

**THE CONTRIBUTORY PENSION PLAN
FOR SALARIED EMPLOYEES OF
McMASTER UNIVERSITY
INCLUDING McMASTER DIVINITY
COLLEGE**

**Report on the Actuarial Valuation
for Funding Purposes
as at July 1, 2000**

October 2000

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Introduction

Report on the Actuarial Valuation as at July 1, 2000

To *McMaster University*
1280 Main Street West
Hamilton, Ontario
L8S 4L8

Ladies and Gentlemen:

At your request, we have conducted an actuarial valuation of the Contributory Pension Plan for Salaried Employees of McMaster University including McMaster Divinity College (the "Plan") as at July 1, 2000. We are pleased to present the results of the valuation.

The purpose of this valuation is to determine the funded status of the Plan as at July 1, 2000, and the range of funding options for the years 2000/2001 to 2002/2003. In our opinion, the next actuarial valuation of the Plan will be required as at a date not later than July 1, 2003 or as at the date of an earlier amendment to the Plan, in accordance with the minimum requirements of the *Pension Benefits Act of Ontario*.

There is a funding excess of \$324,274,000 and wind up assets exceed wind up liabilities, as at July 1, 2000, on the basis of the assumptions and methods described in this report. Thus, from an actuarial perspective, the employer need not contribute to the Plan in order to maintain its fully funded status, until after the entire funding excess has been applied towards the employer's current service cost.

Once the entire funding excess has been so applied, monthly employer contributions must resume. We recommend such employer contributions to be 286% of members' required contributions.

Introduction *(continued)*

Since the funding excess exceeds the maximum allowed under Section 147.2 of the *Income Tax Act*, no contribution to the Plan by the University is permitted before the funding excess has been reduced to less than \$64,305,000, or else the Plan's registered status may be revoked.

This valuation reflects the provisions of the Plan as at July 1, 2000. The Plan provisions used in determining the results of our valuation have not been amended since the date of the previous valuation.

In accordance with the Plan provisions, pensions in payment were increased by 1.74% effective July 1, 2000. The estimated cost of this upgrade at July 1, 2000 is \$4,277,000. In addition, members on LTD had their salary adjusted by 1.74% at July 1, 2000. A summary of the Plan provisions is provided in Appendix D.

We have used the same valuation assumptions and methods as were used for the valuation as at July 1, 1999. The valuation assumptions and methods are described in detail in Appendix B. All assumptions made for the purposes of the valuation were reasonable at the time the valuation was prepared.

After checking with representatives of the University, to the best of our knowledge there have been no events subsequent to the valuation date which, in our opinion, would have a material impact on the results of the valuation.

In our opinion,

- the data on which the valuation is based are sufficient and reliable for the purposes of the valuation,
- the assumptions are, in aggregate, appropriate for the purposes of determining the funded status of the Plan as at July 1, 2000 on going concern and solvency bases, and determining the range of funding options, and

Introduction *(continued)*

- the methods employed in the valuation are appropriate for the purposes of determining the funded status of the Plan as at July 1, 2000 on going concern and solvency bases, and determining the range of funding options.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice. It has also been prepared in accordance with the funding and solvency standards set by the *Pension Benefits Act of Ontario*.

This report will be filed with the Financial Services Commission of Ontario and with the Canada Customs and Revenue Agency.

John M. Higgins
Fellow of the Society of Actuaries
Fellow of the Canadian Institute of Actuaries

Tracey L. Bryan
Fellow of the Society of Actuaries
Fellow of the Canadian Institute of Actuaries

Date

Date

***The Contributory Pension Plan for Salaried Employees of McMaster University including
McMaster Divinity College***

Registration number with the Financial Services Commission of Ontario and with the Canada Customs and Revenue Agency: 0215400

Section 1 ³/₄ Financial Position of the Plan

Valuation Results — Going Concern Basis

When conducting a valuation on a going-concern basis, we determine the relationship between the respective values of assets and accumulated benefits, assuming the Plan will be maintained indefinitely.

