit obligations and its net income has been growing throughout the decade. The low point was in 2002 when the shortfall was only $174,840,000. Two thousand-and-two, not surprisingly, was also the year when the NYSTRS bond portfolio was at a decade high in both absolute and relative terms (*Table III.11*).

In 2008 the gap between NYSTRS retirement and other benefit obligations and its net income increased to a decade high of $1,192,918,000. This figure was 1.1% of an investment portfolio that was much reduced from 2007. It had also risen to 99.6% of employer contributions from 95.3% the year before (*Table III.11*).

In other words, absent capital gains, employer contributions would have to double just to pay current NYSTRS member obligations.

The NYSTRS is far from being unaware of the problem. Here is how a member of the NYSTRS Retirement Board described the unhappy state of affairs in 2005:

> *Slide 1, page 5 dramatically shows a cash flow problem. The darker bars are the benefit payments. The lighter bars are the employer contributions. Back in the 1980s, while the employer contribution rate was in the neighborhood of about 8 percent, we still had positive cash flow. As the capital markets started to take off and the employer contribution rate continued to decline, the number of retirements and the benefit payments increased dramatically. Even if the contribution rate were at a level comparable to the normal rate, for new entrants, of about 12 percent of pay, that lighter bar would still only be about 1.4 billion. So on a payroll to our annuitant population of over $4 billion, even with 1.4 billion you have a significant negative cash flow.*[93]

'Significant' seems to, well, significantly understate the problem.

Barring a rebound in the financial markets in 2009 the NYSTRS will have to begin liquidating its investment portfolio in order to meet its retirement and other benefit obligations. It will have two unpalatable choices. On the one hand it can liquidate equities which yield little in the way of dividends but on which it hopes to realize capital gains in the future. However, it will be selling these at deeply discounted prices in a vicious bear

[93] Society of Actuaries, 2005 New Orleans Health/Pension Spring Meeting, New Orleans, Louisiana, June 15–17, 2005, Record Vol. 31, No. 2, p. 4. Available at: http://soa.org/library/proceedings/record-of-the-society-of-actuaries/2000-09/2005/june/rsa05v31n273sem.pdf

market. On the other hand it can sell its fixed interest investments. These will have maintained their original values in the present market. Indeed they might well have appreciated. Unfortunately, in doing so, since its fixed income investments amount to very little, the NYSTRS will be dramatically reducing its current income. Barring a recovery in the equity markets within in a few years the NYSTRS will have exhausted its fixed income assets.

This is not how a pension fund should be managed.[94] In subsequent years barring a strong recovery in the financial markets employer contribution rates will have to rise dramatically.

Several trends also serve to deepen the hole into which the NYSTRS has dug itself. Employer contributions as a percentage of payrolls for the 2009 to 2010 fiscal year will be less than for the 2008 - 2009 fiscal year (*Table III.10*). Retirement and other benefit disbursement, on the other hand, have been increasing at between 5.3% and 7.0% a year in the last four years (*Table III.14*).

The fact that the NYSTRS will most likely be liquidating its portfolio in the next few years to meet current obligations also means it will not be able to buy equities and other assets at depressed prices. If it had structured its portfolio such that employer and employee contributions more than covered for its current obligations it would have funds to invest in equities and other assets at bargain prices. In other words it would have been able to pursue the classic investment strategy of dollar cost averaging. Instead, its investment strategy ensures that it can never buy low, but must always buy at least if not always high, then moderately high.

It might also be noted that the practice of averaging returns over five years to determine employer contributions means that employer contributions tend to fall to low levels during the onset of bear markets. In the 2008 – 2009 and the 2009 – 2011 school years the employer contributions rates will be 7.63% and 6.19%, respectively. These rates are lower than those that obtained at the height of the credit bubble (*Table III.10*). While these relatively low rates relieve pressure on school district budgets during economic downturns, they hamper returns on the NYSTRS investment portfolio. Bear markets are the time when school districts should be pumping money into the NYSTRS in order to buy assets cheaply.

Nor is it clear how well NYSTRS investment income will hold up in current financial markets. The NYSTRS bond portfolio is of relatively short duration. In 2008 nearly seventy percent of the bond portfolio had duration of five years or less.[95] It is also of a very high quality in terms of credit rating. In 2008 68.9% had a triple AAA rating.[96]

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[94] Pension funds in general are being forced to liquidate their portfolios in collapsing markets to meet current obligations. See, Financial Times, *Double blow for US pensions as values crash*, April 7, 2009. Available at:
http://www.ft.com/cms/s/0/350f5630-23a5-11de-996a-00144feabdc0.html?nclick_check=1

[95] New York State Retirement System Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2008, p. 71

[96].Ibid, p.71.

Considerable amounts of this portfolio will be maturing this year and in the next few years. Interest rates, however, have plummeted.

If the NYSTRS continues to maintain the quality of its bond portfolio it will have to accept an increasingly lower return on this portfolio. Its investment income will accordingly fall. On the other hand it can maintain or even increase this income by purchasing bonds of a much lower quality and a greater market perceived risk of default.

An argument can certainly be made that the risk of default suggested by the interest rates prevailing in certain quarters of the bond market are grossly exaggerated. The future they predict, as the market sages say, is of a depression, not a recession and a depression greater than the great depression itself. If the NYSTRS were to reach for yield they would also be positioned for capital gains if bond risk premiums fell.

Whatever, merit this argument might have, it is not one that the NYSTRS as an investor that is obliged to be prudent would seem able to adopt. It has the appearance of doubling down. The NYSTRS presently finds itself beached through previous overly aggressive investment strategies. It is unlikely that the world will look well upon what will appear to many as another roll of the dice.

The NYSTRS bond portfolio is the most stable of the various NYSTRS investment portfolios. It would seem to be imprudent to increase the potential volatility of the bond portfolio when it is this portfolio that the NYSTRS will have to be liquidating to meet its current obligations. The colleges and schools that participates in the NYSTRS will already have to make vastly larger contributions to bail out the failed speculations of the past decade. It would, as they say, add insult to injury, if they were to be further called upon to make good for losses consequent to the assumption of undue risk in the credit markets.

It is also unlikely that the NYSRS dividend and rental income will fare well in the present economic climate. Equity dividends are being cut and rents are falling. All in all, then, the NYSTRS is facing a squeeze. At the same time it is suffering heavy capital losses its income will be falling while its outgoings are climbing.

The System would appear to have forgotten the fundamentals of investment. An investor should always invest such that he has a steady enough income to more than cover his outgoings through the length of the longest known market downturns. He should never be forced to sell investments into a steep and continuing market downturn to meet current obligations.

This reference to known market downturns leads us nicely into the question of the future value of the NYSTRS investment portfolio. Perhaps our strictures are ill-conceived and irrelevant. Perhaps the markets will soon not only regain their former heights but advance well beyond them as they have on so many occasions in the last three decades. Alas, a

broader historical perspective than that adopted by the NYSTRS suggests otherwise. It is to this question that we will now turn.

XX. The Future Prospects of the New York State Teachers' Retirement System Investment Portfolio

What the future state of the financial markets will be with any reasonable degree of certitude at any more or less precise point of time is something, of course, that no one can say, including this author. If he could chart the course of the financial markets he would doubtless be having others write this study for him.

Still history does allow of a reasonable prognosis that while inevitably vague does suggest unhappy times for the NYSTRS investment portfolio and the unfortunate taxpayers who are its backstop. The current collapse of the financial markets and the attendant freefall of the economy has been unique and catastrophic enough for commentators to label it a once in a century event.

While history may eventually judge this view to be an exaggeration our current travails can clearly stand comparison with the economic downturns of the 1930s and 1970s. We might reasonably then take note of the performance of the financial markets in these periods. In the Great Depression large capitalization stocks peaked in 1928. They did not exceed this peak until eight years later in 1936. This was only a temporary rebound and the large capitalization stock index retreated the following year. The 1928 peak was only permanently surmounted in 1942. Large capitalization stocks thus took fourteen years to recover the value they lost in the Great Depression. These calculations assume that all dividends were reinvested (*Table III.45*).

The large capitalization stocks did much better in the inflation ridden 1970s. They topped out in 1972 and regained this high only four years later. However, as in the 1930s, this was only a temporary rebound and the large capitalization stock index retreated to below its 1972 high the following year. Only in 1979 did the index permanently climb past the 1972 high. In this case then it took large capitalization stocks six years to recover from the economic turmoil of the 1970s. These calculations again assume that all dividends were reinvested (*Table III.45*).

Small capitalization stocks followed virtually the same path in the 1930s as did their large capitalization counterparts. They peaked in 1928, but had regained all their losses by 1935, which was one year earlier than large capitalization stocks. Then in 1937 they retreated again. As with large capitalization stocks it was not until 1942 that the small capitalization index finally surpassed its 1928 high. Again, as with the calculations for large capitalization stocks, these small-cap calculations assume that all dividends were reinvested (*Table III.45*).

In the 1970s equity bear market the small capitalization index suffered a more devastating slide, but enjoyed a faster recovery than the large capitalization index. The former peaked in 1968 which was four years before the former. It then took six years for the small capitalization index to bottom but only two years to surpass its 1968 high (*Table III.45*).

We might also take note of the work of Reinhart and Rogoff. In their study of the aftermath of financial crises they found that equity markets suffered a peak to trough average duration of 3.4 years in real terms. The average decline was 55.9%.[1] In another paper these two authors presented data suggesting that after a trough had been reached equity markets exceeded their pre-crisis peak in about a year on average in real terms.[2] The authors did not present evidence to show when the pre-crisis peak was permanently surmounted.

One suspects that when the NYSTRS writes that its investment strategy is designed to withstand short term volatility its conception of 'short' does not extend to six years let alone eleven or fourteen years.

The need of the NYSTRS investment portfolio to regain its former value is but half the story. During those years when the portfolio is recouping its losses the System needs to earn on average eight percent a year. Given that the current level of bond yields and the fact that they are unlikely to rise to eight percent for a good few years, the return the NYSTRS must realize on its equity holdings must be considerably in excess of eight percent.

It must also be remembered that while the equity markets are treading water or declining the NYSTRS is bleeding money because of its cash flow problems. Since it is dependent upon capital gains to meet its annual pension and other obligations to its members, it will be forced to liquidate at least two billion dollars of its portfolio every year.

We can conservatively estimate how the required eight percent return would lengthen the time needed for the NYSTRS investment portfolio to return to its long-term growth trend line by extrapolating from the 1970s large capitalization bear market. As we noted above it took the large capitalization stock index six years to regain the value that it had at the beginning of this bear market.

If the NYSTRS simply needed an eight percent return on its equity portfolio then over six years its portfolio would have to increase by 58.7%. If some non-equity portions of the NYSTRS investment portfolio earned less than the required eight percent return and the long-term annual return required of its equity portfolio is in fact nine percent, then over six years the NYSTRS equity portfolio would have to have a cumulative return of 67.7%. The figures for returns of ten and eleven percent on the NYSTRS equity portfolio are 77.2% and 87.0%, respectively.

These figures translate into the following unfortunate facts for the NYSTRS, its employer participants and New York State school property tax payers. Consider, for example, the

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[1] Carmen M. Reinhart and Kenneth S. Rogoff, *The Aftermath of Financial Crises*, December 19, 2008, pp. 4 – 5, Paper prepared for presentation at the American Economic Association meetings in San Francisco, Saturday, January 3, 2009 at 10:15 am. Session title: "International Aspects of Financial Market Imperfections." Available at: *http://www.economics.harvard.edu/faculty/rogoff/files/Aftermath.pdf*.

[2] Carmen M. Reinhart and Kenneth S. Rogoff, *Banking Crises: An Equal Opportunity Menace*, December 17, 2008, pp. 30 – 33. Available at: *www.aeaweb.org/annual_mtg_papers/2009/retrieve.php?pdfid*.

case where the NYSTRS equity portfolio is required to achieve a long-term annual rate of return of nine percent. Let us assume further that the NYSTRS equity portfolio was solely invested in large capitalization stocks and the NYSTRS has to experience the pattern of returns that prevailed for these stocks in the 1970s bear market.

It would be six years before the NYSTRS equity portfolio regained its pre-bear market value. Yet over these six years its required annual return was nine percent which translates into a cumulative return of 67.7%. The NYSTRS equity portfolio would accordingly need to increase in value by two-thirds before it regained its long-term trend value. In the aftermath of the 1970s large capitalization bear market it would have taken the NYSTRS equity portfolio another seven years for this to occur. If the annual appreciation in the equity portfolio was required to be either ten or eleven percent, then the additional years required for this portfolio to return to its trend value would increase to eight and eleven years respectively (*Table III.46.a*).

The above calculations are of course extremely crude and simplified. They are made merely to illustrate the point about the present economic downturn. If this downturn has a similar affect on the equity markets as did the mid 1970 economic downturn on large capitalization stocks then it could take a decade or more for the NYSTRS investment portfolio to return to trend growth based on capital gains alone. It should be noted that these simulations ignore the fact that the System must also be paying part of its current obligations out of capital gains.

This is also something of a best case scenario. As was noted above the large capitalization stocks rebounded quite quickly from the 1970s economic turmoil compared to their small capitalization counterparts and the 1930s economic debacle. The impact of a repeat of the 1930s equity market experience on the NYSTRS investment portfolio hardly bears thinking about.

The normal outcome of a credit collapse such as the one that is presently occurring is deflation. Government and Government agency bonds of which the NYSTRS holds substantial amounts, albeit of relatively short duration would soar in value.

However, deflation can probably be discounted. The great nightmare of the Federal Reserve Bank is not runaway inflation, but deflation. To avoid it the Bank will literally drop twenty dollar bills from helicopters. If need be the Governors led by Berneke himself will wander around Washington handing out freshly minted one hundred dollar bills to strangers.

To the extent that it has a policy, the policy of the Federal Reserve Bank in the present financial crisis would seem to be to monetize the bad debt that is paralyzing the financial system. Ultimately, this can only be inflationary, extremely inflationary. In its actions as opposed to its rhetoric the Federal Reserve Bank has over the years been relatively tolerant of inflation. While it has been more than ready to slash interest rates in the face of falling economic activity and financial crisis it has been slow to raise interest rates to crush inflation and unbridled speculation.

The budgetary policies of the present Obama administration promise extraordinarily large Federal deficits. The hope must be that the American consumer will again spend vast sums on East Asian trifles with the result that East Asian governments will once again purchase vast quantities of United States sovereign and sovereign agency debt. To the extent that this does not happen, then interest rates will have to rise.

It is not clear if the Federal Reserve Bank would directly and consciously enter into a policy of monetizing government debt. However, to the extent, and this seems an inevitability, that rising interest rates dampened economic activity, the Federal Reserve Bank might very well find itself indirectly monetizing government debt. A Federal Government deeply in debt is unlikely to complain too loudly at a Federal Reserve Bank policy that greatly reduces its real debt burden.

Inflation, then, would seem to very much in the future of the NYSTRS. To some extent this is perhaps the best thing that could happen to the NYSTRS. A serious inflation would drastically and rapidly reduce NYSTRS obligations to its retirees even though it is now subject to a COLA. The only problem would be if the State Legislature in its eternal solicitude for those who fund the campaigns of its members were to increase the COLA.

On the other hand inflation would decimate the NYSTRS bond portfolio and the equity portfolio would be unlikely to fare well in the turbulent financial environment that debt monetization would create. As Taylor writes after explaining that the diminution of the Obama envisioned debt would require a doubling of the price level:

> *A 100 per cent increase in the price level means about 10 per cent inflation for 10 years. But it would not be that smooth -- probably more like the great inflation of the late 1960s and 1970s with boom followed by bust and recession every three or four years, and a successively higher inflation rate after each recession.*[99]

Equities performed poorly in the inflation ridden 1970s and are unlikely to perform well if the Federal Reserve Bank initiates another inflationary decade.

There is another reason for thinking that the next decade or so is unlikely to see a repeat of the returns implied by the NARIET portfolio simulations or, indeed, of the Ibbotson series themselves. The last three decades will probably be seen in retrospect as a golden age for financial assets. A confluence of forces conspired to create an almost perfect environment for financial assets. Market friendly administrations, the triumph of free market economics over interventionism and planning, the collapse of communism and socialism throughout most of the world, the advance of free trade, deregulation of financial markets, generally loose monetary policy, the willingness of the Federal Reserve Bank to bail out the markets with great geysers of liquidity when crisis struck, disinflation, a tolerance of the Federal Reserve Bank for financial asset inflation and last, but not least, a most peculiar mercantilism on the part of Asian counties that consisted of

[99] John Taylor, *Exploding Debt Threatens America*, Financial Times, May 26, 2009.

the accumulation not of gold, but the debt obligations of the United States and its agencies all served to create a hot house for financial assets.

All these forces combined to create a monetary and economic system that was extremely friendly to financial markets and conducive to rising, indeed soaring asset prices. As the current financial and now economic crisis makes clear the system has fallen apart. Like an elastic band stretched beyond its limits it snapped.

The events of 2008 will likely be seen as a watershed when one economic and financial system collapsed and another was born. Quite what the new system will look like no one can say. Yet one thing is clear. Its birth pangs will be long and violent. They are sure to roil the equity markets. It will be long time before the equity markets assume their historical upward trend.

Our earlier analysis of private equity investing also suggests that the NYSTRS can expect little salvation from its venture into this asset class. Given that much of this investment was made in the boom years the returns on current investments are likely to be disappointing. To the extent that the System is committed to make further capital payments to private equity funds its venture into alternative investments in future years is likely to be a drain on its investment portfolio rather than a source of strength.

We might conclude then that the NYSTRS is unlikely to return to its 2007 market highs anytime soon, though its real obligations to its retired members may well be substantially reduced in coming years thanks to rapidly rising inflation.

XXI. The Prospect for Employer Contributions to the New York State Teachers' Retirement System

The NYSTRS has made no projections as to how employer contribution rates might rise in the future. Because of the stellar performance of the System in the middle years of the current decade the employer contribution for the 2009 – 2010 school year is anticipated to fall to only 6.19% from 7.63% for the 2008 – 2009 school year.

However, the administrative bulletin announcing the happy news for 2009 – 2010 also has the following ominous passage:

> *As you are likely aware, returns in the capital markets have been decidedly negative over the past several months. Although asset performance is not the only factor in the determination of a new ECR, it is likely our next year's ECR (applying to 2010-11 salaries and collected in the fall of 2011) will represent a significant increase.*[100]

Quite what 'significant' might be the bulletin did not say.

In a previous chapter we noted the cash flow problem faced by the System. Particularly disturbing was the admission that the negative cash flow would not be anywhere near closed even if the employer contribution rate was to rise to the twelve percent rate estimated for new entrants into the plan.

In 2005 a NYSTRS board member was opining with regard to the employer contribution rate that:

> *As we talk about going forward, we recognize that while there have been dramatic increases in the contribution rate, should we reach some state of equilibrium, hopefully the contribution rate will stay somewhere between the 10 and 15 percent level once it gets there if capital markets return to more normal returns . . .*
>
> *Liabilities continue to grow. Members continue to earn service and increase their benefits. The employer contribution rate, which was a concept that has been difficult to accept for many of the constituent groups that we talk with, of 12 percent is not a ceiling on the rate, but that's ultimately where the rate should move around depending upon actual gains and losses, primarily investment gains and losses.*

So, if twelve percent or thereabouts is what might be expected under 'normal' market conditions one can only wonder what might be expected under the very abnormal conditions of 2008.

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[100] New York State Teachers' Retirement System, Administrative Bulletin, Issue No. 2009-1, February 2009.

At a minimum one might expect at least a return to the contribution rates that prevailed in the 1970s and into the 1980s. Between 1978 and 1984 NYSTRS employer contributions ranged between a low of 21.40% and a high of 23.49%. It was not until 1989 that contribution rates fell into single figures (*Table III.10*). This was at a time when employees were contributing throughout their employment and not as now, merely for the first ten years.

The New York State sister fund of the NYSTRS, the New York State Common Retirement Fund, which has experienced similar losses to that of the NYSTRS, has projected that employer contributions to the Common Retirement Fund will triple over the next six years from a current rate of 7.4%. This projection rests on the dubious assumption that the financial market implosion of 2008 is similar to that of 1987. Nineteen-eighty-seven was the result of a technical problem – portfolio insurance – rather than structural weaknesses in the financial system and economy, while 2008 was the result of years of reckless credit expansion finally reaching its limits and imploding.

On this flawed comparison the New York State Comptroller, who directs the Common Retirement Fund, assumes Common Retirement Fund returns of 1.5% in the current fiscal year and annual returns of thirteen percent in the following two years and then annual returns of ten percent in the next three years. Even under this extremely optimistic scenario the employer contribution rate will be 30.3% in 2015.[101]

Imagine then what the contribution rates will be if the financial markets fail to rebound.

The policy response from Albany has been what one would expect: kick the problem down the road. The Legislature, at the instigation of the New York State Comptroller and the urgent prompting of the Governor, has considered, but narrowly failed to pass legislation that would allow State pension fund members to borrow from the State pension funds if contribution rates exceed certain caps. The caps would grow from 9.5% for the 2010 – 2011 fiscal year to 14.5% by the 2015 – 2016 fiscal year. Loans would be repayable over ten years..[102]

For the NYSTRS such a plan would at best spread out the pain.

[101] New York Times, *Pension Costs for Local Governments May Triple*, July 7, 2009.
[102] The Assembly bill is A09037. For its text, see, *http://www.assembly.state.ny.us/leg/?bn=A09037&sh=t*. See, also, E. J. McMahon, *The pension bomb goes bomb*, July 9, 2009, New York Fiscal Watch website. Available at: *http://www.nyfiscalwatch.com/?p=1371*.

XII. An Evaluation of the New York State Teachers' Retirement System Investment Strategy

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When all is said and done the investment strategy of the New York State Teachers' Retirement System (NYSTRS) has not served New York State public school property taxpayer well.

The System is to be congratulated for resisting the Gardarene rush of its peers into hedge funds. Its venture into private equity was also measured: it was done by small degrees over a good many years. Still, the returns were high which suggests the System either had an uncanny knack for picking highly skilled private equity managers and ventures or embraced highly risky endeavors in what was a bubble environment for private equity.

Only time can answer this question. It is true that in the management of its active and passive equity portfolios, the NYSTRS has shown no sparkling managerial investment talents. On the other hand it has managed to outperform its real estate, fixed income and cash benchmarks.[103]

The System has been most remiss in its reliance on capital gains to finance ordinary expenditures. This is simply an unacceptable practice. It is part of what seems to be a mindless focus on maximizing returns without any regard to the sustainability of these returns and for the local school property taxpayers who must make good any losses consequent upon NYSTRS investment missteps. There seems to be a complete absence of strategic vision.

The critical failure occurred in the second half of the 1990s when the System plan was over-funded by as much as twenty percent. The system would have been wise at this point to have rebalanced the portfolio by drastically increasing the fixed income allocation. It would also have been wise to have increased the employer contribution rate in order to have further increased the fixed income proportion of the investment portfolio. This rebalancing would have placed the System on a sound footing for many years to come and would have gone a considerable way to precluding State legislative meddling in pension benefits.

The NYSTRS might well retort that such a rebalancing and increase in employer contribution was not feasible in the political environment of the time. However, the NYSTRS is an independent agency and it is only very indirectly answerable to the State Legislature for its actions. As well as having a fiduciary duty to its members it also has an implied duty to act responsibly to the employers of its members and the local property taxpayers who fund these employers.

If the NYSTRS had endured the criticism that would undoubtedly have encountered through implementing the rebalancing suggested above, they would have been vindicated in but a few short years. The millennial bear market would have shown that the enormous

[103] *New York State Retirement System Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2008*, p. 64.

equity gains of the 1990s that propelled the System portfolio to a twenty percent overfunding in 1998 was built on shaky foundations.

As it was the State Legislature took advantage of the record returns the NYSTRS was enjoying, to recklessly enhance member benefits in 2000.[104] The NYSTRS then had several years when it failed to meet its return target of eight percent. The employer contribution rate began to climb upwards after years of trending downwards. This was at a time when school property taxes were spiraling out of control.

The demands on the System investment portfolio had now effectively increased thanks to the rashness of the State Legislature. It is unknown how the attitudes of the NYSTRS trustees were affected by the twin events of the Legislature pension enhancements and the millennial market turndowns. Yet it would not be unreasonable to think that the System would feel itself compelled to increase its risk profile in order to ensure it achieved at least its target return.

Whatever were the thoughts and intentions of the Trustees, the System found itself in 2007 entering an unprecedented market collapse with a very aggressive and, therefore, particularly vulnerable portfolio. We have seen that prior to the onset of the market downturn the NYSTRS was increasing the bond allocation in its investment portfolio. This was not a major rebalancing. It was long overdue. For years the NYSTRS bond portfolio had been shrinking as a proportion of the total NYSTRS investment portfolio.

Yet it is one of the major maxims of investment philosophy that market timing is the road to ruin. The critical determinant of investment returns is asset allocation. The critical factor in determining the allocation is having the portfolio generate sufficient income during adverse markets to preclude forced sales into declining markets or excessive calls on partners liable for capital infusions. This requires a careful examination of financial market history to estimate the likelihood and severity of adverse markets. It is not clear that the NYSTRS ever undertook such an exercise and ever designed its portfolio to meet such exigencies as this exercise might reveal.

From the tone of its annual reports the NYSTRS seemed blissfully unaware of the dangerous waters in which they were adrift. The trustees seemed besotted with their own genius. When they should have been cautious they were reckless.

With all this said, the NYSTRS still seems the junior partner in the teacher pension debacle. If the New York State Legislature had not grossly enhanced NYSTRS pensions in 2000 the System may ultimately have been able to rebalance its investment portfolio and taken a less aggressive market stance that would have served it better in the current market downturn.

It is to the senior partner in the teacher pension debacle then, the New York State Legislature, that we must now turn our attention.

[104] This will be the subject of the next few chapters.

New York State Government and Public Pensions

XXIII. The New York State Legislature and Public Employee Pensions

There was a fatal flaw in the strategy pursued by the NYSTRS in its endeavor to meet its ever growing pension obligations. While the NYSTRS has the responsibility for paying the pensions of its members it does not determine the terms of these pensions. Nor do the school districts that were responsible for funding any shortfalls in NYSTRS assets.

The terms of NYSTRS pensions fell solely within the purview of the New York State Legislature.

Unfortunately, as politicians, New York State legislators face very different incentives than do boards of education and the taxpayers that fund public schools. Pensions are a matter if not of the hereafter then at least of the long-term. The fiscal impact of public pension decisions is often not realized for several decades. The horizon of politicians, on the other hand, generally extends little further than the next election. New York State Legislative elections, unfortunately, are frequent.

Public employees also have a strong incentive to organize and become active in the political sphere. There they will seek ever better salaries, working conditions and fringe benefits, one of which is a pension. They will be wholly unconcerned with the future consequences their actions might have on public finances in the long-term. Since they are human they will delude themselves about these consequences if they are brought to their attention.

Individual members of the public on the other hand have no economic incentive to organize to counter the efforts of the public employees to raid the public treasury.

The temptation, therefore, is for legislators to hand out substantial monetary benefits to extremely politically potent public sector unions especially when there is little immediate cost to the public treasury and with their constituents being little the wiser.

Pensions are a particularly attractive gift that politicians can give to public sector unions. Their immediate cost is small and their full impact will not be felt for possibly decades. Thus it has come about that very many US public authorities are finding their budgets under extreme strain because of pension commitments made by legislators long since departed. Some are finding their pension obligations so burdensome that they see bankruptcy as the only recourse.

New York State is commonly regarded as having the most dysfunctional legislature in the nation. It also had for many years an especially unfortunate balance of power between the two major political parties, the Democrats and the Republicans.

The Democrats due to their lock on New York City have an overwhelming preponderance in the State Assembly. The State Senate, on the other hand, has been controlled by the Republican Party since 1965. However, in recent years the Republican Senate majority has been steadily whittled down until in the November 2008 election

control finally passed to the Democrats by a narrow majority. At the time of writing defections from the Democratic Senate majority made it look as though the Senate would return to Republican control. However, the Democratic turncoats returned to the fold and the Senate for now remains under Democratic control. The ever diminishing Senate Republican majority led to a bidding war between the Republicans and Democrats for the support of the extremely politically potent public sector unions. There was no institutional restraint on public employee pension demands.

Ever since public employees were allowed to unionize they have grown in size and strength. Political success has led to further political success. They can now offer politicians plentiful campaign contributions and electoral campaign support.

The public sector unions, for example, succeed in enacting legislation that makes private sector employees public sector workers and unionizes them at the same time. With their resources thus enhanced the public sector unions can bring even greater pressure to bear on the Governor and Legislature to increase their political power even more.

The combination of a Republican party desperate to keep control of a closely divided State Senate, a Democratic party desperate to capture it and extremely politically potent public sector unions, has been a Senate willing to grant virtually anything these unions ask of it. The constitutional theory that would have a senate act as a brake upon a more representative assembly does not apply in New York State.

The Senate Republicans will not be outbid when it comes to satisfying the incessant demands of the public sector unions. As for the Assembly, this is dominated by Democrats from New York City and the other large cities in the State. These in turn are dominated by their municipal unions.

The only brake on the demands of the public sector unions is the State Governor. Unfortunately, State Governors have shown themselves more than ready to bid for the support of the public sector unions.

This, then, is the flaw in the NYSTRS investment strategy. No matter how high are the returns of its investment portfolio it will always be hard pressed to meet its pension obligations. The State Government will always be pressured – usually successfully - by the public sector unions to use these increased returns to enhance the benefits of existing retirees and retirees soon to be.[105]

Oddly enough some legislators are now justifying their public pension enhancements by explicit reference to the performance of State pension investment funds. Thus one bill that would lower the age at which various public retirement system members with at least twenty-five year of service could retire with full benefits to any age over fifty-five without a reduction in benefits offered as justification the fact that:

[105] This argument is well made by Gelinas and McMahon in Gelinas, Nicole and E.J. McMahon, *The Biggest Public Pension Investment Policy Shift You've Probably Never Heard Of*, Fiscal Watch Memo, Manhattan Institute, Empire Center for New York State Policy, June 5, 2005

> *The public retirement systems in the state have enjoyed significant growth in assets due to investment gains. Employer costs have dropped significantly and there is no employer cost for benefits in some systems.*

This bill is a perennial favorite. Each year it is submitted, amended, recommitted and dies. Even in the present environment where the assets of State pension funds have collapsed the bill still remains before the Legislature in its current session.[106]

The labor of the State and New York City pension funds is the labor of Sisyphus.

As the next chapter will detail the State Legislature has forever been seeking to enhance public employee benefits and the Governor has often obliged them in their endeavors.

[106] The Senate sponsor of this bill is Senator Flanagan of the Second Senate District in which the author of this report resides. For the bill itself, see, *http://public.leginfo.state.ny.us/distsen.cgi*

XXIV. New York State Public Employee Pension Legislation and the New York State Teachers' Retirement System 2000 – 20006

The New York State Legislature is forever seeking to enact legislation that will enhance public employee pensions. In the first week of June, 2005, for example:

> *. . . there were nearly 600 bills before the State Legislature* (*including Assembly and Senate "same-as" introductions*) *dealing with retirement and pensions. Most of these bills seek to enhance benefits or loosen eligibility standards in one fashion or another. This count did not include all of the nearly 200 bills targeted only to individual government employees and retirees.*[107]

Sooner or later the Governor gives his assent to most of these bills.

Very often these bills increase the cost of teacher pensions. One of the six hundred bills noted above proposed to boost the pension base for teachers hired after 1971. Their pensions were presently based on their final average salary for their last three years in service. The proposed bill would allow them the option of computing final average salary as a five-year average including payments for termination, retirement bonuses, annual leave or unused sick leave. The cost to school districts outside of New York City was estimated to be an additional $189 million a year.[108]

Even now, in 2009, when the State, its localities and agencies are facing financial catastrophe, the Legislature passed pension legislation with serious implications for public finances and taxes.[109] To be fair, though, as the magnitude of the pension disaster has become ever more apparent, the politicians finally appear to be drawing a line in the sand.[110] Whether their actions will match their rhetoric remains to be seen.

Between 2000 and 2007 thirty-seven laws were enacted by New York State that the New York State Teachers Retirement System (NYSTRS) considered being of significant impact for itself or its members. The most active years were 2002 and 2000 when ten and eight laws were enacted, respectively. No legislation affecting NYSTRS was enacted in 2007.

Much of this legislation had as its intention the enhancement of NYSTRS member pensions. The most significant year for such enhancements was 2000. As well as being the dawn of the new millennium 2000 was also an election year when both the Governor and the Legislature were running for reelection. Well might the NYSTRS president write of 2000 that:

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[107] McMahon, *E. J., Legislators Still Aim to Sweeten Public Pensions*, New York State Fiscal Watch Memo, July 15, 2005, Manhattan Institute for Policy Research. Available at: *http://www.nyfiscalwatch.com/html/fwm_2005-07.html*.
[108] Ibid.
[109] Lise Bang-Jensen, *Paterson's Veto Pen. The bills David should spike*, New York Post, June 5, 2009.
[110] New York Times, *Pension Costs for Local Governments May Triple*, July 7, 2009.

> *While the economic climate was mixed this fiscal year, the skies were sunny for both our active and retired members, who profited from history-making benefit improvements.*[111]

History-making indeed. Future historians of New York State will probably look back at this legislation and mark it as one of the factors that rendered the decline of the State irreversible.

In terms of their impact on school districts and their property tax payers one of the most significant of these laws was Chapter 125. This law enacted a Cost of Living Adjustment (COLA) for all public employee retirement systems in New York State. The adjustment was to be fifty percent of the annual increase in the Consumer Price Index. It was never to be less than one percent or greater than three percent of the Consumer Price Index annual increase. It was further limited to the first $18,000 of the maximum retirement benefit of a retiree.

It was but a few years before legislators were introducing bills to raise the three percent ceiling to four percent. The camel now had its nose under the tent.

After the COLA, the most significant change in State pension law went was the limitation of member contributions to their systems to the first ten years of service.

Quite what legislators were thinking when they enacted this particular piece of legislation is unknown. Perhaps they were caught up in the stock market bubble mentality that had seen the NASDAQ stock market index climb from about 14,000 in 1998 to just over 5,000 in May 2000 and had led to heady talk of Dow 36,000.

More sober minds would have seen it as a recipe for fiscal disaster, if not for the State, then for public employers. They were anyway acting on the advice of a commission convened by the Governor composed of representatives of employers, unions and other interested parties. Perhaps they were all caught in the 'madness of crowds' that prevailed at the turn of the millennium.

The significance of some of the laws listed in Appendix A will no doubt escape many readers. Consider, for example, Chapter 106 of the Laws of 2002, which created a window during which NYSTRS members who were employed by the New York City Board of Education as substitutes for at least 20 days during a school year could obtain a retroactive date of membership. This law might well have allowed Tier 3 and Tier 4 members to be reclassified into the highly desirable and gold-plated Tiers 1 or 2.

The Governor and Legislature also stood idly by as the public employee pension system itself became ever more unsustainable. In the case of the schools professional staffing was increasing rapidly and salaries were continued their upward ascent. While retirees were living longer teachers were still retiring in their late fifties. However, the incomes of

[111] New York State Teachers Retirement System Annual Report 2001, p. 14.

the public who had to pay the ever increasing and now inflation linked pensions of these teachers were not growing at anything like the necessary pace needed to sustain this structure.

The parlous state of school district finances were only papered over by the vast tax revenues thrown off by the mid-2000s bubble economy. These revenues enabled Albany to continue to pump money into the schools and delay the day of reckoning. It also enabled the Governor and Legislature to delay reforming public pensions.

The minimum reform that should have been enacted was the substitution of a defined contribution plan for the present defined benefit plan. Instead there was desultory talk of a further pension tier, the fabled Tier V. Only after the collapse in State finances consequent to the 2008 economic and financial meltdown does the introduction of Tier V seem likely. It will be too little too late. The tier itself is little more than a watered down version of the original Tier IV. Over the decades it might save the State tens of billions, but over the next decade its impact will be minimal. The horse has already left the stable. Between 2000 and 2008 fifty thousand new members had joined the NYSTRS. They will be weighing on school property taxpayers for many decades.

APPENDIX

Appendix A. New York State Legislation and Legislative Initiatives affecting the New York State Teachers' Retirement System and its Members between 2000 and 2007

2000 Death Benefits signed into law on October 31, 2000 as Chapter 554.
2000 Tier Equity signed into law on October 31, 2000 as Chapter 553.
2000 Prior Service signed into law on October 31, 2000 as Chapter 552.
2000 Military Service Credit signed into law on October 19, 2000 as Chapter 548.
2000 Earnings After Retirement signed into law on August 16, 2000 as Chapter 256.
2000 Article 19 / Benefit Enhancement signed into law on July 11, 2000 as Chapter 126.
2000 COLA signed into law on July 11, 2000 as Chapter 125.
2000 Retirement Incentive signed into law on June 23, 2000 as Chapter 86.
2001 Minimum Retirement Allowance signed into law on December 19, 2001 as Chapter 580.
2001 Earnings After Retirement signed into law on September 5, 2001 as Chapter 281.
2002 Retirement Filing Flexibility signed into law on January 30, 2003 as Chapter 695.
2002 Excess ITHP Retention signed into law on December 3, 2002 as Chapter 667.
2002 Military Payment Refunds signed into law on September 17, 2002 as Chapter 547.
2002 Age for Unlimited Post-Retirement Earnings signed into law on August 20, 2002 as Chapter 474.
2002 Article 19 Eligibility Change signed into law on August 13, 2002 as Chapter 353.
2002 Credit for NYC Teaching Service signed into law on August 13, 2002 as Chapter 352.
2002 Optional Retirement Program Rules signed into law on August 13, 2002 as Chapter 351.
2002 Earnings After Retirement signed into law on August 6, 2002 as Chapter 310.
2002 Credit for NYC Substitute Service signed into law on June 28, 2002 as Chapter 106.
2002 Retirement Incentive signed into law on May 20, 2002 as Chapter 69.
2003 Political Deductions signed into law on September 17, 2003 as Chapter 556.
2003 Mailing Options signed into law on July 29, 2003 as Chapter 248.
2003 Eligibility for Lump-Sum Benefit signed into law on July 22, 2003 as Chapter 167.
2003 Interest Rate for Calculations signed into law on July 22, 2003 as Chapter 140.
2003 Restoration to Service signed into law on July 22, 2003 as Chapter 136.
2004 Death Benefits for Beneficiaries of Active Duty Military Members signed as Chapter 105 of the Laws of 2005.
2004 Inclusion of DC Plan Contributions in Certain FAS Calculations signed as Chapter 472 of the Laws of 2005.
2004 Date New Legislation Takes Effect signed as Chapter 497 of the Laws of 2005.
2004 Non-Contributory Military Service Credit signed as Chapter 326 of the Laws of

2005.

