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ONTARIO TEACHERS' PENSION PLAN BOARD: THE ASSET ALLOCATION DECISION

Steve Foerster and Dean Tzembelicos prepared this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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In early 1994, William Booth, a member of the management team of the Ontario Teachers' Pension Plan Board (OTPPB), was reflecting on his upcoming presentation to the board of directors scheduled for the fall. He had been asked to re-examine the diversification strategy that the fund had been pursuing since its inception and to determine an optimal long-term asset allocation policy for the fund. After inheriting a portfolio that consisted entirely of fixed-income securities in 1990, the OTPPB had moved quickly to diversify its asset mix. By the end of 1993, the allocation to equity had increased to its planned level of 46%, only 20% short of a 1995 "interim" policy target of 66%. Booth's primary task was to determine whether the shift in asset mix should stop at 66% equity in 1995, which was above the allocation to equities for the average Canadian pension plan, or whether it should continue to some higher amount (an independent consultant recommended an 80% allocation to equity). Booth knew that a higher allocation to equities would likely increase total returns over the long-term thereby reducing the cost of funding the plan. However, equities exhibited greater volatility than bonds and a higher allocation to equities therefore created some risk that future funding costs might rise above current levels.

Since its inception, the OTPPB's returns had averaged almost 14% (5.6% in 1990, 19.6% in 1991, 8.9% in 1992 and 21.7% in 1993). As the fund approached the 66% "interim" equity target, Booth realized that the risk of a loss was rising. With well over $30 billion in assets under management and 200,000 members (including current contributing teachers, retired teachers, and former teachers with entitlements), the investment

decisions of the fund affected the future of a large number of people, including the taxpayers of Ontario.

OTPPB HISTORY

The Ontario Teachers' Pension Plan Board (OTPPB) was created in 1990 as an independent organization to manage the pension assets of Ontario schoolteachers. Governed by the Teachers' Pension Act (effective December 31, 1989) and the Pension Benefits Act, the OTPPB was sponsored by the Minister of Education and Training of the Province of Ontario and was responsible for determining the investment policies of the fund. From its inception in 1917 until 1990, the pension plan was limited to investing in Province of Ontario Debentures. With a new administration in place, this restriction was eliminated, and the OTPPB could invest future cash flows in any asset class, subject to "prudence" requirements under the Pension Benefits Act, compliance with all legislation and approval of its board of directors. The current debentures held in the portfolio, however, continued to be non-marketable and would have to be held until maturity (the last debenture matured in 2012).

One of the factors which led to the creation of the OTPPB was the funding status of the plan. An actuarial valuation conducted at the end of 1989 indicated that the actuarial value of the liabilities exceeded the value of assets by almost $8 billion. As plan sponsor, the Province of Ontario agreed to make up this funding shortfall over a forty-year period through a series of special payments. On January 1, 1992, the Ontario Teachers' Federation (OTF) became a co-sponsor in partnership with the Ministry. By 1993, the partnership agreement was amended and each partner would thereafter share responsibility in funding any future shortfalls should they materialize. As equal partners, each co-sponsor appointed four members to the board. The board was responsible for selecting a ninth member to act as chairperson.

As of December 31, 1993, there were over 135 pension funds in Canada, with the top 100 accounting for over $262 billion in assets (see **Exhibit 1** for a list of the top 10 funds). With over $30 billion in assets, the Ontario Teachers' Pension Plan ranked as the largest funded pension plan (public or private) and one of the largest financial institutions in Canada.

PENSION PLANS

Pension plans were classified as belonging to one of two groups: defined contribution or defined benefit plans. The basic distinction between these two groups rested in the way that benefits were calculated. Benefits received from a defined contribution plan were a function of the investment success of the plan. Benefits from a defined benefit plan were fixed according to some formula.