Financial Position

The results of the valuation as at July 1, 2000, in comparison with those of the previous valuation as at July 1, 1999, are summarized as follows:

Financial Position ³/₄ Going Concern Basis (\$000's)		
	July 1, 2000	July 1, 1999
Actuarial value of assets (adjusted for in-transit items)	\$967,325	\$915,416
Actuarial liability		
Present value of accrued benefits for:		
➤ active members	\$348,165	\$338,016
➤ pensioners and survivors	277,087	256,302
➤ deferred pensioners	1,959	1,803
➤ additional voluntary contributions	107	105
➤ inactive – status undecided	15,733	13,411
Total liability	\$643,051	\$609,637
Funding excess (unfunded liability)	\$324,274	\$305,779

Section 1 — Financial Position of the Plan *(continued)**Reconciliation of Financial Position*

The Plan's financial position, a funding excess of \$324,274,000 as at July 1, 2000, is reconciled with its previous position, a funding excess of \$305,779,000 as at July 1, 1999, as follows:

Reconciliation of Financial Position (\$000's)	
Funding excess as at July 1, 1999	\$305,779
Interest on July 1/99 funding excess at 6.5% for 1 year	19,876
Rate of return on actuarial value of assets greater than assumed	30,543
University contributions less than current service cost	(17,052)
Member contributions paid from funding excess	(3,023)
Pensioner upgrade	(4,277)
Actual retirement experience different from assumed	(912)
Actual salary increases different from assumed	5,017
Actual YMPE increase different from assumed	(1,300)
Active termination and mortality different from assumed	(1,780)
Pensioner mortality different from assumed	(3,033)
Interest rate credited on member contributions greater than assumed	(1,489)
Loss on inactive – status undecided members	(778)
Current service cost greater than funding recommendation	(1,424)
Other miscellaneous items and approximations	(1,873)
Funding excess as at July 1, 2000	\$324,274

Section 1 — Financial Position of the Plan *(continued)***Valuation Results — Solvency Basis**

When conducting a solvency valuation, we determine whether or not the Plan's assets exceed its liabilities on a solvency basis, determined in accordance with the *Pension Benefits Act of Ontario*. The values of the Plan's assets and liabilities on a solvency basis are related to the values calculated as though the Plan were wound up and settled on the valuation date.

Impact of Plan Wind-Up

In our opinion, the value of the Plan's assets would be greater than its actuarial liabilities if the Plan were to be wound up on the valuation date. There is no solvency deficiency. The transfer ratio is in excess of 100%.

Financial Position on a Solvency Basis

The Plan's solvency position as at July 1, 2000, in comparison with that of the previous valuation as at July 1, 1999, is determined as follows:

Solvency Position (\$000's)		
	July 1, 2000	July 1, 1999
Market value of assets (adjusted for in-transit items)	\$967,325	\$915,416
Plan termination expenses	(900)	(100)
Market value of assets available to provide benefits	\$966,425	\$915,316
Actuarial Liability		
Present value of accrued benefits for:		
➤ active members	\$356,108	\$351,184
➤ pensioners and survivors	243,084	229,252
➤ deferred pensioners	1,679	1,591
➤ additional voluntary contributions	107	105
➤ inactive – status undecided	15,733	13,411
Solvency Liabilities	\$616,711	\$595,543
Solvency Excess	\$349,714	\$319,773
Transfer ratio	157%	154%

Section 1 — Financial Position of the Plan *(continued)**Pension Benefit Guarantee Fund (PBGF) Assessment*

The PBGF assessment is calculated as follows:

\$1 for each Ontario member	\$4,337
PLUS	
0.5% of PBGF assessment base up to 10% of PBGF liabilities	0
PLUS	
1.0% of PBGF assessment base between 10% and 20% of PBGF liabilities	0
PLUS	
1.5% of PBGF assessment base over 20% of PBGF liabilities	0
PLUS	
0.2% of Special PBGF assessment base	0
PBGF Assessment	\$4,337

The PBGF assessment base and liabilities are derived as follows:

PBGF Assessment Base and PBGF Liabilities (000's)		
PBGF liabilities	\$616,711,000	(a)
Total solvency liabilities	\$616,711,000	(b)
Ontario Asset Ratio	100%	(c) = (a) ÷ (b)
Market value of assets	\$966,425,000	(d)
Ontario Portion of the fund	\$966,425,000	(e) = (c) x (d)
PBGF Assessment Base	\$0	(f) = (a) – (e) (not <0)

Section 2 ³/₄ Funding Requirements

Current Service Cost

The estimated value of the benefits that will accrue on behalf of the active members during 2000/2001, in comparison with the corresponding value determined in the previous valuation as at July 1, 1999, is summarized below:

Employer's Current Service Cost (\$000's)		
	July 1, 2000	July 1, 1999
Total current service cost	\$22,928	\$21,881
Estimated members' required contributions*	5,936	5,721
Estimated employer's current service cost	\$16,992	\$16,160
Employer's current service cost expressed as a percentage of members' contributions	286%	282%

* Members will contribute 50% of this amount during the 2000/2001 and 2001/2002 Plan years. The remainder will be funded through surplus assets in the Plan.

An analysis of the changes in the employer's current service cost follows:

Changes in Employer's Current Service Cost (as a % of member contributions)	
Employer's current service cost as at July 1, 1999	282%
➤ Retirements, terminations and deaths	1%
➤ Ageing of active membership	(2%)
➤ Salary increases less than expected	9%
➤ New entrants	(4%)
Employer's current service cost as at July 1, 2000	286%

Section 2 — Funding Requirements *(continued)*

Employer Contributions

There is a funding excess of \$324,274,000 and wind up assets exceed wind up liabilities, as at July 1, 2000, on the basis of the assumptions and methods described in this report. Thus, from an actuarial perspective, the employer need not contribute to the Plan in order to maintain its fully funded status, until after the entire funding excess has been applied towards the employer's current service cost.

Once the entire funding excess has been so applied, monthly employer contributions must resume. We recommend such employer contributions to be 286% of members' required contributions. The amount of the funding excess should be monitored in order to ensure that monthly employer contributions resume in a timely manner.

In accordance with Section 147.2 of the *Income Tax Act*, the Plan may not retain its registered status if the employer makes a contribution while the funding excess (\$324,274,000 as at July 1, 2000) exceeds the lesser of:

- 20% of the going-concern actuarial liability (\$128,610,000); and
- the greater of
 - 10% of the going-concern actuarial liability (\$64,305,000); and
 - two years of total current service cost (\$45,856,000).

Since the funding excess exceeds the maximum allowed under Section 147.2 of the *Income Tax Act*, no contribution to the Plan by the University is permitted before the funding excess has been reduced to less than \$64,305,000, or else the Plan's registered status may be revoked.

**Actuarial Opinion with Respect to
the Actuarial Valuation as at July 1, 2000
of the Contributory Pension Plan for Salaried
Employees of
McMaster University including McMaster Divinity
College**

Financial Services Commission of Ontario and
Canada Customs and Revenue Agency Registration No.0215400

Based on the results of this valuation, we hereby certify that, as at July 1, 2000,

- The employer's current service cost for 2000/2001 and subsequent years, up to the next actuarial valuation should be calculated as 286% of members' contributions.
- The employer's current service cost for 2000/2001 is estimated to be \$16,992,000.
- There is a funding excess of \$324,274,000 and wind up assets exceed wind up liabilities, as at July 1, 2000, on the basis of the assumptions and methods described in this report. Thus, from an actuarial perspective, the employer need not contribute to the Plan in order to maintain its fully funded status, until after the entire funding excess has been applied towards the employer's current service cost. Once the entire funding excess has been so applied, monthly employer contributions must resume.
- The Plan has a solvency excess of \$349,714,000 as at July 1, 2000. No special payments are required for solvency purposes.
- The solvency liabilities used to determine the solvency status of the Plan do not exclude any benefit provided under the Plan.