2004 Compliance With Older Workers Benefit Protection Act signed as Chapter 559 of the Laws of 2005.

2005 Death Benefits for Beneficiaries of Active Duty Military Members signed as Chapter 105 of the Laws of 2005.

2005 Inclusion of DC Plan Contributions in Certain FAS Calculations signed as Chapter 472 of the Laws of 2005.

2005 Date New Legislation Takes Effect signed as Chapter 497 of the Laws of 2005.

2005 Non-Contributory Military Service Credit signed as Chapter 326 of the Laws of 2005.

2005 Compliance With Older Workers Benefit Protection Act signed as Chapter 559 of the Laws of 2005.

2006 Claiming Credit for Service Earned in Another NYS Public Retirement System signed as Chapter 675 of the Laws of 2006.

2006 Increase in Earnings After Retirement Limit signed as Chapter 74 of the Laws of 2006

TABLES

Table III.1 - New York State Teachers' Retirement System Active membership by participating employer type in 2008

Institution	Number	Percent
Schools	**265,843**	**96.7%**
Public School Districts	*248,074*	*90.2%*
BOCES	*16,838*	*6.1%*
Charter Schools	*931*	*0.3%*
Colleges	**8,596**	**3.1%**
SUNY	*2,991*	*1.1%*
Community Colleges	*5,605*	*2.0%*
Other	**462**	**0.2%**
Total	**274,901**	**100.0%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.2 - Membership of the New York State Teachers' Retirement System

Year	Active members	Retirees	Percentage change	
			Members	Retirees
1965	129,543	16,043		
1970	186,914	22,700	44.3%	41.5%
1975	227,038	35,252	21.5%	55.3%
1980	203,330	46,812	-10.4%	32.8%
1985	178,516	57,366	-12.2%	22.5%
1990	195,194	69,127	9.3%	20.5%
1995	199,398	82,459	2.2%	19.3%
2000	224,986	100,839	12.8%	22.3%
2005	260,356	125,325	15.7%	24.3%
2007	270,045	133,356	3.7%	6.4%
2008	274,901	136,706	1.8%	2.5%

Source: New York State Teachers' Retirement System **annual reports 2001 - 2008**

Table III.3 - New York State Teachers' Retirement System active membership 1982 - 2008

Year	Number	Percentage change	
		Annual	Five year moving average
1982	190,825		
1983	184,586	-3.3%	
1984	180,261	-2.3%	
1985	178,516	-1.0%	-0.9%
1986	179,248	0.4%	0.4%
1987	182,255	1.7%	1.3%
1988	187,933	3.1%	1.8%
1989	191,753	2.0%	1.7%
1990	195,194	1.8%	1.1%
1991	195,305	0.1%	0.5%
1992	192,373	-1.5%	0.4%
1993	192,891	0.3%	0.4%
1994	195,691	1.5%	0.6%
1995	199,398	1.9%	1.2%
1996	200,918	0.8%	1.6%
1997	203,716	1.4%	2.0%
1998	209,080	2.6%	2.5%
1999	216,267	3.4%	3.2%
2000	224,986	4.0%	3.6%
2001	234,350	4.2%	3.4%
2002	242,834	3.6%	3.3%
2003	247,247	1.8%	2.9%
2004	254,515	2.9%	2.4%
2005	260,356	2.3%	2.1%
2006	264,410	1.6%	2.1%
2007	270,045	2.1%	
2008	274,901	1.8%	

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.4 - New York State Teachers' Retirement System retirees as a percentage of total System membership 1992 - 2008

Year	Active members	Retired members	Total membership	Annual percentage change: Active members	Annual percentage change: Retired members	Annual percentage change: Total membership	Retired members as a percentage of total membership
1992	192,373	76,144	268,517				28.4%
1993	192,891	79,268	272,159	0.3%	4.1%	1.4%	29.1%
1994	195,691	80,371	276,062	1.5%	1.4%	1.4%	29.1%
1995	199,398	82,459	281,857	1.9%	2.6%	2.1%	29.3%
1996	200,918	86,482	287,400	0.8%	4.9%	2.0%	30.1%
1997	203,716	90,658	294,374	1.4%	4.8%	2.4%	30.8%
1998	209,080	93,237	302,317	2.6%	2.8%	2.7%	30.8%
1999	216,267	96,788	313,055	3.4%	3.8%	3.6%	30.9%
2000	224,986	100,839	325,825	4.0%	4.2%	4.1%	30.9%
2001	234,350	106,123	340,473	4.2%	5.2%	4.5%	31.2%
2002	242,834	110,858	353,692	3.6%	4.5%	3.9%	31.3%
2003	247,247	118,308	365,555	1.8%	6.7%	3.4%	32.4%
2004	254,515	121,246	375,761	2.9%	2.5%	2.8%	32.3%
2005	260,356	125,325	385,681	2.3%	3.4%	2.6%	32.5%
2006	264,410	129,587	393,997	1.6%	3.4%	2.2%	32.9%
2007	270,045	133,356	403,401	2.1%	2.9%	2.4%	33.1%
2008	274,901	136,706	411,607	1.8%	2.5%	2.0%	33.2%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.5 - New York State Teachers' Retirement System income, contributions and membership 1998 - 2008

Year	Net investment income	Employer contributions	Member contributions	Transfers in/out (net)	Total additions to plan net assets	Active members	Percentage change: Employer contributions	Percentage change: Member contributions	Percentage change: Members
1998	$13,534,138	$209,192	$162,265	$25,446	$13,931,041	209,080			
1999	$10,437,150	$230,926	$171,886	$8,382	$10,848,344	216,267	10.4%	5.9%	3.4%
2000	$5,840,710	$211,499	$186,751	$43,247	$6,282,207	224,986	-8.4%	8.6%	4.0%
2001	-$4,946,207	$152,718	$128,019	$29,023	-$4,636,447	234,350	-27.8%	-31.4%	4.2%
2002	-$5,570,925	$51,861	$137,921	$14,271	-$5,366,872	242,834	-66.0%	7.7%	3.6%
2003	$2,640,564	$220,081	$147,047	$12,716	$3,020,408	247,247	324.4%	6.6%	1.8%
2004	$11,360,077	$306,782	$155,916	$38,277	$11,861,052	254,515	39.4%	6.0%	2.9%
2005	$7,951,926	$695,735	$158,354	$17,155	$8,823,170	260,356	126.8%	1.6%	2.3%
2006	$9,893,833	$997,032	$161,738	$15,807	$11,068,410	264,410	43.3%	2.1%	1.6%
2007	$16,863,349	$1,104,010	$168,462	$7,260	$18,143,081	270,045	10.7%	4.2%	2.1%
2008	-$5,531,807	$1,188,140	$177,959	$2,349	-$4,163,359	274,901	7.6%	5.6%	1.8%
2000	$5,840,710	$211,499	$186,751	$43,247	$6,282,207	224,986			
2008	-$5,531,807	$1,188,140	$177,959	$2,349	-$4,163,359	274,901	461.8%	-4.7%	22.2%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.6 - New York State Teachers' Retirement System (NYSTRS) members, contributions and asset market performance 1998 - 2008

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
NYSTRS net investment income	$13,534,138	$10,437,150	$5,840,710	-$4,946,207	-$5,570,925	$2,640,564	$11,360,077	$7,951,926	$9,893,833	$16,863,349	-$5,531,807
S&P 500 return	28.6%	21.0%	-9.1%	-11.9%	-22.1%	28.7%	10.9%	4.9%	15.8%	5.5%	
S&P Citigroup PMI Group global ex-US equity index return	1.4%	15.0%	32.9%	-14.0%	-19.9%	-15.1%	40.7%	20.7%	17.7%	26.3%	
Long-term US corporate bond return	10.8%	-7.5%	12.9%	10.7%	16.3%	5.3%	8.7%	5.9%	4.8%	7.2%	
Long-term US govt bond return	13.1%	-9.0%	21.5%	3.7%	17.8%	1.5%	8.5%	7.8%	-1.1%	10.1%	
US T-bill return	4.9%	4.7%	5.9%	3.8%	1.7%	1.0%	1.2%	3.0%	4.8%	4.6%	
Wilshire REIT index return	-17.0%	-2.6%	31.0%	12.3%	3.6%	36.2%	33.2%	13.8%	36.0%	-17.6%	
Inflation	1.6%	2.7%	3.4%	1.6%	2.4%	1.9%	3.3%	3.4%	2.5%	4.2%	
NYSTRS members	209,080	216,267	224,986	234,350	242,834	247,247	254,515	260,356	264,410	270,045	274,901
NYSTRS employer contributions	$209,192	$230,926	$211,499	$152,718	$51,861	$220,081	$306,782	$695,735	$997,032	$1,104,010	$1,188,140
NYSTRS member contributions	$162,265	$171,886	$186,751	$128,019	$137,921	$147,047	$155,916	$158,354	$161,738	$168,462	$177,959
NYSTRS transfers in/out (net)	$25,446	$8,382	$43,247	$29,023	$14,271	$12,716	$38,277	$17,155	$15,807	$7,260	$2,349
Total additions to plan net assets	$13,931,041	$10,848,344	$6,282,207	-$4,636,447	-$5,366,872	$3,020,408	$11,861,052	$8,823,170	$11,068,410	$18,143,081	-$4,163,359
NYSTRS employer contributions*		10.4%	-8.4%	-27.8%	-66.0%	324.4%	39.4%	126.8%	43.3%	10.7%	7.6%
NYSTRS member contributions*		5.9%	8.6%	-31.4%	7.7%	6.6%	6.0%	1.6%	2.1%	4.2%	5.6%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Note: 1) asset class returns are total returns 2) the June 2007 composition of the New York State Teachers' Retirmement System investment portfolio was equity 81% (domestic, 55%, international 13%, real estate 9% and private equity 4%) and fixed income 19% (domestic fixed income, 12%, mortgages 5% and cash 2%).

** Annual percentage change of relevant row in this table*

Note: dollar figures are millions of dollars

Table III.7 - New York State Teachers' Retirement System employer and member contributions in total and per employee

	Total contributions			Total contributions per employee		
	Employer	Active members	Active members	Employer	Active members	Member percent
1998	$209,192,000	$162,265,000	129,543	$1,615	$1,253	43.7%
1999	$230,926,000	$171,886,000	186,914	$1,235	$920	42.7%
2000	$211,499,000	$186,751,000	227,038	$932	$823	46.9%
2001	$152,718,000	$128,019,000	203,330	$751	$630	45.6%
2002	$51,861,000	$137,921,000	178,516	$291	$773	72.7%
2003	$220,081,000	$147,047,000	195,194	$1,127	$753	40.1%
2004	$306,782,000	$155,916,000	199,398	$1,539	$782	33.7%
2005	$695,735,000	$158,354,000	224,986	$3,092	$704	18.5%
2006	$997,032,000	$161,738,000	260,356	$3,829	$621	14.0%
2007	$1,104,010,000	$168,462,000	270,045	$4,088	$624	13.2%
2008	$1,188,140,000	$177,959,000	274,901	$4,322	$647	13.0%

Percentage change

	Total contributions			Total contributions per employee		
	Employer	Active members	Active members	Employer	Active members	Member percent
1999	10.4%	5.9%	44.3%	-23.5%	-26.6%	-2.3%
2000	-8.4%	8.6%	21.5%	-24.6%	-10.6%	9.9%
2001	-27.8%	-31.4%	-10.4%	-19.4%	-23.5%	-2.8%
2002	-66.0%	7.7%	-12.2%	-61.3%	22.7%	59.4%
2003	324.4%	6.6%	9.3%	288.1%	-2.5%	-44.9%
2004	39.4%	6.0%	2.2%	36.5%	3.8%	-15.9%
2005	126.8%	1.6%	12.8%	101.0%	-10.0%	-45.0%
2006	43.3%	2.1%	15.7%	23.8%	-11.7%	-24.7%
2007	10.7%	4.2%	3.7%	6.8%	0.4%	-5.1%
2008	7.6%	5.6%	1.8%	5.7%	3.8%	-1.6%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.8 - New York State Teachers' Retirement System membership and payroll statistics 1992 - 2008

Year	Active members	Annual member payroll (millions)	Percentage increase in annual member payroll	Average full-time membership salary	Employer contribution rate as a percentage of payroll
1992	192,373	$7,194	3.1%	$46,285	6.6%
1993	192,891	$7,518	4.5%	$48,114	8.0%
1994	195,691	$7,910	5.2%	$49,748	8.4%
1995	199,398	$8,326	5.3%	$51,228	7.2%
1996	200,918	$8,516	2.3%	$52,033	6.4%
1997	203,716	$8,758	2.8%	$52,806	3.6%
1998	209,080	$9,163	4.6%	$53,872	1.3%
1999	216,267	$9,594	4.7%	$54,537	1.4%
2000	224,986	$10,093	5.2%	$55,368	1.4%
2001	234,350	$10,581	4.8%	$56,197	0.4%
2002	242,834	$11,172	5.6%	$57,308	0.4%
2003	247,247	$11,427	2.3%	$58,497	0.4%
2004	254,515	$11,767	3.0%	$59,918	2.5%
2005	260,356	$12,164	3.4%	$61,543	5.6%
2006	264,410	$12,518	2.9%	$62,549	8.0%
2007	270,045	$13,083	4.5%	$64,651	8.6%
2008	274,901	$13,522	3.4%	N/A	8.7%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.9 - Annual percentage change in New York State Teachers' Retirement System (NYSTRS) membership and payroll statistics 1998 - 2008

Year	Active members	Annual member payroll (millions)	Percentage increase in annual member payroll	Average full-time membership salary ($)	Employer contribution rate as a percentage of payroll
1999	3.4%	4.7%	4.7%	1.2%	13.6%
2000	4.0%	5.2%	5.2%	1.5%	0.7%
2001	4.2%	4.8%	4.8%	1.5%	-69.9%
2002	3.6%	5.6%	5.6%	2.0%	-16.3%
2003	1.8%	2.3%	2.3%	2.1%	0.0%
2004	2.9%	3.0%	3.0%	2.4%	600.0%
2005	2.3%	3.4%	3.4%	2.7%	123.4%
2006	1.6%	2.9%	2.9%	1.6%	41.6%
2007	2.1%	4.5%	3.0%	3.4%	7.9%
2008	1.8%	3.4%	3.0%	N/A	1.5%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: the annual member payroll statistic for 2008 is a NYSTRS estimate

Table III.10 - New York State Teachers' Retirement System employer contribution as a percentage of payroll 1961 - 2009

Fiscal year	Employer contribution
1961-62	18.55%
1962-63	19.55%
1963-64	21.13%
1964-65	17.67%
1965-66	17.70%
1966-67	17.72%
1967-68	18.50%
1968-69	18.80%
1969-70	18.60%
1970-71	18.80%
1971-72	18.80%
1972-73	18.80%
1973-74	18.80%
1974-75	18.80%
1975-76	19.40%
1976-77	19.40%
1977-78	20.40%
1978-79	21.40%
1979-80	22.49%
1980-81	23.49%
1981-82	23.49%
1982-83	23.49%
1983-84	22.90%
1984-85	22.80%
1985-86	21.40%
1986-87	18.80%
1987-88	16.83%
1988-89	14.79%
1989-90	6.87%
1990-91	6.84%
1991-92	6.64%
1992-93	8.00%
1993-94	8.41%
1994-95	7.24%
1995-96	6.37%
1996-97	3.57%
1997-98	1.25%
1998-99	1.42%
1999-00	1.43%
2000-01	0.43%
2001-02	0.36%
2002-03	0.36%
2003-04	2.52%
2004-05	5.63%
2005-06	7.97%
2006-07	8.60%
2007-08	8.73%
2008-09	7.63%
2009-10	6.19%

Source: FOIL request of the NYSTRS and New York State Teachers' Retirement System Administrative Bulletin Issue Nos. 2008-11 and 2009-1

Table III.11 - New York State Teachers' Retirement System investment income, contributions and deductions 2000 - 2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Investment income:									
Capital gain/loss (Net appreciation/ depreciation in fair value of investments	**$3,989,553**	**-$6,952,556**	**-$7,603,666**	**$658,544**	**$9,512,010**	**$5,883,840**	**$7,914,023**	**$14,721,967**	**-$7,781,949**
Income	**$1,851,157**	**$2,006,349**	**$2,032,741**	**$1,982,020**	**$1,848,067**	**$2,068,086**	**$1,979,810**	**$2,141,382**	**$2,250,142**
Interest income	**$962,560**	**$1,162,566**	**$1,120,433**	**$987,574**	**$760,032**	**$699,306**	**$725,755**	**$876,584**	**$963,581**
Dividend income	**$767,517**	**$677,801**	**$682,620**	**$700,242**	**$838,678**	**$1,053,362**	**$1,053,405**	**$1,110,058**	**$1,078,773**
Real estate—net operating income	**$160,924**	**$210,982**	**$268,578**	**$315,995**	**$285,009**	**$381,396**	**$312,781**	**$269,316**	**$276,298**
Securities lending (net)	**$376,042**	**$394,137**	**$23,565**	**$11,070**	**$10,697**	**$8,117**	**$11,569**	**$19,863**	**$14,276**
Other (net)	**$21,661**	**$16,598**	**$11,349**	**$30,100**	**$50,633**	**$28,381**	**$41,494**	**$8,623**	**$85,960**
Less: Investment expenses	**-$437,547**	**-$455,735**	**-$73,804**	**-$62,961**	**-$96,982**	**-$102,476**	**-$165,194**	**-$143,062**	**-$168,746**
Net investment income gain/loss	*$6,278,257*	*-$4,490,472*	*-$5,570,925*	*$2,640,564*	*$11,360,077*	*$7,951,926*	*$9,893,833*	*$16,863,349*	*-$5,531,807*
Contributions:									
Employer	**$211,499**	**$152,718**	**$51,861**	**$220,081**	**$306,782**	**$695,735**	**$997,032**	**$1,104,010**	**$1,188,140**
Member	**$186,751**	**$128,019**	**$137,921**	**$147,047**	**$155,916**	**$158,354**	**$161,738**	**$168,462**	**$177,959**
Transfers in/out (net)	**$43,247**	**$29,023**	**$14,271**	**$12,716**	**$38,277**	**$17,155**	**$15,807**	**$7,260**	**$2,349**
Total	*$441,497*	*$309,760*	*$204,053*	*$379,844*	*$500,975*	*$871,244*	*$1,174,577*	*$1,279,732*	*$1,368,448*
Total additions/reductions	**$6,282,207**	**-$4,636,447**	**-$5,366,872**	**$3,020,408**	**$11,861,052**	**$8,823,170**	**$11,068,410**	**$18,143,081**	**-$4,163,359**
Income/contributions less investment/administrative expenses	**$2,701,323**	**$2,741,263**	**$2,278,137**	**$2,389,882**	**$2,407,087**	**$3,001,497**	**$3,276,913**	**$3,520,283**	**$3,738,320**
Deductions:									
Retirement benefits	**$2,520,461**	**$2,916,103**	**$3,223,631**	**$3,635,133**	**$3,937,389**	**$4,150,588**	**$4,442,016**	**$4,678,484**	**$4,931,238**
Administrative expenses	**$28,878**	**$30,581**	**$32,461**	**$34,943**	**$38,937**	**$40,309**	**$42,668**	**$43,893**	**$49,016**
Total deductions	*$2,549,339*	*$2,946,684*	*$3,256,092*	*$3,670,076*	*$3,976,326*	*$4,190,897*	*$4,484,684*	*$4,722,377*	*$4,980,254*
Increase/decrease in net assets	**3,732,868**	**-7,583,131**	**-$8,622,964**	**-$649,668**	**$7,884,726**	**$4,632,273**	**$6,583,726**	**$13,420,704**	**-$9,143,613**
Net assets, beginning year	**$85,514,415**	**$89,247,283**	**$81,664,152**	**$73,041,188**	**$72,391,520**	**$80,276,246**	**$84,908,519**	**$91,492,245**	**$104,912,949**
Net assets, end of year	**$89,247,283**	**$81,664,152**	**$73,041,188**	**$72,391,520**	**$80,276,246**	**$84,908,519**	**$91,492,245**	**$104,912,949**	**$95,769,336**
Annual gain (beginning of year to end of year)									
Absoluste shortfall	**$180,862**	**-$174,840**	**-$945,494**	**-$1,245,251**	**-$1,530,302**	**-$1,149,091**	**-$1,165,103**	**-$1,158,201**	**-$1,192,918**
As a percentage of net assets at the beginning of the year	**0.2%**	**0.2%**	**1.2%**	**1.7%**	**2.1%**	**1.4%**	**1.4%**	**1.3%**	**1.1%**
As a percentage of employer contributions	**116.9%**	**87.3%**	**5.5%**	**17.7%**	**20.0%**	**60.5%**	**85.6%**	**95.3%**	**99.6%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.12 - Annual percentage change in New York State Teachers' Retirement System investment income, contributions and deductions 2000 - 2008

	2001	2002	2003	2004	2005	2006	2007	2008
Investment income:								
Capital gain/loss (Net appreciation/ depreciation in fair value of investments	**-157.4%**	**-8.6%**	**-1254.6%**	**-93.1%**	**61.7%**	**-25.7%**	**-46.2%**	**-289.2%**
Income	**-7.7%**	**-1.3%**	**2.6%**	**7.2%**	**-10.6%**	**4.5%**	**-7.5%**	**-4.8%**
Interest income	**-17.2%**	**3.8%**	**13.5%**	**29.9%**	**8.7%**	**-3.6%**	**-17.2%**	**-9.0%**
Dividend income	**13.2%**	**-0.7%**	**-2.5%**	**-16.5%**	**-20.4%**	**0.0%**	**-5.1%**	**2.9%**
Real estate—net operating income	**-23.7%**	**-21.4%**	**-15.0%**	**10.9%**	**-25.3%**	**21.9%**	**16.1%**	**-2.5%**
Securities lending (net)	**-4.6%**	**1572.6%**	**112.9%**	**3.5%**	**31.8%**	**-29.8%**	**-41.8%**	**39.1%**
Other (net)	**30.5%**	**46.3%**	**-62.3%**	**-40.6%**	**78.4%**	**-31.6%**	**381.2%**	**-90.0%**
Less: Investment expenses	**-4.0%**	**517.5%**	**17.2%**	**-35.1%**	**-5.4%**	**-38.0%**	**15.5%**	**-15.2%**
Net investment income gain/loss	*-239.8%*	*-19.4%*	*-311.0%*	*-76.8%*	*42.9%*	*-19.6%*	*-41.3%*	*-404.8%*
Contributions:								
Employer	**38.5%**	**194.5%**	**-76.4%**	**-28.3%**	**-55.9%**	**-30.2%**	**-9.7%**	**-7.1%**
Member	**45.9%**	**-7.2%**	**-6.2%**	**-5.7%**	**-1.5%**	**-2.1%**	**-4.0%**	**-5.3%**
Transfers in/out (net)	**49.0%**	**103.4%**	**12.2%**	**-66.8%**	**123.1%**	**8.5%**	**117.7%**	**209.1%**
Total	*42.5%*	*51.8%*	*-46.3%*	*-24.2%*	*-42.5%*	*-25.8%*	*-8.2%*	*-6.5%*
Total additions/reductions	**-235.5%**	**-13.6%**	**-277.7%**	**-74.5%**	**34.4%**	**-20.3%**	**-39.0%**	**-535.8%**
Income/contributions less investment/administrative expenses	**-1.5%**	**20.3%**	**-4.7%**	**-0.7%**	**-19.8%**	**-8.4%**	**-6.9%**	**-5.8%**
Deductions:								
Retirement benefits	**-13.6%**	**-9.5%**	**-11.3%**	**-7.7%**	**-5.1%**	**-6.6%**	**-5.1%**	**-5.1%**
Administrative expenses	**-5.6%**	**-5.8%**	**-7.1%**	**-10.3%**	**-3.4%**	**-5.5%**	**-2.8%**	**-10.5%**
Total deductions	*-13.5%*	*-9.5%*	*-11.3%*	*-7.7%*	*-5.1%*	*-6.6%*	*-5.0%*	*-5.2%*
Increase/decrease in net assets	**-149.2%**	**-12.1%**	**1227.3%**	**-108.2%**	**70.2%**	**-29.6%**	**-50.9%**	**-246.8%**
Net assets, beginning year	**-4.2%**	**9.3%**	**11.8%**	**0.9%**	**-9.8%**	**-5.5%**	**-7.2%**	**-12.8%**
Net assets, end of year	**9.3%**	**11.8%**	**0.9%**	**-9.8%**	**-5.5%**	**-7.2%**	**-12.8%**	**9.5%**
Annual gain (beginning of year to end of year)	**-8.5%**	**-10.6%**	**-0.9%**	**10.9%**	**5.8%**	**7.8%**	**14.7%**	**-8.7%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.13 - Statistical profile of New York State Teachers' Retirement System retirees 1992 - 2008

Fiscal year ending	Number of retired members	Average age at retirement (years/months)	Average service at retirement (years/months)	Average final salary	Average maximum annual benefit	Average maximum annual benefit as a percentage of average final salary
1992	6,401	59–05	29–5	$50,183	$30,383	61%
1993	5,049	59–04	29–2	$54,399	$32,619	60%
1994	3,171	58–10	27–7	$56,047	$32,151	57%
1995	4,226	59–02	28–3	$58,660	$34,351	59%
1996	6,267	59–01	29–5	$61,226	$37,151	61%
1997	6,452	58–05	29–8	$63,854	$38,688	61%
1998	5,303	58–01	29–6	$65,351	$39,254	60%
1999	6,111	58–00	28–8	$65,499	$38,882	59%
2000	6,658	58–01	28–3	$67,458	$39,739	59%
2001	7,946	57–11	30–8	$69,781	$44,681	64%
2002	7,344	57–09	30–2	$72,314	$45,426	63%
2003	10,173	57–05	31–1	$73,197	$47,365	65%
2004	7,287	57–09	29–8	$75,598	$47,520	63%
2005	7,182	57–10	28–6	$72,126	$45,394	63%
2006	7,281	58–04	28–2	$71,840	$43,914	61%
2007	6,900	58–07	28–1	$74,185	$44,204	60%
2008	6,330	58–11	27–8	$77,066	$45,779	59%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.14 - New York State Teachers' Retirement System retired members and beneficiaries added to and removed from the benefit payroll

Year	Added during the year	Removed during the year	Added during the year	Removed during the year	Total number of retired members and beneficiaries	Total annual benefit	Percentage increase in total annual benefit	Average annual benefit
1992	6,695	2,119	$189,075,427	$19,357,583	76,144	$1,123,644,892	17.79%	$14,757
1993	5,319	2,195	$161,078,000	$21,586,331	79,268	$1,263,136,561	12.41%	$15,935
1994	3,479	2,376	$100,365,598	$24,776,260	80,371	$1,338,725,899	5.98%	$16,657
1995	4,553	2,465	$141,184,322	$25,892,977	82,459	$1,454,017,244	8.61%	$17,633
1996	6,583	2,560	$222,494,364	$28,505,982	86,482	$1,648,005,626	13.34%	$19,056
1997	6,792	2,616	$237,240,633	$30,836,628	90,658	$1,854,409,631	12.52%	$20,455
1998	5,639	3,060	$246,966,887	$40,759,141	93,237	$2,135,294,830	10.7%	$22,902
1999	6,431	2,880	$224,988,289	$46,151,729	96,788	$2,314,131,390	8.4%	$23,909
2000	7,006	2,955	$435,197,582	$49,937,199	100,839	$2,699,391,773	16.7%	$26,769
2001	8,301	3,017	$361,578,286	$56,799,443	106,123	$3,004,170,616	11.3%	$28,308
2002	7,711	2,976	$315,749,555	$60,959,965	110,858	$3,258,960,206	8.5%	$29,398
2003	10,547	3,097	$479,080,366	$66,520,014	118,308	$3,671,520,558	12.7%	$31,034
2004	7,668	4,730	$360,221,128	$70,176,373	121,246	$3,961,565,313	7.9%	$32,674
2005	7,536	3,457	$347,943,836	$72,645,187	125,325	$4,236,863,962	7.0%	$33,807
2006	7,682	3,420	$347,529,000	$74,043,173	129,587	$4,510,349,789	6.5%	$34,806
2007	7,291	3,522	$346,344,571	$77,056,365	133,356	$4,779,637,995	6.0%	$35,841
2008	6,711	3,361	$330,202,139	$76,893,575	136,706	$5,032,946,559	5.3%	$36,816

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Note: the 1998 to 2007 statistics are taken from the 2007 annual report and the 1992 to 1997 statistics are taken from the 2001 annual report. The 2008 statistics are taken from the 2008 annual report

Table III.15 - Percentage change in the New York State Teachers' Retirement System retired members and beneficiaries added to and removed from the benefit payroll

	Percentage change							
Year	Added during the year	Removed during the year	Added during the year	Removed during the year	Total number of retired members and beneficiaries	Total annual benefit	*Percentage point change* in the percentage increase in total annual benefit	Average annual benefit
1993	-20.6%	3.6%	-14.8%	11.5%	4.1%	12.4%	-5.4	8.0%
1994	-34.6%	8.2%	-37.7%	14.8%	1.4%	6.0%	-6.4	4.5%
1995	30.9%	3.7%	40.7%	4.5%	2.6%	8.6%	2.6	5.9%
1996	44.6%	3.9%	57.6%	10.1%	4.9%	13.3%	4.7	8.1%
1997	3.2%	2.2%	6.6%	8.2%	4.8%	12.5%	-0.8	7.3%
1998	-17.0%	17.0%	4.1%	32.2%	2.8%	15.1%	-1.8	12.0%
1999	14.0%	-5.9%	-8.9%	13.2%	3.8%	8.4%	-2.3	4.4%
2000	8.9%	2.6%	93.4%	8.2%	4.2%	16.6%	8.3	12.0%
2001	18.5%	2.1%	-16.9%	13.7%	5.2%	11.3%	-5.4	5.7%
2002	-7.1%	-1.4%	-12.7%	7.3%	4.5%	8.5%	-2.8	3.9%
2003	36.8%	4.1%	51.7%	9.1%	6.7%	12.7%	4.2	5.6%
2004	-27.3%	52.7%	-24.8%	5.5%	2.5%	7.9%	-4.8	5.3%
2005	-1.7%	-26.9%	-3.4%	3.5%	3.4%	6.9%	-1.0	3.5%
2006	1.9%	-1.1%	-0.1%	1.9%	3.4%	6.5%	-0.5	3.0%
2007	-5.1%	3.0%	-0.3%	4.1%	2.9%	6.0%	-0.5	3.0%
2008	-8.0%	-4.6%	-4.7%	-0.2%	2.5%	5.3%	-0.7	2.7%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Note: the 1998 to 2007 statistics are taken from the 2007 annual report and the 1992 to 1997 statistics are taken from the 2001 annual report. The 2008 statistics are taken from the 2008 annual report

Table III.16.a - New York State Teachers' Retirement System investment portfolio 1961 - 2005

Year	Bonds	Stocks	Mortgages	Other real estate owned	Real estate, separate accounts, commingled	Real estate investments	Real estate	Total real estate	Venture capital	Alternative investments	Cash	Total
1961	$560,185,359	$14,164,566	$230,663,524					$230,663,524			$8,295,624	$813,309,073
1965	$980,831,358	$122,587,340	$347,154,575					$347,154,575			$334,064	$1,450,907,337
1970	$1,258,239,621	$323,557,079	$614,883,620					$614,883,620			$185,638	$2,196,865,958
1975	$1,731,279,292	$1,547,893,276	$941,640,328	$17,015,090		$229,653		$958,885,071			$6,499	$4,238,064,138
1980	$2,990,944,611	$2,500,532,983	$1,088,152,142	$27,683,160		$15,527,744		$1,131,363,046			$391,107,104	$7,013,947,744
1985	$6,033,223,584	$6,467,778,562	$1,595,403,863		$25,000,000	$18,222,050		$1,638,625,913	$19,921,901	$19,921,901	$757,695,173	$14,917,245,133
1990	$9,351,417,000	$11,594,113,000	$1,546,469,000	$20,631,000	$523,888,000	$195,805,000		$2,286,793,000	$30,327,000	$30,327,000	$326,740,000	$23,589,390,000
1995	$10,030,399,000	$31,821,412,000	$2,235,810,000				$1,167,287,000	$3,403,097,000		$39,472,000	$444,638	$45,294,824,638
2000	$16,761,444,000	$63,858,416,000	$3,074,910,000				$3,005,364,000	$6,080,274,000		$653,613,000	$954,716	$87,354,701,716
2005	$11,251,834,000	$60,301,450,000	$4,008,728,000				$4,225,044,000	$8,233,772,000		$3,089,946,000	$791,190,000	$83,668,192,000

Source: New York State Teachers' Retirement System annual reports 1961 - 2005

Table III.16.b - New York State Teachers' Retirement System investment portfolio allocation 1961 - 2005

Year	Bonds	Stocks	Real estate	Alternative investments	Cash	Total
1961	68.9%	1.7%	28.4%		1.0%	100.0%
1965	67.6%	8.4%	23.9%		0.0%	100.0%
1970	57.3%	14.7%	28.0%		0.0%	100.0%
1975	40.9%	36.5%	22.6%		0.0%	100.0%
1980	42.6%	35.7%	16.1%		5.6%	100.0%
1985	40.4%	43.4%	11.0%	0.1%	5.1%	100.0%
1990	39.6%	49.1%	9.7%	0.1%	1.4%	100.0%
1995	22.1%	70.3%	7.5%	0.1%	0.0%	100.0%
2000	19.2%	73.1%	7.0%	0.7%	0.0%	100.0%
2005	13.4%	72.1%	9.8%	3.7%	0.9%	100.0%

Source: New York State Teachers' Retirement System annual reports 1961 - 2005

Table III.16.c - New York State Teachers' Retirement System net assets 2000 - 2008

Assets and liabilities	2000	2001	2002	2003	2004	2005	2006	2007	2008
Investments—at fair value									
Short-term	$954,716	$3,098,906	$2,544,693	$965,799	$1,772,206	$791,190	$2,320,857	$2,368,777	$529,367
Domestic fixed income securities	$16,761,444	$16,085,191	$16,243,332	$14,224,897	$12,101,661	$11,251,834	$11,465,623	$12,932,826	$16,212,220
Domestic equities	$54,798,012	$46,680,553	$38,817,974	$41,368,456	$48,422,431	$51,716,161	$52,516,790	$57,652,571	$46,097,043
International equities	$9,060,404	$6,730,334	$5,826,091	$5,752,951	$7,556,573	$8,585,289	$10,867,369	$14,057,326	$12,471,647
Mortgages	$3,074,910	$3,796,545	$4,178,519	$4,102,444	$3,621,378	$4,008,728	$3,771,978	$3,988,511	$4,381,116
Real estate	$3,005,364	$3,553,453	$3,493,798	$3,586,041	$3,654,042	$4,225,044	$5,064,520	$6,981,564	$7,580,112
Alternative investments	$653,613	$1,068,098	$1,320,269	$1,658,924	$2,289,910	$3,089,946	$4,041,434	$5,388,876	$6,876,575
Total investments	$88,308,463	$81,013,080	$72,424,676	$71,659,512	$79,418,201	$83,668,192	$90,048,571	$103,370,451	$94,148,080
Receivables:									
Employer	$123,076	$24,227	$14,503	$15,073	$269,589	$659,632	$970,818	$1,075,722	$1,139,697
Employer—long-term	$244,486	$253,165	$159,528	$269,293	$141,260	$89,194	$48,103	$23,723	$52
Member	$174,966	$107,459	$112,691	$127,188	$137,632	$147,993	$153,976	$161,929	$171,163
Investment income	$233,456	$221,792	$240,729	$210,180	$183,919	$167,253	$174,539	$181,777	$212,985
Investment sales	$115,947	$34,663	$34,330	$42,503	$16,993	$45,096	$16,622	$51,897	$75,911
Total receivables	$891,931	$641,306	$561,781	$664,237	$749,393	$1,109,168	$1,364,058	$1,495,048	$1,599,808
Other Assets									
Securities lending cash collateral—invested	$7,781,616	$3,620,278	$4,187,529	$4,255,534	$5,767,385	$6,309,845	$9,229,044	$13,387,800	$11,216,122
Member loans	$122,434	$140,951	$148,789	$153,461	$150,780	$145,238	$142,521	$146,930	$148,076
Building and equipment—net of depreciation	$14,146	$13,272	$15,371	$26,879	$36,719	$36,299	$35,010	$33,105	$29,661
Miscellaneous assets	$73,146	$63,153	$55,483	$37,698	$43,493	$101,025	$37,251	$80,461	$46,715
Total other assets	$7,991,342	$3,837,654	$4,407,172	$4,473,572	$5,998,377	$6,592,407	$9,443,826	$13,648,296	$11,440,574
Total assets	$97,191,736	$85,492,040	$77,393,629	$76,797,321	$86,165,971	$91,369,767	$100,856,455	$118,513,795	$107,188,462
Liabilities and net assets									
Securities lending collateral—due to borrowers	$7,781,616	$3,620,278	$4,187,529	$4,255,534	$5,767,385	$6,309,845	$9,229,044	$13,387,800	$11,266,834
Investment purchases payable	$39,520	$68,851	$39,613	$39,907	$20,857	$39,195	$14,582	$101,026	$64,844
Mortgage escrows/deposits—net of investments	$56,429	$59,750	$45,951	$39,165	$30,722	$28,334	$25,638	$11,315	$12,383
Other liabilities	$66,888	$79,009	$79,348	$71,195	$70,761	$83,874	$94,946	$100,705	$75,065
Total liabilities	$7,944,453	$3,827,888	$4,352,441	$4,405,801	$5,889,725	$6,461,248	$9,364,210	$13,600,846	$11,419,126
Net assets held in trust for pension benefits	$89,247,283	$81,664,152	$73,041,188	$72,391,520	$80,276,246	$84,908,519	$91,492,245	$104,912,949	$95,769,336