With defined contribution plans, a fixed amount of contributions were made on a regular basis by either the employee, the employer, or both. The contributions were then pooled with other employee contributions and invested in various asset classes. Specific details regarding investment policies varied from plan to plan. Upon retirement, the employee ultimately received an annuity stream based on the value of the contributions plus accumulated income. The greater the investment returns (where the portfolio of invested assets grew rapidly prior to retirement), the greater the pension benefits.

With defined benefit plans, post-retirement benefits were based on a pre-determined formula. Usually, this formula was a function of years of service and salary. For example, a formula could specify benefits as the pre-retirement annual salary (or an average of, say, the best five years) times the number of years of service (sometimes capped at, say, 35 years) times a percentage (usually between 1% and 2%). In a few cases, benefits were indexed (or partially indexed) to account for post-retirement inflation. Given the nature of the plan, there was a possibility that assets would be insufficient to cover the promised benefits. In almost all cases, the onus was on the sponsor, not the beneficiary, to protect against a funding shortfall. The sponsor addressed this issue periodically by calculating the difference between the present value of the actuarially anticipated pension benefits (net of contributions) and the amount of funds currently available. Where investments were successful, pension surpluses usually arose (assets exceed liabilities).

THE TEACHERS' PLAN

The Ontario Teachers' Pension Plan was a defined benefit plan with both the Province and teachers contributing equally. Benefits were calculated as 2% of the average annual salary (calculated using the five highest annual earning years) multiplied by the number of years in service. Benefits were then indexed to inflation at 100% of the increase in the Consumer Price Index (CPI), subject to a maximum of 8% in any year, with the excess carried forward.

The average contribution rate for the plan depended primarily on the real rate of return (i.e., adjusted for inflation) earned on pension assets. Contributions could fall, for example, if real returns increased because a greater proportion of pension payments could be paid from reinvested income rather than from capital contributions. Given the long time period over which pension assets were to be invested, the compounding effect of reinvested income was significant. Even small improvements in returns could have a large impact on the costs of funding the plan. The OTPPB had an explicit target to obtain a minimum real (i.e., adjusted for inflation) rate of return of 4.5% on the overall portfolio on a four-year moving average basis. This return was driven by the unique features of the liabilities. If achieved, a 4.5% real rate of return would probably allow contribution rates to fall. It was estimated that a 4% real rate of return would maintain contribution rates at 8% and that a 1% improvement in returns to 5% might lower contribution rates by

25%, from 8% to 6%. (**Exhibit 2** outlines the circumstances under which this might be true.)

ASSET MIX ANALYSIS AND THE 1991 REPORT

When the OTPPB assumed responsibility for managing the pension assets in 1990, the new management team realized that the first priority was to diversify the fund's economic exposure. A higher allocation to equities would likely increase returns and would reduce the exposure to any single issuer or single component of the capital markets. Up to a point, a higher allocation to equities would both reduce the volatility of overall returns and increase returns. Beyond some point, however, there was no "free lunch" - higher expected returns were possible but only with higher volatility in the rate of return. The effects of diversification on the plan's deficiency, however, were less clear and depended on the nature of the plan's liabilities.

In 1991, the OTPPB engaged an independent consulting firm to identify the primary asset classes in which the fund should invest. The consultants were also asked to recommend a target asset allocation that would best achieve the fund's long-term objectives and to suggest how the transition should proceed allowing for likely cash flows from scheduled maturities of non-marketable Ontario debentures as well as net contributions.

The consultants followed a six-step process in their review. First, they identified the primary objective of the plan, which was to secure and deliver expected benefits at current or lower levels of contributions (as a percentage of earnings) within an acceptable range of costs (i.e., range of contribution rates). This goal reflected a focus on surplus (i.e., accounted for both assets and liabilities). Second, they identified the three key financial risks facing the plan: short-term volatility in real rates of return, long-term potential decline in real rates of return and unexpected increases in teachers' real salaries. Third, they reviewed the historical performance of key economic variables. Fourth, they evaluated the impact of alternative asset allocations in an "asset only" risk/reward framework. Fifth, they evaluated the impact of alternative asset allocations in an "asset/liability" framework. Finally, they made a recommendation for an optimal long-term asset allocation and evaluated the impact of alternative transition scenarios.