Section 3 ³/₄ Actuarial Opinion (continued)

- The Pension Benefits Guarantee Fund annual assessment under Section 37 of the Regulations to the *Pension Benefits Act of Ontario* is \$1 per Ontario Plan Beneficiary. The estimated PBGF assessment for 1999/2000 is \$4,337 payable no later than March 31, 2001.
- The transfer ratio of the Plan is 157%. The Prior Year Credit Balance on July 1, 2000 is \$0.
- In our opinion, for the purposes of the valuation,
 - the data on which the valuation is based are sufficient and reliable for the purposes of the valuation,
 - the assumptions are in aggregate, appropriate for the purposes of determining the funded status of the Plan as at July 1, 2000 on going concern and solvency bases, and determining the range of funding options, and
 - the methods employed in the valuation are appropriate for the purposes of determining the funded status of the Plan as at July 1, 2000 on going concern and solvency bases, and determining the range of funding options.
- This certificate and report have been prepared, and our opinions given, in accordance with accepted actuarial practice.
- All assumptions made for the purposes of the valuation were reasonable at the time the valuation was prepared.

John M. Higgins
Fellow of the Society of Actuaries
Fellow of the Canadian Institute of Actuaries

Tracey L. Bryan
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Section 3 ³/₄ Actuarial Opinion *(continued)*

Date

Date

Appendix A ³/₄ Plan Assets

Sources of Plan Asset Data

The pension fund is held in trust by CIBC–Mellon and is invested in accordance with the investment policy.

We have relied upon fund statements prepared by CIBC–Mellon for the period from July 1, 1999 to July 1, 2000.

Reconciliation of Plan Assets

The pension fund transactions for the period from July 1, 1999 to July 1, 2000 are summarized as follows:

Reconciliation of Plan Assets (book value – \$000's)		
	1999/2000	1998/1999
As at July 1	\$800,867	\$727,831
PLUS:		
Members' contributions	\$2,919	\$2,775
Company's contributions	0	0
Investment income	19,975	43,576
Net capital gains (losses)	111,478	55,859
Transfers	50	(238)
	<hr/>	<hr/>
	\$134,422	\$101,972
LESS:		
Pensions paid	\$22,481	\$20,903
Lump–sum refunds	11,330	5,723
Administration and investment fees	2,054	2,310
	<hr/>	<hr/>
	\$35,865	\$28,936
As at June 30	<hr/>	<hr/>
	\$899,424	\$800,867

Appendix A ³/₄ Plan Assets *(continued)*

The market value of assets at July 1, 2000 is \$971,543,000.

We have tested the pensions paid, the lump-sum refunds and the contributions for consistency with the membership data for the Plan members who have received benefits or made contributions. The results of these tests were satisfactory.

Appendix B ³/₄ Actuarial Methods and Assumptions

Actuarial Valuations Methods — Going Concern Basis

Valuation of Assets

For this valuation, we have continued to use an adjusted market value method to determine the actuarial value of Plan assets. The asset values produced by this method are related to the market value of the assets, with the advantage that, over time, the market-related asset values will tend to be more stable than market values.

The actuarial value of the fund was determined in the following manner:

At July 1 of Year	Book Value	Market Value	Ratio of Market Value to Book Value
2000	\$899,424,000	\$971,543,000	108.0%
1999	\$800,867,000	\$918,258,000	114.7%
1998	\$727,831,000	\$898,839,000	123.5%
1997	\$651,270,000	\$806,666,000	123.9%
1996	\$614,550,000	\$686,936,000	111.8%

The five-year average ratio of market value to book value is 116.4%. Multiplying this average ratio by the July 1, 2000 book value of the fund produces an asset value of \$1,046,930,000.

The actuarial value of the fund is equal to the lower of market value or the value calculated using the five-year average ratio of market value to book value method. The July 1, 2000 actuarial value of the fund is therefore \$971,543,000.

In addition, there were contributions in transit of \$244,000 and benefit payments in transit of \$4,462,000 as at July 1, 2000. Thus, the actuarial value of assets as at July 1, 2000 adjusted for in-transit items is \$967,325,000. The market value of assets at July 1, 2000 adjusted for in-transit items is also \$967,325,000.