Source: New York State Teachers' Retirement System **Annual Financial Reports 2001 - 2008**
Note: dollar figures are millions of dollars

Table III.17 - Asset allocation of the New York State Teachers' Retirement System Investment Portfolio 2001 - 2008

	Target	Range			Actual
Domestic equities					
2001	55.0%	45.0%	-	65.0%	56.4%
2002	55.0%	45.0%	-	65.0%	52.2%
2003	55.0%	45.0%	-	65.0%	56.5%
2004	55.0%	45.0%	-	65.0%	59.6%
2005	55.0%	45.0%	-	65.0%	60.0%
2006	51.0%	41.0%	-	61.0%	56.5%
2007	51.0%	41.0%	-	61.0%	54.5%
2008	46.0%	36.0%	-	56.0%	47.7%
International equities					
2001	9.0%	4.0%	-	15.0%	7.9%
2002	10.0%	5.0%	-	15.0%	8.1%
2003	8.0%	4.0%	-	12.0%	8.0%
2004	8.0%	4.0%	-	12.0%	9.5%
2005	8.0%	4.0%	-	12.0%	10.3%
2006	10.0%	6.0%	-	14.0%	12.1%
2007	10.0%	6.0%	-	14.0%	13.2%
2008	15.0%	11.0%	-	19.0%	12.9%
Emerging market equities					
2001	1.0%	0.0%	-	2.0%	0.4%
2002					
2003					
2004					
2005					
2006					
2007					
2008					
Total Equities					
2001	65.0%	49.0%	-	82.0%	64.7%
2002	65.0%	50.0%		80.0%	60.3%
2003	63.0%	49.0%		77.0%	64.5%
2004	63.0%	49.0%		77.0%	69.1%
2005	63.0%	49.0%		77.0%	70.3%
2006	61.0%	47.0%		75.0%	68.6%
2007	61.0%	47.0%		75.0%	67.7%
2008	61.0%	47.0%		75.0%	60.6%

Continued

Table III.17 - Asset allocation of the New York State Teachers' Retirement System Investment Portfolio 2001 - 2008

	Target	Range			Actual
Real Estate					
2001	**6.0%**	**3.0%**	**-**	**9.0%**	**6.0%**
2002	**6.0%**	**3.0%**	**-**	**9.0%**	**6.8%**
2003	**8.0%**	**5.0%**	**-**	**11.0%**	**6.9%**
2004	**8.0%**	**5.0%**	**-**	**11.0%**	**6.8%**
2005	**8.0%**	**5.0%**	**-**	**11.0%**	**7.6%**
2006	**8.0%**	**5.0%**	**-**	**11.0%**	**8.1%**
2007	**8.0%**	**5.0%**	**-**	**11.0%**	**9.0%**
2008	**5.0%**	**2.0%**	**-**	**10.0%**	**6.0%**
Alternative/Private equitiy					
2001	**3.0%**	**1.0%**	**-**	**5.0%**	**0.7%**
2002	**3.0%**	**1.0%**	**-**	**5.0%**	**1.0%**
2003	**3.0%**	**1.0%**	**-**	**5.0%**	**1.5%**
2004	**3.0%**	**1.0%**	**-**	**5.0%**	**1.9%**
2005	**3.0%**	**2.0%**	**-**	**7.0%**	**2.7%**
2006	**5.0%**	**2.0%**	**-**	**8.0%**	**3.5%**
2007	**5.0%**	**2.0%**	**-**	**8.0%**	**4.2%**
2008	**5.0%**	**2.0%**	**-**	**10.0%**	**6.0%**
Total non-fixed income					
2001					
2002	**74.0%**		**-**		**68.1%**
2003	**74.0%**		**-**		**72.9%**
2004	**74.0%**		**-**		**77.8%**
2005	**74.0%**		**-**		**80.6%**
2006	**74.0%**		**-**		**80.2%**
2007	**74.0%**		**-**		**80.9%**
2008	**74.0%**		**-**		**77.1%**
			-		

Continued

Table III.17 - Asset allocation of the New York State Teachers' Retirement System Investment Portfolio 2001 - 2008

Fixed income	Target	Range			Actual
Domestic fixed income					
2001					19.6%
2002	20.0%	15.0%	-	30.0%	21.0%
2003	18.0%	15.0%	-	25.0%	19.2%
2004	18.0%	15.0%	-	25.0%	14.6%
2005	18.0%	11.0%	-	25.0%	12.9%
2006	18.0%	11.0%	-	25.0%	12.2%
2007	18.0%	11.0%	-	25.0%	12.0%
2008	18.0%	11.0%	-	25.0%	16.3%
			-		
Mortgages					
2001	6.0%	3.0%	-	10.0%	5.2%
2002	6.0%	3.0%	-	10.0%	6.6%
2003	8.0%	5.0%	-	11.0%	6.6%
2004	8.0%	5.0%	-	11.0%	5.4%
2005	8.0%	5.0%	-	11.0%	5.6%
2006	8.0%	5.0%	-	11.0%	5.0%
2007	8.0%	5.0%	-	11.0%	4.8%
2008	8.0%	5.0%	-	11.0%	6.0%
Cash equivalents					
2001	0.0%	0.0%	-	2.0%	3.8%
2002	0.0%	0.0%	-	2.0%	3.5%
2003	0.0%	0.0%	-	5.0%	1.3%
2004	0.0%	0.0%	-	5.0%	2.2%
2005	0.0%	0.0%	-	5.0%	0.9%
2006	0.0%	0.0%	-	5.0%	2.6%
2007	0.0%	0.0%	-	5.0%	2.3%
2008	0.0%	0.0%	-	5.0%	0.6%
Total fixed income					
2001	26.0%		-		28.6%
2002	26.0%		-		31.9%
2003	26.0%		-		27.1%
2004	26.0%		-		22.2%
2005	26.0%		-		19.4%
2006	26.0%		-		19.8%
2007	26.0%		-		19.1%
2008	26.0%		-		22.9%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.18 - Asset allocation of the New York State Teachers' Retirement System Investment Portfolio as of June 30, 2007

	Target	Range			Actual
Equities					
Domestic equities	**51%**	**41%**	**-**	**61%**	**54.5%**
International equities	**10%**	**6%**	**-**	**14%**	**13.2%**
Real Estate	**8%**	**5%**	**-**	**11%**	**9.0%**
Private equitiy	**5%**	**2%**	**-**	**8%**	**4.2%**
Total equities	**74%**				**80.9%**
Fixed income					
Domestic fixed income	**18%**	**11%**	**-**	**25%**	**12.0%**
Mortgages	**8%**	**5%**	**-**	**11%**	**4.8%**
Cash equivalents	**0%**	**0%**	**-**	**5%**	**2.3%**
Total fixed income	**26%**				**19.1%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.19.a - New York State Teachers' Retirement System investment portfolio value 2006 - 2008

	2008	2007	2006	Increase/ Decrease 2007 to 2008	Percentage Change 2007 to 2008
Short-term	$529,367	$2,368,777	$2,320,857	-$1,839,410	-77.7%
Domestic fixed income securities	$16,212,220	$12,932,826	$11,465,623	$3,279,394	25.4%
Domestic equities	$46,097,043	$57,652,571	$52,516,790	-$11,555,528	-20.0%
International equities	$12,471,647	$14,057,326	$10,867,369	-$1,585,679	-11.3%
Mortgages	$4,381,116	$3,988,511	$3,771,978	$392,605	9.8%
Real estate	$7,580,112	$6,981,564	$5,064,520	$598,548	8.6%
Alternative investments	$6,876,575	$5,388,876	$4,041,434	$1,487,699	27.6%
Total investments	$94,148,080	$103,370,451	$90,048,571	-$9,222,371	-8.9%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.19.b - New York State Teachers' Retirement System investment portfolio value 2007 - 2008

	Dec 2008	Dec 2007	June 2008	June 2007	Percentage change Jun 2007 - Dec 2008
Short-term	$1,263,761	$3,169,531	$529,367	$2,368,777	-46.6%
Domestic fixed income securities	$15,615,173	$14,788,767	$16,212,220	$12,932,826	20.7%
Domestic equities	$31,636,469	$53,149,759	$46,097,043	$57,652,571	-45.1%
International equities	$7,938,061	$14,036,009	$12,471,647	$14,057,326	-43.5%
Mortgages	$4,164,083	$4,017,241	$4,381,116	$3,988,511	4.4%
Real estate	$7,106,233	$7,183,965	$7,580,112	$6,981,564	1.8%
Alternative investments	$6,777,756	$6,341,723	$6,876,575	$5,388,876	25.8%
Total investments	$74,501,538	$102,686,995	$94,148,080	$103,370,451	-27.9%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008 and a FOIL request of the NYSTRS
Note: dollar figures are millions of dollars

Table III.19.c - New York State Teachers' Retirement System real estate and alternative investments as of December 2007 and December 2008

	2008	2007	Change
MORTGAGES			
Conventional	**$4,137,785,963**	**$3,984,433,031**	**3.8%**
FHA	**$26,296,728**	**$32,807,640**	**-19.8%**
REAL ESTATE			
Direct equity	**$4,300,589,522**	**$4,476,055,651**	**-3.9%**
Commingled	**$2,805,643,780**	**$2,707,909,174**	**3.6%**
ALTERNATIVE INVESTMENTS			
Private equity	**$5,522,928,574**	**$5,188,006,222**	**6.5%**
Real estate equity funds	**$516,837,957**	**$501,972,061**	**3.0%**
Real estate debt funds	**$464,588,716**	**$428,792,994**	**8.3%**
Timberland	**$273,401,223**	**$222,952,027**	**22.6%**

Source: Freedom of Information Law request of the New York State Teachers' Retirement System

Table III.20 - New York State Teachers' Retirement System equity portfolio as of June 30, 2007 and June 30, 2008

Equity class	June 30 2008	June 30, 2007	Percentage change
Total equities	**$61,424,390,703**	**$73,463,004,245**	**-16.4%**
Domestic equities	**$46,097,043,104**	**$56,353,210,752**	**-18.2%**
Internally managed passive	**$42,943,134,774**	**$54,183,131,971**	**-20.7%**
S&P 1500 Index	**$32,985,679,325**	***$39,584,764,972***	**-16.7%**
Russell Value Index 1000	**$1,708,635,671**	***$4,303,061,281***	**-60.3%**
S&P Value Tilt 1500	**$1,317,117,619**	***$1,628,272,398***	**-19.1%**
S&P Growth Tilt 1500	**$1,830,531,692**	***$2,202,938,710***	**-16.9%**
S&P 1500 Composite	**$1,310,978,047**	***$1,602,926,832***	**-18.2%**
S&P Small Cap 600	**$2,536,266,017**	***$3,293,606,681***	**-23.0%**
S&P Equal Weight 500	**$1,253,926,403**	***$1,567,561,097***	**-20.0%**
REITs	**$1,195,402,614**	**$1,299,359,888**	**-8.0%**
Externally managed active equity	**$1,958,505,716**	**$2,170,078,781**	**-9.7%**
Large cap value	**$1,092,034,268**	***$1,174,003,355***	**-7.0%**
Fund of funds/Small cap	***$866,471,448***	***$996,075,426***	**-13.0%**
Core	**--**	***$79,127,907***	
Growth	**$431,872,647**	***$487,594,786***	**-11.4%**
Value	**$434,598,801**	***$429,352,733***	**1.2%**
International equities	**$12,173,439,269**	**$13,640,354,824**	**-10.8%**
Benchmark agnostic developed countries	**$2,341,798,738**	**$3,175,034,561**	**-26.2%**
Core active developed countries	**$3,766,512,190**	**$4,136,309,805**	**-8.9%**
Emerging markets	**$461,880,684**	**$620,204,662**	**-25.5%**
Passive	**$1,166,904,093**	**$1,298,567,875**	**-10.1%**
Enhanced passive	**$4,436,343,564**	**$4,410,237,921**	**0.6%**

Sources: New York State Teachers' Retirement System annual reports 2007 and 2008

Table III.21 - Top twenty US public pension plans by assets under management in 2007

Investor name	Number of members	Assets under management (millions)	Private equity			
			Actual		Target	
			(Millions)	(Percent)	(Millions)	(Percent)
Oregon State Treasury	315,000	$67,000	$10,050	15.0	$10,050	15.0
Washington State Investment Board	443,699	$76,300	$10,682	14.0	$12,971	17.0
Michigan Department of Treasury	576,163	$55,000	$6,600	12.0	$7,500	13.6
Pennsylvania Public School Employees' Retirement System	410,000	$57,168	$5,431	9.5	$6,300	11.0
California Public Employees' Retirement System	1,500,000	$230,300	$21,625	9.4	$13,818	6.0
Oregon Public Employees' Retirement Fund	300,000	$60,000	$5,400	9.0	$7,200	12.0
Minnesota State Board of Investment	498,000	$45,000	$3,375	7.5	$4,500	10.0
California State Teachers' Retirement System	795,000	$158,000	$10,371	6.5	$18,960	12.0
New York State Common Retirement Fund	995,000	$130,000	$8,190	6.3	$11,700	9.0
State Teachers' Retirement System of Ohio	446,500	$65,500	$3,657	5.6	$1,965	3.0
Virginia Retirement System	500,000	$48,500	$2,570	5.3	$3,395	7.0
Regents of the University of California	N/A	$71,000	$3,550	5.0	$8,875	12.5
Teacher Retirement System of Texas	1,000,000	$109,000	$3,564	3.3	$4,360	4.0
New York State Teachers' Retirement System	385,000	$85,000	$2,800	3.3	$4,250	5.0
Florida State Board of Administration	240,000	$123,000	$3,379	3.0	$6,150	5.0
State of Wisconsin Investment Board	527,000	$81,570	$2,447	3.0	$4,079	5.0
New Jersey State Investment Council	600,000	$79,000	$2,370	3.0	$4,345	5.5
New York City Teachers' Retirement System	150,000	$87,353	$2,446	2.8	$4,368	5.0
New York City Retirement System	200,000	$114,598	$2,177	1.9	$5,730	5.0
Ohio Public Employees' Retirement System	670,000	$67,582	$607	0.9	$2,703	4.0
All	10,551,362	$1,810,871	$111,291	5.8	$143,219	7.9

Source: **Public Value: A Primer on Private Equity*, Private Equity Council, 2007, p. 4. Available at:***
www.privateequitycouncil.org/wordpress/wp-content/uploads/pec_primer_layout_final-1.pdf

Table III.22 - New York State Teachers' Retirement System asset allocation as of June 30, 2007

Short-term:	
U.S. Treasury and agency	**$267,159**
Corporate	**$2,101,618**
Total	**$2,368,777**
Domestic fixed income securities:	
United States Treasury	**$4,548,100**
Federal agency, notes and debentures	**$760,163**
Federal agency mortgage backed	**$3,070,473**
Commercial mortgage backed	**$479,972**
Corporate	**$3,970,612**
Canadian	**$103,506**
Total	**$12,932,826**
Domestic equities:	
Basic materials	**$6,387,154**
Capital goods	**$7,432,651**
Consumer cyclicals	**$5,566,537**
Consumer staples	**$4,115,550**
Energy	**$5,438,418**
Financial	**$13,800,114**
Technology	**$8,154,151**
Transportation	**$1,382,394**
Utilities	**$5,365,760**
Diversified and Miscellaneous	**$9,842**
Total	**$57,652,571**
International equities:	
Commingled investments	**$12,915,946**
ADRs	**$724,408**
REITs	**$416,972**
Total	**$14,057,326**
Mortgages:	
Conventional	**$3,952,234**
Federal Housing Administration	**$36,277**
Total	**$3,988,511**
Real estate:	
Direct equity real estate investments	**$4,322,551**
Commingled real estate investments	**$2,659,013**
Total	**$6,981,564**
Alternative investments:	
Private equity	**$4,328,378**
Real estate equity funds	**$426,211**
Real estate debt funds	**$428,528**
Timberland	**$205,759**
Total	**$5,388,876**
Grand total	**$103,370,451**

Source: New York State Teachers' Retirement System annual report 2007
Note: dollar figures are millions of dollars

Table III.23 - New York State Teachers' Retirement System asset allocation as of June 30, 2008 (dollars)

Short-term:	
U.S. Treasury and agency	**$169,990**
Corporate	**$359,377**
Total	**$529,367**
Domestic fixed income securities:	
United States Treasury	**$4,734,279**
Federal agency, notes and debentures	**$1,682,033**
Federal agency mortgage backed	**$3,976,139**
Commercial mortgage backed	**$876,391**
Corporate	**$4,943,378**
Canadian	
Total	**$16,212,220**
Domestic equities:	
Basic materials	**$5,474,452**
Capital goods	**$6,140,319**
Consumer cyclicals	**$4,208,746**
Consumer staples	**$3,569,301**
Energy	**$5,941,613**
Financial	**$8,195,577**
Technology	**$7,161,076**
Transportation	**$1,230,716**
Utilities	**$4,163,791**
Diversified and Miscellaneous	**$11,452**
Total	**$46,097,043**
International equities:	
Commingled investments	**$11,519,039**
ADRs	**$654,401**
REITs	**$298,207**
Total	**$12,471,647**
Mortgages:	
Conventional	**$4,349,011**
Federal Housing Administration	**$32,105**
Total	**$4,381,116**
Real estate:	
Direct equity real estate investments	**$4,690,159**
Commingled real estate investments	**$2,889,953**
Total	**$7,580,112**
Alternative investments:	
Private equity	**$5,612,296**
Real estate equity funds	**$510,245**
Real estate debt funds	**$497,001**
Timberland	**$257,033**
Total	**$6,876,575**
Grand total	**$94,148,080**

Source: New York State Teachers' Retirement System annual report 2007
Note: dollar figures are millions of dollars

Table III.24 - New York State Teachers' Retirement System asset allocation as of June 30, 2007 (percentages)

Short-term:	
U.S. Treasury and agency	*0.3%*
Corporate	*2.0%*
Total	**2.3%**
Domestic fixed income securities:	
United States Treasury	*4.4%*
Federal agency, notes and debentures	*0.7%*
Federal agency mortgage backed	*3.0%*
Commercial mortgage backed	*0.5%*
Corporate	*3.8%*
Canadian	*0.1%*
Total	**12.5%**
Domestic equities:	
Basic materials	*6.2%*
Capital goods	*7.2%*
Consumer cyclicals	*5.4%*
Consumer staples	*4.0%*
Energy	*5.3%*
Financial	*13.4%*
Technology	*7.9%*
Transportation	*1.3%*
Utilities	*5.2%*
Diversified and Miscellaneous	*0.0%*
Total	**55.8%**
International equities:	
Commingled investments	*12.5%*
ADRs	*0.7%*
REITs	*0.4%*
Total	**13.6%**
Mortgages:	
Conventional	*3.8%*
Federal Housing Administration	*0.0%*
Total	**3.9%**
Real estate:	
Direct equity real estate investments	*4.2%*
Commingled real estate investments	*2.6%*
Total	**6.8%**
Alternative investments:	
Private equity	*4.2%*
Real estate equity funds	*0.4%*
Real estate debt funds	*0.4%*
Timberland	*0.2%*
Total	**5.2%**
Grand total	**100.0%**

Source: New York State Teachers' Retirement System annual report 2007

Table III.25 - Asset allocation of the New York State Teachers' Retirement System Investment Portfolio as of June 30, 2008

	Target	Range			Actual
Equities					
Domestic equities	**46%**	**36%**	**-**	**56%**	**47.70%**
International equities	**15%**	**11%**	**-**	**19%**	**12.90%**
Real Estate	**8%**	**4%**	**-**	**12%**	**10.50%**
Private equitiy	**5%**	**2%**	**-**	**10%**	**6.00%**
Total equities	**74%**				**77.10%**
Fixed income					
Domestic fixed income	**18%**	**11%**	**-**	**25%**	**16.30%**
Mortgages	**8%**	**5%**	**-**	**11%**	**6.00%**
Cash equivalents	**0%**	**0%**	**-**	**5%**	**0.60%**
Total fixed income	**26%**				**22.90%**

Source: New York State Teachers' Retirement System annual report 2008

Table III.26 - New York State Teachers's Retirement System asset allocation as of June 30, 2008 (percentages)

Short-term:	
U.S. Treasury and agency	*0.2%*
Corporate	*0.4%*
Total	**0.6%**
Domestic fixed income securities:	
United States Treasury	*5.0%*
Federal agency, notes and debentures	*1.8%*
Federal agency mortgage backed	*4.2%*
Commercial mortgage backed	*0.9%*
Corporate	*5.3%*
Canadian	*0.0%*
Total	**17.2%**
Domestic equities:	
Basic materials	*5.8%*
Capital goods	*6.5%*
Consumer cyclicals	*4.5%*
Consumer staples	*3.8%*
Energy	*6.3%*
Financial	*8.7%*
Technology	*7.6%*
Transportation	*1.3%*
Utilities	*4.4%*
Diversified and Miscellaneous	*0.0%*
Total	**49.0%**
International equities:	
Commingled investments	*12.2%*
ADRs	*0.7%*
REITs	*0.3%*
Total	**13.2%**
Mortgages:	
Conventional	*4.6%*
Federal Housing Administration	*0.0%*
Total	**4.7%**
Real estate:	
Direct equity real estate investments	*5.0%*
Commingled real estate investments	*3.1%*
Total	**8.1%**
Alternative investments:	
Private equity	*6.0%*
Real estate equity funds	*0.5%*
Real estate debt funds	*0.5%*
Timberland	*0.3%*
Total	**7.3%**
Grand total	**100.0%**

Source: New York State Teachers' Retirement System annual report 2008

Table III.27 - New York State Teachers' Retirement System fixed income investments 2000 - 2008

Fixed income assets	2000	2001	2002	2003	2004	2005	2006	2007	2008
Short term									
U.S. Treasury and agency	$106,657	$785,927	$409,385	$184,929	$221,793	$92,957	$264,322	$267,159	$169,990
Corporate	$848,059	$2,312,979	$2,135,308	$780,870	$1,550,413	$698,233	$2,056,535	$2,101,618	$359,377
Total	*$954,716*	*$3,098,906*	*$2,544,693*	*$965,799*	*$1,772,206*	*$791,190*	*$2,320,857*	*$2,368,777*	*$529,367*
Bonds									
United States Treasury	$5,845,193	$5,910,487	$5,706,038	$6,125,400	$5,421,417	$5,292,970	$4,505,420	$4,548,100	$4,734,279
Federal agencies, notes/debentures	$1,450,647	$950,547	$1,027,962	$782,899	$677,101	$642,945	$837,848	$1,070,602	$1,682,033
Federal agencies, mortgage backed	$1,861,383	$2,968,524	$2,752,332	$928,763	$629,566	$622,194	$1,819,760	$3,070,473	$3,976,139
Commercial mortgage backed			$420,309	$445,034	$454,883	$463,400	$488,781	$479,972	$876,391
Corporate	$5,398,783	$6,034,290	$6,078,034	$5,687,100	$4,679,420	$4,022,441	$3,656,452	$3,763,679	$4,943,378
Canadian	$188,566	$221,343	$258,657	$255,701	$239,274	$207,884	$157,362		
Global bonds	$2,016,872								
Total	*$14,744,572*	*$16,085,191*	*$16,243,332*	*$14,224,897*	*$12,101,661*	*$11,251,834*	*$11,465,623*	*$12,932,826*	*$16,212,220*
Mortgages:									
Conventional	$2,519,824	$3,271,788	$3,727,403	$3,809,952	$3,436,793	$3,900,861	$3,709,784	$3,952,234	$4,349,011
Federal Housing Administration	$555,086	$524,757	$451,116	$292,492	$184,585	$107,867	$62,194	$36,277	$32,105
Total	*$3,074,910*	*$3,796,545*	*$4,178,519*	*$4,102,444*	*$3,621,378*	*$4,008,728*	*$3,771,978*	*$3,988,511*	*$4,381,116*
Total investments	$88,308,463	$81,013,080	$72,424,676	$71,659,512	$79,418,201	$83,668,192	$90,048,571	$103,370,451	$94,148,080

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.28 - Percentage distribution of New York State Teachers' Retirement System fixed income investments 2000 - 2008

Fixed income assets	2000	2001	2002	2003	2004	2005	2006	2007	2008
Short term									
U.S. Treasury and agency	**0.1%**	**1.0%**	**0.6%**	**0.3%**	**0.3%**	**0.1%**	**0.3%**	**0.3%**	**0.2%**
Corporate	**1.0%**	**2.9%**	**2.9%**	**1.1%**	**2.0%**	**0.8%**	**2.3%**	**2.0%**	**0.4%**
Total	*1.1%*	*3.8%*	*3.5%*	*1.3%*	*2.2%*	*0.9%*	*2.6%*	*2.3%*	*0.6%*
Bonds									
United States Treasury	**6.6%**	**7.3%**	**7.9%**	**8.5%**	**6.8%**	**6.3%**	**5.0%**	**4.4%**	**5.0%**
Federal agencies, notes/debentures	**1.6%**	**1.2%**	**1.4%**	**1.1%**	**0.9%**	**0.8%**	**0.9%**	**1.0%**	**1.8%**
Federal agencies, mortgage backed	**2.1%**	**3.7%**	**3.8%**	**1.3%**	**0.8%**	**0.7%**	**2.0%**	**3.0%**	**4.2%**
Commercial mortgage backed	**0.0%**	**0.0%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.5%**		
Corporate	**6.1%**	**7.4%**	**8.4%**	**7.9%**	**5.9%**	**4.8%**	**4.1%**	**3.6%**	**5.3%**
Canadian			**0.4%**	**0.4%**	**0.3%**	**0.2%**	**0.2%**	**0.0%**	**0.0%**
Global bonds									**0.0%**
Total	*16.7%*	*19.9%*	*22.4%*	*19.9%*	*15.2%*	*13.4%*	*12.7%*	*12.5%*	*17.2%*
Mortgages:									
Conventional	**2.9%**	**4.0%**	**5.1%**	**5.3%**	**4.3%**	**4.7%**	**4.1%**	**3.8%**	**4.6%**
Federal Housing Administration	**0.6%**	**0.6%**	**0.6%**	**0.4%**	**0.2%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**
Total	*3.5%*	*4.7%*	*5.8%*	*5.7%*	*4.6%*	*4.8%*	*4.2%*	*3.9%*	*4.7%*
Total investments	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.29 - Annual percentage change in New York State Teachers' Retirement System fixed income investments 2000 - 2008

Fixed income assets	2001	2002	2003	2004	2005	2006	2007	2008
Short term								
U.S. Treasury and agency	**-86.4%**	**92.0%**	**121.4%**	**-16.6%**	**138.6%**	**-64.8%**	**-1.1%**	**57.2%**
Corporate	**-63.3%**	**8.3%**	**173.5%**	**-49.6%**	**122.0%**	**-66.0%**	**-2.1%**	**484.8%**
Total	-69.2%	21.8%	163.5%	-45.5%	124.0%	-65.9%	-2.0%	347.5%
Bonds								
United States Treasury	**-1.1%**	**3.6%**	**-6.8%**	**13.0%**	**2.4%**	**17.5%**	**-0.9%**	**-3.9%**
Federal agencies, notes/debentures	**52.6%**	**-7.5%**	**31.3%**	**15.6%**	**5.3%**	**-23.3%**	**-21.7%**	**-36.4%**
Federal agencies, mortgage backed	**-37.3%**	**7.9%**	**196.3%**	**47.5%**	**1.2%**	**-65.8%**	**-40.7%**	**-22.8%**
Commercial mortgage backed			**-5.6%**	**-2.2%**	**-1.8%**	**-5.2%**	**1.8%**	**-45.2%**
Corporate	**-10.5%**	**-0.7%**	**6.9%**	**21.5%**	**16.3%**	**10.0%**	**-2.8%**	**-23.9%**
Canadian	**-14.8%**	**-14.4%**	**1.2%**	**6.9%**	**15.1%**	**32.1%**		
Global bonds								
Total	*-8.3%*	*-1.0%*	*14.2%*	*17.5%*	*7.6%*	*-1.9%*	*-11.3%*	*-20.2%*
Mortgages:								
Conventional	**-23.0%**	**-12.2%**	**-2.2%**	**10.9%**	**-11.9%**	**5.2%**	**-6.1%**	**-9.1%**
Federal Housing Administration	**5.8%**	**16.3%**	**54.2%**	**58.5%**	**71.1%**	**73.4%**	**71.4%**	**13.0%**
Total	*-19.0%*	*-9.1%*	*1.9%*	*13.3%*	*-9.7%*	*6.3%*	*-5.4%*	*-9.0%*
Total investments	**9.0%**	**11.9%**	**1.1%**	**-9.8%**	**-5.1%**	**-7.1%**	**-12.9%**	**9.8%**

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.30 - New York State Teachers' Retirement System portfolio acquisitions, appreciation/depreciation and redemptions/maturities and paydowns 2000 - 2008

	2007 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ pay downs	2008 fair value	Percent of 2008 fair value
Short-term	$2,368,777		-$966		$529,367	0.56
Domestic fixed income	$12,932,826		$348,023		$16,212,220	17.22
Domestic equities	$57,652,571		-$8,461,630		$46,097,043	48.96
International equities	$14,057,326		-$1,479,879		$12,471,647	13.25
Global bonds						0.00
Mortgages	$3,988,511		$143,557		$4,381,116	4.65
Real estate separate accounts, cominged						0.00
Real estate	$6,981,564		$814,070		$7,580,112	8.05
Other real estate owned						0.00
Alternative investments	$5,388,876		$854,876		$6,876,575	7.30
Total	$103,370,451		-$7,781,949		$94,148,080	100.00

	2006 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2007 fair value	Percent of 2007 fair value
Short-term	$2,320,857	$43,107,202	-----	$43,059,282	$2,368,777	2.29
Domestic fixed income	$11,465,623	$3,590,973	$224,614	$2,348,384	$12,932,826	12.51
Domestic equities	$52,516,790	$6,566,057	$9,290,223	$10,720,499	$57,652,571	55.77
International equities	$10,867,369	$1,984,369	$2,821,584	$1,615,996	$14,057,326	13.60
Global bonds						
Mortgages	$3,771,978	$385,362	$66	$168,895	$3,988,511	3.87
Real estate separate accounts, cominged						
Real estate	$5,064,520	$1,297,617	$1,209,417	$589,990	$6,981,564	6.75
Other real estate owned						
Alternative investments	$4,041,434	$1,720,945	$1,176,063	$1,549,566	$5,388,876	5.21
Total	$90,048,571	$58,652,525	$14,721,967	$60,052,612	$103,370,451	100.00

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.30 - New York State Teachers' Retirement System portfolio acquisitions, appreciation/depreciation and redemptions/maturities and paydowns 2000 - 2008

	2005 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2006 fair value	Percent of 2006 fair value
Short-term	$791,190	$40,946,411	-----	$39,416,744	$2,320,857	2.58
Domestic fixed income	$11,251,834	$2,665,427	-$310,781	$2,140,857	$11,465,623	12.73
Domestic equities	$51,716,161	$6,043,686	$4,091,439	$9,334,496	$52,516,790	58.32
International equities	$8,585,289	$341,946	$2,307,388	$367,254	$10,867,369	12.07
Global bonds						
Mortgages	$4,008,728	$534,883	-$234,422	$537,211	$3,771,978	4.19
Real estate separate accounts, cominged						
Real estate	$4,225,044	$1,006,480	$900,907	$1,067,911	$5,064,520	5.62
Other real estate owned						
Alternative investments	$3,089,946	$1,181,195	$1,159,492	$1,389,199	$4,041,434	4.49
Total	$83,668,192	$52,720,028	$7,914,023	$54,253,672	$90,048,571	100.00

	2004 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2005 fair value	Percent of 2005 fair value
Short-term	$1,772,206	$37,079,520	-----	$38,060,536	$791,190	0.95
Domestic fixed income	$12,101,661	$449,123	$160,702	$1,459,652	$11,251,834	13.45
Domestic equities	$48,422,431	$9,491,067	$3,632,336	$9,829,673	$51,716,161	61.81
International equities	$7,556,573	$6,832,601	$1,050,628	$6,854,513	$8,585,289	10.26
Global bonds						
Mortgages	$3,621,378	$514,733	$160,257	$287,640	$4,008,728	4.79
Real estate separate accounts, cominged						
Real estate	$3,654,042	$866,250	$335,338	$630,586	$4,225,044	5.05
Other real estate owned						
Alternative investments	$2,289,910	$1,052,283	$544,579	$796,826	$3,089,946	3.69
Total	$79,418,201	$56,285,577	$5,883,840	$57,919,426	$83,668,192	100.00

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.30 - New York State Teachers' Retirement System portfolio acquisitions, appreciation/depreciation and redemptions/maturities and paydowns 2000 - 2008

	2003 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2004 fair value	Percent of 2004 fair value
Short-term	$965,799	$24,086,455	-----	$23,280,048	$1,772,206	2.23
Domestic fixed income	$14,224,897	$821,977	-$450,198	$2,495,015	$12,101,661	15.24
Domestic equities	$41,368,456	$5,425,023	$7,869,415	$6,240,463	$48,422,431	60.97
International equities	$5,752,951	$916,518	$1,812,663	$925,559	$7,556,573	9.52
Global bonds						
Mortgages	$4,102,444	$714,877	-$259,288	$936,655	$3,621,378	4.56
Real estate separate accounts, cominged	$1,064,156	$229,730	$62,797	$196,693	$1,159,990	1.46
Real estate	$2,521,885	$668,078	$115,111	$811,022	$2,494,052	3.14
Alternative investments	$1,658,924	$806,240	$361,510	$536,764	$2,289,910	2.88
Total	$71,659,512	$33,668,898	$9,512,010	$35,422,219	$79,418,201	100.00

	2002 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2003 fair value	Percent of 2003 fair value
Short-term	$2,544,693	$22,202,129	-----	$23,781,023	$965,799	1.35
Domestic fixed income	$16,243,332	$455,862	$1,085,589	$3,559,886	$14,224,897	19.85
Domestic equities	$38,817,974	$7,020,252	-$459,979	$4,009,791	$41,368,456	57.73
International equities	$5,826,091	$2,714,786	-$297,586	$2,490,340	$5,752,951	8.03
Global bonds						
Mortgages	$4,178,519	$163,146	$216,495	$455,716	$4,102,444	5.72
Real estate separate accounts, cominged	$1,167,724	$279,791	$12,305	$395,664	$1,064,156	1.49
Real estate	$2,326,074	$730,176	$73,679	$608,044	$2,521,885	3.51
Other real estate owned						
Alternative investments	$1,320,269	$620,260	$28,041	$309,646	$1,658,924	2.32
Total	$72,424,676	$34,186,402	$658,544	$35,610,110	$71,659,512	100.00

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.30 - New York State Teachers' Retirement System portfolio acquisitions, appreciation/depreciation and redemptions/maturities and paydowns 2000 - 2008

	2001 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2002 fair value	Percent of 2002 fair value
Short-term	$3,098,906	$27,750,249	—	$28,304,462	$2,544,693	3.51
Domestic fixed income	$16,085,191	$2,618,549	$623,125	$3,083,533	$16,243,332	22.43
Domestic equities	$46,680,553	$4,129,555	-$7,552,934	$4,439,200	$38,817,974	53.60
International equities	$6,730,334	$1,050,306	-$603,413	$1,351,136	$5,826,091	8.05
Global bonds						
Mortgages	$3,796,545	$526,100	$131,586	$275,712	$4,178,519	5.77
Real estate separate accounts, cominged	$937,561	$347,216	-$50,263	$66,790	$1,167,724	1.61
Real estate	$2,508,892	$350,209	-$116,646	$416,381	$2,326,074	3.21
Other real estate owned	$107,000	—	$11,563	$118,563	—	0.00
Alternative investments	$1,068,098	$580,796	-$46,684	$281,941	$1,320,269	1.82
Total	$81,013,080	$37,352,980	-$7,603,666	$38,337,718	$72,424,676	100.00

	2000 fair value	Acquisitions	Appreciation/ depreciation	Redemptions/ maturities/ paydowns	2001 fair value	Percent of 2001 fair value
Short-term	$954,716	$36,071,419	—	$33,927,229	$3,098,906	3.82
Domestic fixed income	$14,744,572	$3,236,044	$922,106	$2,817,531	$16,085,191	19.85
Domestic equities	$54,798,012	$6,177,911	-$5,943,074	$8,352,296	$46,680,553	57.62
Global bonds	$9,060,404	—	-$2,193,098	$136,972	$6,730,334	8.31
International equities	$2,016,872	—	-$20,475	$1,996,397	—	—
Mortgages	$3,074,910	$915,274	$46,575	$240,214	$3,796,545	4.69
Real estate separate accounts, cominged	$739,145	$176,517	$50,357	$28,458	$937,561	1.16
Real estate	$2,167,219	$775,018	$132,811	$566,156	$2,508,892	3.10
Other real estate owned	$99,000	$4,325	$8,700	$5,025	$107,000	0.13
Alternative investments	$653,613	$509,993	$43,542	$139,050	$1,068,098	1.32
Total	$88,308,463	$47,866,501	-$6,952,556	$48,209,328	$81,013,080	100.00

