

# THE TEACHERS' CHALLENGE

## How is one of Canada's most prominent pension plans handling the upcoming demographic crisis?

Victoria Barclay, CFA

Ontario Teachers' Pension Plan is sailing into strong headwinds, like so many other pension funds these days. Falling interest rates are making it hard to meet long-term real return thresholds, and at the same time its demographics—with the number of retirees per active employee increasing significantly over time—are going against the renowned pension fund. However, over the years Teachers' has built a reputation for being one of the savviest plans in Canada. So what unique approach is the investment team at Teachers' taking in order to avoid crisis on the high seas?

### A newsworthy fund

When you're this big, you can't help but attract attention. Teachers' is the largest single-profession pension plan in Canada, with 295,000 members including 117,000 retirees. Net assets as of 31 Dec 2010 totalled \$107.5 billion.

Teachers' opinion is actively sought on matters such as the proposed merger of the Toronto and London Stock Exchanges. Citing economies of scale, and access to a deeper pool of investors, Teachers' recently came out in favour of the merger. It's all in the name of fiduciary obligation to their members and that obligation becomes more pressing each year.

Teachers' was also in the news in mid-March, when it announced it was open to selling its two-thirds majority stake in Maple Leaf Sports and Entertainment, a surprising move given its previous active involvement.

Its overseas investments have also been newsworthy. In early 2010, the fund paid \$625-million for the operator of the U.K. national lottery, and later joined other parties in investing \$3.4-billion for HS1, Britain's only high-speed rail line.

### Operating within a regulatory framework

Teachers' is jointly sponsored by the Ontario Teachers' Federation and the Ontario government, each of which appoints four Board members, who then jointly appoint a ninth Board member as chair. The OTF and the Ontario government determine the contribution rate and benefit changes in the Funding Policy.

Teachers' operates within a regulatory environment (Teachers' Pension Act and Pension Benefits Act) that mandates minimum funding levels relative to the fund's mark-to-market liabilities. Pension regulations require all plans in Ontario to demonstrate their funding balance at least every three years, with Teachers' being due in 2012 at the latest.

In April 2011, Teachers' announced that in 2010, its investments had earned the largest value-add dollar amount in its history, with \$13.3 billion in investment income, representing a 14.3 percent rate of return—an enviable \$4 billion above its 9.8 percent benchmark. Despite laudable performance, the funding shortfall of the plan held constant from the previous year at \$17 billion.

Clearly there is imbalance in the plan. Contributions received totalled \$2.7 billion, while \$4.5 billion was paid out in defined benefits. The contribution rate for working teachers in 2010 was 10.4 percent of earnings, up to the CPP limit of \$47,200 and 12.0 percent of earnings above that. These contributions are matched by the government and designated employers.

**“We do not assume any kind of distributions,” stated Frishman. “Distributions move around and correlation behaviour, especially, is unstable.”**

### Demographic pressure cooker

*The Analyst* recently spoke to Zev Frishman, VP global equity strategies in his office at Yonge and Finch. Tall and soft-spoken, he was clearly enthusiastic about how Teachers' is tackling the challenges it faces. True, there was the \$19 billion lost due to the financial downturn in 2008, an 18 percent decline that was not as bad as some other funds. “It was a paper loss due to the mark-to-market requirements,” said Frishman. That was redressed by good investment performance in 2009 and 2010. More serious are the looming demographic issues, summarized in Table 1. There is a systemic imbalance caused in part by the burgeoning growth of the beneficiaries' pool. The typical retired teacher doesn't smoke, and has healthy lifestyle habits; unfortunately, the excellent

odds for her survival translate into a lot of pressure on the pension fund, whose commitments to beneficiaries were hammered out many years earlier. In the same way that baby boomers created a swell in the population, those who were hired en masse to teach them in the 1960s and 70s have now created a swell in the retirees' demographics.

The other part of the systemic imbalance is the shrinkage of the contributors' pool, with the declining number of new hires now that fewer children are being born. In 1990, the average teacher worked for 29 years and drew benefits for 25 years. Nowadays, the average teacher works for 26 years and draws a pension for 30 years.

**Table 1: Teachers' demographics at a glance**

Year	1970	1990	2009
Number active teachers per retiree	10	4	1.5
Number years on pension	20	25	30
Average contribution rate (percent)	5.2	8	11.1
Required increase in contribution rate to cover 10% drop in AUM (percent)	0.56	1.9	4.3

Source: OTPP

Teachers' cannot depend on earning its way out of the shortfall, which at \$17.2 billion is 29 percent larger than the size of its best annual return. The existing Funding Policy has two main levers: contribution rates can be increased to as much as 15 percent, or the conditional inflation provision can be invoked. Neither of these addresses the root cause, which is the decreasing number of teachers being hired for decreasing numbers of children, and the increasing longevity of retirees.