Performance of Fund Assets

Our estimate of the average rate of return experienced by the fund during the period July 1, 1999 to June 30, 2000 is 9.32% on market value, 16.47% on book value and 9.32% on actuarial value.

The average return on the actuarial value since the last valuation was 9.32% per year. This rate exceeds the assumed investment return of 6.5% by 2.82% per year. This has resulted in experience gains of \$30,543,000 for the Plan.

A history of fund yields is set out in Appendix F.

Valuation of Actuarial Liabilities

Over time, the real cost to the employer of a pension plan is the excess of benefits and expenses over member contributions and investment earnings. The actuarial cost method allocates this cost to annual time periods.

For purposes of the going concern valuation, we have continued to use the *projected unit credit actuarial cost method*. Under this method, we determine the actuarial present value of benefits accrued in respect of service prior to the valuation date, including ancillary benefits, based on projected final average earnings. This is referred to as the *actuarial liability*.

The *funding excess* or *unfunded liability*, as the case may be, is the difference between the actuarial value of assets and the actuarial liability. An unfunded liability will be amortised over no more than 15 years through special payments as required under the *Pension Benefits Act of Ontario*. A funding excess may, from an actuarial standpoint, be applied immediately to reduce required employer current service contributions unless precluded by the terms of the Plan or by legislation.

This actuarial funding method produces a reasonable matching of contributions with accruing benefits. Because benefits are recognised as they accrue, the actuarial funding method aims at keeping the Plan fully funded at all times. This promotes benefit security, once any unfunded

Appendix B ³/₄ Actuarial Methods and Assumptions (continued)

liabilities and solvency deficiencies have been funded. However, emerging experience will result in gains or losses that will be revealed and considered in future actuarial valuations.

Current Service Cost

The *current service cost* is the actuarial present value of projected benefits to be paid under the Plan with respect to service during the year following the valuation date.

The employer's current service cost is the total current service cost reduced by the members' required contributions.

The employer's current service cost has been expressed as a percentage of members' contributions in order to provide an automatic adjustment in the event of fluctuations in membership and pensionable earnings.

Under the projected unit credit actuarial cost method, the current service cost for an individual member will increase each year as the member approaches retirement. However, the current service cost of the entire group, expressed as a percentage of the members' contributions, can be expected to remain stable as long as the average age of the group remains constant.

Employer's Contribution

Accordingly, the employer's contributions for this purpose are determined as follows:

Employer's Contributions	
with a funding excess	with an unfunded liability
Employer's current service cost	Employer's current service cost
MINUS	PLUS
any funding excess applied to cover the Employer's current service cost	payments to amortise any unfunded liability

Actuarial Assumptions — Going Concern Basis

The actuarial value of benefits is based on economic and demographic assumptions. At each valuation, we determine whether, in our opinion, the actuarial assumptions are still appropriate for the purposes of the valuation, and we revise them if necessary.

In this valuation, we have used the same assumptions as in the previous valuation. Emerging experience will result in gains or losses that will be revealed and considered in future actuarial valuations. For this valuation, we have used the following assumptions:

Economic Assumptions

➤ ***Investment Return***

It was assumed that the pension fund will earn interest net of expenses at the rate of 6.5% per annum prior to retirement and 4.5% per annum after retirement. The post-retirement interest assumption reflects the fact that investment income in excess of 4.5% on the book value of fixed income investments of the fund can be used for augmenting pensions in payment to the extent allowed by the Plan.

➤ ***Expenses***

No explicit allowance has been made to cover the anticipated expenses of administration of the Plan. The interest rate used to value the Plan is net of expenses.

➤ ***Increases in Pensionable Earnings***

The benefits ultimately paid will depend on each member's final average earnings. To calculate the pension benefits payable upon retirement, death or termination of employment, we have assumed that pensionable earnings will increase at 5.5% per year.

➤ ***Increases in the YMPE***

Appendix B ³/₄ Actuarial Methods and Assumptions *(continued)*

Since the benefits provided by the Plan depend on the final average Year's Maximum Pensionable Earnings (YMPE) under the Canada Pension Plan, it is necessary to make an assumption about increases in the YMPE for this valuation. We have assumed that the YMPE will increase at the rate of 4.5% per year from its 2000 level of \$37,600.