The key economic variables identified by the consultants included inflation (measured as the Consumer Price Index), equity returns (Canadian and foreign), and interest rates. Inflation directly affected the liabilities and indirectly affected the returns earned by the fund's assets. Equity returns were a key variable because this asset class achieved the highest return of all asset classes over the long-term but exhibited the highest short-term volatility. Interest rates affected bond returns directly, equity prices indirectly and the discount rate used to value liabilities.

The "asset only" analysis involved examining efficient frontiers (a concept in portfolio theory) to evaluate alternative asset allocations. The key insight into portfolio theory, credited to Nobel-prize winner Harry Markowitz, was that investors could achieve the highest return/risk tradeoff by combining individual assets into portfolios. The key to enhanced risk-adjusted returns was the covariance (correlation) between pairs of assets in a portfolio. For low or (ideally) negatively correlated assets, the return-risk tradeoff was enhanced. Given expected returns, estimated risks (as measured by return standard deviations) and correlations among assets, investors could map "optimal" combinations of assets which would provide the greatest expected return for a given level of risk, or the lowest level of risk for a given expected return. Such portfolios constitute the "efficient frontier" - the maximum expected return for a given level of risk for a given period of time.

The first step in creating an efficient frontier involved defining a set of asset classes. These classes were defined as: North American stocks (no distinction being made between Canadian and U.S. equities); small capitalization stocks (stocks with a market capitalization or "cap" of below $250 million); international stocks (primary large cap stocks of non-North American corporations in Europe, Australia, and Far East - E.A.F.E.); real estate (investments in primarily Canadian income-producing rental properties); Canadian bonds (further segmented as long-term or medium-term and including non-marketable Ontario debentures); international bonds; and cash/short-term securities (instruments with up to one year to maturity). The consultants felt that these asset classes represented a fair approximation of the investment environment available to the OTPPB at the time. Returns, variances, and covariances for these asset classes were then compiled based on empirical studies.

Efficient frontier analysis was based on two critical assumptions: investors prefer higher returns (all else equal) and investors prefer less variability in expected returns. While the first assumption was straightforward and readily applicable to all investors, the second assumption pertained only to the vast majority of investors who were averse to risk. Together, these two assumptions suggested that investors sought to earn as great a return as possible for any given level of risk.

The consultants presented a number of efficient frontiers to management over the course of their engagement (**Exhibit 3** contains one such example), reflecting different capital market assumptions and constraints regarding the minimum and maximum allocations to various asset classes (see **Exhibit 4** for constraints). **Exhibit 5** contains a summary of real rates of return over different eras as well as the "best estimate" assumptions used in the consultants' analysis. **Exhibit 6** contains the assumptions for expected returns and standard deviations. **Exhibit 7** contains the correlation matrix of asset returns (both historical and expected).

Booth was aware of efficient frontier analysis, but he was cautious about its applicability in practice. First, "optimal" or efficient portfolios were very sensitive to the assumptions

regarding correlations, risks and returns. Small changes in a standard deviation or correlation, for example, could have a significant impact on the position of the frontier. Second, the use of statistical measures like standard deviation assumed that the returns were normally distributed. Lastly, pension fund efficient frontier analyses often ignored liabilities.

While this "asset only" analysis helped the new management team and board appreciate the different asset risks and return tradeoffs that the fund might face in the future, all agreed that the final recommendations would have to reflect the unique liabilities of the OTPPB.