### The role of risk management at Teachers'

The overarching demographics are not so much a risk as a certainty. While there are decisions to be made in the political realm, internally the focus is on prudent risk management. With a 14.3 percent rate of return—a rate 46 percent above the benchmark—the question becomes, are the risks for these investment decisions being properly managed at the same time the fund is under heavy pressure to perform?

Zev Frishman has a deep understanding of the risks and the long-term view taken by Teachers'. He joined in 1994 and spent five years in the Research and Economics department, where his first project was to develop the in-house asset-liability model (that, following several modifications and enhancements, is still in use today). After that, he was part of the team that created the first framework and principles of the risk system. When he moved to Public Equities he began to experience the in-house models from the user's side. "Now, part of my responsibility [in Global Equity Strategies] is the liaison between the Public Equity area and Asset Mix and Risk."

Frishman believes risk management at Teachers' is strong because of three things: methodology, data, and resources. The methodology makes "no assumptions as to the nature of the capital markets." The actual portfolios of today are run through all the constellations of daily data going back to 1986, enough to encompass several business cycles. There are enough tail events and repeat losses of a severe magnitude that true sampling can be obtained. It's vital to have "as long as possible of a data stream as we can," he stated. Contrast this with the typical data stream used by some other funds, which may go back only 3-5 years, leading to pro-cyclical and therefore unreliable behaviour. Third, the fund must be willing to commit significant resources to continually develop and enhance the methodology and the data streams.

Teachers' manages long-term risk with an eye to maintaining stability of contribution rates and benefits, as well as preserving the plan's long-term sustainability. The risk is most commonly seen through the lens of the contribution rate risk, a single number that summarizes the risk to the fund in the long term. It is a comprehensive measure that embodies various assumptions, economic inputs, and stages of modelling.

The Asset Mix and Risk department develops economic scenarios based on certain variables and assumptions. Asset-liability modelling is then used to develop an appropriate strategic asset mix. The model is capable of analyzing numerous scenarios up to a 40-year horizon. To summarize the risk and return, the contribution rates, and the changes in inflation protection, are determined through the modelling. The contribution rate risk is measured as the average of the expected 10 percent worst contribution rates that are predicted to occur over the next 20 years.

The in-house risk system generates two sets of numbers that indicate the risk in the shorter term: the total risk and the active risk. These are Value at Risk (VaR) numbers that capture "tail risk" at the 1 percent level of worst outcomes. (1) Total risk is the risk of assets relative to liabilities over a one-year period, stated as % of assets. (2) Active risk is the risk of the assets relative to the benchmarks over a one-year period stated in dollars.

These two VaR numbers generated by Teachers' in-house risk system emphasize "tail risk" and do not presume a normal distribution of events—thereby averting two pitfalls common to risk models, Frishman points out. Assumptions

come into play in developing economic scenarios, especially when projecting into the future, but the risk-estimation models are assumption-free. "We do not assume any kind of distributions," stated Frishman. "Distributions move around and correlation behaviour, especially, is unstable. So we don't fit the data."

The quantitative risk system continues to be enhanced. Teachers' is presently at work on valuation of illiquid investments, as well as how to quantify the risk of non-transparent investments (or delayed-transparency) investments such as some hedge funds.

The Board approves annual risk budgets for the total fund and all departments, but it stops short of specifying limits for individual portfolios. The risk budgets are allocated within departments, with some tailoring due to different levels of diversification and changes in portfolio characteristics. Since risk is not additive, the total risk at a department level is often significantly lower than the sum of the risk of individual portfolios.

The individual departments allocate risk and liquidity to areas that are expected to optimize return on allocated risk. As for Public Equities, if the department's aggregate positions go beyond the comfort level, a committee within the department acts to mitigate or eliminate the positions via overlays.

"Our compensation is driven by the risk system," said Frishman. Compensation is based on return to allocated risk targets. "What if" scenario analysis and stress testing is also used, mostly at the total fund level.