➤ ***Increases in the Maximum Pension Permitted under the Income Tax Act***

The Income Tax Act stipulates that the maximum pension that can be provided under a registered pension plan will be increased, starting in 2005, in accordance with general increases in the average wage.

For this valuation, we have assumed that the maximum pension payable under the Plan will increase at the rate of 4.5% per year starting in 2005.

➤ ***Interest Rate on Members' Contributions***

It was assumed that members required contributions would be credited with interest at a rate equal to 6.5% per annum.

Demographic Assumptions

➤ ***Retirement Age***

We have assumed that 13% of those eligible to retire under the "Rule of 80" would do so when first eligible with the remainder of the members retiring at 65. Those retiring under the "Rule of 80" are assumed to receive an unreduced pension and a bridge benefit commencing at age 60 (or actual retirement, if after age 60).

➤ ***Termination of Employment***

We have made an allowance for projected benefits payable on the termination of employment before retirement for reasons other than death.

Medium termination rates obtained by the Ontario Committee on Portable Pensions were used without graduation, but restricted to age 39.

Appendix B ³/₄ Actuarial Methods and Assumptions *(continued)*

Examples of these rates at various ages are shown below:

Annual Termination Rates	
Age	Probability of Terminating Within 1 Year
20	.360
25	.200
30	.112
35	.063
40 and over	.000

➤ ***Mortality***

The actuarial value of the pension depends on the life expectancy of the member. We have assumed mortality rates, both before and after retirement, in accordance with the Group Annuity Mortality (GAM) Table for 1983, which is commonly used in actuarial valuations of pension plans. According to this table, the life expectancy at age 65 is 16.7 years for a man and 21.3 years for a woman.

➤ ***Family Composition***

Benefits in case of death, before and after retirement, depend on the Plan member's marital status.

For this valuation, we have assumed that 85% of Plan members will have an eligible spouse on death and that the male partner will be 3 years older than the female partner.

➤ ***Valuation of Termination and Death Benefits***

This valuation has assumed that for purposes of calculating the actuarial liability, the benefit payable upon termination or pre-retirement death will equal twice contributions with interest.

Actuarial Valuation Methods and Assumptions — Solvency Basis

We have used the market value of the Plan's assets in our valuation of the Plan for solvency purposes.

To determine the solvency actuarial liability, the benefits valued are those that would have been paid had the Plan been wound up on the valuation date, with all members fully vested in their accrued benefits. No benefits payable on Plan wind up were excluded from our calculations.

We have considered that members whose age plus service at July 1, 2000 totalled 80 points are assumed to have their pensions commence immediately on an unreduced basis. Members who satisfy the "Rule of 55" are assumed to retire at the age at which they would attain 80 points assuming a grow-in of age and service. Those "Rule of 55" members who will not have 80 points before age 65 are assumed to have their pension commence at age 62 or their current age if older. Pensions, in this case, are reduced by 6% per year for each year the pension is assumed to commence prior to age 65. Retirement at age 62 is assumed to create the largest potential liability for an individual who cannot attain 80 points prior to age 65. Members who do not have 55 points at the valuation date are assumed to retire at age 65.

The value of benefits accrued on July 1, 2000, is based on the assumptions described in the Recommendations for the Computation of Transfer Values from Registered Pension Plans of the Canadian Institute of Actuaries applicable for July 1, 2000 for benefits expected to be settled through transfer in accordance with relevant portability requirements. For benefits expected to be settled through the purchase of annuities, an estimate of the cost of settlement through purchase of annuities has been made. We have assumed that pensioners will have their benefits settled through the purchase of annuities and that all other members will have their benefits settled through transfers. Assumption are as follows:

Appendix B ³/₄ Actuarial Methods and Assumptions *(continued)*

Actuarial Assumptions

Mortality rates:	GAM-1983 blending 50% male mortality and 50% female mortality
Interest rates for benefits to be settled through transfer:	6.50% per year for the first 15 years following July 1, 2000, 6% per year thereafter
Interest rates for benefits to be settled through annuity purchase:	6.05% per year
Final average earnings:	Based on actual pensionable earnings over the averaging period
Family composition:	Same as for going concern valuation
Plan termination expenses:	\$900,000

In a solvency valuation, the accrued benefits are based on the member's final average earnings on the valuation date. As a result, no salary projection is used. Also, the employment of each member is assumed to have terminated on the valuation date. Therefore, no assumption is required for future rates of termination of employment.