MODELING THE LIABILITIES

The OTPPB's liabilities represented the present value or current cost of meeting the expected pension and related benefits to be paid to Ontario's teachers. This cost was primarily determined by the long-term real rate of return on the pension fund assets. Using a proprietary model, the consultants examined the impact of different asset allocations on the costs to fund the plan. Among other things, they assumed a ten year time horizon and a funding policy which adjusted contribution rates every three years to reflect the accumulated surplus or deficiency in the plan (i.e., contribution rates would fall in the case of a surplus and rise for deficiencies). The expected range of future costs (or contribution rates) to fund the plan depended on the asset allocation strategy. Based on simulated results, *expected* teacher contribution rates (i.e., the median of the simulation results) ranged from 4.5% to 6.1%. The lowest expected rate was based on a strategy of 80% allocation to equities. For this particular strategy, the simulation results suggested a 1% chance that contribution rates would need to be as high as 13%, but there was also a small chance that contribution rates would be zero.

Relying heavily on this analysis, the consultants recommended an 80% allocation to equities. This recommendation included a 40% allocation to large cap North American equities (80% of which would be Canadian, 20% US), 20% Non-North American equities, 10% small cap North American equities (40% Canadian, 60% US) and 10% real estate. The remaining 20% would be invested in bonds, including the non-marketable debentures, and cash.

The consultants believed that a high allocation to equities would greatly reduce funding costs with moderate risks of higher funding costs over the long-term. It was expected that the teacher contribution rates would decline steadily throughout the transition period. Finally, the consultants recommended that the transition process begin as soon as possible. Since most of the portfolio was tied up in illiquid fixed-income securities, they suggested using derivative instruments to swap the economic exposure of the Ontario debentures into equities. Derivatives would allow the OTPPB to reallocate funds very quickly compared to waiting for cash flows from maturing debentures. Furthermore, derivatives

enabled the plan to comply with changing Income Tax limits on foreign investment[1] while moving towards the desired foreign content exposure reflected in the recommended asset allocation strategy.

The 80% equity recommendation seemed high to the board and was well above the average allocation to equities for the typical Canadian pension plan. Fortunately, the transition to a higher equity mix would take years to implement so the board agreed to "aim" for this 80% target by 1996 and to revisit the issue before the asset mix achieved its 66% "interim" target scheduled for 1995. By December 31, 1993, 46% of the fund's economic exposure was in equities and real estate (see **Exhibit 8** for a breakdown by asset class). In addition, almost 21% of this exposure was outside Canada and over 13% was outside North America (see **Exhibit 9**).

THE DECISION

By early 1994, Booth realized that he had less than a year to complete his analysis and come up with his own recommendations. He felt that he could replicate the consultants' "asset only" analysis using any one of a number of software packages that solved for efficient frontiers. In fact, he could also build his own model in a conventional spreadsheet like Excel or Lotus, perhaps incorporating one of the many "optimizer" add-ins to make his work easier. However, he anticipated it would take the better part of a year to replicate the consultants' multi-period asset/liability model. At this stage, he would be satisfied if he could understand why the consultants' analysis and recommendations made sense.

The fund had also recently allocated a 2% target to real return bonds (RRBs). These bonds, which paid a real coupon on a principal amount that changed with the Consumer Price Index, were first issued by the Canadian government in late 1991 and offered a real coupon payment of 4.25% over a thirty-year term. A second RRB issue in 1995 increased the availability of these bonds in the market but the total amount issued was still small relative to the size of the OTPPB's assets, limiting the amount that the fund could actually purchase. Compared to nominal bonds, RRBs offered a better inflation hedge against the fund's indexed liabilities.

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[1]The Income Tax Act specified the maximum amount of foreign property investments that could be held by a Canadian pension plan. Prior to 1990, foreign property was limited to 10% of the book value of a pension fund. Revised regulations loosened these restrictions. Consequently, foreign property was limited to the following percentages of the book value of the fund: 14% in 1991, 16% in 1992, 18% in 1993, and 20% in 1994 and beyond. The use of derivative instruments allowed the OTPPB to achieve its desired asset mix (in terms of economic exposure) while remaining in compliance with the Income Tax Act.