Source: New York State Teachers' Retirement System annual reports 2001 - 2008
Note: dollar figures are millions of dollars

Table III.31 - New York State Teachers' Retirement System (NYSTRS) asset allocation in 2006 compared to the asset allocations of all other state public pension funds in 2006

All state public pension funds	Equities	Bonds	Real estate	Cash and other short term investments	Alternative investments	Other
NYSTRS	70.4	12.7	10.6	2.6	3.7	0.0
Median	61.2	24.1	6.1	1.6	5.5	6.8
Average	58.7	26.1	6.0	2.6	5.8	9.2
Minimum	22.7	7.0	0.0	0.1	0.0	0.0
Maximum	80.4	96.7	20.2	12.2	22.2	50.3
Twenty-fifth percentile	53.2	21.8	3.0	0.9	2.6	3.7
Seventy-fifth percentile	63.8	28.9	8.3	3.3	8.3	11.8

All state teacher public pension funds	Equities	Bonds	Real estate	Cash and other short term investments	Alternative investments	Other
NYSTRS	70.4	12.7	10.6	2.6	3.7	0.0
Median	61.7	24.1	6.2	1.9	4.4	6.1
Average	59.3	25.4	6.2	3.0	6.2	9.1
Minimum	24.2	8.4	0.0	0.1	0.0	0.0
Maximum	80.4	55.3	20.2	11.6	22.2	50.3
Twenty-fifth percentile	55.3	20.9	3.4	0.9	2.8	3.7
Seventy-fifth percentile	65.0	27.9	8.2	4.4	8.6	11.0

The sixteen state pension funds with assets with a market value of $40,000,000	Equities	Bonds	Real estate	Cash and other short term investments	Alternative investments	Other
NYSTRS	70.4	12.7	10.6	2.6	3.7	0.0
Median	62.9	22.3	5.7	1.5	3.7	6.0
Average	60.9	21.6	6.1	1.7	5.1	10.1
Minimum	39.3	7.0	0.2	0.1	1.7	0.0
Maximum	70.4	36.8	20.2	5.0	12.7	23.3
Twenty-fifth percentile	60.2	15.5	4.0	1.0	2.8	3.7
Seventy-fifth percentile	65.9	27.4	7.3	2.1	6.4	19.7

Table III.31 - New York State Teachers' Retirement System (NYSTRS) asset allocation in 2006 compared to the asset allocations of all other state public pension funds in 2006

Six largest state pension funds	Equities	Bonds	Real estate	Cash and other short term investments	Alternative investments	Other
New York State Teachers ($91,492,245,000)	70.4	12.7	10.6	2.6	3.7	
Texas Teachers ($100,701,949,000)	67.1	27.7	0.2	1.1	1.7	2.2
Florida RS ($116,340,049,000)	69.9	21.3	4.9	0.8	3.1	
NY State & Local ERS ($121,208,884,000)	63.0	20.6	4.7	4.7	7.0	
California Teachers ($144,212,376,000)	64.3	22.1	7.4	0.2	6.0	
California PERF ($211,564,738,000)	61.2	24.5	7.2	1.4	5.7	

Source: Center for Retirement Research at Boston College, 2006 State pension fund data set. Available at:
http://crr.bc.edu/frequently_requested_data/state_and_local_pension_data_4.html

Table III.32 - New York State Teachers' Retirement System funding position

Fiscal year end	Actuarial Value of Assets	Accrued Pension Benefit Liability	Percentage Funded
1991	$31,577	$33,337	94.7
1992	$32,432	$34,158	94.9
1993	$35,527	$37,230	95.4
1994	$38,465	$40,004	96.2
1995	$42,985	$44,258	97.1
1996	$48,865	$47,996	101.8
1997	$56,085	$50,868	110.3
1998	$64,779	$53,962	120.0
1999	$74,721	$65,637	113.8
2000	$83,422	$67,202	124.1
2001	$87,295	$69,817	125.0
2002	$71,374	$71,693	99.6
2003	$71,780	$72,209	99.4
2004	$72,044	$72,605	99.2
2005	$74,074	$74,961	98.8
2006	$78,336	$76,353	102.6
2007	$82,859	$79,537	104.2

Source: New York State Teachers' Retirement System **Annual Financial Report 2008**
Note: dollar figures are millions of dollars

Table III.33 - New York State Teachers' Retirement System pension benefits 1997 - 2006

	Years of credited service							
Retirement Effective Date	**0 - 5**	**5 - 10**	**10 - 15**	**15-20**	**20 - 25**	**25 - 30**	**30 - 35**	**35+**
Period 7/1/1997 to 6/30/1998								
Average monthly benefit	**$46**	**$276**	**$433**	**$938**	**$1,817**	**$2,998**	**$3,842**	**$4,599**
Average annual benefit	**$552**	**$3,312**	**$5,196**	**$11,256**	**$21,804**	**$35,976**	**$46,104**	**$55,188**
Average final average salary	**$9,578**	**$21,013**	**$28,669**	**$39,795**	**$52,718**	**$65,930**	**$71,162**	**$74,108**
Average annual benefit as a percentage of average annual benefit	**5.8%**	**15.8%**	**18.1%**	**28.3%**	**41.4%**	**54.6%**	**64.8%**	**74.5%**
Number of retired members	**24**	**74**	**463**	**376**	**622**	**980**	**1,906**	**858**
Percentage of retired members	**0.5%**	**1.4%**	**8.7%**	**7.1%**	**11.7%**	**18.5%**	**35.9%**	**16.2%**
Cumulative percentage	**0.5%**	**1.8%**	**10.6%**	**17.7%**	**29.4%**	**47.9%**	**83.8%**	**100.0%**
Period 7/1/1998 to 6/30/1999								
Average monthly benefit	**$85**	**$253**	**$403**	**$949**	**$1,941**	**$3,004**	**$3,966**	**$4,633**
Average annual benefit	**$1,020**	**$3,036**	**$4,836**	**$11,388**	**$23,292**	**$36,048**	**$47,592**	**$55,596**
Average final average salary	**$13,399**	**$26,106**	**$26,850**	**$40,178**	**$55,608**	**$66,258**	**$73,374**	**$75,027**
Average annual benefit as a percentage of average annual benefit	**7.6%**	**11.6%**	**18.0%**	**28.3%**	**41.9%**	**54.4%**	**64.9%**	**74.1%**
Number of retired members	**52**	**225**	**595**	**464**	**606**	**1,075**	**2,187**	**907**
Percentage of retired members	**0.9%**	**3.7%**	**9.7%**	**7.6%**	**9.9%**	**17.6%**	**35.8%**	**14.8%**
Cumulative percentage	**0.9%**	**4.5%**	**14.3%**	**21.9%**	**31.8%**	**49.4%**	**85.2%**	**100.0%**
Period 7/1/1999 to 6/30/2000								
Average monthly benefit	**$63**	**$220**	**$445**	**$1,049**	**$2,096**	**$3,185**	**$4,146**	**$4,883**
Average annual benefit	**$756**	**$2,640**	**$5,340**	**$12,588**	**$25,152**	**$38,220**	**$49,752**	**$58,596**
Average final average salary	**$13,587**	**$23,776**	**$29,057**	**$41,984**	**$57,788**	**$69,629**	**$76,548**	**$79,416**
Average annual benefit as a percentage of average annual benefit	**5.6%**	**11.1%**	**18.4%**	**30.0%**	**43.5%**	**54.9%**	**65.0%**	**73.8%**
Number of retired members	**37**	**270**	**656**	**459**	**789**	**1,216**	**2,419**	**812**
Percentage of retired members	**0.6%**	**4.1%**	**9.9%**	**6.9%**	**11.9%**	**18.3%**	**36.3%**	**12.2%**
Cumulative percentage	**0.6%**	**4.6%**	**14.5%**	**21.4%**	**33.2%**	**51.5%**	**87.8%**	**100.0%**
Period 7/1/2000 to 6/30/2001								
Average monthly benefit	**$96**	**$223**	**$478**	**$1,140**	**$2,059**	**$3,026**	**$4,209**	**$4,934**
Average annual benefit	**$1,152**	**$2,676**	**$5,736**	**$13,680**	**$24,708**	**$36,312**	**$50,508**	**$59,208**
Average final average salary	**$17,754**	**$24,759**	**$30,352**	**$44,904**	**$56,437**	**$66,528**	**$76,231**	**$78,955**
Average annual benefit as a percentage of average annual benefit	**6.5%**	**10.8%**	**18.9%**	**30.5%**	**43.8%**	**54.6%**	**66.3%**	**75.0%**
Number of retired members	**43**	**239**	**659**	**477**	**616**	**935**	**2,501**	**2,476**
Percentage of retired members	**0.5%**	**3.0%**	**8.3%**	**6.0%**	**7.8%**	**11.8%**	**31.5%**	**31.2%**
Cumulative percentage	**0.5%**	**3.5%**	**11.8%**	**17.8%**	**25.6%**	**37.4%**	**68.8%**	**100.0%**
Period 7/1/2001 to 6/30/2002								
Average monthly benefit	**$72**	**$216**	**$436**	**$1,134**	**$2,105**	**$3,182**	**$4,375**	**$5,212**
Average annual benefit	**$864**	**$2,592**	**$5,232**	**$13,608**	**$25,260**	**$38,184**	**$52,500**	**$62,544**
Average final average salary	**$12,590**	**$24,126**	**$29,195**	**$45,001**	**$58,520**	**$69,879**	**$78,648**	**$84,343**
Average annual benefit as a percentage of average annual benefit	**6.9%**	**10.7%**	**17.9%**	**30.2%**	**43.2%**	**54.6%**	**66.8%**	**74.2%**
Number of retired members	**33**	**248**	**714**	**462**	**706**	**860**	**2,700**	**1,621**
Percentage of retired members	**0.4%**	**3.4%**	**9.7%**	**6.3%**	**9.6%**	**11.7%**	**36.8%**	**22.1%**
Cumulative percentage	**0.4%**	**3.8%**	**13.5%**	**19.8%**	**29.5%**	**41.2%**	**77.9%**	**100.0%**
Period 7/1/2002 to 6/30/2003								
Average monthly benefit	**$127**	**$196**	**$457**	**$1,163**	**$2,181**	**$3,211**	**$4,422**	**$5,138**
Average annual benefit	**$1,524**	**$2,352**	**$5,484**	**$13,956**	**$26,172**	**$38,532**	**$53,064**	**$61,656**
Average final average salary	**$26,834**	**$23,297**	**$30,975**	**$47,047**	**$60,152**	**$69,988**	**$79,549**	**$82,324**
Average annual benefit as a percentage of average annual benefit	**5.7%**	**10.1%**	**17.7%**	**29.7%**	**43.5%**	**55.1%**	**66.7%**	**74.9%**
Number of retired members	**39**	**391**	**747**	**540**	**777**	**1,004**	**3,288**	**3,387**
Percentage of retired members	**0.4%**	**3.8%**	**7.3%**	**5.3%**	**7.6%**	**9.9%**	**32.3%**	**33.3%**
Cumulative percentage	**0.4%**	**4.2%**	**11.6%**	**16.9%**	**24.5%**	**34.4%**	**66.7%**	**100.0%**

Table III.33 - New York State Teachers' Retirement System pension benefits 1997 - 2006

	Years of credited service							
Retirement Effective Date	**0 - 5**	**5 - 10**	**10 - 15**	**15-20**	**20 - 25**	**25 - 30**	**30 - 35**	**35+**
Period 7/1/2003 to 6/30/2004								
Average monthly benefit	$108	$202	$490	$1,230	$2,315	$3,362	$4,571	$5,593
Average annual benefit	$1,296	$2,424	$5,880	$14,760	$27,780	$40,344	$54,852	$67,116
Average final average salary	$20,675	$24,200	$31,828	$49,231	$64,041	$73,613	$82,002	$90,463
Average annual benefit as a percentage of average annual benefit	6.3%	10.0%	18.5%	30.0%	43.4%	54.8%	66.9%	74.2%
Number of retired members	28	318	569	475	675	788	2,744	1,690
Percentage of retired members	0.4%	4.4%	7.8%	6.5%	9.3%	10.8%	37.7%	23.2%
Cumulative percentage	0.4%	4.7%	12.6%	19.1%	28.3%	39.2%	76.8%	100.0%
Period 7/1/2004 to 6/30/2005								
Average monthly benefit	$235	$296	$482	$1,153	$2,432	$3,477	$4,646	$5,793
Average annual benefit	$2,820	$3,552	$5,784	$13,836	$29,184	$41,724	$55,752	$69,516
Average final average salary	$37,120	$25,825	$30,400	$47,128	$65,314	$74,902	$81,145	$91,010
Average annual benefit as a percentage of average annual benefit	7.6%	13.8%	19.0%	29.4%	44.7%	55.7%	68.7%	76.4%
Number of retired members	33	270	626	513	746	790	2,574	1,630
Percentage of retired members	0.5%	3.8%	8.7%	7.1%	10.4%	11.0%	35.8%	22.7%
Cumulative percentage	0.5%	4.2%	12.9%	20.1%	30.5%	41.5%	77.3%	100.0%
Period 7/1/2005 to 6/30/2006								
Average monthly benefit	$131	$227	$503	$1,245	$2,414	$3,359	$4,569	$5,657
Average annual benefit	$1,572	$2,724	$6,036	$14,940	$28,968	$40,308	$54,828	$67,884
Average final average salary	$21,859	$27,506	$34,427	$50,742	$64,892	$74,120	$81,845	$90,272
Average annual benefit as a percentage of average annual benefit	7.2%	9.9%	17.5%	29.4%	44.6%	54.4%	67.0%	75.2%
Number of retired members	60	451	547	486	756	865	2,377	1,739
Percentage of retired members	0.8%	6.2%	7.5%	6.7%	10.4%	11.9%	32.6%	23.9%
Cumulative percentage	0.8%	7.0%	14.5%	21.2%	31.6%	43.5%	76.1%	100.0%
Period 7/1/2006 to 6/30/2007								
Average monthly benefit	$118	$257	$558	$1,264	$2,222	$3,336	$4,629	$5,831
Average annual benefit	$1,416	$3,084	$6,696	$15,168	$26,664	$40,032	$55,548	$69,972
Average final average salary	$24,409	$28,422	$37,416	$52,612	$65,663	$76,566	$84,377	$94,039
Average annual benefit as a percentage of average annual benefit	5.8%	10.9%	17.9%	28.8%	40.6%	52.3%	65.8%	74.4%
Number of retired members	65	415	537	491	722	831	2,152	1,687
Percentage of retired members	0.9%	6.0%	7.8%	7.1%	10.5%	12.0%	31.2%	24.4%
Cumulative percentage	0.9%	7.0%	14.7%	21.9%	32.3%	44.4%	75.6%	100.0%
Period 7/1/2007 to 6/30/2008								
Average monthly benefit	$136	$264	$559	$1,326	$2,358	$3,587	$4,767	$6,064
Average annual benefit	$1,632	$3,168	$6,708	$15,912	$28,296	$43,044	$57,204	$72,768
Average final average salary	$25,781	$30,873	$38,528	$55,668	$69,848	$81,072	$87,087	$97,266
Average annual benefit as a percentage of average annual benefit	6.3%	10.3%	17.4%	28.6%	40.5%	53.1%	65.7%	74.8%
Number of retired members	67	397	529	422	721	761	1,753	1,680
Percentage of retired members	1.1%	6.3%	8.4%	6.7%	11.4%	12.0%	27.7%	26.5%
Cumulative percentage	1.1%	7.3%	15.7%	22.4%	33.7%	45.8%	73.5%	100.0%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.34 - New York State Teachers' Retirement System final average salary by years of credited service 1997 - 2006

Retirement Effective Date	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1997 - 6/30/1998	$9,578	$21,013	$28,669	$39,795	$52,718	$65,930	$71,162	$74,108
7/1/1998 - 6/30/1999	$13,399	$26,106	$26,850	$40,178	$55,608	$66,258	$73,374	$75,027
7/1/1999 - 6/30/2000	$13,587	$23,776	$29,057	$41,984	$57,788	$69,629	$76,548	$79,416
7/1/2000 - 6/30/2001	$17,754	$24,759	$30,352	$44,904	$56,437	$66,528	$76,231	$78,955
7/1/2001 - 6/30/2002	$12,590	$24,126	$29,195	$45,001	$58,520	$69,879	$78,648	$84,343
7/1/2002 - 6/30/2003	$26,834	$23,297	$30,975	$47,047	$60,152	$69,988	$79,549	$82,324
7/1/2003 - 6/30/2004	$20,675	$24,200	$31,828	$49,231	$64,041	$73,613	$82,002	$90,463
7/1/2004 - 6/30/2005	$37,120	$25,825	$30,400	$47,128	$65,314	$74,902	$81,145	$91,010
7/1/2005 - 6/30/2006	$21,859	$27,506	$34,427	$50,742	$64,892	$74,120	$81,845	$90,272
7/1/2006 - 6/30/2007	$24,409	$28,422	$37,416	$52,612	$65,663	$76,566	$84,377	$94,039
7/1/2007 - 6/30/2008	$25,781	$30,873	$38,528	$55,668	$69,848	$81,072	$87,087	$97,266

Percentage change in final average salary

Retirement Effective Date	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1998 - 6/30/1999	39.9%	24.2%	-6.3%	1.0%	5.5%	0.5%	3.1%	1.2%
7/1/1999 - 6/30/2000	1.4%	-8.9%	8.2%	4.5%	3.9%	5.1%	4.3%	5.8%
7/1/2000 - 6/30/2001	30.7%	4.1%	4.5%	7.0%	-2.3%	-4.5%	-0.4%	-0.6%
7/1/2001 - 6/30/2002	-29.1%	-2.6%	-3.8%	0.2%	3.7%	5.0%	3.2%	6.8%
7/1/2002 - 6/30/2003	113.1%	-3.4%	6.1%	4.5%	2.8%	0.2%	1.1%	-2.4%
7/1/2003 - 6/30/2004	-23.0%	3.9%	2.8%	4.6%	6.5%	5.2%	3.1%	9.9%
7/1/2004 - 6/30/2005	79.5%	6.7%	-4.5%	-4.3%	2.0%	1.8%	-1.0%	0.6%
7/1/2005 - 6/30/2006	-41.1%	6.5%	13.2%	7.7%	-0.6%	-1.0%	0.9%	-0.8%
7/1/2006 - 6/30/2007	11.7%	3.3%	8.7%	3.7%	1.2%	3.3%	3.1%	4.2%
7/1/2007 - 6/30/2008	5.6%	8.6%	3.0%	5.8%	6.4%	5.9%	3.2%	3.4%
Median	8.6%	4.0%	3.7%	4.5%	3.2%	2.5%	3.1%	2.3%

Three year moving average of final average salary centered on the second year

Retirement Effective Date	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1997 - 6/30/2000	$12,188	$23,632	$28,192	$40,652	$55,371	$67,272	$73,695	$76,184
7/1/1998 - 6/30/2001	$14,913	$24,880	$28,753	$42,355	$56,611	$67,472	$75,384	$77,799
7/1/1999 - 6/30/2002	$14,644	$24,220	$29,535	$43,963	$57,582	$68,679	$77,142	$80,905
7/1/2000 - 6/30/2003	$19,059	$24,061	$30,174	$45,651	$58,370	$68,798	$78,143	$81,874
7/1/2001 - 6/30/2004	$20,033	$23,874	$30,666	$47,093	$60,904	$71,160	$80,066	$85,710
7/1/2002 - 6/30/2005	$28,210	$24,441	$31,068	$47,802	$63,169	$72,834	$80,899	$87,932
7/1/2003 - 6/30/2006	$26,551	$25,844	$32,218	$49,034	$64,749	$74,212	$81,664	$90,582
7/1/2004 - 6/30/2007	$27,796	$27,251	$34,081	$50,161	$65,290	$75,196	$82,456	$91,774

Table III.34 - New York State Teachers' Retirement System final average salary by years of credited service 1997 - 2006

Percentage change in three year moving average of final average salary centered on the second year

Change from previous period	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1998 - 6/30/2001	22.4%	5.3%	2.0%	4.2%	2.2%	0.3%	2.3%	2.1%
7/1/1999 - 6/30/2002	-1.8%	-2.7%	2.7%	3.8%	1.7%	1.8%	2.3%	4.0%
7/1/2000 - 6/30/2003	30.2%	-0.7%	2.2%	3.8%	1.4%	0.2%	1.3%	1.2%
7/1/2001 - 6/30/2004	5.1%	-0.8%	1.6%	3.2%	4.3%	3.4%	2.5%	4.7%
7/1/2002 - 6/30/2005	40.8%	2.4%	1.3%	1.5%	3.7%	2.4%	1.0%	2.6%
7/1/2003 - 6/30/2006	-5.9%	5.7%	3.7%	2.6%	2.5%	1.9%	0.9%	3.0%
7/1/2004 - 6/30/2007	4.7%	5.4%	5.8%	2.3%	0.8%	1.3%	1.0%	1.3%
Median	5.1%	2.4%	2.2%	3.2%	2.2%	1.8%	1.3%	2.6%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.35 - New York State Teachers' Retirement System final average salary by years of credited service 1997 - 2006 using constant 2006 dollars

Retirement Effective Date	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1997 - 6/30/1998	$12,630	$27,709	$37,804	$52,476	$69,516	$86,938	$93,838	$97,722
7/1/1998 - 6/30/1999	$17,299	$33,704	$34,665	$51,872	$71,793	$85,543	$94,730	$96,864
7/1/1999 - 6/30/2000	$17,040	$29,819	$36,442	$52,655	$72,476	$87,326	$96,004	$99,601
7/1/2000 - 6/30/2001	$21,521	$30,013	$36,793	$54,433	$68,413	$80,646	$92,408	$95,710
7/1/2001 - 6/30/2002	$15,007	$28,757	$34,799	$53,639	$69,753	$83,292	$93,744	$100,532
7/1/2002 - 6/30/2003	$31,108	$27,007	$35,908	$54,540	$69,732	$81,134	$92,218	$95,435
7/1/2003 - 6/30/2004	$22,909	$26,815	$35,267	$54,550	$70,961	$81,567	$90,862	$100,237
7/1/2004 - 6/30/2005	$40,213	$27,977	$32,933	$51,055	$70,757	$81,144	$87,907	$98,594
7/1/2005 - 6/30/2006	$22,415	$28,205	$35,302	$52,032	$66,541	$76,004	$83,925	$92,567
7/1/2006 - 6/30/2007	$24,409	$28,422	$37,416	$52,612	$65,663	$76,566	$84,377	$94,039
7/1/2007 - 6/30/2008	$24,666	$29,537	$36,861	$53,260	$66,826	$77,564	$83,319	$93,058

Percentage change in final average salary

Change from previous school year	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1998 - 6/30/1999	37.0%	21.6%	-8.3%	-1.2%	3.3%	-1.6%	1.0%	-0.9%
7/1/1999 - 6/30/2000	-1.5%	-11.5%	5.1%	1.5%	1.0%	2.1%	1.3%	2.8%
7/1/2000 - 6/30/2001	26.3%	0.7%	1.0%	3.4%	-5.6%	-7.7%	-3.7%	-3.9%
7/1/2001 - 6/30/2002	-30.3%	-4.2%	-5.4%	-1.5%	2.0%	3.3%	1.4%	5.0%
7/1/2002 - 6/30/2003	107.3%	-6.1%	3.2%	1.7%	0.0%	-2.6%	-1.6%	-5.1%
7/1/2003 - 6/30/2004	-26.4%	-0.7%	-1.8%	0.0%	1.8%	0.5%	-1.5%	5.0%
7/1/2004 - 6/30/2005	75.5%	4.3%	-6.6%	-6.4%	-0.3%	-0.5%	-3.3%	-1.6%
7/1/2005 - 6/30/2006	-44.3%	0.8%	7.2%	1.9%	-6.0%	-6.3%	-4.5%	-6.1%
7/1/2006 - 6/30/2007	8.9%	0.8%	6.0%	1.1%	-1.3%	0.7%	0.5%	1.6%
7/1/2007 - 6/30/2008	1.1%	3.9%	-1.5%	1.2%	1.8%	1.3%	-1.3%	-1.0%
Median	5.0%	0.7%	-0.3%	1.2%	0.5%	0.0%	-1.4%	-1.0%

Table III.35 - New York State Teachers' Retirement System final average salary by years of credited service 1997 - 2006 using constant 2006 dollars

Three year moving average of final average salary centered on the second year

Retirement Effective Date	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1997 - 6/30/2000	$15,656	$30,411	$36,304	$52,334	$71,262	$86,602	$94,857	$98,062
7/1/1998 - 6/30/2001	$18,620	$31,179	$35,967	$52,987	$70,894	$84,505	$94,380	$97,391
7/1/1999 - 6/30/2002	$17,856	$29,530	$36,011	$53,576	$70,214	$83,755	$94,052	$98,614
7/1/2000 - 6/30/2003	$22,545	$28,592	$35,833	$54,204	$69,299	$81,691	$92,790	$97,226
7/1/2001 - 6/30/2004	$23,008	$27,526	$35,325	$54,243	$70,148	$81,998	$92,275	$98,735
7/1/2002 - 6/30/2005	$31,410	$27,266	$34,703	$53,382	$70,483	$81,282	$90,329	$98,089
7/1/2003 - 6/30/2006	$28,512	$27,666	$34,501	$52,546	$69,420	$79,571	$87,565	$97,133
7/1/2004 - 6/30/2007	$29,012	$28,201	$35,217	$51,900	$67,654	$77,905	$85,403	$95,067

Percentage change in three year moving average of final average salary centered on the second year

Change from previous period	Years of credited service							
	0 - 5	5 - 10	10 - 15	15-20	20 - 25	25 - 30	30 - 35	35+
7/1/1998 - 6/30/2001	18.9%	2.5%	-0.9%	1.2%	-0.5%	-2.4%	-0.5%	-0.7%
7/1/1999 - 6/30/2002	-4.1%	-5.3%	0.1%	1.1%	-1.0%	-0.9%	-0.3%	1.3%
7/1/2000 - 6/30/2003	26.3%	-3.2%	-0.5%	1.2%	-1.3%	-2.5%	-1.3%	-1.4%
7/1/2001 - 6/30/2004	2.1%	-3.7%	-1.4%	0.1%	1.2%	0.4%	-0.6%	1.6%
7/1/2002 - 6/30/2005	36.5%	-0.9%	-1.8%	-1.6%	0.5%	-0.9%	-2.1%	-0.7%
7/1/2003 - 6/30/2006	-9.2%	1.5%	-0.6%	-1.6%	-1.5%	-2.1%	-3.1%	-1.0%
7/1/2004 - 6/30/2007	1.8%	1.9%	2.1%	-1.2%	-2.5%	-2.1%	-2.5%	-2.1%
Median	2.1%	-0.9%	-0.6%	0.1%	-1.0%	-2.1%	-1.3%	-0.7%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008

Table III.36 - Projected pension payouts by year to the median New York State Teachers' Retirement System 2006 and 2007 retiree by pension quintile

		2006 Retirees						2007 Retirees					
		2006 retiree pension quintile						2007 retiree pension quintile					
		Twentieth	Fourtieth	Sixtieth	Eightieth			Twentieth	Fourtieth	Sixtieth	Eightieth		
Year	Age	$18,810	$41,137	$52,093	$66,130	Year	Age	$18,694	$42,112	$52,383	$65,192		
2006	57.5	$18,810	$41,137	$52,093	$66,130	2007	58	$18,694	$42,112	$52,383	$65,192		
2007	58.5	$18,810	$41,137	$52,093	$66,130	2008	59	$18,694	$42,112	$52,383	$65,192		
2008	59.5	$18,810	$41,137	$52,093	$66,130	2009	60	$18,694	$42,112	$52,383	$65,192		
2009	60.5	$18,810	$41,137	$52,093	$66,130	2010	61	$18,694	$42,112	$52,383	$65,192		
2010	61.5	$18,810	$41,137	$52,093	$66,130	2011	62	$18,694	$42,112	$52,383	$65,192		
2011	62.5	$19,080	$41,407	$52,363	$66,400	2012	63	$18,964	$42,382	$52,653	$65,462		
2012	63.5	$19,350	$41,677	$52,633	$66,670	2013	64	$19,234	$42,652	$52,923	$65,732		
2013	64.5	$19,620	$41,947	$52,903	$66,940	2014	65	$19,504	$42,922	$53,193	$66,002		
2014	65.5	$19,890	$42,217	$53,173	$67,210	2015	66	$19,774	$43,192	$53,463	$66,272		
2015	66.5	$20,160	$42,487	$53,443	$67,480	2016	67	$20,044	$43,462	$53,733	$66,542		
2016	67.5	$20,430	$42,757	$53,713	$67,750	2017	68	$20,314	$43,732	$54,003	$66,812		
2017	68.5	$20,700	$43,027	$53,983	$68,020	2018	69	$20,584	$44,002	$54,273	$67,082		
2018	69.5	$20,970	$43,297	$54,253	$68,290	2019	70	$20,854	$44,272	$54,543	$67,352		
2019	70.5	$21,240	$43,567	$54,523	$68,560	2020	71	$21,124	$44,542	$54,813	$67,622		
2020	71.5	$21,510	$43,837	$54,793	$68,830	2021	72	$21,394	$44,812	$55,083	$67,892		
2021	72.5	$21,780	$44,107	$55,063	$69,100	2022	73	$21,664	$45,082	$55,353	$68,162		
2022	73.5	$22,050	$44,377	$55,333	$69,370	2023	74	$21,934	$45,352	$55,623	$68,432		
2023	74.5	$22,320	$44,647	$55,603	$69,640	2024	75	$22,204	$45,622	$55,893	$68,702		
2024	75.5	$22,590	$44,917	$55,873	$69,910	2025	76	$22,474	$45,892	$56,163	$68,972		
2025	76.5	$22,860	$45,187	$56,143	$70,180	2026	77	$22,744	$46,162	$56,433	$69,242		
2026	77.5	$23,130	$45,457	$56,413	$70,450	2027	78	$23,014	$46,432	$56,703	$69,512		
2027	78.5	$23,400	$45,727	$56,683	$70,720	2028	79	$23,284	$46,702	$56,973	$69,782		
2028	79.5	$23,670	$45,997	$56,953	$70,990	2029	80	$23,554	$46,972	$57,243	$70,052		
2029	80.5	$23,940	$46,267	$57,223	$71,260	2030	81	$23,824	$47,242	$57,513	$70,322		
2030	81.5	$24,210	$46,537	$57,493	$71,530	2031	82	$24,094	$47,512	$57,783	$70,592		
2031	82.5	$24,480	$46,807	$57,763	$71,800	2032	83	$24,364	$47,782	$58,053	$70,862		

Source: data on retiree pension quintiles was calculated from data obtained from the Newsday New York State Teacher Retirement System database. The database is available at
http://www.newsdayinteractive.com/community/teacherpensions.php
Note: the projections are those of the author

Table III.37 - Projected cumulative pension payouts by year to the median New York State Teachers' Retirement System 2006 and 2007 retiree by pension quintile

		2006 Retirees						2007 Retirees					
		2006 retiree pension quintile						2007 retiree pension quintile					
		Twentieth	Fourtieth	Sixtieth	Eightieth			Twentieth	Fourtieth	Sixtieth	Eightieth		
Year	Age	$18,810	$41,137	$52,093	$66,130	Year	Age	$18,694	$42,112	$52,383	$65,192		
2006	57.5	$18,810	$41,137	$52,093	$66,130	2006	57.5	$18,694	$42,112	$52,383	$65,192		
2007	58.5	$37,620	$82,274	$104,186	$132,260	2007	58.5	$37,388	$84,224	$104,766	$130,384		
2008	59.5	$56,430	$123,411	$156,279	$198,390	2008	59.5	$56,082	$126,336	$157,149	$195,576		
2009	60.5	$75,240	$164,548	$208,372	$264,520	2009	60.5	$74,776	$168,448	$209,532	$260,768		
2010	61.5	$94,050	$205,685	$260,465	$330,650	2010	61.5	$93,470	$210,560	$261,915	$325,960		
2011	62.5	$113,130	$247,092	$312,828	$397,050	2011	62.5	$112,434	$252,942	$314,568	$391,422		
2012	63.5	$132,480	$288,769	$365,461	$463,720	2012	63.5	$131,668	$295,594	$367,491	$457,154		
2013	64.5	$152,100	$330,716	$418,364	$530,660	2013	64.5	$151,172	$338,516	$420,684	$523,156		
2014	65.5	$171,990	$372,933	$471,537	$597,870	2014	65.5	$170,946	$381,708	$474,147	$589,428		
2015	66.5	$192,150	$415,420	$524,980	$665,350	2015	66.5	$190,990	$425,170	$527,880	$655,970		
2016	67.5	$212,580	$458,177	$578,693	$733,100	2016	67.5	$211,304	$468,902	$581,883	$722,782		
2017	68.5	$233,280	$501,204	$632,676	$801,120	2017	68.5	$231,888	$512,904	$636,156	$789,864		
2018	69.5	$254,250	$544,501	$686,929	$869,410	2018	69.5	$252,742	$557,176	$690,699	$857,216		
2019	70.5	$275,490	$588,068	$741,452	$937,970	2019	70.5	$273,866	$601,718	$745,512	$924,838		
2020	71.5	$297,000	$631,905	$796,245	$1,006,800	2020	71.5	$295,260	$646,530	$800,595	$992,730		
2021	72.5	$318,780	$676,012	$851,308	$1,075,900	2021	72.5	$316,924	$691,612	$855,948	$1,060,892		
2022	73.5	$340,830	$720,389	$906,641	$1,145,270	2022	73.5	$338,858	$736,964	$911,571	$1,129,324		
2023	74.5	$363,150	$765,036	$962,244	$1,214,910	2023	74.5	$361,062	$782,586	$967,464	$1,198,026		
2024	75.5	$385,740	$809,953	$1,018,117	$1,284,820	2024	75.5	$383,536	$828,478	$1,023,627	$1,266,998		
2025	76.5	$408,600	$855,140	$1,074,260	$1,355,000	2025	76.5	$406,280	$874,640	$1,080,060	$1,336,240		
2026	77.5	$431,730	$900,597	$1,130,673	$1,425,450	2026	77.5	$429,294	$921,072	$1,136,763	$1,405,752		
2027	78.5	$455,130	$946,324	$1,187,356	$1,496,170	2027	78.5	$452,578	$967,774	$1,193,736	$1,475,534		
2028	79.5	$478,800	$992,321	$1,244,309	$1,567,160	2028	79.5	$476,132	$1,014,746	$1,250,979	$1,545,586		
2029	80.5	$502,740	$1,038,588	$1,301,532	$1,638,420	2029	80.5	$499,956	$1,061,988	$1,308,492	$1,615,908		
2030	81.5	$526,950	$1,085,125	$1,359,025	$1,709,950	2030	81.5	$524,050	$1,109,500	$1,366,275	$1,686,500		
2031	82.5	$551,430	$1,131,932	$1,416,788	$1,781,750	2031	82.5	$548,414	$1,157,282	$1,424,328	$1,757,362		

Source: data on retiree pension quintiles was calculated from data obtained from the Newsday New York State Teacher Retirement System database. The database is available at:
http://www.newsdayinteractive.com/community/teacherpensions.php

Table III.38 - 2004 United State life table for those aged 57 and above

Age	Probability of dying between ages x to x+1	Number surviving to age x	Number dying between ages x to x+1	Person-years lived between ages x to x+1	Total number of person-years lived above	Expectation of life at age x ages x to x+1
57–58	0.7%	90,169	656	89,841	2,249,269	24.9
58–59	0.8%	89,512	707	89,159	2,159,428	24.1
59–60	0.9%	88,805	767	88,422	2,070,269	23.3
60–61	0.9%	88,038	836	87,621	1,981,848	22.5
61–62	1.0%	87,203	911	86,747	1,894,227	21.7
62–63	1.1%	86,291	988	85,798	1,807,480	20.9
63–64	1.2%	85,304	1060	84,774	1,721,683	20.2
64–65	1.3%	84,244	1130	83,679	1,636,909	19.4
65–66	1.4%	83,114	1203	82,513	1,553,230	18.7
66–67	1.6%	81,911	1286	81,268	1,470,718	18.0
67–68	1.7%	80,625	1377	79,936	1,389,450	17.2
68–69	1.9%	79,248	1476	78,510	1,309,513	16.5
69–70	2.0%	77,772	1580	76,982	1,231,004	15.8
70–71	2.2%	76,191	1684	75,349	1,154,022	15.1
71–72	2.4%	74,507	1790	73,612	1,078,673	14.5
72–73	2.6%	72,717	1906	71,764	1,005,060	13.8
73–74	2.9%	70,811	2035	69,793	933,296	13.2
74–75	3.2%	68,776	2171	67,690	863,503	12.6
75–76	3.4%	66,605	2293	65,458	795,812	11.9
76–77	3.7%	64,312	2404	63,110	730,354	11.4
77–78	4.1%	61,908	2523	60,646	667,244	10.8
78–79	4.5%	59,385	2658	58,056	606,597	10.2
79–80	4.9%	56,727	2802	55,326	548,542	9.7
80–81	5.4%	53,925	2937	52,456	493,216	9.1
81–82	6.0%	50,987	3048	49,463	440,760	8.6
82–83	6.5%	47,940	3137	46,371	391,297	8.2
83–84	7.2%	44,803	3208	43,199	344,925	7.7
84–85	7.9%	41,595	3266	39,962	301,727	7.3
85–86	8.6%	38,329	3292	36,683	261,765	6.8
86–87	9.4%	35,037	3290	33,392	225,082	6.4
87–88	10.3%	31,747	3255	30,119	191,690	6.0
88–89	11.2%	28,491	3187	26,898	161,571	5.7
89–90	12.2%	25,304	3085	23,761	134,673	5.3
90–91	13.3%	22,219	2949	20,744	110,912	5.0
91–92	14.4%	19,270	2781	17,879	90,168	4.7
92–93	15.7%	16,489	2584	15,197	72,289	4.4
93–94	17.0%	13,905	2363	12,723	57,092	4.1
94–95	18.4%	11,542	2123	10,480	44,369	3.8
95–96	19.9%	9,419	1873	8,482	33,889	3.6
96–97	21.5%	7,545	1619	6,736	25,407	3.4
97–98	23.1%	5,926	1370	5,241	18,671	3.2
98–99	24.9%	4,556	1133	3,990	13,430	2.9
99–100	26.7%	3,423	913	2,967	9,440	2.8
100+	100.0%	2,510	2510	6,473	6,473	2.6