Liabilities have been valued as the greater of twice contributions with interest or the commuted value.

No provision has been made for the indexation of pensions in payment.

In determining the estimated Plan termination expenses, we have assumed that the Plan sponsor is solvent.

Appendix C ³/₄ Membership Data

Analysis of Membership Data

The actuarial valuation is based on membership data as at July 1, 2000, provided by the University.

We have applied tests for internal consistency, as well as for consistency with the data used for the previous valuation. These tests were applied to membership reconciliation, basic information (date of birth, date of hire, date of membership, sex, etc.), pensionable earnings levels, contributions accumulated with interest and pensions to retirees and other members entitled to a deferred pension. The results of these tests were satisfactory.

Plan membership data is summarized on the following page. For comparison, we have also summarized corresponding data from the previous valuation.

Appendix C ³/₄ Membership Data (continued)

Membership Data						
	July 1, 2000			July 1, 1999		
	Males	Females	Totals	Males	Females	Totals
Active Members						
Full-time						
Number	1,044	1,467	2,511	1,017	1,397	2,414
Total Salary	\$81,272,629	\$67,570,787	\$148,843,416	\$79,648,365	\$63,382,029	\$143,030,394
Average Salary	\$77,847	\$46,061	\$59,277	\$78,317	\$45,370	\$59,250
Average Pensionable Service	14.0	11.0	12.2	14.7	11.1	12.6
Average Age	47.3	44.3	45.6	47.6	44.2	45.6
Part-time						
Number	42	336	378	57	320	377
Total Salary	\$2,518,831	\$12,965,912	\$15,484,743	\$3,323,718	\$12,574,496	\$15,898,214
Average Salary	\$59,972	\$38,589	\$40,965	\$58,311	\$39,295	\$42,170
Average Pensionable Service	15.2	8.2	9.0	12.2	8.5	9.0
Average Age	50.8	45.0	45.7	48.1	45.4	45.8
Pensioners						
Number	595	486	1,081	572	454	1,026
Total Annual Basic Pension	\$18,001,390	\$5,122,865	\$23,124,255	\$16,591,471	\$4,618,071	\$21,209,542
Average Annual Basic Pension	\$30,254	\$10,541	\$21,392	\$29,006	\$10,172	\$20,672
Average Age	70.8	71.9	71.3	70.5	71.7	71.0
Deferred Pensioners						
Number	27	33	60	26	33	59
Total Annual Pension	\$172,098	\$93,419	\$265,517	\$164,772	\$95,242	\$260,014
Average Annual Pension	\$6,374	\$2,831	\$4,425	\$6,337	\$2,886	\$4,407
Average Age	49.0	43.9	46.2	47.8	42.8	45.0

Appendix C ³/₄ Membership Data (continued)

The membership movement for all categories of membership since the previous actuarial valuation is as follows:

Reconciliation of Membership					
	Actives	Deferred Vested	Pensioners and Beneficiaries	Inactive – Status Undecided	Total
Total at July 1, 1999	2,791	59	1,026	302	4,178
New Entrants	275			11	286
Terminations					
➤ Status Undecided	(56)			56	
➤ Transfers/Refunds	(56)			(50)	(106)
➤ Deferred Pensions	(1)	2		(1)	
➤ Refunds Pending	(13)			(4)	(17)
Death – No Outstanding Benefits	(4)		(10)	(1)	(15)
Rehired	8			(6)	2
Retirements	(65)		65		
Transfers from Hourly Plan	1				1
Data Corrections	9	(1)			8
Total at July 1, 2000	2,889	60	1,081	307	4,337