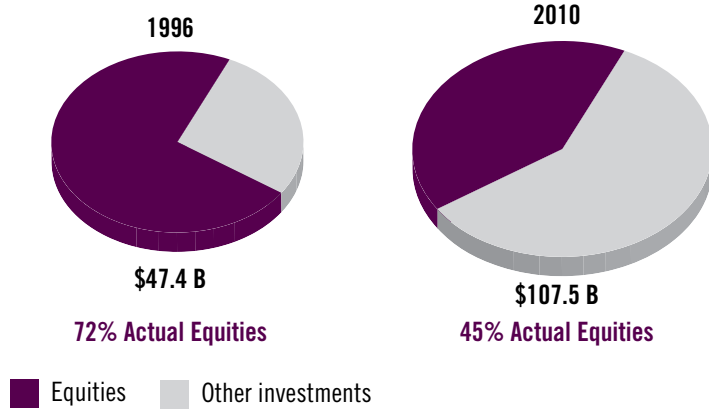
### Integrated risk management

Teachers' makes a point of integrating its risk management system in the portfolio management process. Under Bob Bertram, former EVP, Investments and Chief Investment Officer, Teachers' integrated all programs so they were centred on risk management, and then tied the compensation system into the risk management budget. The bar was set so that each portfolio had to meet the benchmark, plus have a return on the risk capital that was allocated.

Teachers' quantitative in-house risk system is part of the Teachers' Investment Division. Teachers' fine-tunes its asset mix to counteract the underlying risks of the fund. "Because of the progression of the risk approach, we realized a main driver of a spike in liabilities could be a spike in unanticipated inflation," Frishman said. In 1996, Teachers' had its highest allocation to public equities and this has since been scaled back (see Chart 1). "In high inflation periods, equities often do not catch up. That's why a significant portion of our assets are now in real assets and commodities—they behave well in high inflation periods, so they will be a good match for our liabilities."

"This close integration of risk with the investment side allows risk to be part of everyday decision making," said Frishman. However, the daily measurement and reporting on risk, carried out by the Risk Analytics team, as part of the Finance department, is kept independent of the investment division.

Chart 1: Portfolio asset mix &amp; size



### Big decisions ahead

In communicating with plan beneficiaries, Teachers' takes a conservative approach—with sober emphasis on the funding shortfall. Yes, it was terrific that returns were at 14.3 percent, more than 4 percent over benchmark, but “watch out for that piano about to fall on your head.”

In the 2010 Report from the Board, its Chair, Eileen Mercier, wrote that, “even before the financial crisis of 2008, we recognized that the issue of sustainability was moving steadily to the forefront.”

When in doubt, strike a committee. The Board created a Sustainability Working Group consisting of all stakeholders, and it engaged an extensive dialogue with plan beneficiaries through a dedicated web site (FundingYourPension.com).

Of the choices open to Teachers', none comes without some difficulty. The age of retirement could be boosted, an option recently discussed by former Teachers' CEO Claude Lamoureux at the February 2011 Quebec forum on the future of pension plans.

The rate of contribution could be increased; it has been hiked up since 1970, as shown in Table 1. Under the current Funding Policy, the sponsors could agree to increase members' contribution rates to a maximum of 15 percent of their salary, matched by the government.

Neither of these options to increase—age or contribution rate—sits well with current teachers, who wonder why they should have to fund earlier generations.

Mercier wrote that, at its inception, the fund adhered to the principle of “generational equity,” in which members of each generation would pay for the benefits they receive. However, the changes in demographics have been unprecedented, and this has now morphed into a concept of “intergenerational fairness and affordability.” Current members are asked to help close the gap.

The fund is reluctantly exploring how to decrease payouts. The benefits could be gently eroded in a manner such as “conditional inflation protection” such as that proposed by Bertram and enacted in 2008. Conditional inflation protection is defined so that, for all contributions after 2009, the indexing to inflation is set to fifty percent of the CPI, with the remaining increase being contingent on the funding status of the plan. The sponsors are currently contemplating whether to invoke this provision—no doubt once again the media spotlight will shine on one of Canada's most watched pension plans.

Victoria Barclay, CFA is a Toronto based risk manager and has been a CFA charterholder since 2006. She is a frequent contributor to *The Analyst*.



### Zev Frishman Vice President, Global Equity Strategies Ontario Teachers' Pension Plan

Zev is a regular conference speaker on a variety of investment management topics, and received the 2010 Benefits Canada award for outstanding achievement and is on the 2010 list of “Top 25 Most Influential Plan Sponsors”.

He holds a B.A. in Economics and Statistics (Cum Laude), an MSc in Economics, and has completed PhD comprehensive exams in Finance. He is a graduate and member of the Institute of Corporate Directors, a member of CFA Institute, Toronto CFA Society, the Brandes Institute Advisory Board, the Canadian Investment Review Advisory Board and the Toronto CFA Society Derivative and Risk Management Committee.