Elizabeth Arias, *United States Life Tables, 2004*, National Vital Statistics Reports, Volume 56, No.9, December 28, 2007

Table III.39 - Projected pension payouts of New York State Teachers' Retirement System members who retired in the 2006 - 2007 school year

Year	Age	Year	Number of retirees	Percent still alive	Median pension	Median cumulative pension payout
2006 - 2007	57 - 58	1	6,766	100%	$47,281	$47,281
2007 - 2008	58 - 59	2	6,717	99%	$47,281	$94,563
2008 - 2009	59 - 60	3	6,664	98%	$47,281	$141,844
2009 - 2010	60 - 61	4	6,606	98%	$47,281	$189,125
2010 - 2011	61 - 62	5	6,543	97%	$47,281	$236,407
2011 - 2012	62 - 63	6	6,475	96%	$47,551	$283,958
2012 - 2013	63 - 64	7	6,401	95%	$47,821	$331,779
2013 - 2014	64 - 65	8	6,321	93%	$48,091	$379,871
2014 - 2015	65 - 66	9	6,237	92%	$48,361	$428,232
2015 - 2016	66 - 67	10	6,146	91%	$48,631	$476,863
2016 - 2017	67 - 68	11	6,050	89%	$48,901	$525,765
2017 - 2018	68 - 69	12	5,947	88%	$49,171	$574,936
2018 - 2019	69 - 70	13	5,836	86%	$49,441	$624,377
2019 - 2020	70 - 71	14	5,717	84%	$49,711	$674,088
2020 - 2021	71 - 72	15	5,591	83%	$49,981	$724,070
2021 - 2022	72 - 73	16	5,456	81%	$50,251	$774,321
2022 - 2023	73 - 74	17	5,313	79%	$50,521	$824,842
2023 - 2024	74 - 75	18	5,161	76%	$50,791	$875,634
2024 - 2025	75 - 76	19	4,998	74%	$51,061	$926,695
2025 - 2026	76 - 77	20	4,826	71%	$51,331	$978,026
2026 - 2027	77 - 78	21	4,645	69%	$51,601	$1,029,628
2027 - 2028	78 - 79	22	4,456	66%	$51,871	$1,081,499
2028 - 2029	79 - 80	23	4,257	63%	$52,141	$1,133,640
2029 - 2030	80 - 81	24	4,046	60%	$52,411	$1,186,052
2030 - 2031	81 - 82	25	3,826	57%	$52,681	$1,238,733
2031 - 2032	82 - 83	26	3,597	53%	$52,951	$1,291,684
2032 - 2033	83 - 84	27	3,362	50%	$53,221	$1,344,906
2033 - 2034	84 - 85	28	3,121	46%	$53,491	$1,398,397
2034 - 2035	85 - 86	29	2,876	43%	$53,761	$1,452,158
2035 - 2036	86 - 87	30	2,629	39%	$54,031	$1,506,190
2036 - 2037	87 - 88	31	2,382	35%	$54,301	$1,560,491
2037 - 2038	88 - 89	32	2,138	32%	$54,571	$1,615,062
2038 - 2039	89 - 90	33	1,899	28%	$54,841	$1,669,904
2039 - 2040	90 - 91	34	1,667	25%	$55,111	$1,725,015
2040 - 2041	91 - 92	35	1,446	21%	$55,381	$1,780,396
2041 - 2042	92 - 93	36	1,237	18%	$55,651	$1,836,048
2042 - 2043	93 - 94	37	1,043	15%	$55,921	$1,891,969
2043 - 2044	94 - 95	38	866	13%	$56,191	$1,948,160
2044 - 2045	95 - 96	39	707	10%	$56,461	$2,004,621
2045 - 2046	96 - 97	40	566	8%	$56,731	$2,061,353
2046 - 2047	97 - 98	41	445	7%	$57,001	$2,118,354
2047 - 2048	98 - 99	42	342	5%	$57,271	$2,175,625
2048 - 2049	99 - 100	43	257	4%	$57,541	$2,233,167

Source: raw data for the projections made by the author were taken from the *New York State Teachers' Retirement System,* Vision, Value & Growth, Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2007 *and Elizabeth Arias,* United States Life Tables, 2004*, National Vital Statistics Reports, Volume 56, No.9, December 28, 2007*
Note: the projections are those of the author

Table III.40.a - New York State Teachers Retirement System investment portfolio annual performance 1988 - 2008

1988	**-1.5**
1989	**16.8**
1990	**11.4**
1991	**8.4**
1992	**13.0**
1993	**13.6**
1994	**1.8**
1995	**19.3**
1996	**18.8**
1997	**22.0**
1998	**21.5**
1999	**14.0**
2000	**6.8**
2001	**-5.7**
2002	**-6.8**
2003	**4.0**
2004	**16.1**
2005	**10.6**
2006	**11.8**
2007	**19.4**
2008	**-6.4**

Source: Freedom of Information Law request of the New York State Teachers' Retirement System

Table III.40.b - Annual percentage change in the investments of the New York State Teachers Retirement System compared to the annual percentage change in the performance of other state retirement funds

2008 financial year	One year	Three years	Five years	Ten years
New York State Teachers' Retirement System	–6.4%	7.70%	9.90%	6.00%
Public funds with one billion or more in market value	-4.36%	7.57%	9.82%	6.00%
All public funds	-4.50%	6.60%	8.90%	5.80%

2007 financial year	One year	Three years	Five years	Ten years
New York State Teachers' Retirement System	19.30%	13.80%	12.30%	8.80%
Public funds with one billion or more in market value	17.69%	12.84%	11.47%	8.19%
All public funds	16.10%	11.80%	10.90%	8.00%

2006 financial year	One year	Three years	Five years	Ten years
New York State Teachers' Retirement System	11.80%	12.80%	6.80%	9.00%
Public funds with one billion or more in market value	10.72%	12.24%	6.57%	8.42%
All public funds	9.40%	11.40%	6.30%	8.30%

2005 financial year	One year	Three years	Five years	Ten years
New York State Teachers' Retirement System	10.60%	10.10%	3.30%	9.70%
Public funds with one billion or more in market value	9.95%	9.71%	3.49%	9.00%
All public funds	9.40%	9.50%	3.50%	9.00%

Table III.40.b - Annual percentage change in the investments of the New York State Teachers Retirement System compared to the annual percentage change in the performance of other state retirement funds

2004 financial year	One year	Three years	Five years	Ten years
New York State Teachers' Retirement System	16.10%	4.00%	2.60%	10.50%
Public funds with one billion or more in market value	15.88%	4.22%	3.66%	9.80%
All public funds	15.80%	4.10%	3.60%	9.70%
2003 financial year	**One year**	**Three years**	**Five years**	**Ten years**
New York State Teachers' Retirement System	4.00%	-2.90%	2.20%	9.10%
Public funds with one billion or more in market value	4.00%	2.40%	2.70%	8.30%
All public funds	3.90%	-2.40%	2.60%	8.30%
2002 financial year	**One year**	**Three years**	**Five years**	**Ten years**
New York State Teachers' Retirement System	-6.80%	-2.10%	5.40%	10.00%
Public funds with one billion or more in market value	-5.82%	-0.40%	5.13%	9.34%
All public funds	-5.80%	-0.30%	5.20%	9.40%
2001 financial year	**One year**	**Three years**	**Five years**	**Ten years**
New York State Teachers' Retirement System	-5.70%	4.70%	11.20%	12.20%
Public funds with one billion or more in market value	-6.10%	4.82%	10.41%	11.32%
All public funds	N/A	N/A	N/A	N/A

Source: New York State Teachers' Retirement System annual reports 2001 - 2008. California Public Employees' Retirement System, *Comprehensive Annual Financial Reports*, 2001 - 2008. Available at:
https://www.calpers.ca.gov/mss-pub/SearchController?viewcategory=action&PageId=SearchCatalog&category_code=8&subcategory_code=58
and Iowa Public Employees' Retirement System, *Comprehensive Annual Financial Reports 2001 - 2008*. Available at:
http://www.ipers.org/publications/misc/pdf/financial/cafr/cafr2004.pdf

Table III.41 - Annual and ten-year annualized performance of the New York State Teachers' Retirement System pension fund compared to that of other state public pension funds

	Annual performance			Ten-year annualized performance		
		Public pension funds			Public pension funds	
Year	NYSTRS	All	Assets of more than one billion dollars	NYSTRS	All	Assets of more than one billion dollars
2001	-5.70%	-6.10%		12.20%	11.32%	
2002	-6.80%	-5.82%	-5.80%	10.00%	9.34%	9.40%
2003	4.00%	4.00%	3.90%	9.10%	8.30%	8.30%
2004	16.10%	15.88%	15.80%	10.50%	9.80%	9.70%
2005	10.60%	9.95%	9.40%	9.70%	9.00%	9.00%
2006	11.80%	10.72%	9.40%	9.00%	8.42%	8.30%
2007	19.30%	17.69%	16.10%	8.80%	8.19%	8.00%
2008	-6.4%	-4.36%	-4.50%	6.00%	6.00%	5.80%

NYSTRS under/over performance

	Annual performance		Ten-year annualized performance	
		Assets of more than		Assets of more than
Year	All	one billion dollars	All	one billion dollars
2001	0.40%		0.88%	
2002	-0.98%	-1.00%	0.66%	0.60%
2003	0.00%	0.10%	0.80%	0.80%
2004	0.22%	0.30%	0.70%	0.80%
2005	0.65%	1.20%	0.70%	0.70%
2006	1.08%	2.40%	0.58%	0.70%
2007	1.61%	3.20%	0.61%	0.80%
2008	-2.04%	-1.90%	0.00%	0.20%
Median	0.31%	0.30%	0.68%	0.70%
Average	0.12%	0.61%	0.62%	0.66%
Postive years				
Median	0.52%	1.20%	0.70%	0.80%
Average	0.66%	1.44%	0.71%	0.76%

Source: New York State Teachers' Retirement System annual reports 2001 - 2008. California Public Employees' Retirement System c*omprehensive annual financial reports*, 2001 - 2008. Available at:
https://www.calpers.ca.gov/mss-pub/SearchController?viewcategory=action&PageId=SearchCatalog&category_code=8&subcategory_code=58
and Iowa Public Employees' Retirement System c*omprehensive annual financial reports 2001 - 2008*. Available at:
http://www.ipers.org/publications/misc/pdf/financial/cafr/cafr2004.pdf

Table III.42 - New York State Teachers' Retirement System (NYSTRS) annualized investment returns by asset class and fund as of June 30, 2002 with comparisons to NYSTRS benchmarks

Asset	Annualized return over: One year	Three years	Five years	Ten years
Domestic Equities				
NYSTRS Index Fund	**-16.7**	**7.6**	**4.3**	**11.4**
NYSTRS Value Tilt	**-15.6**	**----**	**----**	**----**
*Benchmark: Russell 3000**	*-17.2*	*-7.9*	*3.8*	*11.0*
NYSTRS Value Index Fund	**-8.3**	**-2.4**	**7.0**	**----**
Benchmark: Russell 1000 Value	*-9.0*	*-2.9*	*6.5*	*----*
Total Active Large Cap Management	**-19.5**	**-14.8**	**-2.7**	**8.4**
Benchmark: S&P 500	*-18.0*	*-9.2*	*3.7*	*11.4*
Total Active Small Cap Management	**-11.2**	**1.8**	**2.1**	**10.7**
*Benchmark: Russell 2000**	*-8.6*	*1.7*	*4.4*	*10.3*
Total	**-15.5**	**-7.1**	**4.1**	**11.4**
International Equities				
Total Active Management	**-8.4**	**-6.3**	**-1.4**	**5.5**
Total Passive/Enhanced Management	**-8.8**	**-6.4**	**-1.3**	**5.7**
Total	**-8.6**	**-6.5**	**-1.2**	**5.7**
Benchmark: MSCI EAFE	*-9.5*	*-6.8*	*-1.6*	*5.4*
Real Estate	**6.9**	**10.5**	**11.2**	**9.0**
*Benchmark: Blended NCREIF/Wilshire**	*7.3*	*10.4*	*11.1*	*7.8*
Alternative Investments	**-12.9**	**-0.2**	**11.6**	**----**
Benchmark: S&P 500 plus 5%	*-13.0*	*-4.2*	*8.7*	*----*
Domestic Fixed Income	**8.7**	**8.1**	**7.9**	**7.8**
*Benchmark: Lehman Bros. Aggregate**	*8.6*	*8.1*	*7.6*	*7.6*
Mortgages	**11.4**	**9.4**	**8.7**	**9.4**
Short Term	**2.5**	**4.8**	**5.1**	**4.9**
Benchmark: iMoneyNetTM Fund Avgs/All Taxable	*2.0*	*4.2*	*4.5*	*4.4*
Total Fund	**-6.8**	**-2.1**	**5.4**	**10.0**

Source: New York State Teachers' Retirement System annual reports 2002

Table III.43 - New York State Teachers' Retirement System annualized investment returns by asset class and fund as of June 30, 2007

Asset	Annualized return over: One year	Three years	Five years	Ten years
Domestic Equities				
NYSTRS Composite Fund	**19.2**	**13.8**	**----**	**----**
NYSTRS Growth Tilt Fund	**20.1**	**13.1**	**----**	**----**
NYSTRS Index Fund	**20.8**	**12.2**	**11.2**	**7.7**
NYSTRS Value Tilt Fund	**20.1**	**13.9**	**12.2**	**----**
*Benchmark: S&P 1500**	*20.2*	*12.1*	*11.1*	*7.4*
NYSTRS Value Index Fund	**21.4**	**15.8**	**13.4**	**10.2**
Benchmark: Russell 1000 Value	*21.9*	*15.9*	*13.3*	*9.9*
NYSTRS S&P 500 Equal Weight Fund	**21.4**	**----**	**----**	**----**
Benchmark: S&P 500 Equal Weight	*21.2*	*----*	*----*	*----*
NYSTRS Small Cap Fund	**16.2**	**14.6**	**----**	**----**
Benchmark: S&P 600	*16.0*	*14.5*	*----*	*----*
Total Active Large Cap Management	**30.6**	**18.7**	**15.9**	**6.2**
Benchmark: S&P 500	*20.6*	*11.7*	*10.7*	*7.1*
Total Active Small Cap Management	**17.7**	**12.0**	**13.4**	**7.6**
*Benchmark: Russell 2000**	*16.4*	*13.4*	*13.9*	*9.1*
Total	**20.7**	**13.2**	**11.8**	**7.9**
International Equities				
NYSTRS S&P ADR Index Fund	**29.6**	**----**	**----**	**----**
Benchmark: S&P ADR Index	*29.4*	*----*	*----*	*----*
Total Passive/Enhanced Management	**27.7**	**22.9**	**18.4**	**8.1**
Total Active Management	**24.3**	**21.2**	**16.7**	**7.3**
Total	**25.5**	**21.7**	**17.3**	**7.7**
Benchmark: MSCI EAFE	*27.0*	*22.2*	*17.7*	*7.7*
Real Estate	**25.3**	**25.5**	**20.0**	**15.6**
*Benchmark: Blended NCREIF/DJ Wilshire REIT**	*16.4*	*19.0*	*15.5*	*13.3*
Private Equity	**36.1**	**31.8**	**22.0**	**15.3**
Benchmark: S&P 500 plus 5%	*25.6*	*16.7*	*15.7*	*12.1*
Domestic Fixed Income	**6.0**	**3.8**	**4.7**	**6.2**
*Benchmark: Lehman Bros. Aggregate**	*6.1*	*4.0*	*4.5*	*6.0*
Mortgages	**7.1**	**6.9**	**6.9**	**7.8**
Short Term	**5.5**	**4.0**	**2.9**	**4.0**
Benchmark: iMoneyNetTM Fund Avgs/All Taxable	*4.8*	*3.4*	*2.3*	*3.4*
Total Fund	**19.3**	**13.8**	**12.3**	**8.8**

Source: New York State Teachers' Retirement System annual reports 2007

Table III.44 - New York State Teachers' Retirement System annualized investment returns by asset class and fund as of June 30, 2008

Asset	Annualized return over: One year	Three years	Five years	Ten years
Domestic Equities				
NYSTRS Composite Fund	**-16.9**	**3.2**	**----**	**----**
NYSTRS Growth Tilt Fund	**–14.7**	**3.3**	**8.5**	**----**
NYSTRS Index Fund	**–12.9**	**4.6**	**8.2**	**3.5**
NYSTRS Value Tilt Fund	**–15.8**	**3.8**	**8.7**	**----**
*Benchmark: S&P 1500**	*–12.7*	*4.6*	*8.1*	*3.3*
NYSTRS Value Index Fund	**–18.5**	**3.7**	**8.9**	**5.3**
Benchmark: Russell 1000 Value	*–18.8*	*3.5*	*8.9*	*4.9*
NYSTRS S&P 500 Equal Weight Fund	**–16.7**	**4.2**	**----**	**----**
Benchmark: S&P 500 Equal Weight	*–16.9*	*4.1*	*----*	*----*
NYSTRS Small Cap Fund	**–14.2**	**4.4**	**----**	**----**
Benchmark: S&P 600	*–14.7*	*4.1*	*----*	*----*
Total Active Large Cap Management	**–2.4**	**11.6**	**15.8**	**3.9**
Benchmark: S&P 500	*–13.1*	*4.4*	*7.6*	*2.9*
Total Active Small Cap Management	**–12.5**	**5.8**	**10.2**	**4.8**
*Benchmark: Russell 2000**	*–16.2*	*3.8*	*10.3*	*5.5*
Total	**–13.4**	**4.7**	**8.7**	**3.8**
International Equities				
NYSTRS S&P ADR Index Fund	**–3.1**	**16.3**	**----**	**----**
Benchmark: S&P ADR Index	*–4.7*	*15.9*	*----*	*----*
Total Passive/Enhanced Management	**–11.6**	**12.8**	**16.9**	**6.2**
Total Active Management	**–10.8**	**11.9**	**15.6**	**5.3**
Total	**–10.6**	**12.4**	**16.1**	**5.7**
Benchmark: MSCI EAFE	*–10.6*	*12.8*	*16.7*	*5.8*
Real Estate	**5.2**	**18.4**	**19.3**	**14.5**
*Benchmark: Blended NCREIF/DJ Wilshire REIT**	*4.6*	*13.2*	*15.0*	*12.1*
Private Equity	**4.5**	**24.4**	**23.4**	**12.5**
Benchmark: S&P 500 plus 5%	*–8.1*	*9.4*	*12.6*	*7.9*
Domestic Fixed Income	**7.4**	**4.7**	**3.8**	**5.8**
*Benchmark: Lehman Bros. Aggregate**	*7.1*	*4.1*	*3.9*	*5.6*
Mortgages	**4.0**	**4.4**	**5.2**	**6.8**
Short Term	**4.1**	**4.6**	**3.4**	**3.8**
Benchmark: iMoneyNetTM Fund Avgs/All Taxable	*3.6*	*4.0*	*2.8*	*3.2*
Total Fund	**-6.4**	**7.7**	**9.9**	**6.0**

Source: New York State Teachers' Retirement System annual reports 2008

Table III.45 - Number of years before large capitalization stocks and small capitalization stocks regained their pre-bear market values in the 1930s and 1970s bear markets

Large capitalization stocks				Small capitalization stocks			
Year	**Index**	**Year**	**Index**	**Year**	**Index**	**Year**	**Index**
1928	*2.204*	*1972*	*84.956*	*1928*	*1.710*	*1968*	*168.429*
1929	**2.018**	**1973**	**72.500**	**1929**	**0.832**	**1969**	**126.233**
1930	**1.516**	**1974**	**53.311**	**1930**	**0.515**	**1970**	**104.226**
1931	**0.859**	**1975**	**73.144**	**1931**	**0.259**	**1971**	**121.423**
1932	**0.789**	*1976*	*90.584*	**1932**	**0.245**	**1972**	**126.807**
1933	**1.214**	**1977**	**84.077**	**1933**	**0.594**	**1973**	**87.618**
1934	**1.197**	*1978*	*89.592*	**1934**	**0.738**	**1974**	**70.142**
1935	**1.767**			*1935*	*1.035*	**1975**	**107.189**
1936	*2.367*			**1936**	**1.705**	*1976*	*168.691*
1937	**1.538**			**1937**	**0.716**		
1938	**2.016**			**1938**	**0.951**		
1939	**2.008**			**1939**	**0.954**		
1940	**1.812**			**1940**	**0.905**		
1941	**1.602**			**1941**	**0.823**		
1942	**1.927**			**1942**	**1.190**		
1943	*2.427*			*1943*	*2.242*		

Source: R.G. Ibbotson Associates, Ibbotson SBBI 2007 Classic Yearbook. Market Results for Stocks, Bonds, Bills, and Inflation 1926-2006, Chicago, 2007
Note: 1) for both stock indices dividends are reinvested 2) the indices are not adjusted for inflation

Table III.46.a - Years required for the stock market to provide the New York State Teachers' Retirement System investment portfolio with annualized gains of between eight and eleven percent after the 1972 to 1975 bear market

Year	Ibbotson large capitalization stock index	NYSTRS required portfolio growth				NYSTRS required portfolio growth with the Ibbotson large capitalization stock index rebased to 100 in 1972			
		8%	9%	10%	11%				
1972	84.956	84.956	84.956	84.956	84.956	100.0	100.0	100.0	100.0
1973	72.500	91.752	92.602	93.452	94.301	108.0	109.0	110.0	111.0
1974	53.311	99.093	100.936	102.797	104.674	116.6	118.8	121.0	123.2
1975	73.144	107.020	110.020	113.076	116.188	126.0	129.5	133.1	136.8
1976	90.584	115.582	119.922	124.384	128.969	136.0	141.2	146.4	151.8
1977	84.077	124.828	130.715	136.822	143.156	146.9	153.9	161.1	168.5
1978	89.592	134.814	142.480	150.505	158.903	158.7	167.7	177.2	187.0
1979	106.113	145.600	155.303	165.555	176.382	171.4	182.8	194.9	207.6
1980	140.514	157.248	169.280	182.111	195.784	185.1	199.3	214.4	230.5
1981	133.616	169.827	184.515	200.322	217.321	199.9	217.2	235.8	255.8
1982	162.223	183.414	201.122	220.354	241.226	215.9	236.7	259.4	283.9
1983	198.745	198.087	219.223	242.389	267.761	233.2	258.0	285.3	315.2
1984	211.199		238.953	266.628	297.214		281.3	313.8	349.8
1985	279.117		260.458	293.291	329.908		306.6	345.2	388.3
1986	330.671			322.620	366.198			379.7	431.0
1987	347.967				406.480				478.5
1988	406.458				451.192				531.1
1989	534.455				500.823				589.5

Source: R.G. Ibbotson Associates, Ibbotson SBBI 2007 Classic Yearbook. Market Results for Stocks, Bonds, Bills, and Inflation 1926-2006, Chicago, 2007

Note: 1) dividends are reinvested 2) the index is not adjusted for inflation

Table III.46.b - Large capitalization stock market index 1925 - 2006

Year	Index	Ten year compound annual return	Year	Index	Ten year compound annual return
1925	1.000		1966	47.674	10.45%
1926	1.116		1967	59.104	8.86%
1927	1.535		1968	65.642	8.77%
1928	2.204		1969	60.059	7.76%
1929	2.018		1970	62.465	5.63%
1930	1.516		1971	71.406	8.04%
1931	0.859		1972	84.956	7.70%
1932	0.789		1973	72.500	4.40%
1933	1.214		1974	53.311	0.06%
1934	1.197	1.81%	1975	73.144	4.37%
1935	1.767	4.70%	1976	90.584	4.36%
1936	2.367	4.43%	1977	84.077	2.51%
1937	1.538	-3.53%	1978	89.592	4.08%
1938	2.016	-0.01%	1979	106.113	5.44%
1939	2.008	2.85%	1980	140.514	7.00%
1940	1.812	7.75%	1981	133.616	4.63%
1941	1.602	7.34%	1982	162.223	8.39%
1942	1.927	4.73%	1983	198.745	14.06%
1943	2.427	7.32%	1984	211.199	11.19%
1944	2.906	5.10%	1985	279.117	11.91%
1945	3.965	5.29%	1986	330.671	14.68%
1946	3.645	9.01%	1987	347.967	14.53%
1947	3.853	6.69%	1988	406.458	14.37%
1948	4.065	7.31%	1989	534.455	14.29%
1949	4.829	10.30%	1990	517.499	14.50%
1950	6.360	14.78%	1991	675.592	15.33%
1951	7.888	15.14%	1992	727.412	13.85%
1952	9.336	14.42%	1993	800.078	14.25%
1953	9.244	12.27%	1994	810.538	11.25%
1954	14.108	13.53%	1995	1113.918	12.91%
1955	18.561	17.68%	1996	1370.946	14.70%
1956	19.778	17.77%	1997	1828.326	16.23%
1957	17.646	15.81%	1998	2350.892	15.97%
1958	25.298	18.01%	1999	2845.629	18.58%
1959	28.322	16.11%	2000	2586.524	14.37%
1960	28.455	13.69%	2001	2279.127	12.10%
1961	36.106	14.48%	2002	1775.341	8.30%
1962	32.954	13.55%	2003	2284.785	10.92%
1963	40.469	11.11%	2004	2533.204	8.56%
1964	47.139	9.77%	2005	2657.559	6.84%
1965	53.008	10.36%	2006	3077.329	5.34%

Source: R.G. Ibbotson Associates, Ibbotson SBBI 2006 A5Classic Yearbook. Market Results for Stocks, Bonds, Bills, and Inflation 1926-2007, Chicago, 2007
Note: 1) dividends are reinvested 2) the index is not adjusted for inflation

Table III.47 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Checkable deposits and currency	Time and savings deposits	Money market fund shares	Security RPs	Credit market instruments	Open market paper	Treasury securities	Agency- and GSE-backed securities	Municipal securities	Corporate and foreign bonds	Mortgages	Corporate equities	Mutual fund shares	Miscell-aneous assets	Pension fund reserves (liabilities)	Total financial assets
1945	0.1	0.0	0.0	0.0	2.5	0.0	1.5	0.0	0.8	0.1	0.0	0.0	0.0	0.0	2.6	2.6
1946	0.1	0.0	0.0	0.0	2.8	0.0	1.7	0.0	0.9	0.2	0.0	0.0	0.0	0.0	2.9	2.9
1947	0.1	0.0	0.0	0.0	3.1	0.0	1.9	0.0	1.0	0.2	0.0	0.0	0.0	0.0	3.2	3.2
1948	0.1	0.0	0.0	0.0	3.5	0.0	2.1	0.0	1.2	0.3	0.0	0.0	0.0	0.0	3.6	3.6
1949	0.1	0.0	0.0	0.0	4.1	0.0	2.3	0.0	1.3	0.4	0.1	0.0	0.0	0.0	4.2	4.2
1950	0.1	0.0	0.0	0.0	4.7	0.0	2.5	0.0	1.5	0.6	0.1	0.0	0.0	0.0	4.9	4.9
1951	0.1	0.0	0.0	0.0	5.4	0.0	2.9	0.0	1.7	0.7	0.1	0.0	0.0	0.0	5.6	5.6
1952	0.2	0.0	0.0	0.0	6.4	0.0	3.4	0.0	1.9	1.0	0.1	0.1	0.0	0.0	6.6	6.6
1953	0.2	0.0	0.0	0.0	7.7	0.0	3.9	0.0	2.1	1.5	0.2	0.1	0.0	0.0	8.0	8.0
1954	0.2	0.0	0.0	0.0	9.2	0.0	4.4	0.0	2.4	2.1	0.2	0.1	0.0	0.0	9.5	9.5
1955	0.2	0.0	0.0	0.0	10.5	0.0	4.7	0.1	2.7	2.7	0.3	0.2	0.0	0.0	10.8	10.8
1956	0.2	0.0	0.0	0.0	11.7	0.0	4.9	0.1	3.1	3.2	0.4	0.2	0.0	0.0	12.1	12.1
1957	0.2	0.0	0.0	0.0	13.3	0.0	5.1	0.1	3.5	4.0	0.5	0.3	0.0	0.0	13.8	13.8
1958	0.2	0.0	0.0	0.0	15.0	0.0	5.0	0.1	4.0	5.1	0.7	0.4	0.0	0.0	15.6	15.6
1959	0.2	0.0	0.0	0.0	16.8	0.0	5.5	0.1	4.3	6.0	1.0	0.5	0.0	0.0	17.6	17.6
1960	0.2	0.0	0.0	0.0	18.9	0.0	5.7	0.2	4.4	7.1	1.5	0.6	0.0	0.0	19.7	19.7
1961	0.3	0.0	0.0	0.0	21.1	0.0	5.8	0.3	4.3	8.9	1.9	0.9	0.0	0.0	22.3	22.3
1962	0.3	0.0	0.0	0.0	23.2	0.0	6.1	0.4	3.8	10.7	2.2	1.0	0.0	0.0	24.5	24.5
1963	0.3	0.0	0.0	0.0	25.6	0.0	6.5	0.3	3.3	12.8	2.6	1.5	0.0	0.0	27.4	27.4
1964	0.3	0.0	0.0	0.0	28.3	0.0	7.0	0.4	2.9	14.9	3.1	2.0	0.0	0.0	30.6	30.6
1965	0.3	0.0	0.0	0.0	31.3	0.0	7.2	0.5	2.6	17.2	3.7	2.5	0.0	0.0	34.1	34.1
1966	0.4	0.0	0.0	0.0	34.9	0.0	7.1	0.7	2.5	20.2	4.5	2.8	0.0	0.0	38.1	38.1
1967	0.3	0.2	0.0	0.0	38.3	0.0	6.2	0.8	2.4	23.9	5.0	3.9	0.0	0.0	42.6	42.6
1968	0.4	0.2	0.0	0.0	41.6	0.0	5.9	1.4	2.4	26.6	5.4	5.8	0.0	0.0	48.0	48.0
1969	0.3	0.2	0.0	0.0	45.5	0.0	5.4	1.6	2.3	30.6	5.6	7.3	0.0	0.0	53.2	53.2
1970	0.4	0.2	0.0	0.0	49.6	0.0	5.1	1.5	2.0	35.1	5.9	10.1	0.0	0.0	60.3	60.3
1971	0.5	0.1	0.0	0.0	52.9	0.0	3.9	1.5	2.2	39.0	6.3	15.4	0.0	0.0	69.0	69.0
1972	0.8	0.2	0.0	0.0	57.4	0.0	3.6	2.1	2.0	43.2	6.5	22.2	0.0	0.0	80.6	80.6
1973	0.5	0.8	0.0	0.0	63.1	0.0	2.5	3.3	1.7	48.4	7.1	20.2	0.0	0.0	84.7	84.7
1974	0.3	1.5	0.0	0.0	69.4	0.0	1.6	4.6	1.0	54.5	7.7	16.4	0.0	0.0	87.7	87.6
1975	0.3	1.2	0.0	0.0	78.3	0.0	2.5	5.3	1.9	61.0	7.5	24.3	0.0	0.0	104.2	104.0
1976	0.3	1.1	0.0	0.0	87.7	0.0	4.1	6.8	3.4	65.7	7.7	30.1	0.0	0.0	119.5	119.2
1977	0.3	1.4	0.0	0.0	99.2	0.0	6.8	9.6	3.5	71.3	8.0	30.0	0.0	0.0	131.3	130.9
1978	0.4	2.4	0.0	0.0	116.0	0.0	9.5	14.0	4.0	80.0	8.6	33.3	0.0	0.0	152.5	152.0
1979	0.6	3.5	0.0	0.0	126.6	0.0	14.7	15.4	3.9	83.0	9.6	37.1	0.0	0.0	168.4	167.7
1980	0.6	3.7	0.0	0.0	147.2	0.0	20.9	19.1	4.1	92.2	10.9	44.3	0.0	0.1	196.8	195.8
1981	0.6	3.8	0.0	0.0	169.0	0.0	27.6	24.3	3.9	100.8	12.5	47.8	0.0	0.1	222.6	221.3
1982	1.0	6.0	0.0	0.0	190.7	0.0	36.9	34.3	3.1	102.6	13.8	60.2	0.0	0.3	259.6	258.1
1983	1.4	8.8	0.0	1.0	198.8	1.0	48.9	39.3	2.0	93.0	14.7	89.6	0.0	0.5	302.0	300.2

Table III.47 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Checkable deposits and currency	Time and savings deposits	Money market fund shares	Security RPs	Credit market instruments	Open market paper	Treasury securities	Agency- and GSE-backed securities	Municipal securities	Corporate and foreign bonds	Mortgages	Corporate equities	Mutual fund shares	Miscell-aneous assets	Pension fund reserves (liabilities)	Total financial assets
1984	2.0	12.0	0.0	2.5	233.2	2.5	67.9	43.3	1.5	102.7	15.3	96.5	0.0	0.4	349.0	346.5
1985	2.4	13.3	1.4	5.0	252.4	5.0	85.4	38.1	1.1	107.4	15.3	120.1	6.8	0.5	405.1	401.8
1986	3.1	9.9	1.7	8.3	297.1	8.3	115.3	38.1	0.7	119.1	15.6	150.2	5.5	0.7	480.7	476.5
1987	4.8	5.2	2.0	11.3	328.8	11.3	138.9	43.0	0.8	119.5	15.3	170.1	9.1	0.6	537.2	531.9
1988	4.4	7.1	2.3	10.2	350.5	10.2	150.7	35.3	0.5	138.2	15.6	212.6	7.4	2.1	603.2	596.8
1989	3.2	9.1	2.8	9.7	381.5	9.7	152.4	51.2	0.3	152.6	15.3	277.8	7.8	6.3	706.0	698.1
1990	5.0	7.7	2.8	12.2	402.0	12.2	168.2	62.9	0.5	142.1	16.1	284.6	7.8	7.8	739.3	729.9
1991	3.8	8.8	3.0	18.9	404.6	18.9	165.5	58.0	0.6	144.7	16.9	395.0	13.1	4.6	861.8	851.8
1992	6.5	6.9	3.1	24.7	441.8	24.7	203.5	39.8	0.4	156.9	16.5	431.7	17.9	4.5	947.7	937.1
1993	6.6	6.2	4.1	20.4	468.6	20.4	217.5	35.8	1.4	179.0	14.5	506.2	25.6	4.1	1053.7	1042.0
1994	6.7	2.5	5.0	27.8	478.7	27.8	215.6	39.9	1.1	179.1	15.2	521.7	44.8	4.6	1106.9	1091.8
1995	4.2	4.5	5.9	31.5	509.8	31.5	208.2	63.1	1.8	189.2	15.9	703.5	62.9	4.8	1344.2	1327.1
1996	7.5	2.3	7.6	28.2	538.4	28.2	212.8	68.6	0.6	211.4	16.7	846.6	73.2	5.5	1529.2	1509.2
1997	5.3	2.4	9.6	28.6	598.3	28.6	219.0	87.0	1.5	244.5	17.6	1051.3	93.4	5.6	1819.5	1794.5
1998	10.0	2.0	9.9	37.5	661.5	37.5	212.6	106.1	3.3	279.6	22.4	1188.1	115.9	5.8	2061.9	2030.6
1999	9.2	1.7	11.8	40.4	707.0	40.4	198.8	129.0	3.0	310.0	25.7	1407.7	140.9	7.1	2361.3	2325.8
2000	9.9	1.6	13.2	39.8	743.2	47.3	179.1	178.9	1.7	314.2	22.1	1298.7	178.3	8.2	2335.0	2293.1
2001	11.4	1.8	15.4	34.0	689.4	51.3	155.1	180.7	1.7	279.7	21.0	1260.4	184.3	10.0	2253.5	2206.6
2002	12.9	1.7	15.5	27.1	638.7	48.0	158.9	192.6	0.9	217.3	21.1	1056.8	167.4	10.4	1980.0	1930.5
2003	13.7	0.8	13.4	23.4	657.5	41.6	148.6	235.1	4.4	207.4	20.4	1421.0	207.9	11.3	2399.1	2349.2
2004	16.3	1.4	11.6	20.2	675.3	35.2	151.0	258.8	1.8	213.5	15.1	1600.9	235.9	15.9	2625.6	2577.5
2005	15.8	1.3	11.7	19.7	693.4	35.2	153.8	258.4	1.7	227.9	16.4	1715.8	248.4	15.4	2765.2	2721.4
2006	13.3	0.8	13.0	22.6	769.7	40.1	153.0	295.1	1.7	265.6	14.1	1927.5	287.7	15.1	3086.9	3049.6
2007	15.6	1.0	15.3	26.7	799.8	47.4	164.5	317.2	0.9	257.5	12.4	1987.1	296.6	15.0	3185.7	3157.1
2008*	15.5	1.0	15.2	21.5	812.3	47.0	167.3	322.5	0.5	262.8	12.2	1739.1	259.2	14.9	2902.1	2878.7