Booth's review of the consultants' reports and recommendations seemed to raise more questions than answers. He wondered whether to recommend an aggressive approach, allocating as much as 80% of the portfolio in equities, whether to maintain the current 66% "interim" target, or whether the equity target should be reduced to a lower level consistent with the "typical" Canadian pension plan. Within equities, he wondered whether the allocation between Canada and other countries was appropriate. He also wondered whether the RRB allocation should be increased, and if so, what asset class exposure would have to be decreased. He wondered whether fixed targets were appropriate or whether some leeway should be allowed around them (for example, a 10% band around a 66% equity target, permitting equity exposures ranging from 56% to 76%). With the individual asset classes, he needed to consider how to define each asset class and then how to allocate the fund's assets within each class. He also wondered how varying some of the assumptions used in the 1991 analysis would have affected his conclusions. Finally, he needed to address the issue of an appropriate risk measure for the pension plan. Booth knew that the quality of his analysis and the resulting recommendations would have a substantial impact on the pensions of over 200,000 members and their families, as well as on Ontario taxpayers.

Exhibit 1

TOP 10 PENSION FUNDS IN CANADA
(Total Asset Market Value as of December 31, 1993 - in $millions)

	Pension Fund	1993	1992	In-house	Balanced	Specialist
1	Ontario Teachers	$33,040	$26,430	90%	0%	10%
2	Quebec Public Employees	$30,500	$27,300	48%	52%	0%
3	OMERS	$20,000	$15,800	75%	0%	25%
4	Ontario Public Service	$11,616	$10,180	60%	24%	16%
5	Alberta Public Sector	$9,150	$7,540	83%	2%	15%
6	CN Railways	$8,347	$7,133	96%	0%	4%
7	Ontario Hospitals	$7,875	$6,549	93%	0%	7%
8	Bell Canada	$7,346	$6,517	0%	100%	0%
9	Ontario Hydro	$6,949	$5,829	95%	0%	5%
10	B.C. Municipal	$6,762	$5,769	100%	0%	0%

Source: Benefits Canada

Exhibit 2

EXAMPLE TO ILLUSTRATE THE FUNDING COSTS FOR A PENSION PLAN

The cost of funding a pension plan depends primarily on two things: the plan's design (i.e., size of benefits) and portfolio returns. Higher costs would be incurred for pension plans that had better benefits and/or whose asset returns were lower. The sensitivity of funding costs (i.e., contribution rates, as a percentage of salary) to the rate of return earned on pension assets can be illustrated by making a few simplifying assumptions.

Example

The basic funding question for the OTPPB plan is: "what annual contribution is sufficient to provide benefits to replace, say, 50% of teachers' salary upon retirement?"

If we assume that teachers, on average, receive pensions after retirement for a period which is about equal to the time they work and contribute to the plan (say 30 years), then the cost of funding the plan would be simple to calculate. The first year's contribution could be invested so that it funds the pension payable in the first year of retirement. In the same way, the last contribution just prior to retirement, including income thereon, would fund the last pension payment to be received. Under these simplifying assumptions, a contribution rate of 8% (16%, including the Province's matching portion) would be sufficient if the real rate of return on pension assets is 4%[2]. If real returns were 1% higher, say at 5%, the cost of funding the pension would fall by 25% to 6%[3] of salary (12%, including the Province's share).

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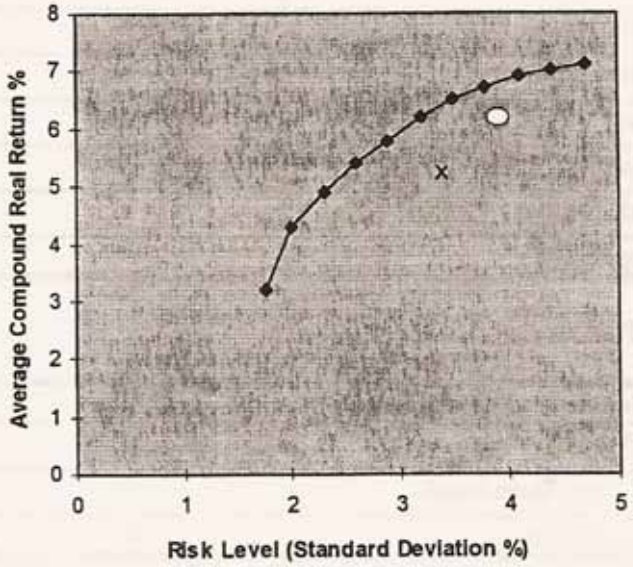
[2]For example, solve for "50% salary replacement at retirement = contribution amount x (1+real return)$^{30\ \text{Years}}$." If contributions equal 16% of salary, a 50% salary replacement could be achieved if returns are approximately 4%; i.e., 0.50 is approximately equal to 0.16 x $(1.04)^{30}$.