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm

**** Through the second quarter of 2008***

Table III.48 - Percentage distribution of state and local government employee retirement funds 1944 - June 30, 2008 (amounts outstanding end of period, not seasonally

Year	Checkable deposits and currency	Time and savings deposits	Money market fund shares	Security RPs	Credit market instruments	Open market paper	Treasury securities	Agency- and GSE-backed securities	Municipal securities	Corporate and foreign bonds	Mortgages	Corporate equities	Mutual fund shares	Miscell-aneous assets	Total financial assets
1945	3.8%	0.0%	0.0%	0.0%	96.2%	0.0%	57.7%	0.0%	30.8%	3.8%	0.0%	0.0%	0.0%	0.0%	100.0%
1946	3.4%	0.0%	0.0%	0.0%	96.6%	0.0%	58.6%	0.0%	31.0%	6.9%	0.0%	0.0%	0.0%	0.0%	100.0%
1947	3.1%	0.0%	0.0%	0.0%	96.9%	0.0%	59.4%	0.0%	31.3%	6.3%	0.0%	0.0%	0.0%	0.0%	100.0%
1948	2.8%	0.0%	0.0%	0.0%	97.2%	0.0%	58.3%	0.0%	33.3%	8.3%	0.0%	0.0%	0.0%	0.0%	100.0%
1949	2.4%	0.0%	0.0%	0.0%	97.6%	0.0%	54.8%	0.0%	31.0%	9.5%	2.4%	0.0%	0.0%	0.0%	100.0%
1950	2.0%	0.0%	0.0%	0.0%	95.9%	0.0%	51.0%	0.0%	30.6%	12.2%	2.0%	0.0%	0.0%	0.0%	100.0%
1951	1.8%	0.0%	0.0%	0.0%	96.4%	0.0%	51.8%	0.0%	30.4%	12.5%	1.8%	0.0%	0.0%	0.0%	100.0%
1952	3.0%	0.0%	0.0%	0.0%	97.0%	0.0%	51.5%	0.0%	28.8%	15.2%	1.5%	1.5%	0.0%	0.0%	100.0%
1953	2.5%	0.0%	0.0%	0.0%	96.3%	0.0%	48.8%	0.0%	26.3%	18.8%	2.5%	1.3%	0.0%	0.0%	100.0%
1954	2.1%	0.0%	0.0%	0.0%	96.8%	0.0%	46.3%	0.0%	25.3%	22.1%	2.1%	1.1%	0.0%	0.0%	100.0%
1955	1.9%	0.0%	0.0%	0.0%	97.2%	0.0%	43.5%	0.9%	25.0%	25.0%	2.8%	1.9%	0.0%	0.0%	100.0%
1956	1.7%	0.0%	0.0%	0.0%	96.7%	0.0%	40.5%	0.8%	25.6%	26.4%	3.3%	1.7%	0.0%	0.0%	100.0%
1957	1.4%	0.0%	0.0%	0.0%	96.4%	0.0%	37.0%	0.7%	25.4%	29.0%	3.6%	2.2%	0.0%	0.0%	100.0%
1958	1.3%	0.0%	0.0%	0.0%	96.2%	0.0%	32.1%	0.6%	25.6%	32.7%	4.5%	2.6%	0.0%	0.0%	100.0%
1959	1.1%	0.0%	0.0%	0.0%	95.5%	0.0%	31.3%	0.6%	24.4%	34.1%	5.7%	2.8%	0.0%	0.0%	100.0%
1960	1.0%	0.0%	0.0%	0.0%	95.9%	0.0%	28.9%	1.0%	22.3%	36.0%	7.6%	3.0%	0.0%	0.0%	100.0%
1961	1.3%	0.0%	0.0%	0.0%	94.6%	0.0%	26.0%	1.3%	19.3%	39.9%	8.5%	4.0%	0.0%	0.0%	100.0%
1962	1.2%	0.0%	0.0%	0.0%	94.7%	0.0%	24.9%	1.6%	15.5%	43.7%	9.0%	4.1%	0.0%	0.0%	100.0%
1963	1.1%	0.0%	0.0%	0.0%	93.4%	0.0%	23.7%	1.1%	12.0%	46.7%	9.5%	5.5%	0.0%	0.0%	100.0%
1964	1.0%	0.0%	0.0%	0.0%	92.5%	0.0%	22.9%	1.3%	9.5%	48.7%	10.1%	6.5%	0.0%	0.0%	100.0%
1965	0.9%	0.0%	0.0%	0.0%	91.8%	0.0%	21.1%	1.5%	7.6%	50.4%	10.9%	7.3%	0.0%	0.0%	100.0%
1966	1.0%	0.0%	0.0%	0.0%	91.6%	0.0%	18.6%	1.8%	6.6%	53.0%	11.8%	7.3%	0.0%	0.0%	100.0%
1967	0.7%	0.5%	0.0%	0.0%	89.9%	0.0%	14.6%	1.9%	5.6%	56.1%	11.7%	9.2%	0.0%	0.0%	100.0%
1968	0.8%	0.4%	0.0%	0.0%	86.7%	0.0%	12.3%	2.9%	5.0%	55.4%	11.3%	12.1%	0.0%	0.0%	100.0%
1969	0.6%	0.4%	0.0%	0.0%	85.5%	0.0%	10.2%	3.0%	4.3%	57.5%	10.5%	13.7%	0.0%	0.0%	100.0%
1970	0.7%	0.3%	0.0%	0.0%	82.3%	0.0%	8.5%	2.5%	3.3%	58.2%	9.8%	16.7%	0.0%	0.0%	100.0%
1971	0.7%	0.1%	0.0%	0.0%	76.7%	0.0%	5.7%	2.2%	3.2%	56.5%	9.1%	22.3%	0.0%	0.0%	100.0%
1972	1.0%	0.2%	0.0%	0.0%	71.2%	0.0%	4.5%	2.6%	2.5%	53.6%	8.1%	27.5%	0.0%	0.0%	100.0%
1973	0.6%	0.9%	0.0%	0.0%	74.5%	0.0%	3.0%	3.9%	2.0%	57.1%	8.4%	23.8%	0.0%	0.0%	100.0%
1974	0.3%	1.7%	0.0%	0.0%	79.2%	0.0%	1.8%	5.3%	1.1%	62.2%	8.8%	18.7%	0.0%	0.0%	100.0%
1975	0.3%	1.2%	0.0%	0.0%	75.3%	0.0%	2.4%	5.1%	1.8%	58.7%	7.2%	23.4%	0.0%	0.0%	100.0%
1976	0.3%	0.9%	0.0%	0.0%	73.6%	0.0%	3.4%	5.7%	2.9%	55.1%	6.5%	25.3%	0.0%	0.0%	100.0%
1977	0.2%	1.1%	0.0%	0.0%	75.8%	0.0%	5.2%	7.3%	2.7%	54.5%	6.1%	22.9%	0.0%	0.0%	100.0%
1978	0.3%	1.6%	0.0%	0.0%	76.3%	0.0%	6.3%	9.2%	2.6%	52.6%	5.7%	21.9%	0.0%	0.0%	100.0%
1979	0.4%	2.1%	0.0%	0.0%	75.5%	0.0%	8.8%	9.2%	2.3%	49.5%	5.7%	22.1%	0.0%	0.0%	100.0%
1980	0.3%	1.9%	0.0%	0.0%	75.2%	0.0%	10.7%	9.8%	2.1%	47.1%	5.6%	22.6%	0.0%	0.1%	100.0%
1981	0.3%	1.7%	0.0%	0.0%	76.4%	0.0%	12.5%	11.0%	1.8%	45.5%	5.6%	21.6%	0.0%	0.0%	100.0%
1982	0.4%	2.3%	0.0%	0.0%	73.9%	0.0%	14.3%	13.3%	1.2%	39.8%	5.3%	23.3%	0.0%	0.1%	100.0%
1983	0.5%	2.9%	0.0%	0.3%	66.2%	0.3%	16.3%	13.1%	0.7%	31.0%	4.9%	29.8%	0.0%	0.2%	100.0%
1984	0.6%	3.5%	0.0%	0.7%	67.3%	0.7%	19.6%	12.5%	0.4%	29.6%	4.4%	27.8%	0.0%	0.1%	100.0%

Table III.48 - Percentage distribution of state and local government employee retirement funds 1944 - June 30, 2008 (amounts outstanding end of period, not seasonally

Year	Checkable deposits and currency	Time and savings deposits	Money market fund shares	Security RPs	Credit market instruments	Open market paper	Treasury securities	Agency- and GSE-backed securities	Municipal securities	Corporate and foreign bonds	Mortgages	Corporate equities	Mutual fund shares	Miscell-aneous assets	Total financial assets
1985	0.6%	3.3%	0.3%	1.2%	62.8%	1.2%	21.3%	9.5%	0.3%	26.7%	3.8%	29.9%	1.7%	0.1%	100.0%
1986	0.7%	2.1%	0.4%	1.7%	62.4%	1.7%	24.2%	8.0%	0.1%	25.0%	3.3%	31.5%	1.2%	0.1%	100.0%
1987	0.9%	1.0%	0.4%	2.1%	61.8%	2.1%	26.1%	8.1%	0.2%	22.5%	2.9%	32.0%	1.7%	0.1%	100.0%
1988	0.7%	1.2%	0.4%	1.7%	58.7%	1.7%	25.3%	5.9%	0.1%	23.2%	2.6%	35.6%	1.2%	0.4%	100.0%
1989	0.5%	1.3%	0.4%	1.4%	54.6%	1.4%	21.8%	7.3%	0.0%	21.9%	2.2%	39.8%	1.1%	0.9%	100.0%
1990	0.7%	1.1%	0.4%	1.7%	55.1%	1.7%	23.0%	8.6%	0.1%	19.5%	2.2%	39.0%	1.1%	1.1%	100.0%
1991	0.4%	1.0%	0.4%	2.2%	47.5%	2.2%	19.4%	6.8%	0.1%	17.0%	2.0%	46.4%	1.5%	0.5%	100.0%
1992	0.7%	0.7%	0.3%	2.6%	47.1%	2.6%	21.7%	4.2%	0.0%	16.7%	1.8%	46.1%	1.9%	0.5%	100.0%
1993	0.6%	0.6%	0.4%	2.0%	45.0%	2.0%	20.9%	3.4%	0.1%	17.2%	1.4%	48.6%	2.5%	0.4%	100.0%
1994	0.6%	0.2%	0.5%	2.5%	43.8%	2.5%	19.7%	3.7%	0.1%	16.4%	1.4%	47.8%	4.1%	0.4%	100.0%
1995	0.3%	0.3%	0.4%	2.4%	38.4%	2.4%	15.7%	4.8%	0.1%	14.3%	1.2%	53.0%	4.7%	0.4%	100.0%
1996	0.5%	0.2%	0.5%	1.9%	35.7%	1.9%	14.1%	4.5%	0.0%	14.0%	1.1%	56.1%	4.9%	0.4%	100.0%
1997	0.3%	0.1%	0.5%	1.6%	33.3%	1.6%	12.2%	4.8%	0.1%	13.6%	1.0%	58.6%	5.2%	0.3%	100.0%
1998	0.5%	0.1%	0.5%	1.8%	32.6%	1.8%	10.5%	5.2%	0.2%	13.8%	1.1%	58.5%	5.7%	0.3%	100.0%
1999	0.4%	0.1%	0.5%	1.7%	30.4%	1.7%	8.5%	5.5%	0.1%	13.3%	1.1%	60.5%	6.1%	0.3%	100.0%
2000	0.4%	0.1%	0.6%	1.7%	32.4%	2.1%	7.8%	7.8%	0.1%	13.7%	1.0%	56.6%	7.8%	0.4%	100.0%
2001	0.5%	0.1%	0.7%	1.5%	31.2%	2.3%	7.0%	8.2%	0.1%	12.7%	1.0%	57.1%	8.4%	0.5%	100.0%
2002	0.7%	0.1%	0.8%	1.4%	33.1%	2.5%	8.2%	10.0%	0.0%	11.3%	1.1%	54.7%	8.7%	0.5%	100.0%
2003	0.6%	0.0%	0.6%	1.0%	28.0%	1.8%	6.3%	10.0%	0.2%	8.8%	0.9%	60.5%	8.8%	0.5%	100.0%
2004	0.6%	0.1%	0.5%	0.8%	26.2%	1.4%	5.9%	10.0%	0.1%	8.3%	0.6%	62.1%	9.2%	0.6%	100.0%
2005	0.6%	0.0%	0.4%	0.7%	25.5%	1.3%	5.7%	9.5%	0.1%	8.4%	0.6%	63.0%	9.1%	0.6%	100.0%
2006	0.4%	0.0%	0.4%	0.7%	25.2%	1.3%	5.0%	9.7%	0.1%	8.7%	0.5%	63.2%	9.4%	0.5%	100.0%
2007	0.5%	0.0%	0.5%	0.8%	25.3%	1.5%	5.2%	10.0%	0.0%	8.2%	0.4%	62.9%	9.4%	0.5%	100.0%
2008*	0.5%	0.0%	0.5%	0.7%	28.2%	1.6%	5.8%	11.2%	0.0%	9.1%	0.4%	60.4%	9.0%	0.5%	100.0%

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm

**** Through the second quarter of 2008***

Table III.49 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1945	$0.1	$2.4	$0.0	$0.0	$0.0	$0.0	$2.5
1946	$0.1	$2.8	$0.0	$0.0	$0.0	$0.0	$2.9
1947	$0.1	$3.1	$0.0	$0.0	$0.0	$0.0	$3.2
1948	$0.1	$3.6	$0.0	$0.0	$0.0	$0.0	$3.7
1949	$0.1	$4.0	$0.1	$0.0	$0.0	$0.0	$4.2
1950	$0.1	$4.6	$0.1	$0.0	$0.0	$0.0	$4.8
1951	$0.1	$5.3	$0.1	$0.0	$0.0	$0.0	$5.5
1952	$0.2	$6.3	$0.1	$0.1	$0.0	$0.0	$6.7
1953	$0.2	$7.5	$0.2	$0.1	$0.0	$0.0	$8.0
1954	$0.2	$8.9	$0.2	$0.1	$0.0	$0.0	$9.4
1955	$0.2	$10.2	$0.3	$0.2	$0.0	$0.0	$10.9
1956	$0.2	$11.3	$0.4	$0.2	$0.0	$0.0	$12.1
1957	$0.2	$12.7	$0.5	$0.3	$0.0	$0.0	$13.7
1958	$0.2	$14.2	$0.7	$0.4	$0.0	$0.0	$15.5
1959	$0.2	$15.9	$1.0	$0.5	$0.0	$0.0	$17.6
1960	$0.2	$17.4	$1.5	$0.6	$0.0	$0.0	$19.7
1961	$0.3	$19.3	$1.9	$0.9	$0.0	$0.0	$22.4
1962	$0.3	$21.0	$2.2	$1.0	$0.0	$0.0	$24.5
1963	$0.3	$22.9	$2.6	$1.5	$0.0	$0.0	$27.3
1964	$0.3	$25.2	$3.1	$2.0	$0.0	$0.0	$30.6
1965	$0.3	$27.5	$3.7	$2.5	$0.0	$0.0	$34.0
1966	$0.4	$30.5	$4.5	$2.8	$0.0	$0.0	$38.2
1967	$0.5	$33.3	$5.0	$3.9	$0.0	$0.0	$42.7
1968	$0.6	$36.3	$5.4	$5.8	$0.0	$0.0	$48.1
1969	$0.5	$39.9	$5.6	$7.3	$0.0	$0.0	$53.3
1970	$0.6	$43.7	$5.9	$10.1	$0.0	$0.0	$60.3
1971	$0.6	$46.6	$6.3	$15.4	$0.0	$0.0	$68.9
1972	$1.0	$50.9	$6.5	$22.2	$0.0	$0.0	$80.6
1973	$1.3	$55.9	$7.1	$20.2	$0.0	$0.0	$84.5
1974	$1.8	$61.7	$7.7	$16.4	$0.0	$0.0	$87.6
1975	$1.5	$70.7	$7.5	$24.3	$0.0	$0.0	$104.0
1976	$1.4	$80.0	$7.7	$30.1	$0.0	$0.0	$119.2
1977	$1.7	$91.2	$8.0	$30.0	$0.0	$0.0	$130.9
1978	$2.8	$107.5	$8.6	$33.3	$0.0	$0.0	$152.2
1979	$4.1	$117.0	$9.6	$37.1	$0.0	$0.0	$167.8
1980	$4.3	$136.3	$10.9	$44.3	$0.0	$0.1	$195.9
1981	$4.4	$156.6	$12.5	$47.8	$0.0	$0.1	$221.4
1982	$7.0	$176.9	$13.8	$60.2	$0.0	$0.3	$258.2
1983	$12.2	$183.2	$14.7	$89.6	$0.0	$0.5	$300.2
1984	$19.0	$215.4	$15.3	$96.5	$0.0	$0.4	$346.6
1985	$27.1	$232.0	$15.3	$120.1	$6.8	$0.5	$401.8
1986	$31.3	$273.2	$15.6	$150.2	$5.5	$0.7	$476.5
1987	$34.6	$302.2	$15.3	$170.1	$9.1	$0.6	$531.9

Table III.49 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1988	$34.2	$324.7	$15.6	$212.6	$7.4	$2.1	$596.6
1989	$34.5	$356.5	$15.3	$277.8	$7.8	$6.3	$698.2
1990	$39.9	$373.7	$16.1	$284.6	$7.8	$7.8	$729.9
1991	$53.4	$368.8	$16.9	$395.0	$13.1	$4.6	$851.8
1992	$65.9	$400.6	$16.5	$431.7	$17.9	$4.5	$937.1
1993	$57.7	$433.7	$14.5	$506.2	$25.6	$4.1	$1,041.8
1994	$69.8	$435.7	$15.2	$521.7	$44.8	$4.6	$1,091.8
1995	$77.6	$462.3	$15.9	$703.5	$62.9	$4.8	$1,327.0
1996	$73.8	$493.4	$16.7	$846.6	$73.2	$5.5	$1,509.2
1997	$74.5	$552.0	$17.6	$1,051.3	$93.4	$5.6	$1,794.4
1998	$96.9	$601.6	$22.4	$1,188.1	$115.9	$5.8	$2,030.7
1999	$103.5	$640.8	$25.7	$1,407.7	$140.9	$7.1	$2,325.7
2000	$111.8	$673.9	$22.1	$1,298.7	$178.3	$8.2	$2,293.0
2001	$113.9	$617.2	$21.0	$1,260.4	$184.3	$10.0	$2,206.8
2002	$105.2	$569.7	$21.1	$1,056.8	$167.4	$10.4	$1,930.6
2003	$92.9	$595.5	$20.4	$1,421.0	$207.9	$11.3	$2,349.0
2004	$84.7	$625.1	$15.1	$1,600.9	$235.9	$15.9	$2,577.6
2005	$83.7	$641.8	$16.4	$1,715.8	$248.4	$15.4	$2,721.5
2006	$89.8	$715.4	$14.1	$1,927.5	$287.7	$15.1	$3,049.6
2007	$106.0	$740.1	$12.4	$1,987.1	$296.6	$15.0	$3,157.2
2008*	$100.2	$753.1	$12.2	$1,739.1	$259.2	$14.9	$2,878.7

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm
**** Through the second quarter of 2008***

Table III.50 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class using three year moving averages centered on the second year (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1945							
1946							
1947	$0.1	$3.2	$0.0	$0.0	$0.0	$0.0	$3.3
1948	$0.1	$3.6	$0.0	$0.0	$0.0	$0.0	$3.8
1949	$0.1	$4.1	$0.1	$0.0	$0.0	$0.0	$4.3
1950	$0.1	$4.8	$0.1	$0.0	$0.0	$0.0	$5.0
1951	$0.1	$5.5	$0.1	$0.0	$0.0	$0.0	$5.8
1952	$0.2	$6.5	$0.1	$0.1	$0.0	$0.0	$6.9
1953	$0.2	$7.6	$0.2	$0.1	$0.0	$0.0	$8.1
1954	$0.2	$8.8	$0.2	$0.1	$0.0	$0.0	$9.4
1955	$0.2	$10.1	$0.3	$0.2	$0.0	$0.0	$10.8
1956	$0.2	$11.5	$0.4	$0.2	$0.0	$0.0	$12.3
1957	$0.2	$12.9	$0.6	$0.3	$0.0	$0.0	$14.0
1958	$0.2	$14.3	$0.8	$0.4	$0.0	$0.0	$15.7
1959	$0.2	$15.9	$1.1	$0.5	$0.0	$0.0	$17.8
1960	$0.2	$17.6	$1.5	$0.7	$0.0	$0.0	$19.9
1961	$0.3	$19.3	$1.8	$0.9	$0.0	$0.0	$22.3
1962	$0.3	$21.2	$2.3	$1.2	$0.0	$0.0	$24.9
1963	$0.3	$23.2	$2.7	$1.6	$0.0	$0.0	$27.8
1964	$0.3	$25.4	$3.2	$2.0	$0.0	$0.0	$30.9
1965	$0.4	$27.9	$3.8	$2.5	$0.0	$0.0	$34.6
1966	$0.4	$30.6	$4.3	$3.4	$0.0	$0.0	$38.7
1967	$0.5	$33.5	$4.8	$4.5	$0.0	$0.0	$43.3
1968	$0.5	$36.7	$5.3	$6.0	$0.0	$0.0	$48.5
1969	$0.6	$40.0	$5.6	$8.5	$0.0	$0.0	$54.7
1970	$0.7	$43.5	$5.9	$12.2	$0.0	$0.0	$62.2
1971	$0.8	$47.4	$6.3	$15.0	$0.0	$0.0	$69.5
1972	$1.1	$51.8	$6.7	$16.9	$0.0	$0.0	$76.4
1973	$1.2	$57.2	$7.0	$19.7	$0.0	$0.0	$85.1
1974	$1.4	$63.8	$7.3	$22.6	$0.0	$0.0	$95.2
1975	$1.5	$71.9	$7.6	$24.2	$0.0	$0.0	$105.2
1976	$1.8	$82.2	$7.9	$26.8	$0.0	$0.0	$118.8
1977	$2.3	$93.3	$8.3	$31.0	$0.0	$0.0	$134.8
1978	$2.9	$106.4	$9.0	$35.0	$0.0	$0.0	$153.2
1979	$3.5	$121.7	$9.9	$38.5	$0.0	$0.0	$173.6
1980	$4.5	$138.9	$11.1	$44.5	$0.0	$0.1	$199.1
1981	$6.4	$154.0	$12.3	$55.8	$0.0	$0.2	$228.7
1982	$9.4	$173.7	$13.4	$67.7	$0.0	$0.3	$264.5
1983	$13.9	$192.8	$14.3	$82.8	$1.4	$0.4	$305.6
1984	$19.3	$216.1	$14.9	$103.3	$2.5	$0.5	$356.7
1985	$24.8	$241.2	$15.2	$125.3	$4.3	$0.5	$411.4
1986	$29.2	$269.5	$15.4	$149.9	$5.8	$0.9	$470.7

Table III.50 - State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class using three year moving averages centered on the second year (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1987	$32.3	$297.7	$15.4	$186.2	$7.3	$2.0	$541.0
1988	$34.9	$326.1	$15.6	$219.1	$7.5	$3.5	$606.6
1989	$39.3	$345.2	$15.8	$268.0	$9.0	$4.3	$681.7
1990	$45.6	$364.9	$16.1	$320.3	$10.8	$5.1	$762.7
1991	$50.3	$386.7	$15.9	$379.1	$14.4	$5.5	$851.8
1992	$57.3	$402.5	$15.8	$427.8	$21.8	$5.1	$930.5
1993	$64.9	$420.2	$15.8	$511.6	$32.9	$4.5	$1,049.9
1994	$69.0	$445.1	$15.8	$601.9	$44.9	$4.7	$1,181.4
1995	$70.7	$475.4	$16.0	$725.9	$60.0	$4.9	$1,352.8
1996	$78.5	$509.0	$17.6	$862.2	$78.0	$5.3	$1,550.6
1997	$85.3	$550.0	$19.7	$1,039.4	$97.3	$5.8	$1,797.4
1998	$92.1	$592.3	$20.9	$1,158.5	$120.3	$6.4	$1,990.6
1999	$100.1	$617.1	$21.8	$1,241.2	$142.6	$7.3	$2,130.1
2000	$106.3	$620.6	$22.5	$1,242.3	$157.4	$8.3	$2,157.4
2001	$105.5	$619.4	$22.1	$1,288.9	$175.8	$9.4	$2,221.0
2002	$101.7	$616.3	$19.9	$1,327.6	$194.8	$11.2	$2,271.4
2003	$96.1	$609.9	$18.8	$1,411.0	$208.8	$12.6	$2,357.1
2004	$91.3	$629.5	$17.4	$1,544.4	$229.5	$13.6	$2,525.7
2005	$91.4	$663.6	$15.7	$1,730.5	$255.3	$14.5	$2,771.0
2006							
2007							

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm
**** Through the second quarter of 2008***

Table III.51 - Inflation adjusted State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Inflation index	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1945	1.000	$0.1	$2.4	$0.0	$0.0	$0.0	$0.0	$2.5
1946	1.181	$0.1	$2.4	$0.0	$0.0	$0.0	$0.0	$2.5
1947	1.288	$0.1	$2.4	$0.0	$0.0	$0.0	$0.0	$2.5
1948	1.323	$0.1	$2.7	$0.0	$0.0	$0.0	$0.0	$2.8
1949	1.299	$0.1	$3.1	$0.1	$0.0	$0.0	$0.0	$3.2
1950	1.374	$0.1	$3.3	$0.1	$0.0	$0.0	$0.0	$3.5
1951	1.455	$0.1	$3.6	$0.1	$0.0	$0.0	$0.0	$3.8
1952	1.468	$0.1	$4.3	$0.1	$0.1	$0.0	$0.0	$4.6
1953	1.477	$0.1	$5.1	$0.1	$0.1	$0.0	$0.0	$5.4
1954	1.470	$0.1	$6.1	$0.1	$0.1	$0.0	$0.0	$6.4
1955	1.475	$0.1	$6.9	$0.2	$0.1	$0.0	$0.0	$7.4
1956	1.517	$0.1	$7.4	$0.3	$0.1	$0.0	$0.0	$8.0
1957	1.564	$0.1	$8.1	$0.3	$0.2	$0.0	$0.0	$8.8
1958	1.591	$0.1	$8.9	$0.4	$0.3	$0.0	$0.0	$9.7
1959	1.615	$0.1	$9.8	$0.6	$0.3	$0.0	$0.0	$10.9
1960	1.638	$0.1	$10.6	$0.9	$0.4	$0.0	$0.0	$12.0
1961	1.649	$0.2	$11.7	$1.2	$0.5	$0.0	$0.0	$13.6
1962	1.670	$0.2	$12.6	$1.3	$0.6	$0.0	$0.0	$14.7
1963	1.698	$0.2	$13.5	$1.5	$0.9	$0.0	$0.0	$16.1
1964	1.717	$0.2	$14.7	$1.8	$1.2	$0.0	$0.0	$17.8
1965	1.751	$0.2	$15.7	$2.1	$1.4	$0.0	$0.0	$19.4
1966	1.809	$0.2	$16.9	$2.5	$1.5	$0.0	$0.0	$21.1
1967	1.864	$0.3	$17.9	$2.7	$2.1	$0.0	$0.0	$22.9
1968	1.952	$0.3	$18.6	$2.8	$3.0	$0.0	$0.0	$24.6
1969	2.071	$0.2	$19.3	$2.7	$3.5	$0.0	$0.0	$25.7
1970	2.185	$0.3	$20.0	$2.7	$4.6	$0.0	$0.0	$27.6
1971	2.258	$0.3	$20.6	$2.8	$6.8	$0.0	$0.0	$30.5
1972	2.336	$0.4	$21.8	$2.8	$9.5	$0.0	$0.0	$34.5
1973	2.541	$0.5	$22.0	$2.8	$7.9	$0.0	$0.0	$33.3
1974	2.851	$0.6	$21.6	$2.7	$5.8	$0.0	$0.0	$30.7
1975	3.051	$0.5	$23.2	$2.5	$8.0	$0.0	$0.0	$34.1
1976	3.198	$0.4	$25.0	$2.4	$9.4	$0.0	$0.0	$37.3
1977	3.415	$0.5	$26.7	$2.3	$8.8	$0.0	$0.0	$38.3
1978	3.724	$0.8	$28.9	$2.3	$8.9	$0.0	$0.0	$40.9
1979	4.218	$1.0	$27.7	$2.3	$8.8	$0.0	$0.0	$39.8
1980	4.741	$0.9	$28.7	$2.3	$9.3	$0.0	$0.0	$41.3
1981	5.165	$0.9	$30.3	$2.4	$9.3	$0.0	$0.0	$42.9
1982	5.365	$1.3	$33.0	$2.6	$11.2	$0.0	$0.1	$48.1
1983	5.568	$2.2	$32.9	$2.6	$16.1	$0.0	$0.1	$53.9
1984	5.788	$3.3	$37.2	$2.6	$16.7	$0.0	$0.1	$59.9
1985	6.007	$4.5	$38.6	$2.5	$20.0	$1.1	$0.1	$66.9
1986	6.075	$5.2	$45.0	$2.6	$24.7	$0.9	$0.1	$78.4

Table III.51 - Inflation adjusted State and Local Government Employee Retirement Funds 1944 - June 30, 2008 by major asset class (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Inflation index	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1987	6.343	$5.5	$47.6	$2.4	$26.8	$1.4	$0.1	$83.9
1988	6.623	$5.2	$49.0	$2.4	$32.1	$1.1	$0.3	$90.1
1989	6.930	$5.0	$51.4	$2.2	$40.1	$1.1	$0.9	$100.7
1990	7.354	$5.4	$50.8	$2.2	$38.7	$1.1	$1.1	$99.3
1991	7.579	$7.0	$48.7	$2.2	$52.1	$1.7	$0.6	$112.4
1992	7.799	$8.4	$51.4	$2.1	$55.4	$2.3	$0.6	$120.2
1993	8.013	$7.2	$54.1	$1.8	$63.2	$3.2	$0.5	$130.0
1994	8.228	$8.5	$53.0	$1.8	$63.4	$5.4	$0.6	$132.7
1995	8.436	$9.2	$54.8	$1.9	$83.4	$7.5	$0.6	$157.3
1996	8.716	$8.5	$56.6	$1.9	$97.1	$8.4	$0.6	$173.1
1997	8.865	$8.4	$62.3	$2.0	$118.6	$10.5	$0.6	$202.4
1998	9.008	$10.8	$66.8	$2.5	$131.9	$12.9	$0.6	$225.4
1999	9.250	$11.2	$69.3	$2.8	$152.2	$15.2	$0.8	$251.4
2000	9.564	$11.7	$70.5	$2.3	$135.8	$18.6	$0.9	$239.8
2001	9.711	$11.7	$63.6	$2.2	$129.8	$19.0	$1.0	$227.2
2002	9.942	$10.6	$57.3	$2.1	$106.3	$16.8	$1.0	$194.2
2003	10.129	$9.2	$58.8	$2.0	$140.3	$20.5	$1.1	$231.9
2004	10.459	$8.1	$59.8	$1.4	$153.1	$22.6	$1.5	$246.4
2005	10.816	$7.7	$59.3	$1.5	$158.6	$23.0	$1.4	$251.6
2006	11.0906	$8.1	$64.5	$1.3	$173.8	$25.9	$1.4	$275.0
2007	11.5433	$9.2	$64.1	$1.1	$172.1	$25.7	$1.3	$273.5
2008*	12.0258	$8.3	$62.6	$1.0	$144.6	$21.6	$1.2	$239.4

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm
**** Through the second quarter of 2008***

Table III.52 - Inflation adjusted State and Local Government Employee Retirement Funds 1944 - 2007 by major asset class using three year moving averages centered on the second year (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Inflation index	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1945								
1946								
1947	1.218	0.083	2.596	0.015	0.000	0.000	0.000	$2.7
1948	1.293	0.078	2.785	0.030	0.000	0.000	0.000	$2.9
1949	1.348	0.074	3.040	0.044	0.000	0.000	0.000	$3.2
1950	1.384	0.086	3.416	0.057	0.014	0.000	0.000	$3.6
1951	1.415	0.098	3.888	0.084	0.027	0.000	0.000	$4.1
1952	1.449	0.110	4.483	0.096	0.041	0.000	0.000	$4.7
1953	1.469	0.122	5.197	0.122	0.068	0.000	0.000	$5.5
1954	1.481	0.135	5.958	0.161	0.094	0.000	0.000	$6.3
1955	1.500	0.133	6.724	0.212	0.119	0.000	0.000	$7.2
1956	1.523	0.131	7.493	0.273	0.156	0.000	0.000	$8.1
1957	1.552	0.129	8.251	0.369	0.204	0.000	0.000	$9.0
1958	1.585	0.126	8.992	0.512	0.250	0.000	0.000	$9.9
1959	1.611	0.136	9.843	0.689	0.333	0.000	0.000	$11.0
1960	1.633	0.147	10.734	0.889	0.414	0.000	0.000	$12.2
1961	1.654	0.157	11.647	1.107	0.541	0.000	0.000	$13.5
1962	1.674	0.167	12.612	1.344	0.712	0.000	0.000	$14.8
1963	1.697	0.177	13.630	1.584	0.924	0.000	0.000	$16.3
1964	1.729	0.185	14.662	1.851	1.125	0.000	0.000	$17.8
1965	1.768	0.202	15.720	2.124	1.423	0.000	0.000	$19.5
1966	1.819	0.229	16.741	2.371	1.841	0.000	0.000	$21.2
1967	1.889	0.242	17.660	2.551	2.313	0.000	0.000	$22.8
1968	1.976	0.263	18.518	2.668	2.952	0.000	0.000	$24.4
1969	2.066	0.271	19.273	2.729	4.006	0.000	0.000	$26.3
1970	2.160	0.303	20.058	2.749	5.488	0.000	0.000	$28.6
1971	2.278	0.344	20.738	2.754	6.484	0.000	0.000	$30.3
1972	2.434	0.422	21.213	2.753	6.929	0.000	0.000	$31.3
1973	2.607	0.466	21.847	2.705	7.598	0.000	0.000	$32.6
1974	2.795	0.500	22.723	2.629	8.116	0.000	0.000	$34.0
1975	3.011	0.514	23.707	2.541	7.973	0.000	0.000	$34.7
1976	3.248	0.562	25.080	2.444	8.171	0.000	0.000	$36.3
1977	3.521	0.630	26.300	2.359	8.780	0.000	0.000	$38.1
1978	3.859	0.713	27.416	2.327	9.056	0.000	0.004	$39.5
1979	4.252	0.796	28.477	2.330	9.025	0.000	0.008	$40.6
1980	4.642	0.958	29.731	2.375	9.512	0.000	0.019	$42.6
1981	5.011	1.245	30.537	2.442	10.942	0.000	0.037	$45.2
1982	5.325	1.707	32.432	2.515	12.517	0.000	0.051	$49.2
1983	5.579	2.428	34.407	2.565	14.647	0.226	0.063	$54.3
1984	5.761	3.288	37.337	2.594	17.741	0.407	0.083	$61.4
1985	5.956	4.118	40.270	2.562	20.860	0.694	0.090	$68.6
1986	6.167	4.713	43.496	2.505	24.062	0.918	0.136	$75.8
1987	6.395	5.052	46.342	2.418	28.745	1.143	0.304	$84.0

Table III.52 - Inflation adjusted State and Local Government Employee Retirement Funds 1944 - 2007 by major asset class using three year moving averages centered on the second year (billions of dollars; amounts outstanding end of period, not seasonally adjusted)

Year	Inflation index	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1988	6.665	5.235	48.781	2.347	32.486	1.129	0.499	$90.5
1989	6.966	5.614	49.518	2.279	37.965	1.293	0.598	$97.3
1990	7.257	6.213	50.263	2.220	43.672	1.465	0.694	$104.5
1991	7.535	6.620	51.282	2.110	49.886	1.881	0.733	$112.5
1992	7.794	7.321	51.585	2.038	54.551	2.745	0.663	$118.9
1993	8.011	8.076	52.381	1.977	63.488	4.024	0.565	$130.5
1994	8.238	8.360	53.970	1.915	72.491	5.358	0.570	$142.7
1995	8.452	8.351	56.151	1.889	85.138	7.006	0.580	$159.1
1996	8.651	9.062	58.683	2.024	98.882	8.940	0.607	$178.2
1997	8.855	9.603	61.946	2.210	116.636	10.898	0.649	$201.9
1998	9.081	10.101	65.080	2.295	127.118	13.135	0.706	$218.4
1999	9.280	10.754	66.469	2.345	133.650	15.251	0.786	$229.3
2000	9.495	11.189	65.477	2.372	131.191	16.512	0.869	$227.6
2001	9.719	10.872	63.878	2.278	132.870	18.043	0.963	$228.9
2002	9.961	10.254	61.976	2.011	133.047	19.508	1.114	$227.9
2003	10.211	9.464	59.751	1.852	137.615	20.372	1.227	$230.3
2004	10.487	8.737	59.941	1.674	146.417	21.765	1.293	$239.8
2005	10.808	8.458	61.303	1.464	159.586	23.536	1.344	$255.7
2006								
2007								