[3] If real returns are 5%, costs fall from approximately 16% to 12%, a 25% reduction in costs; i.e., 0.50 is approximately equal to 0.12 x $(1.05)^{30}$.

Exhibit 3

EFFICIENT FRONTIER
10 YEAR TIME HORIZON



Asset Mix %	1	2	3	4	5	6	7	8	9	10	11	I	CA
T-Bills	57.1	29.1	25.0	13.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Mid Bonds	20.0	20.0	20.0	32.0	43.7	35.9	23.4	11.7	0.6	0.0	0.0	0.0	45.0
Long Bonds	0.0	0.0	0.0	0.0	0.0	3.6	9.4	14.8	20.0	20.0	20.0	33.0	0.0
International Bonds	2.9	14.5	10.4	5.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real Estate	0.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	4.6	0.0	10.0	0.0
N.A. Equities	20.0	20.0	20.0	20.0	20.0	24.4	29.8	34.8	39.5	44.3	48.0	42.0	50.0
EAFE Equities	0.0	5.5	9.6	14.2	18.2	20.0	20.0	20.0	20.0	20.0	20.0	10.0	0.0
Small Cap	0.0	0.9	5.0	5.0	5.0	6.1	7.4	8.7	9.9	11.1	12.0	5.0	0.0

Note: "I" represents "interim policy (oval on the graph), "CA" represents "median of Canadian pension plans" (x on the graph).

Source: Consultant's Report

Exhibit 4

CONSTRAINTS ON EFFICIENT PORTFOLIO

Individual Asset Classes	Minimum (%)	Maximum (%)
T-Bills	0	100
Mid-Term Bonds	0	100
Long-Term Bonds	0	100
International Bonds *	0	15
Real Estate	0	10
North American Equity	20	100
Non-North American Equity *	0	20
Small Cap Equity	0	20

* Foreign Property

Combinations of Asset Classes	(%)	(%)
Foreign Property	0	20
Mid- and Long-Term Bonds	0	100
Small Cap Equities	0	20% of total domestic equities

** North American Equity plus Small Cap Equity

Source: Consultant's Report

Exhibit 5

ANALYSIS OF REAL RETURNS

Era	CPI	T-Bills	Bonds	TSE	S&P 500	EAFE	Real
1926-40	-0.8	2.8	6.3	5.9	5.7	-	-
1941-51	5.2	-4.5	-2.5	12.8	8.0	-	-
1952-65	1.3	1.6	1.5	9.6	13.7	-	-
1966-81	7.2	0.6	-3.3	2.1	-0.5	-	-
1982-90	4.9	5.8	9.9	4.6	10.6	13.6	5.5
Last 25	6.4	2.5	1.3	3.0	3.3	-	-
Last 10	5.6	5.9	7.4	1.9	7.6	10.7	6.2
1926-90	3.4	1.2	1.8	6.7	6.8	-	-
Best Estimate	4.5	1.5	4.0	6.5	6.5	7.5	5.0