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm

Table III.53 - Percentage distribution of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1945	3.8%	92.3%	0.0%	0.0%	0.0%	0.0%	100.0%
1946	3.4%	96.6%	0.0%	0.0%	0.0%	0.0%	100.0%
1947	3.1%	96.9%	0.0%	0.0%	0.0%	0.0%	100.0%
1948	2.8%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1949	2.4%	95.2%	2.4%	0.0%	0.0%	0.0%	100.0%
1950	2.0%	93.9%	2.0%	0.0%	0.0%	0.0%	100.0%
1951	1.8%	94.6%	1.8%	0.0%	0.0%	0.0%	100.0%
1952	3.0%	95.5%	1.5%	1.5%	0.0%	0.0%	100.0%
1953	2.5%	93.8%	2.5%	1.3%	0.0%	0.0%	100.0%
1954	2.1%	93.7%	2.1%	1.1%	0.0%	0.0%	100.0%
1955	1.9%	94.4%	2.8%	1.9%	0.0%	0.0%	100.0%
1956	1.7%	93.4%	3.3%	1.7%	0.0%	0.0%	100.0%
1957	1.4%	92.0%	3.6%	2.2%	0.0%	0.0%	100.0%
1958	1.3%	91.0%	4.5%	2.6%	0.0%	0.0%	100.0%
1959	1.1%	90.3%	5.7%	2.8%	0.0%	0.0%	100.0%
1960	1.0%	88.3%	7.6%	3.0%	0.0%	0.0%	100.0%
1961	1.3%	86.5%	8.5%	4.0%	0.0%	0.0%	100.0%
1962	1.2%	85.7%	9.0%	4.1%	0.0%	0.0%	100.0%
1963	1.1%	83.6%	9.5%	5.5%	0.0%	0.0%	100.0%
1964	1.0%	82.4%	10.1%	6.5%	0.0%	0.0%	100.0%
1965	0.9%	80.6%	10.9%	7.3%	0.0%	0.0%	100.0%
1966	1.0%	80.1%	11.8%	7.3%	0.0%	0.0%	100.0%
1967	1.2%	78.2%	11.7%	9.2%	0.0%	0.0%	100.0%
1968	1.3%	75.6%	11.3%	12.1%	0.0%	0.0%	100.0%
1969	0.9%	75.0%	10.5%	13.7%	0.0%	0.0%	100.0%
1970	1.0%	72.5%	9.8%	16.7%	0.0%	0.0%	100.0%
1971	0.9%	67.5%	9.1%	22.3%	0.0%	0.0%	100.0%
1972	1.2%	63.2%	8.1%	27.5%	0.0%	0.0%	100.0%
1973	1.5%	66.0%	8.4%	23.8%	0.0%	0.0%	100.0%
1974	2.1%	70.4%	8.8%	18.7%	0.0%	0.0%	100.0%
1975	1.4%	68.0%	7.2%	23.4%	0.0%	0.0%	100.0%
1976	1.2%	67.1%	6.5%	25.3%	0.0%	0.0%	100.0%
1977	1.3%	69.7%	6.1%	22.9%	0.0%	0.0%	100.0%
1978	1.8%	70.7%	5.7%	21.9%	0.0%	0.0%	100.0%
1979	2.4%	69.8%	5.7%	22.1%	0.0%	0.0%	100.0%
1980	2.2%	69.6%	5.6%	22.6%	0.0%	0.1%	100.0%
1981	2.0%	70.8%	5.6%	21.6%	0.0%	0.0%	100.0%
1982	2.7%	68.5%	5.3%	23.3%	0.0%	0.1%	100.0%
1983	4.1%	61.0%	4.9%	29.8%	0.0%	0.2%	100.0%
1984	5.5%	62.2%	4.4%	27.8%	0.0%	0.1%	100.0%
1985	6.7%	57.7%	3.8%	29.9%	1.7%	0.1%	100.0%
1986	6.6%	57.3%	3.3%	31.5%	1.2%	0.1%	100.0%
1987	6.5%	56.8%	2.9%	32.0%	1.7%	0.1%	100.0%

Table III.53 - Percentage distribution of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1988	5.7%	54.4%	2.6%	35.6%	1.2%	0.4%	100.0%
1989	4.9%	51.1%	2.2%	39.8%	1.1%	0.9%	100.0%
1990	5.5%	51.2%	2.2%	39.0%	1.1%	1.1%	100.0%
1991	6.3%	43.3%	2.0%	46.4%	1.5%	0.5%	100.0%
1992	7.0%	42.7%	1.8%	46.1%	1.9%	0.5%	100.0%
1993	5.5%	41.6%	1.4%	48.6%	2.5%	0.4%	100.0%
1994	6.4%	39.9%	1.4%	47.8%	4.1%	0.4%	100.0%
1995	5.8%	34.8%	1.2%	53.0%	4.7%	0.4%	100.0%
1996	4.9%	32.7%	1.1%	56.1%	4.9%	0.4%	100.0%
1997	4.2%	30.8%	1.0%	58.6%	5.2%	0.3%	100.0%
1998	4.8%	29.6%	1.1%	58.5%	5.7%	0.3%	100.0%
1999	4.5%	27.6%	1.1%	60.5%	6.1%	0.3%	100.0%
2000	4.9%	29.4%	1.0%	56.6%	7.8%	0.4%	100.0%
2001	5.2%	28.0%	1.0%	57.1%	8.4%	0.5%	100.0%
2002	5.4%	29.5%	1.1%	54.7%	8.7%	0.5%	100.0%
2003	4.0%	25.3%	0.9%	60.5%	8.8%	0.5%	100.0%
2004	3.3%	24.3%	0.6%	62.1%	9.2%	0.6%	100.0%
2005	3.1%	23.6%	0.6%	63.0%	9.1%	0.6%	100.0%
2006	2.9%	23.5%	0.5%	63.2%	9.4%	0.5%	100.0%
2007	3.4%	23.4%	0.4%	62.9%	9.4%	0.5%	100.0%
2008*	3.5%	26.2%	0.4%	60.4%	9.0%	0.5%	100.0%

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm

**** Through the second quarter of 2008***

Table III.54 - Annual percentage change in the value of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1946	0.0%	16.7%					16.0%
1947	0.0%	10.7%					10.3%
1948	0.0%	16.1%					15.6%
1949	0.0%	11.1%					13.5%
1950	0.0%	15.0%	0.0%				14.3%
1951	0.0%	15.2%	0.0%				14.6%
1952	100.0%	18.9%	0.0%				21.8%
1953	0.0%	19.0%	100.0%	0.0%			19.4%
1954	0.0%	18.7%	0.0%	0.0%			17.5%
1955	0.0%	14.6%	50.0%	100.0%			16.0%
1956	0.0%	10.8%	33.3%	0.0%			11.0%
1957	0.0%	12.4%	25.0%	50.0%			13.2%
1958	0.0%	11.8%	40.0%	33.3%			13.1%
1959	0.0%	12.0%	42.9%	25.0%			13.5%
1960	0.0%	9.4%	50.0%	20.0%			11.9%
1961	50.0%	10.9%	26.7%	50.0%			13.7%
1962	0.0%	8.8%	15.8%	11.1%			9.4%
1963	0.0%	9.0%	18.2%	50.0%			11.4%
1964	0.0%	10.0%	19.2%	33.3%			12.1%
1965	0.0%	9.1%	19.4%	25.0%			11.1%
1966	33.3%	10.9%	21.6%	12.0%			12.4%
1967	25.0%	9.2%	11.1%	39.3%			11.8%
1968	20.0%	9.0%	8.0%	48.7%			12.6%
1969	-16.7%	9.9%	3.7%	25.9%			10.8%
1970	20.0%	9.5%	5.4%	38.4%			13.1%
1971	0.0%	6.6%	6.8%	52.5%			14.3%
1972	66.7%	9.2%	3.2%	44.2%			17.0%
1973	30.0%	9.8%	9.2%	-9.0%			4.8%
1974	38.5%	10.4%	8.5%	-18.8%			3.7%
1975	-16.7%	14.6%	-2.6%	48.2%			18.7%
1976	-6.7%	13.2%	2.7%	23.9%			14.6%
1977	21.4%	14.0%	3.9%	-0.3%			9.8%
1978	64.7%	17.9%	7.5%	11.0%			16.3%
1979	46.4%	8.8%	11.6%	11.4%			10.2%
1980	4.9%	16.5%	13.5%	19.4%			16.7%
1981	2.3%	14.9%	14.7%	7.9%		0.0%	13.0%
1982	59.1%	13.0%	10.4%	25.9%		200.0%	16.6%
1983	74.3%	3.6%	6.5%	48.8%		66.7%	16.3%
1984	55.7%	17.6%	4.1%	7.7%		-20.0%	15.5%
1985	42.6%	7.7%	0.0%	24.5%		25.0%	15.9%
1986	15.5%	17.8%	2.0%	25.1%	-19.1%	40.0%	18.6%
1987	10.5%	10.6%	-1.9%	13.2%	65.5%	-14.3%	11.6%
1988	-1.2%	7.4%	2.0%	25.0%	-18.7%	250.0%	12.2%

Table III.54 - Annual percentage change in the value of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1989	0.9%	9.8%	-1.9%	30.7%	5.4%	200.0%	17.0%
1990	15.7%	4.8%	5.2%	2.4%	0.0%	23.8%	4.5%
1991	33.8%	-1.3%	5.0%	38.8%	67.9%	-41.0%	16.7%
1992	23.4%	8.6%	-2.4%	9.3%	36.6%	-2.2%	10.0%
1993	-12.4%	8.3%	-12.1%	17.3%	43.0%	-8.9%	11.2%
1994	21.0%	0.5%	4.8%	3.1%	75.0%	12.2%	4.8%
1995	11.2%	6.1%	4.6%	34.8%	40.4%	4.3%	21.5%
1996	-4.9%	6.7%	5.0%	20.3%	16.4%	14.6%	13.7%
1997	0.9%	11.9%	5.4%	24.2%	27.6%	1.8%	18.9%
1998	30.1%	9.0%	27.3%	13.0%	24.1%	3.6%	13.2%
1999	6.8%	6.5%	14.7%	18.5%	21.6%	22.4%	14.5%
2000	8.0%	5.2%	-14.0%	-7.7%	26.5%	15.5%	-1.4%
2001	1.9%	-8.4%	-5.0%	-2.9%	3.4%	22.0%	-3.8%
2002	-7.6%	-7.7%	0.5%	-16.2%	-9.2%	4.0%	-12.5%
2003	-11.7%	4.5%	-3.3%	34.5%	24.2%	8.7%	21.7%
2004	-8.8%	5.0%	-26.0%	12.7%	13.5%	40.7%	9.7%
2005	-1.2%	2.7%	8.6%	7.2%	5.3%	-3.1%	5.6%
2006	7.3%	11.5%	-14.0%	12.3%	15.8%	-1.9%	12.1%
2007	18.0%	3.5%	-12.1%	3.1%	3.1%	-0.7%	3.5%
2008*	-5.5%	1.8%	-1.6%	-12.5%	-12.6%	-0.7%	-8.8%

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm
**** Through the second quarter of 2008***

Table III.55 - Annual percentage change in the inflation adjusted value of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1946	-15.3%	-1.2%					-1.8%
1947	-8.3%	1.6%					1.2%
1948	-2.7%	13.0%					12.5%
1949	1.9%	13.2%					15.7%
1950	-5.5%	8.7%	-5.5%				8.0%
1951	-5.6%	8.8%	-5.6%				8.2%
1952	98.3%	17.8%	-0.9%				20.8%
1953	-0.6%	18.3%	98.8%	-0.6%			18.7%
1954	0.5%	19.2%	0.5%	0.5%			18.1%
1955	-0.3%	14.2%	49.5%	99.3%			15.6%
1956	-2.8%	7.7%	29.6%	-2.8%			7.9%
1957	-3.0%	9.1%	21.3%	45.6%			9.9%
1958	-1.7%	9.9%	37.6%	31.0%			11.2%
1959	-1.5%	10.3%	40.8%	23.2%			11.9%
1960	-1.4%	7.9%	47.8%	18.3%			10.3%
1961	49.0%	10.2%	25.8%	49.0%			13.0%
1962	-1.2%	7.5%	14.4%	9.7%			8.0%
1963	-1.6%	7.3%	16.3%	47.6%			9.6%
1964	-1.1%	8.8%	17.9%	31.8%			10.8%
1965	-1.9%	7.0%	17.1%	22.6%			9.0%
1966	29.0%	7.3%	17.7%	8.4%			8.7%
1967	21.3%	5.9%	7.8%	35.2%			8.5%
1968	14.6%	4.1%	3.1%	42.0%			7.6%
1969	-21.5%	3.6%	-2.3%	18.6%			4.4%
1970	13.7%	3.8%	-0.2%	31.1%			7.2%
1971	-3.2%	3.2%	3.3%	47.6%			10.6%
1972	61.1%	5.6%	-0.3%	39.4%			13.1%
1973	19.5%	1.0%	0.4%	-16.3%			-3.6%
1974	23.4%	-1.6%	-3.4%	-27.6%			-7.6%
1975	-22.1%	7.1%	-9.0%	38.5%			10.9%
1976	-11.0%	8.0%	-2.0%	18.2%			9.4%
1977	13.7%	6.8%	-2.7%	-6.7%			2.8%
1978	51.0%	8.1%	-1.4%	1.8%			6.6%
1979	29.3%	-3.9%	-1.4%	-1.6%			-2.7%
1980	-6.7%	3.6%	1.0%	6.2%			3.9%
1981	-6.1%	5.5%	5.3%	-1.0%		-8.2%	3.7%
1982	53.2%	8.8%	6.3%	21.2%		188.8%	12.3%
1983	67.9%	-0.2%	2.6%	43.4%		60.6%	12.0%
1984	49.8%	13.1%	0.1%	3.6%		-23.0%	11.1%
1985	37.4%	3.8%	-3.6%	19.9%		20.4%	11.7%
1986	14.2%	16.4%	0.8%	23.7%	-20.0%	38.4%	17.3%
1987	5.9%	5.9%	-6.1%	8.5%	58.5%	-17.9%	6.9%
1988	-5.3%	2.9%	-2.3%	19.7%	-22.1%	235.2%	7.4%

Table III.55 - Annual percentage change in the inflation adjusted value of state and local government employee retirement funds 1944 - June 30, 2008 by major asset class (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1989	-3.6%	4.9%	-6.3%	24.9%	0.7%	186.7%	11.8%
1990	9.0%	-1.2%	-0.8%	-3.5%	-5.8%	16.7%	-1.5%
1991	29.9%	-4.2%	1.8%	34.7%	62.9%	-42.8%	13.2%
1992	19.9%	5.6%	-5.1%	6.2%	32.8%	-4.9%	6.9%
1993	-14.8%	5.4%	-14.5%	14.1%	39.2%	-11.3%	8.2%
1994	17.8%	-2.2%	2.1%	0.4%	70.4%	9.3%	2.1%
1995	8.4%	3.5%	2.0%	31.5%	36.9%	1.8%	18.5%
1996	-7.9%	3.3%	1.7%	16.5%	12.6%	10.9%	10.1%
1997	-0.7%	10.0%	3.6%	22.1%	25.5%	0.1%	16.9%
1998	28.0%	7.3%	25.3%	11.2%	22.1%	1.9%	11.4%
1999	4.0%	3.7%	11.7%	15.4%	18.4%	19.2%	11.5%
2000	4.5%	1.7%	-16.8%	-10.8%	22.4%	11.7%	-4.6%
2001	0.3%	-9.8%	-6.4%	-4.4%	1.8%	20.1%	-5.2%
2002	-9.8%	-9.8%	-1.9%	-18.1%	-11.3%	1.6%	-14.5%
2003	-13.3%	2.6%	-5.1%	32.0%	21.9%	6.6%	19.4%
2004	-11.7%	1.7%	-28.3%	9.1%	9.9%	36.3%	6.3%
2005	-4.4%	-0.7%	5.0%	3.6%	1.8%	-6.3%	2.1%
2006	4.6%	8.7%	-16.2%	9.6%	13.0%	-4.4%	9.3%
2007	13.4%	-0.6%	-15.5%	-1.0%	-0.9%	-4.6%	-0.5%
2008*	-9.3%	-2.3%	-5.6%	-16.0%	-16.1%	-4.7%	-12.5%

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm
**** Through the second quarter of 2008***

Table III.56 - Annual percentage change in the inflation adjusted value of state and local government employee retirement funds 1944 - 2007 by major asset class using three year moving averages centered on the second year (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1946							
1947							
1948	-6.6%	7.3%	94.5%				7.4%
1949	-4.1%	9.1%	45.9%				9.2%
1950	15.8%	12.4%	31.2%				13.2%
1951	13.9%	13.8%	47.2%	99.4%			14.7%
1952	12.0%	15.3%	14.0%	50.1%			15.4%
1953	11.4%	15.9%	27.2%	66.5%			16.5%
1954	10.3%	14.6%	31.9%	38.8%			15.2%
1955	-1.2%	12.9%	31.2%	26.3%			13.2%
1956	-1.5%	11.4%	28.8%	30.9%			12.0%
1957	-1.9%	10.1%	35.5%	31.0%			11.2%
1958	-2.1%	9.0%	38.6%	22.6%			10.3%
1959	7.9%	9.5%	34.7%	33.1%			11.3%
1960	7.6%	9.0%	28.9%	24.4%			10.7%
1961	7.0%	8.5%	24.6%	30.5%			10.4%
1962	6.5%	8.3%	21.4%	31.6%			10.3%
1963	5.9%	8.1%	17.8%	29.8%			10.0%
1964	4.4%	7.6%	16.9%	21.7%			9.2%
1965	9.6%	7.2%	14.7%	26.6%			9.2%
1966	12.9%	6.5%	11.6%	29.3%			8.8%
1967	5.8%	5.5%	7.6%	25.6%			7.5%
1968	8.5%	4.9%	4.6%	27.6%			7.2%
1969	3.4%	4.1%	2.3%	35.7%			7.7%
1970	11.8%	4.1%	0.7%	37.0%			8.8%
1971	13.5%	3.4%	0.2%	18.1%			6.0%
1972	22.6%	2.3%	0.0%	6.9%			3.3%
1973	10.3%	3.0%	-1.8%	9.6%			4.1%
1974	7.4%	4.0%	-2.8%	6.8%			4.1%
1975	2.8%	4.3%	-3.3%	-1.8%			2.3%
1976	9.3%	5.8%	-3.8%	2.5%			4.4%
1977	12.1%	4.9%	-3.5%	7.5%			5.0%
1978	13.2%	4.2%	-1.3%	3.1%			3.8%
1979	11.6%	3.9%	0.1%	-0.3%		91.8%	2.8%
1980	20.3%	4.4%	2.0%	5.4%		138.2%	4.8%
1981	30.1%	2.7%	2.8%	15.0%		93.2%	6.1%
1982	37.1%	6.2%	3.0%	14.4%		37.1%	8.9%
1983	42.2%	6.1%	2.0%	17.0%		24.3%	10.4%
1984	35.4%	8.5%	1.2%	21.1%	80.0%	30.2%	13.1%
1985	25.2%	7.9%	-1.2%	17.6%	70.4%	9.4%	11.6%
1986	14.4%	8.0%	-2.2%	15.4%	32.2%	50.3%	10.5%

Table III.56 - Annual percentage change in the inflation adjusted value of state and local government employee retirement funds 1944 - 2007 by major asset class using three year moving averages centered on the second year (amounts outstanding end of period, not seasonally adjusted)

Year	Cash	Bonds	Mortgages	Equties	Mutual funds	All other	Total
1987	7.2%	6.5%	-3.5%	19.5%	24.5%	123.7%	10.8%
1988	3.6%	5.3%	-3.0%	13.0%	-1.2%	64.3%	7.7%
1989	7.2%	1.5%	-2.9%	16.9%	14.6%	19.7%	7.5%
1990	10.7%	1.5%	-2.6%	15.0%	13.3%	16.1%	7.5%
1991	6.6%	2.0%	-4.9%	14.2%	28.4%	5.6%	7.6%
1992	10.6%	0.6%	-3.4%	9.4%	45.9%	-9.5%	5.7%
1993	10.3%	1.5%	-3.0%	16.4%	46.6%	-14.8%	9.8%
1994	3.5%	3.0%	-3.2%	14.2%	33.2%	0.9%	9.3%
1995	-0.1%	4.0%	-1.4%	17.4%	30.8%	1.9%	11.5%
1996	8.5%	4.5%	7.2%	16.1%	27.6%	4.6%	12.0%
1997	6.0%	5.6%	9.2%	18.0%	21.9%	6.9%	13.3%
1998	5.2%	5.1%	3.9%	9.0%	20.5%	8.9%	8.2%
1999	6.5%	2.1%	2.1%	5.1%	16.1%	11.3%	5.0%
2000	4.1%	-1.5%	1.2%	-1.8%	8.3%	10.5%	-0.7%
2001	-2.8%	-2.4%	-4.0%	1.3%	9.3%	10.9%	0.6%
2002	-5.7%	-3.0%	-11.7%	0.1%	8.1%	15.6%	-0.4%
2003	-7.7%	-3.6%	-7.9%	3.4%	4.4%	10.2%	1.0%
2004	-7.7%	0.3%	-9.6%	6.4%	6.8%	5.4%	4.1%
2005	-3.2%	2.3%	-12.5%	9.0%	8.1%	3.9%	6.6%
2006							
2007							

Source: United States Federal Reserve Bank, Federal Reserve Flow of Funds Accounts of the United States. Historical Data. Available at: http://www.federalreserve.gov/Releases/Z1/Current/data.htm

Table III.57 - Cambridge Associates private equity index quarterly returns

Year	Quarter	Index value	Quarterly return (percent)	Annual return
1986	Q1	100.0		
1986	Q2	104.2	4.220	
1986	Q3	102.5	-1.640	
1986	Q4	102.9	0.390	
1987	Q1	106.5	3.470	6.5%
1987	Q2	107.8	1.200	3.4%
1987	Q3	108.9	1.020	6.2%
1987	Q4	106.2	-2.410	3.2%
1988	Q1	108.5	2.130	1.9%
1988	Q2	112.4	3.580	4.3%
1988	Q3	116.0	3.210	6.6%
1988	Q4	119.1	2.690	12.1%
1989	Q1	121.7	2.150	12.1%
1989	Q2	126.1	3.620	12.2%
1989	Q3	128.6	1.980	10.8%
1989	Q4	131.2	2.010	10.1%
1990	Q1	131.8	0.460	8.3%
1990	Q2	137.9	4.670	9.4%
1990	Q3	137.7	-0.160	7.1%
1990	Q4	138.3	0.440	5.4%
1991	Q1	142.0	2.670	7.8%
1991	Q2	143.8	1.290	4.3%
1991	Q3	146.9	2.130	6.7%
1991	Q4	152.2	3.610	10.0%
1992	Q1	155.2	2.000	9.3%
1992	Q2	156.6	0.850	8.9%
1992	Q3	160.5	2.510	9.3%
1992	Q4	174.8	8.910	14.8%
1993	Q1	180.7	3.380	16.4%
1993	Q2	191.3	5.870	22.2%
1993	Q3	203.2	6.230	26.6%
1993	Q4	216.9	6.760	24.1%
1994	Q1	219.1	0.990	21.3%
1994	Q2	225.3	2.840	17.8%
1994	Q3	229.8	1.990	13.1%
1994	Q4	243.5	5.940	12.2%
1995	Q1	252.5	3.720	15.3%
1995	Q2	262.1	3.810	16.3%
1995	Q3	273.8	4.460	19.2%
1995	Q4	303.2	10.740	24.6%
1996	Q1	319.3	5.310	26.5%
1996	Q2	339.6	6.360	29.6%
1996	Q3	361.6	6.480	32.1%
1996	Q4	390.7	8.040	28.9%
1997	Q1	392.8	0.530	23.0%
1997	Q2	428.7	9.130	26.2%
1997	Q3	460.4	7.410	27.3%
1997	Q4	504.7	9.620	29.2%

Table III.57 - Cambridge Associates private equity index quarterly returns

Year	Quarter	Index value	Quarterly return (percent)	Annual return
1998	Q1	545.3	8.040	38.8%
1998	Q2	579.0	6.190	35.1%
1998	Q3	545.7	-5.750	18.5%
1998	Q4	581.5	6.550	15.2%
1999	Q1	605.2	4.080	11.0%
1999	Q2	666.2	10.070	15.0%
1999	Q3	689.4	3.490	26.3%
1999	Q4	783.6	13.660	34.8%
2000	Q1	888.0	13.320	46.7%
2000	Q2	876.0	-1.350	31.5%
2000	Q3	864.7	-1.290	25.4%
2000	Q4	808.1	-6.540	3.1%
2001	Q1	764.3	-5.420	-13.9%
2001	Q2	783.1	2.450	-10.6%
2001	Q3	718.2	-8.280	-16.9%
2001	Q4	718.6	0.060	-11.1%
2002	Q1	716.3	-0.330	-6.3%
2002	Q2	691.7	-3.430	-11.7%
2002	Q3	662.2	-4.270	-7.8%
2002	Q4	663.6	0.220	-7.7%
2003	Q1	663.5	-0.020	-7.4%
2003	Q2	707.9	6.700	2.3%
2003	Q3	740.7	4.620	11.9%
2003	Q4	818.6	10.530	23.4%
2004	Q1	846.2	3.370	27.5%
2004	Q2	873.4	3.210	23.4%
2004	Q3	893.0	2.250	20.6%
2004	Q4	1022.4	14.480	24.9%
2005	Q1	1041.6	1.880	23.1%
2005	Q2	1125.7	8.080	28.9%
2005	Q3	1204.8	7.020	34.9%
2005	Q4	1311.6	8.870	28.3%
2006	Q1	1374.2	4.770	31.9%
2006	Q2	1429.6	4.030	27.0%
2006	Q3	1490.8	4.280	23.7%
2006	Q4	1666.1	11.760	27.0%
2007	Q1	1762.9	5.810	28.3%
2007	Q2	1903.9	8.000	33.2%
2007	Q3	1932.3	1.490	29.6%
2007	Q4	2007.4	3.890	20.5%
2008	Q1	1981.3	-1.300	12.4%
2008	Q2	2000.8	0.980	5.1%

Source: Cambridge Associates LLC U.S. Private Equity Index® And Benchmark Statistics June 30, 2008

Table III.58 - Cambridge Associates private equity index annual returns compared to S&P 500 annual returns

	Cambridge Associates private equity index			
Year	Index value	Annual return	S&P 500	Difference
1986	100.0			
1987	106.5	6.5%	5.3%	*1.2%*
1988	108.5	1.9%	16.6%	-14.7%
1989	121.7	12.1%	31.7%	-19.5%
1990	131.8	8.3%	-3.1%	*11.4%*
1991	142.0	7.8%	30.5%	-22.7%
1992	155.2	9.3%	7.6%	*1.7%*
1993	180.7	16.4%	10.1%	*6.3%*
1994	219.1	21.3%	1.3%	*19.9%*
1995	252.5	15.3%	37.6%	-22.3%
1996	319.3	26.5%	23.0%	*3.5%*
1997	392.8	23.0%	33.4%	-10.4%
1998	545.3	38.8%	28.6%	*10.2%*
1999	605.2	11.0%	21.0%	-10.0%
2000	888.0	46.7%	-9.1%	*55.8%*
2001	764.3	-13.9%	-11.9%	-2.0%
2002	716.3	-6.3%	-22.1%	*15.8%*
2003	663.5	-7.4%	28.7%	-36.1%
2004	846.2	27.5%	10.9%	*16.7%*
2005	1041.6	23.1%	4.9%	*18.2%*
2006	1374.2	31.9%	15.8%	*16.1%*
2007	1762.9	28.3%	5.5%	*22.8%*

Source: Cambridge Associates LLC U.S. Private Equity Index® And Benchmark Statistics June 30, 2008. S&P 500 statistics are available at
http://www2.standardandpoors.com/spf/xls/index/MONTHLY.xls

Table III.59 - United State private equity performance for trailing time periods ending December 31, 2004

Private equity	One year	Three years	Five years	Ten years	Twenty years
Venture	19.30%	-2.90%	-1.30%	26.00%	15.70%
Buyouts	14.30%	6.90%	2.30%	8.40%	12.80%
Mezzanine	8.00%	3.10%	2.90%	6.90%	9.30%
All	16.40%	3.70%	1.50%	12.70%	13.80%

Public equity/bonds	One year	Three years	Five years	Ten years	Twenty years
S&P 500	10.90%	3.60%	-2.30%	12.10%	13.20%
Lehman Aggregate Bond	4.30%	6.20%	7.70%	7.70%	8.80%
MSCI EAFE	20.30%	11.90%	-1.10%	5.60%	11.40%

Source: Venture Economics reported in William J. Monagle, Jr and Sean W. B. Gill, *Private Equity. "Investment Strategies of the Past and the Future"* , 10th Annual NEPC Client Conference, May 26, 2005. Available at: www.nepc.com

Table III.60 - United State private equity performance for trailing time periods ending December 31, 2006

Private equity	One year	Three years	Five years	Ten years	Twenty years
Venture	16.40%	9.10%	1.00%	20.30%	16.60%
Buyouts	12.60%	5.00%	4.10%	6.10%	8.50%
Mezzanine	24.50%	14.60%	10.40%	8.50%	12.90%
All	23.30%	12.70%	7.50%	11.00%	13.90%

Public equity/bonds	One year	Three years	Five years	Ten years	Twenty years
S&P 500	10.80%	8.20%	4.20%	6.60%	9.20%
NASDAQ	4.70%	6.20%	4.30%	6.40%	10.10%

Source: Thomson Financial / National Venture Capital Association. Reported in Charles Uhrig, *Recent Trends in the Mergers & Acquisitions and Private Equity Markets*, University of Florida, August 31, 2007, p. 22. Available at:
http://www.cba.ufl.edu/fire/docs/msf/speaker/presentation_Uhrig0807.pdf

Table III.61 - United States private equity internal rates of return 1980 - 2006

Fund type	Number of funds	Returns (percent) Average	Capital weighted average	Pooled average	Maximum	Upper quartile	Median	Lower quartile	Minimum
All venture	**1,191**	**13.4**	**7.9**	**15.9**	**721.0**	**16.0**	**0.5**	**-3.2**	**-100.0**
Early seed	*559*	*16.4*	*8.3*	*19.5*	*721.0*	*16.2*	*3.1*	*-6.0*	*-80.3*
Seed	*55*	*10.0*	*3.5*	*9.5*	*257.7*	*13.3*	*3.9*	*-3.1*	*-19.4*
Early state	*494*	*17.3*	*8.6*	*20.3*	*721.0*	*16.4*	*3.1*	*-6.2*	*-80.3*
Balanced VC	*444*	*10.4*	*7.9*	*14.3*	*195.2*	*15.7*	*5.6*	*-1.1*	*-39.0*
Later stage VC	*188*	*11.4*	*7.2*	*13.7*	*239.2*	*17.4*	*6.4*	*-1.2*	*-100.0*
All buyouts	**482**	**12.1**	**11.8**	**13.7**	**243.9**	**18.8**	**8.2**	**-0.1**	**-59.8**
Small buyouts	*174*	*12.5*	*10.2*	*24.4*	*243.9*	*18.0*	*8.0*	*0.2*	*-42.2*
Medium buyouts	*108*	*14.0*	*14.1*	*17.7*	*128.9*	*22.6*	*9.4*	*-0.3*	*-59.8*
Large buyouts	*91*	*9.1*	*8.5*	*12.5*	*91.3*	*18.5*	*5.6*	*-2.3*	*-30.8*
Mega buyouts	*109*	*12.0*	*12.4*	*11.8*	*71.3*	*19.1*	*6.7*	*0.5*	*-42.3*
Mezzanine	**70**	**7.3**	**6.3**	**8.9**	**53.7**	**12.6**	**7.8**	**0.8**	**-31.9**
Buyouts and other private equity	**637**	**11.0**	**11.1**	**12.8**	**243.9**	**17.8**	**8.2**	**0.0**	**-59.8**
All private equity	**1,833**	**12.5**	**10.1**	**14.2**	**721.0**	**16.7**	**6.2**	**-2.0**	**-100.0**

Source: Thomson Financial Venture Economics/NVCA as reported in Marc Lustenberger, *Risk Aspects in Private Equity Investments*, Diploma Thesis in Corporate Finance at the Swiss Banking Institute University of Zurich, August 30, 2007. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1022280&rec=1&srcabs=1088543

Table III.62 - Private equity internal rates of return 1990 - 2004

Vintage year	U.S. venture capital					U.S. private equity buyouts				
	Maximum	Upper quartile	Median	Lower quartile	Minimum	Maximum	Upper quartile	Median	Lower quartile	Minimum
1990	74.90%	25.30%	13.70%	-0.30%	-11.00%	54.20%	16.80%	12.30%	-0.50%	-31.20%
1991	61.40%	25.70%	18.60%	4.40%	-0.90%	22.40%	15.00%	13.00%	5.50%	-0.20%
1992	102.30%	31.70%	15.10%	10.90%	-47.20%	60.10%	22.50%	18.50%	10.00%	-23.40%
1993	116.40%	39.80%	12.20%	-0.40%	-25.00%	57.00%	25.40%	15.70%	9.80%	0.20%
1994	113.00%	39.80%	18.40%	4.60%	-47.90%	91.30%	22.70%	12.20%	2.90%	-8.40%
1995	247.80%	63.50%	22.90%	3.60%	-28.30%	48.40%	13.90%	7.30%	-0.20%	-9.70%
1996	454.90%	95.90%	38.10%	1.10%	-24.10%	81.50%	10.60%	6.10%	-1.20%	-14.70%
1997	296.00%	60.80%	19.50%	-2.60%	-55.40%	65.30%	9.90%	2.80%	-3.00%	-26.10%
1998	721.00%	12.00%	2.50%	-7.20%	-44.80%	57.00%	13.10%	2.80%	-6.60%	-31.70%
1999	140.70%	-0.80%	-13.00%	-23.30%	-73.20%	62.00%	7.20%	-2.50%	-7.20%	-20.80%
2000	29.90%	-1.90%	-10.60%	-17.80%	-41.30%	112.10%	14.40%	1.30%	-3.30%	-29.20%
2001	26.20%	0.00%	-9.00%	-16.10%	-29.80%	40.30%	19.20%	0.70%	-6.40%	-33.90%
2002	12.60%	0.00%	-7.40%	-18.80%	-39.30%	209.30%	11.00%	0.00%	-7.40%	-41.10%
2003	63.60%	-10.90%	-24.50%	-46.50%	-60.30%	122.90%	14.70%	-9.80%	-16.70%	-82.60%
2004	-11.30%	-30.60%	-43.20%	-52.80%	-74.20%	-7.80%	-15.60%	-32.70%	-49.80%	-91.40%

Vintage year	European venture capital					European private equity buyouts				
	Maximum	Upper quartile	Median	Lower quartile	Minimum	Maximum	Upper quartile	Median	Lower quartile	Minimum
1990	55.20%	21.70%	11.50%	0.40%	-9.70%	35.70%	19.40%	8.60%	3.00%	-3.40%
1991	36.20%	10.00%	6.30%	1.30%	-12.30%	40.20%	21.60%	12.80%	5.30%	-17.50%
1992	26.80%	22.20%	17.70%	1.30%	-4.80%	43.70%	31.80%	18.00%	11.00%	3.80%
1993	55.40%	24.80%	10.30%	-2.00%	-10.10%	87.90%	23.30%	15.10%	10.60%	-11.00%
1994	26.40%	18.00%	4.80%	-0.70%	-32.20%	59.20%	46.00%	17.20%	12.00%	-1.80%
1995	200.80%	4.30%	0.50%	-2.10%	7.10%	107.50%	39.80%	15.80%	2.10%	-13.60%
1996	103.90%	15.00%	5.90%	1.10%	-6.30%	268.10%	25.40%	11.40%	7.90%	-9.10%
1997	262.10%	12.30%	1.00%	-5.30%	-25.10%	133.10%	24.10%	4.90%	-2.90%	-17.50%
1998	180.90%	1.00%	-1.80%	9.70%	-22.60%	42.10%	12.40%	3.20%	-1.70%	-11.40%
1999	169.10%	0.00%	-1.80%	-11.60%	-42.70%	25.40%	6.60%	0.40%	-4.00%	-18.40%
2000	154.90%	-2.10%	-10.40%	-17.50%	-100.00%	31.30%	8.90%	4.90%	-1.40%	-14.10%
2001	13.90%	-2.40%	-8.90%	-19.50%	-51.80%	28.80%	12.80%	0.00%	-4.10%	-14.90%
2002	38.20%	-1.60%	-14.40%	-30.70%	-60.90%	48.70%	4.90%	-4.40%	-13.50%	-25.70%
2003	18.30%	-0.50%	-4.30%	-16.30%	-39.60%	25.60%	0.00%	-10.60%	-17.20%	-97.80%
2004	70.50%	6.60%	-2.00%	-41.30%	-73.50%	0.00%	0.00%	-42.10%	-53.80%	-94.90%

Source: Venture Economics reported in William J. Monagle, Jr and Sean W. B. Gill, *Private Equity. "Investment Strategies of the Past and the Future"*, 10th Annual NEPC Client Conference, May 26, 2005. Available at: www.nepc.com