Source: Consultant's Report

Exhibit 6

ASSET CLASS RETURNS AND RISK

Asset Class	Real Returns		Standard Deviations	
	Best Estimate	1926-90 History, Ex-Yield Trend	Best Estimate	1926-90 History, Not Modified
T-Bills (TB)	1.5%	1.2%	3.5%	4.5%
Mid-Bonds (MB)	3.5%	2.8%[1]	9.0%	7.9%
Long-Bonds (LB)	4.0%	3.1%[2]	11.5%	9.0%
International Bonds (IB)	3.2%	2.5%[3]	10.0%	8.9%
Real Estate (RE)	5.0%	5.7%	9.0%	6.6%
North American Equities (NA)	6.5%	6.7%	18.5%	19.9%
EAFE Equities (EF)	7.5%	8.5%	21.0%	25.0%
Small Cap (SC)	8.3%	8.5%	30.0%	22.4%

[1]Long bonds less 0.32% average yield spread since commencement of S-M indexes in 1948 (mid-term was constructed as 35% of T-bills plus 75% of S-M Long index prior to 1979)
[2]2.7% long Canada's, plus 0.40% for provincial/corporate content of expected portfolio
[3]Assumed to equal mid-term Canadian bonds less 0.3% for additional expenses; standard deviation assumed to be 1% higher than mid-term, largely due to currency fluctuation.

Source: Consultant's Report

Exhibit 7

ASSET CLASS CORRELATIONS

The "upper triangle" (shaded) represents actual historical correlations while the lower triangle (unshaded) represents expected correlations

	TB	MB	LB	IB	RE	NA	EF	SC
T-Bills (TB)	1.0	0.6	0.6	0.3[1]	-0.2	0.0	0.3	-0.1
Mid-Bonds (MB)	0.5	1.0	1.0	0.4	-0.5	0.2	0.4	0.1
Long-Bonds (LB)	0.4	0.9	1.0	0.4[1]	-0.4	0.2	0.3	0.0
International Bonds (IB)	0.1	0.3	0.3	1.0	0.4[1]	0.2[1]	0.5[1]	0.3[1]
Real Estate (RE)	0.4	0.1	0.0	0.0	1.0	-.03	-0.2	-0.4
North American Equities (NA)	0.0	0.4	0.45	0.0	0.25	1.0	0.6	0.8
EAFE Equities (EF)	0.0	0.0	0.0	0.2	0.05	0.45	1.0	0.6
Small Cap (SC)	0.0	0.0	0.3	0.0	0.0	0.65	0.25	1.0

[1] Using 1959-84 U.S. nominal returns data (from "World Wealth: Market Value and Returns," Ibbotson, Siegel and Love, *Journal of Portfolio Management*, Fall 1985), plus 0.2 to adjust to real returns data since 1985.

Source: Consultant's Report

Exhibit 8

ONTARIO TEACHERS' PENSION PLAN ASSETS:
ASSET BREAKDOWN
(as at December 31, 1993)

Asset Class	Percentage of Fund*
Fixed Income Ontario Debentures	47.15%
Canadian Equities	21.93%
U.S. Equities	7.81%
Non-North American Equities	13.21%
Money Market Securities	3.90%
Bonds	1.80%
Index linked mortgages	1.80%
Real Estate	2.60%
Private Placements	0.60%
Total	**100.00%**

* Percentages are in terms of economic exposure. Much of the non-Canadian equity exposure was achieved through the use of derivative contracts such as equity swaps.

Source: Annual Report

Exhibit 9

ONTARIO TEACHERS' PENSION PLAN ASSETS:
CANADIAN EQUITIES BY SECTOR
(as at December 31, 1993)

Sector	% of Canadian Equities
Financial Services	16.8%
Pipelines and Utilities	14.4%
Industrial Products	11.2%
Oil and Gas	9.8%
Gold and Silver	9.1%
Consumer Products	8.0%
Metals and Minerals	7.2%
Communications and Media	5.8%
Management Companies	5.6%
Other	12.1%
Total	**100.0%**

NON-NORTH AMERICAN EQUITIES BY COUNTRY

Country	% of Non-North American Equities
Japan	26.1%
United Kingdom	14.1%
Hong Kong	9.0%
France	8.1%
Netherlands	6.4%
Australia	5.5%
Other	30.8%
Total	**100.0%**

Source: Annual Report