Table III.63 - United States and European private equity returns 1990 - 2004

					US venture capital - vintage year - cumulative IRR			US buyoutl - vintage year - cumulative IRR			Annualized return	
Year	U.S. venture capital	U.S. buyouts	European venture capital	European buyouts	Upper quartile	Median	Lower quartile	Upper quartile	Median	Lower quartile	Russell 2000	S&P 500
1990	27.40%	18.50%	18.50%	8.80%								
1991	31.20%	9.60%	6.90%	15.80%								
1992	30.10%	20.40%	15.20%	28.30%								
1993	44.20%	18.50%	10.20%	17.10%								
1994	39.20%	14.80%	10.50%	40.10%	39.80%	18.40%	4.60%	22.70%	12.20%	2.90%	10.30%	11.10%
1995	61.70%	8.80%	47.90%	38.20%	63.50%	22.90%	3.60%	13.90%	7.30%	*-0.20%*	11.50%	12.10%
1996	86.40%	5.90%	15.70%	18.40%	95.90%	38.10%	1.10%	10.60%	6.10%	*-1.20%*	9.80%	9.60%
1997	51.60%	8.90%	12.30%	6.90%	60.80%	19.50%	*-2.60%*	9.90%	2.80%	*-3.00%*	9.00%	8.00%
1998	14.60%	1.30%	-1.50%	7.10%	12.00%	2.50%	*-7.20%*	13.10%	2.80%	*-6.60%*	7.20%	4.80%
1999	-11.00%	6.20%	-4.20%	1.90%	-0.80%	*-13.00%*	*-23.30%*	7.20%	*-2.50%*	*-7.20%*	8.90%	1.30%
2000	-7.70%	7.80%	-10.10%	14.50%	*-1.90%*	*-10.60%*	*-17.80%*	14.40%	1.30%	*-3.30%*	6.60%	-2.30%
2001	-4.90%	13.50%	-7.70%	1.90%	0.00%	*-9.00%*	*-16.10%*	19.20%	0.70%	*-6.40%*	9.20%	-0.50%
2002	-7.50%	4.30%	-17.40%	-7.00%	0.00%	*-7.40%*	*-18.80%*	11.00%	0.00%	*-7.40%*	11.50%	3.60%
2003	-7.70%	66.20%	-5.80%	2.80%								
2004	-50.60%	-30.30%	-14.40%	-62.70%								

Source: Venture Economics reported in William J. Monagle, Jr and Sean W. B. Gill, *Private Equity. "Investment Strategies of the Past and the Future"*, 10th Annual NEPC Client Conference, May 26, 2005. Available at: www.nepc.com

Table III.64 - University endowment asset allocation and performance 1989 - 2005

Year	US equities	Non-US equities	US fixed income	Non-US fixed income	Real estate (public)	Real estate (private)	Cash	Other	Hedge funds	Venture capital	Private equity	Natural resources	AUM	Mean return	Return standard deviation	Mean payout	Payout standard deviation	Number of observations
1989	47.0	1.7	30.9	0.8	2.4	0.5	12.9	2.9	0.0	0.6	0.2	0.1	165.4	13.6	4.7	n.a.	n.a.	281
1990	47.5	2.3	35.0	0.6	2.2	0.7	10.3	0.0	0.3	0.6	0.2	0.2	174.3	10.0	6.0	n.a.	n.a.	298
1991	47.5	2.3	35.3	0.7	2.1	0.7	10.2	0.0	0.3	0.6	0.2	0.2	171.9	7.3	4.9	n.a.	n.a.	328
1992	48.1	3.0	35.0	0.9	1.8	0.6	9.4	0.0	0.4	0.5	0.2	0.2	196.3	13.0	4.9	n.a.	n.a.	318
1993	48.1	4.2	33.6	1.3	0.0	1.6	7.3	2.0	0.7	0.2	0.6	0.3	196.0	13.2	4.3	n.a.	n.a.	394
1994	46.2	7.4	30.0	1.8	1.6	0.3	7.4	2.8	1.4	0.7	0.2	0.3	189.1	3.3	4.4	5.2	1.8	375
1995	46.9	7.9	28.1	1.9	1.7	0.4	6.5	3.9	1.6	0.7	0.2	0.3	236.1	15.1	4.2	5.0	1.5	422
1996	51.8	9.4	25.9	1.8	1.6	0.4	5.4	0.7	1.9	0.8	0.3	0.2	282.2	17.3	4.0	4.8	1.3	405
1997	52.5	11.2	23.9	1.8	1.7	0.3	4.6	0.5	2.2	0.8	0.3	0.2	328.3	20.1	4.4	4.8	1.8	456
1998	53.1	10.9	23.9	1.6	2.1	1.3	2.2	0.6	1.6	0.9	0.5	1.2	371.2	18.1	4.0	4.7	1.2	445
1999	53.9	10.5	22.2	1.6	0.6	1.3	3.9	0.6	3.1	1.3	0.7	0.2	410.3	10.8	4.7	4.8	1.2	467
2000	50.7	11.6	22.1	1.3	0.7	1.2	4.0	4.0	0.7	2.4	1.0	0.3	462.5	12.7	10.1	5.0	1.4	507
2001	49.6	10.0	23.9	1.0	0.8	1.3	4.0	5.8	0.6	1.5	0.9	0.4	393.1	-3.2	6.3	5.2	1.4	568
2002	46.4	10.1	25.9	1.1	1.2	1.4	4.0	1.6	5.6	1.0	1.2	0.4	336.9	-5.95	4.23	5.22	1.54	535
2003	47.4	9.7	24.9	0.7	1.0	1.8	3.9	1.6	6.3	0.8	1.4	0.4	294.9	2.69	3.67	5.21	1.51	665
2004	48.7	11.1	21.1	0.8	1.0	1.8	3.6	1.6	7.5	0.8	1.4	0.6	324.5	15.02	4.42	4.88	1.62	705
2005	45.7	12.7	20.5	0.9	1.2	2.0	3.4	1.4	8.9	0.8	1.6	1.0	352.6	9.16	3.29	4.78	1.4	709

Source: Keith C. Browny, Lorenzo Garlapp and Christian Tiu, Does Asset Allocation Influence Portfolio Performance?: Evidence from University Endowment Funds, November 23, 2008. Available at:

Table III.65 - University endowment asset allocation and performance 1989 - 2005 and State public pension fund performance 2001 - 2008

										State public pension funds	
Year	Equities	Fixed income	Real estate	Cash	Alternative investments	Other	Mean return	Return standard deviation	Number of observations	Assets of less than one billion dollars	Assets of more than one billion dollars
1989	48.7	31.7	2.9	12.9	0.9	2.9	13.6	4.7	281		
1990	49.8	35.6	2.9	10.3	1.3	0.0	10.0	6.0	298		
1991	49.8	36.0	2.8	10.2	1.3	0.0	7.3	4.9	328		
1992	51.1	35.9	2.4	9.4	1.3	0.0	13.0	4.9	318		
1993	52.3	34.9	1.6	7.3	1.8	2.0	13.2	4.3	394		
1994	53.6	31.8	1.9	7.4	2.6	2.8	3.3	4.4	375		
1995	54.8	30.0	2.1	6.5	2.8	3.9	15.1	4.2	422		
1996	61.2	27.7	2.0	5.4	3.2	0.7	17.3	4.0	405		
1997	63.7	25.7	2.0	4.6	3.5	0.5	20.1	4.4	456		
1998	64.0	25.5	3.4	2.2	4.2	0.6	18.1	4.0	445		
1999	64.4	23.8	1.9	3.9	5.3	0.6	10.8	4.7	467		
2000	62.3	23.4	1.9	4.0	4.4	4.0	12.7	10.1	507		
2001	59.6	24.9	2.1	4.0	3.4	5.8	-3.2	6.3	568	-6.1%	
2002	56.5	27.0	2.6	4.0	8.2	1.6	-6.0	4.23	535	-5.8%	-5.8%
2003	57.1	25.6	2.8	3.9	8.9	1.6	2.7	3.67	665	4.0%	3.9%
2004	59.8	21.9	2.8	3.6	10.3	1.6	15.0	4.42	705	15.9%	15.8%
2005	58.4	21.4	3.2	3.4	12.3	1.4	9.2	3.29	709	10.0%	9.4%
2006							10.7			10.7%	9.4%
2007							17.2			17.7%	16.1%
2008							-0.3			-4.4%	-4.5%

Sources: Keith C. Browny, Lorenzo Garlapp and Christian Tiu, *Does Asset Allocation Influence Portfolio Performance?: Evidence from University Endowment Funds*, November 23, 2008. Available at:
http://www.mccombs.utexas.edu/faculty/keith.brown/Research/endowment.htm

Mean returns for 2006 through 2008 are taken from the Chronicle of Higher Education for the following publication dates: January 26, 2007, February 1, 2008 and January 27, 2009

Source: New York State Teachers' Retirement System annual reports 2001 - 2008. California Public Employees' Retirement System *comprehensive annual financial reports*, 2001 - 2008. Available at:
https://www.calpers.ca.gov/mss-pub/SearchController?viewcategory=action&PageId=SearchCatalog&category_code=8&subcategory_code=58
and Iowa Public Employees' Retirement System *comprehensive annual financial reports 2001 - 2008*. Available at:
http://www.ipers.org/publications/misc/pdf/financial/cafr/cafr2004.pdf

Table III.66 - Hedge fund returns 1979 - 2008

Year	Equal Weighted Hedge Fund	Convertible Arbitrage	Distressed Securities	Emerging Markets	Equity Market Neutral	Equity Long/Short	Equity Long/Short Asia	Equity Long/Short Europe	Event Driven Multi-Strategy	Fixed Income Arbitrage
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989	100.00		100.00	100.00	100.00	100.00			100.00	
1990	106.54		119.31	105.06	110.18	98.54			96.69	
1991	138.96	100.00	149.20	169.65	123.86	131.74			117.81	
1992	162.35	116.68	176.43	205.20	133.67	154.64			140.61	
1993	211.53	136.00	231.57	299.37	146.68	187.97			177.82	
1994	218.99	138.99	221.60	312.09	154.19	194.33			184.29	
1995	265.35	163.27	270.25	309.71	173.00	245.67			220.77	
1996	327.01	187.35	327.15	389.81	196.69	300.56			270.02	
1997	398.26	214.04	388.24	447.68	225.93	371.92			333.64	100.00
1998	414.08	230.00	369.48	285.49	251.15	407.52			346.64	102.97
1999	566.42	261.98	435.44	408.08	275.91	547.72			420.89	113.99
2000	616.03	301.89	460.93	390.92	314.18	590.31	100.00	100.00	471.70	125.20
2001	651.23	341.94	503.51	437.99	337.03	603.72	110.62	106.07	505.00	135.33
2002	653.91	372.34	538.02	473.52	343.91	575.20	114.24	107.98	510.94	144.34
2003	788.78	408.25	673.95	612.43	374.27	683.83	134.98	122.82	622.66	157.19
2004	867.41	418.36	786.10	693.99	392.87	751.24	143.16	133.38	698.16	167.15
2005	952.74	413.57	844.58	792.91	420.82	817.82	164.93	154.12	744.43	178.24
2006	1,064.78	464.50	978.74	932.44	452.97	899.54	164.32	174.05	848.52	191.34
2007	1,176.73	482.91	1,030.39	1,091.86	482.34	975.81	170.81	183.51	904.22	202.22
2008	951.27	390.63	829.05	717.42	485.28	835.01	137.86	165.86	732.03	165.89

Table III.66 - Hedge fund returns 1979 - 2008

Year	Global Macro	Merger Arbitrage	Mortgage-Backed Securities	Sector	Sector Technology	Fund of Funds	Fund of Funds Diversified	CTA Asset Weighted
1979								100.00
1980								152.99
1981								154.70
1982								162.57
1983								163.03
1984								192.46
1985								244.63
1986								252.18
1987								397.88
1988	100.00							456.08
1989	111.26	100.00				100.00	100.00	489.13
1990	151.83	98.31				107.47	107.52	622.60
1991	185.77	116.33				119.61	119.35	727.34
1992	261.72	136.54				133.88	133.72	799.36
1993	248.51	172.56				166.30	164.92	958.12
1994	276.28	181.59				158.95	157.59	951.43
1995	303.52	211.72	100.00			178.42	177.36	1,095.33
1996	351.98	245.52	104.82			208.19	207.20	1,255.70
1997	380.52	290.15	121.34			244.00	242.61	1,381.98
1998	412.95	306.10	125.45			248.02	246.77	1,511.49
1999	454.34	354.39	142.98	163.31	119.10	288.26	301.96	1,568.54
2000	479.67	405.33	159.30	181.38	117.42	309.50	324.15	1,665.40
2001	493.14	422.64	178.58	171.83	102.55	325.54	340.34	1,735.15
2002	551.13	423.82	200.20	162.81	96.03	328.96	342.55	1,942.42
2003	575.84	455.04	208.40	191.17	109.49	362.60	376.95	2,199.77
2004	614.15	486.95	224.81	208.29	119.71	388.42	404.19	2,293.00
2005	644.50	515.05	240.49	223.88	129.18	413.56	429.91	2,407.80
2006	721.80	570.05	257.82	252.70	149.62	451.24	463.42	2,556.28
2007	748.61	591.30	277.30	271.61	164.94	490.41	507.50	2,790.03
2008		591.84	276.20	213.79	135.10	406.83	422.05	3,287.97

Table III.66 - Hedge fund returns 1979 - 2008

Year	CTA Asset Weighted Currency	CTA Asset Weighted Diversified	CTA Asset Weighted Equity	CTA Asset Weighted Financials	CTA Asset Weighted Physicals	CTA Asset Weighted Discretionary	CTA Asset Weighted Systematic	CTA Equal Weighted	CTA Equal Weighted Currency	CTA Equal Weighted Diversified
1979		100.00		100.00				100.00		
1980		148.59		122.25				155.67		
1981		135.32		208.36				179.19		
1982		142.55		454.49				280.57		
1983		138.57		570.16				290.29		
1984		172.12		723.67				356.79		
1985		215.64		846.97				476.63		
1986		198.00		911.20		100.00		568.13		
1987		273.64		1,324.58		186.37		920.40		
1988		318.46		1,518.30		237.42		1,066.47		
1989	100.00	314.76		1,725.00		323.57		1,089.59		
1990	141.95	377.10		2,139.51		392.81		1,371.27		
1991	171.19	419.88		2,688.98		449.00	100.00	1,466.18		
1992	223.15	394.66		2,678.63		531.85	102.05	1,487.40		
1993	219.90	481.97	100.00	3,341.38		703.24	119.55	1,663.44		
1994	191.59	507.47	117.07	3,230.18		695.93	114.86	1,709.10		
1995	224.60	583.87	94.61	3,786.74		780.50	132.73	1,921.97		
1996	248.77	658.17	90.30	4,573.54		898.06	150.36	2,161.82		
1997	273.85	704.81	97.37	5,267.21		954.20	164.29	2,447.62		
1998	286.32	786.60	111.87	5,775.16		1,024.47	179.35	2,706.95		
1999	294.64	837.71	109.54	5,807.70		1,186.70	179.76	2,741.19		
2000	309.81	905.34	105.85	6,022.76	100.00	1,230.25	190.09	3,028.03	100.00	100.00
2001	316.40	960.01	127.18	6,199.87	97.50	1,343.74	193.74	3,177.02	106.78	103.78
2002	316.18	1,078.85	130.04	7,357.15	93.66	1,457.91	212.24	3,602.80	117.75	120.05
2003	386.52	1,190.95	139.25	8,513.40	105.87	1,636.96	239.30	4,001.54	128.03	136.72
2004	376.72	1,237.97	148.69	9,145.62	128.97	1,719.31	246.96	4,154.87	134.48	140.40
2005	389.36	1,224.58	164.85	10,482.39	125.90	1,887.43	260.31	4,256.09	136.37	146.73
2006	390.26	1,312.21	179.62	11,450.30	124.01	2,186.33	275.88	4,497.00	139.93	155.36
2007	412.93	1,470.25	223.79	12,310.09	112.65	2,604.55	299.16	5,017.47	149.90	175.87
2008	442.69	1,753.56	241.46	14,148.56	123.83	2,762.90	353.76	6,109.13	158.37	225.94

Table III.66 - Hedge fund returns 1979 - 2008

Year	CTA Equal Weighted Equity	CTA Equal Weighted Financials	CTA Equal Weighted Physicals	CTA Equal Weighted Discretionary	CTA Equal Weighted Systematic	CPO Asset Weighted	Public CPO Asset Weighted	CPO Equal Weighted	Public CPO Equal Weighted
1979						100.00		100.00	
1980						146.35		138.80	
1981						175.05		156.71	
1982						215.42		173.79	
1983						199.07		169.65	
1984						207.39		198.13	
1985						252.66		240.18	
1986						223.57		241.43	
1987						328.37		356.56	
1988						356.05		380.56	
1989						392.01	100.00	394.44	
1990						468.51	114.22	471.67	
1991						518.75	125.66	486.26	
1992						524.08	123.90	475.25	
1993						603.48	137.21	519.67	
1994						590.31	126.62	491.06	
1995						647.35	144.20	539.11	
1996						724.30	158.29	597.60	
1997						793.04	170.35	654.43	
1998						846.98	183.83	720.44	
1999						859.54	181.24	714.58	
2000	100.00	100.00	100.00	100.00	100.00	940.07	189.69	780.69	100.00
2001	106.35	108.19	100.38	102.66	105.50	1,010.75	189.48	816.54	103.18
2002	108.89	126.00	115.90	116.15	120.17	1,131.97	216.53	932.02	117.36
2003	114.35	135.76	136.55	128.21	133.88	1,269.76	241.54	1,057.59	128.60
2004	121.87	135.76	152.03	143.69	136.05	1,310.70	245.13	1,078.68	129.49
2005	122.98	137.69	157.55	156.50	139.35	1,388.99	247.39	1,114.99	133.75
2006	132.06	146.53	157.25	181.87	144.99	1,504.31	264.21	1,191.06	142.96
2007	163.20	159.90	155.09	220.12	160.29	1,632.87	280.73	1,291.58	151.88
2008	167.35	182.88	189.01	232.48	199.02	1,898.84	339.49	1,591.33	187.79

Source: Center for International Securities and Derivatives Markets, University of Massachusetts, Amherst. Available at:
http://cisdm.som.umass.edu/index.asp

Table III.67 - Annual percentage change in hedge fund returns 1990 - 2008

Year	Equal Weighted Hedge Fund	Convertible Arbitrage	Distressed Securities	Emerging Markets	Equity Market Neutral	Equity Long/Short	Equity Long/Short Asia	Equity Long/Short Europe	Event Driven Multi-Strategy	Fixed Income Arbitrage
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989										
1990	6.5%		19.3%	5.1%	10.2%	-1.5%			-3.3%	
1991	30.4%		25.1%	61.5%	12.4%	33.7%			21.8%	
1992	16.8%	16.7%	18.3%	21.0%	7.9%	17.4%			19.4%	
1993	30.3%	16.6%	31.2%	45.9%	9.7%	21.6%			26.5%	
1994	3.5%	2.2%	-4.3%	4.3%	5.1%	3.4%			3.6%	
1995	21.2%	17.5%	22.0%	-0.8%	12.2%	26.4%			19.8%	
1996	23.2%	14.7%	21.1%	25.9%	13.7%	22.3%			22.3%	
1997	21.8%	14.2%	18.7%	14.8%	14.9%	23.7%			23.6%	
1998	4.0%	7.5%	-4.8%	-36.2%	11.2%	9.6%			3.9%	3.0%
1999	36.8%	13.9%	17.9%	42.9%	9.9%	34.4%			21.4%	10.7%
2000	8.8%	15.2%	5.9%	-4.2%	13.9%	7.8%			12.1%	9.8%
2001	5.7%	13.3%	9.2%	12.0%	7.3%	2.3%	10.6%	6.1%	7.1%	8.1%
2002	0.4%	8.9%	6.9%	8.1%	2.0%	-4.7%	3.3%	1.8%	1.2%	6.7%
2003	20.6%	9.6%	25.3%	29.3%	8.8%	18.9%	18.2%	13.7%	21.9%	8.9%
2004	10.0%	2.5%	16.6%	13.3%	5.0%	9.9%	6.1%	8.6%	12.1%	6.3%
2005	9.8%	-1.1%	7.4%	14.3%	7.1%	8.9%	15.2%	15.6%	6.6%	6.6%
2006	11.8%	12.3%	15.9%	17.6%	7.6%	10.0%	-0.4%	12.9%	14.0%	7.4%
2007	10.5%	4.0%	5.3%	17.1%	6.5%	8.5%	3.9%	5.4%	6.6%	5.7%
2008	-19.2%	-19.1%	-19.5%	-34.3%	0.6%	-14.4%	-19.3%	-9.6%	-19.0%	-18.0%

Table III.67 - Annual percentage change in hedge funds 1990 - 2008

Year	Global Macro	Merger Arbitrage	Mortgage-Backed Securities	Sector	Sector Technology	Fund of Funds	Fund of Funds Diversified	CTA Asset Weighted
1979								
1980								53.0%
1981								1.1%
1982								5.1%
1983								0.3%
1984								18.1%
1985								27.1%
1986								3.1%
1987								57.8%
1988								14.6%
1989	11.3%							7.2%
1990	36.5%	-1.7%				7.5%	7.5%	27.3%
1991	22.4%	18.3%				11.3%	11.0%	16.8%
1992	40.9%	17.4%				11.9%	12.0%	9.9%
1993	-5.0%	26.4%				24.2%	23.3%	19.9%
1994	11.2%	5.2%				-4.4%	-4.4%	-0.7%
1995	9.9%	16.6%				12.3%	12.5%	15.1%
1996	16.0%	16.0%	4.8%			16.7%	16.8%	14.6%
1997	8.1%	18.2%	15.8%			17.2%	17.1%	10.1%
1998	8.5%	5.5%	3.4%			1.6%	1.7%	9.4%
1999	10.0%	15.8%	14.0%			16.2%	22.4%	3.8%
2000	5.6%	14.4%	11.4%	11.1%	-1.4%	7.4%	7.3%	6.2%
2001	2.8%	4.3%	12.1%	-5.3%	-12.7%	5.2%	5.0%	4.2%
2002	11.8%	0.3%	12.1%	-5.3%	-6.4%	1.0%	0.7%	11.9%
2003	4.5%	7.4%	4.1%	17.4%	14.0%	10.2%	10.0%	13.2%
2004	6.7%	7.0%	7.9%	9.0%	9.3%	7.1%	7.2%	4.2%
2005	4.9%	5.8%	7.0%	7.5%	7.9%	6.5%	6.4%	5.0%
2006	12.0%	10.7%	7.2%	12.9%	15.8%	9.1%	7.8%	6.2%
2007	3.7%	3.7%	7.6%	7.5%	10.2%	8.7%	9.5%	9.1%
2008		0.1%	-0.4%	-21.3%	-18.1%	-17.0%	-16.8%	17.8%

Table III.67 - Annual percentage change in hedge funds 1990 - 2008

Year	CTA Asset Weighted Currency	CTA Asset Weighted Diversified	CTA Asset Weighted Equity	CTA Asset Weighted Financials	CTA Asset Weighted Physicals	CTA Asset Weighted Discretionary	CTA Asset Weighted Systematic	CTA Equal Weighted	CTA Equal Weighted Currency	CTA Equal Weighted Diversified
1979										
1980		48.6%		22.3%				55.7%		
1981		-8.9%		70.4%				15.1%		
1982		5.3%		118.1%				56.6%		
1983		-2.8%		25.5%				3.5%		
1984		24.2%		26.9%				22.9%		
1985		25.3%		17.0%				33.6%		
1986		-8.2%		7.6%				19.2%		
1987		38.2%		45.4%		86.4%		62.0%		
1988		16.4%		14.6%		27.4%		15.9%		
1989		-1.2%		13.6%		36.3%		2.2%		
1990	41.9%	19.8%		24.0%		21.4%		25.9%		
1991	20.6%	11.3%		25.7%		14.3%		6.9%		
1992	30.3%	-6.0%		-0.4%		18.5%	2.1%	1.4%		
1993	-1.5%	22.1%		24.7%		32.2%	17.1%	11.8%		
1994	-12.9%	5.3%	17.1%	-3.3%		-1.0%	-3.9%	2.7%		
1995	17.2%	15.1%	-19.2%	17.2%		12.2%	15.6%	12.5%		
1996	10.8%	12.7%	-4.6%	20.8%		15.1%	13.3%	12.5%		
1997	10.1%	7.1%	7.8%	15.2%		6.3%	9.3%	13.2%		
1998	4.6%	11.6%	14.9%	9.6%		7.4%	9.2%	10.6%		
1999	2.9%	6.5%	-2.1%	0.6%		15.8%	0.2%	1.3%		
2000	5.2%	8.1%	-3.4%	3.7%		3.7%	5.7%	10.5%		
2001	2.1%	6.0%	20.1%	2.9%	-2.5%	9.2%	1.9%	4.9%	6.8%	3.8%
2002	-0.1%	12.4%	2.3%	18.7%	-3.9%	8.5%	9.6%	13.4%	10.3%	15.7%
2003	22.2%	10.4%	7.1%	15.7%	13.0%	12.3%	12.8%	11.1%	8.7%	13.9%
2004	-2.5%	3.9%	6.8%	7.4%	21.8%	5.0%	3.2%	3.8%	5.0%	2.7%
2005	3.4%	-1.1%	10.9%	14.6%	-2.4%	9.8%	5.4%	2.4%	1.4%	4.5%
2006	0.2%	7.2%	9.0%	9.2%	-1.5%	15.8%	6.0%	5.7%	2.6%	5.9%
2007	5.8%	12.0%	24.6%	7.5%	-9.2%	19.1%	8.4%	11.6%	7.1%	13.2%
2008	7.2%	19.3%	7.9%	14.9%	9.9%	6.1%	18.3%	21.8%	5.7%	28.5%

Table III.67 - Annual percentage change in hedge funds 1990 - 2008

Year	CTA Equal Weighted Equity	CTA Equal Weighted Financials	CTA Equal Weighted Physicals	CTA Equal Weighted Discretionary	CTA Equal Weighted Systematic	CPO Asset Weighted	Public CPO Asset Weighted	CPO Equal Weighted	Public CPO Equal Weighted
1979									
1980						46.4%		38.8%	
1981						19.6%		12.9%	
1982						23.1%		10.9%	
1983						-7.6%		-2.4%	
1984						4.2%		16.8%	
1985						21.8%		21.2%	
1986						-11.5%		0.5%	
1987						46.9%		47.7%	
1988						8.4%		6.7%	
1989						10.1%		3.6%	
1990						19.5%	14.2%	19.6%	
1991						10.7%	10.0%	3.1%	
1992						1.0%	-1.4%	-2.3%	
1993						15.1%	10.7%	9.3%	
1994						-2.2%	-7.7%	-5.5%	
1995						9.7%	13.9%	9.8%	
1996						11.9%	9.8%	10.8%	
1997						9.5%	7.6%	9.5%	
1998						6.8%	7.9%	10.1%	
1999						1.5%	-1.4%	-0.8%	
2000						9.4%	4.7%	9.3%	
2001	6.3%	8.2%	0.4%	2.7%	5.5%	7.5%	-0.1%	4.6%	3.2%
2002	2.4%	16.5%	15.5%	13.1%	13.9%	12.0%	14.3%	14.1%	13.7%
2003	5.0%	7.7%	17.8%	10.4%	11.4%	12.2%	11.6%	13.5%	9.6%
2004	6.6%	0.0%	11.3%	12.1%	1.6%	3.2%	1.5%	2.0%	0.7%
2005	0.9%	1.4%	3.6%	8.9%	2.4%	6.0%	0.9%	3.4%	3.3%
2006	7.4%	6.4%	-0.2%	16.2%	4.0%	8.3%	6.8%	6.8%	6.9%
2007	23.6%	9.1%	-1.4%	21.0%	10.6%	8.5%	6.3%	8.4%	6.2%
2008	2.5%	14.4%	21.9%	5.6%	24.2%	16.3%	20.9%	23.2%	23.6%

Source: Center for International Securities and Derivatives Markets, University of Massachusetts, Amherst. Available at:
http://cisdm.som.umass.edu/index.asp

Table III.68 - Hedge fund returns compared to S&P 500 returns 1980 - 2008

Year	Equal Weighted Hedge Fund	Equity Market Neutral	Equity Long/Short	Fund of Funds	Fund of Funds Diversified	CTA Asset Weighted	CTA Equal Weighted	CPO Asset Weighted	CPO Equal Weighted	S&P 500 total return index	S&P 500 total return (percent)
1980										215.9	
1981						53.0%	55.7%	46.4%	38.8%	205.3	-4.9%
1982						1.1%	15.1%	19.6%	12.9%	249.5	21.5%
1983						5.1%	56.6%	23.1%	10.9%	305.8	22.6%
1984						0.3%	3.5%	-7.6%	-2.4%	325.0	6.3%
1985						18.1%	22.9%	4.2%	16.8%	428.1	31.7%
1986						27.1%	33.6%	21.8%	21.2%	507.9	18.6%
1987						3.1%	19.2%	-11.5%	0.5%	534.6	5.3%
1988						57.8%	62.0%	46.9%	47.7%	623.4	16.6%
1989						14.6%	15.9%	8.4%	6.7%	820.9	31.7%
1990	6.5%	10.2%	-1.5%			7.2%	2.2%	10.1%	3.6%	795.5	-3.1%
1991	30.4%	12.4%	33.7%	7.5%	7.5%	27.3%	25.9%	19.5%	19.6%	1037.8	30.5%
1992	16.8%	7.9%	17.4%	11.3%	11.0%	16.8%	6.9%	10.7%	3.1%	1116.9	7.6%
1993	30.3%	9.7%	21.6%	11.9%	12.0%	9.9%	1.4%	1.0%	-2.3%	1229.4	10.1%
1994	3.5%	5.1%	3.4%	24.2%	23.3%	19.9%	11.8%	15.1%	9.3%	1245.7	1.3%
1995	21.2%	12.2%	26.4%	-4.4%	-4.4%	-0.7%	2.7%	-2.2%	-5.5%	1713.7	37.6%
1996	23.2%	13.7%	22.3%	12.3%	12.5%	15.1%	12.5%	9.7%	9.8%	2107.2	23.0%
1997	21.8%	14.9%	23.7%	16.7%	16.8%	14.6%	12.5%	11.9%	10.8%	2810.3	33.4%
1998	4.0%	11.2%	9.6%	17.2%	17.1%	10.1%	13.2%	9.5%	9.5%	3613.4	28.6%
1999	36.8%	9.9%	34.4%	1.6%	1.7%	9.4%	10.6%	6.8%	10.1%	4373.7	21.0%
2000	8.8%	13.9%	7.8%	16.2%	22.4%	3.8%	1.3%	1.5%	-0.8%	3975.5	-9.1%
2001	5.7%	7.3%	2.3%	7.4%	7.3%	6.2%	10.5%	9.4%	9.3%	3503.0	-11.9%
2002	0.4%	2.0%	-4.7%	5.2%	5.0%	4.2%	4.9%	7.5%	4.6%	2728.8	-22.1%
2003	20.6%	8.8%	18.9%	1.0%	0.7%	11.9%	13.4%	12.0%	14.1%	3511.6	28.7%
2004	10.0%	5.0%	9.9%	10.2%	10.0%	13.2%	11.1%	12.2%	13.5%	3893.7	10.9%
2005	9.8%	7.1%	8.9%	7.1%	7.2%	4.2%	3.8%	3.2%	2.0%	4085.0	4.9%
2006	11.8%	7.6%	10.0%	6.5%	6.4%	5.0%	2.4%	6.0%	3.4%	4730.1	15.8%
2007	10.5%	6.5%	8.5%	9.1%	7.8%	6.2%	5.7%	8.3%	6.8%	4990.0	5.5%
2008	-19.2%	0.6%	-14.4%	8.7%	9.5%	9.1%	11.6%	8.5%	8.4%	3143.7	-37.0%

Source: Center for International Securities and Derivatives Markets, University of Massachusetts, Amherst. Available at:
http://cisdm.som.umass.edu/index.asp

Table III.69 - The percentage of years that hedge funds outperformed the S&P 500 between 1981 and 2007

Year	Equal Weighted Hedge Fund	Equity Market Neutral	Equity Long/Short	Fund of Funds	Fund of Funds Diversified	CTA Asset Weighted	CTA Equal Weighted	CPO Asset Weighted	CPO Equal Weighted
1981						*57.9%*	*60.6%*	*51.3%*	*43.7%*
1982						**-20.4%**	**-6.4%**	**-1.9%**	**-8.6%**
1983						**-17.5%**	*34.0%*	**0.5%**	**-11.7%**
1984						**-6.0%**	**-2.8%**	**-13.9%**	**-8.7%**
1985						**-13.7%**	**-8.8%**	**-27.5%**	**-14.9%**
1986						*8.5%*	*14.9%*	*3.2%*	*2.6%*
1987						**-2.2%**	*13.9%*	**-16.8%**	**-4.7%**
1988						*41.2%*	*45.4%*	*30.3%*	*31.1%*
1989						**-17.1%**	**-15.8%**	**-23.3%**	**-25.0%**
1990	*9.6%*	*13.3%*	*1.6%*			*10.3%*	*5.3%*	*13.2%*	*6.7%*
1991	*0.0%*	**-18.0%**	*3.2%*	**-23.0%**	**-22.9%**	**-3.2%**	**-4.6%**	**-10.9%**	**-10.9%**
1992	*9.2%*	*0.3%*	*9.8%*	*3.7%*	*3.4%*	*9.2%*	**-0.7%**	*3.1%*	**-4.5%**
1993	*20.2%*	**-0.3%**	*11.5%*	*1.9%*	*2.0%*	**-0.2%**	**-8.6%**	**-9.0%**	**-12.3%**
1994	*2.2%*	*3.8%*	*2.1%*	*22.9%*	*22.0%*	*18.5%*	*10.5%*	*13.8%*	*8.0%*
1995	**-16.4%**	**-25.4%**	**-11.2%**	**-42.0%**	**-42.0%**	**-38.3%**	**-34.8%**	**-39.8%**	**-43.1%**
1996	0.3%	**-9.3%**	**-0.6%**	**-10.7%**	**-10.4%**	**-7.8%**	**-10.5%**	**-13.3%**	**-13.2%**
1997	**-11.6%**	**-18.5%**	**-9.6%**	**-16.7%**	**-16.5%**	**-18.7%**	**-20.9%**	**-21.5%**	**-22.5%**
1998	**-24.6%**	**-17.4%**	**-19.0%**	**-11.4%**	**-11.5%**	**-18.5%**	**-15.4%**	**-19.1%**	**-19.1%**
1999	*15.7%*	**-11.2%**	*13.4%*	**-19.4%**	**-19.3%**	**-11.7%**	**-10.4%**	**-14.2%**	**-11.0%**
2000	*17.9%*	*23.0%*	*16.9%*	*25.3%*	**31.5%**	*12.9%*	*10.4%*	*10.6%*	*8.3%*
2001	*17.6%*	*19.2%*	*14.2%*	*19.3%*	*19.2%*	*18.1%*	*22.3%*	*21.3%*	*21.1%*
2002	*22.5%*	*24.1%*	*17.4%*	*27.3%*	*27.1%*	*26.3%*	*27.0%*	*29.6%*	*26.7%*
2003	**-8.1%**	**-19.9%**	**-9.8%**	**-27.6%**	**-28.0%**	**-16.7%**	**-15.3%**	**-16.7%**	**-14.5%**
2004	**-0.9%**	**-5.9%**	**-1.0%**	**-0.7%**	**-0.8%**	*2.4%*	*0.2%*	*1.3%*	*2.6%*
2005	*4.9%*	*2.2%*	*4.0%*	*2.2%*	*2.3%*	**-0.7%**	**-1.1%**	**-1.7%**	**-2.9%**
2006	**-4.0%**	**-8.2%**	**-5.8%**	**-9.3%**	**-9.4%**	**-10.8%**	**-13.4%**	**-9.8%**	**-12.4%**
2007	*5.0%*	*1.0%*	*3.0%*	*3.6%*	*2.3%*	*0.7%*	*0.2%*	*2.8%*	*1.3%*
Percentage of years hedge funds outperformed the S&P 500	**61.1%**	**44.4%**	**61.1%**	**47.1%**	**47.1%**	**40.7%**	**44.4%**	**44.4%**	**37.0%**

Source: Center for International Securities and Derivatives Markets, University of Massachusetts, Amherst. Available at:
http://cisdm.som.umass.edu/index.asp

Table III.70 - Periodic returns on traditional and alternative investments as of March 31, 2007

	One year	Three year	Five year	Ten year	Ten year standard deviation	Sharpe Ratio
MSCI EAFE	20.70%	20.30%	16.20%	8.70%	21.00%	0.261
Lehman Global Aggregate	8.10%	3.40%	8.30%	6.00%	6.20%	0.317
Real Estate						
Public (FTSE EPRA/NAREIT)	32.70%	28.50%	27.00%	13.70%	19.50%	0.48
Private (NCREIF)	16.60%	17.40%	13.70%	12.90%	4.40%	2.302
Infrastructure						
UBS Infrastructure	42.90%	33.60%	29.70%	14.20%	20.10%	0.492
UBS Infrastructure & Utilities	36.50%	26.90%	19.00%	12.70%	18.30%	0.479
Hedge Funds						
Credit Suisse/Tremont	11.60%	10.30%	10.40%	10.30%	7.40%	0.766
Hedge Fund Research	9.60%	10.10%	9.90%	10.60%	9.30%	0.707
Private Equity						
Thomson Venture Economics*	22.60%	20.70%	12.80%	15.20%	26.90%	0.519
Cambridge Associates*	25.80%	26.20%	17.90%	15.10%	17.40%	0.702

Source: Source: MSCI Barra, Lehman Brothers, NCREIF, EPRA/NAREIT, UBS, Credit Suisse/Tremont, Hedge Fund Research, Thomson Financial, Cambridge Associates, Economy.com and Datastream. Reported in RREEF Research, Alternative Investments in Perspective, September 2007. Available at:
http://www.irei.com/uploads/marketresearch/98/marketResearchFile/rreef_aip9-07.pdf
**** As of December 31, 2006***