Appendix C ³/₄ Membership Data (continued)

The distribution of the active members by age and pensionable service as at July 1, 2000, is summarized as follows:

**Distribution of Active Members by Age Group and Pensionable Service
as at July 1, 2000**

Age	Years of Pensionable Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
0 - 19										0
20 - 24	17									17
	28,780									28,780
25 - 29	93	8								101
	33,647	30,364								33,387
30 - 34	171	64	26							261
	40,991	37,331	34,354							39,433
35 - 39	178	87	122	30	1					418
	46,218	47,759	40,619	37,732	**					44,267
40 - 44	142	108	129	82	31	2				494
	47,776	51,387	65,759	48,675	43,796	**				53,116
45 - 49	99	82	151	94	64	38	2			530
	40,814	51,898	73,807	68,755	58,242	45,158	**			59,305
50 - 54	58	80	129	92	84	67	25			535
	43,673	51,203	59,071	77,948	87,145	58,808	48,966			63,374
55 - 59	27	36	68	59	76	75	28	1		370
	41,110	49,832	64,515	75,967	86,183	87,185	84,002	**		74,227
60 - 64	9	12	20	23	20	25	30	10	1	150
	47,209	51,097	51,549	68,217	69,260	101,406	102,838	102,571	**	78,437
65 - 69		2	4	1	1	1	4			13
		**	49,971	**	**	**	103,095			66,618
Total	794	479	649	381	277	208	89	11	1	2,889
	42,503	48,413	59,653	65,266	73,676	71,499	80,426	115,973	**	56,881

For each age-service cell, the second row indicates the average annual earnings.

** For individual cells with information on one or two members, the average earnings are not disclosed for confidentiality reasons.

Appendix C ³/₄ Membership Data (continued)

The distribution of the inactive members by age as at July 1, 2000, is summarized as follows:

**Distribution of Inactive Members by Age Group
as at July 1, 2000**

Age Group	Deferred Pensioners		Pensioners and Survivors	
	Number	Total Annual Pension	Number	Total Annual Pension*
25 – 29	1	\$540	–	–
30 – 34	1	\$612	–	–
35 – 39	13	\$16,742	–	–
40 – 44	14	\$35,034	–	–
45 – 49	13	\$34,541	–	–
50 – 54	9	\$29,950	7	\$130,017
55 – 59	4	\$56,152	60	\$1,526,186
60 – 64	4	\$90,960	154	\$3,941,521
65 – 69	–	–	259	\$6,485,587
70 – 74	–	–	234	\$5,195,183
75 – 79	–	–	187	\$3,383,048
80 – 84	1	\$986	125	\$1,791,432
85 – 89	–	–	44	\$492,988
90 – 94	–	–	8	\$125,183
95 +	–	–	3	\$53,110
TOTAL	60	\$265,517	1,081	\$23,124,255

* Basic pension only

Appendix D ³/₄ Summary of Plan Provisions

Effective Date

The effective date of the Plan was September 1, 1947.

Eligibility

Full-time employees may elect to join the Plan immediately but are required to join on the July 1st following completion of six months' employment.

Retirement

Normal retirement is on the 1st of July next following the member's 65th birthday. However, a member may normally elect to retire immediately on attaining age 65.

A member whose age plus pensionable service equals or exceeds 80 points may retire early and receive an unreduced pension and a bridge benefit.

A member may also retire early with a reduced pension at any time during the 10-year period preceding his normal retirement date. The reduction will be 0.5% for each month by which actual retirement precedes age 65.

With the consent of the University, a member may postpone his actual retirement on a year-to-year basis, but in no event shall he remain in service beyond the 1st of the month prior to attainment of age 69. He will continue to make contributions and his benefits under the Plan will continue to accrue until such postponed retirement date.

Contributions

Appendix D — Summary of Plan Provisions *(continued)*

Each member is required to contribute 3.5% of his regular annual earnings up to the Year's Maximum Pensionable Earnings and 5% of his regular annual earnings in excess of the Year's Maximum Pensionable Earnings.

Effective July 1, 1997, member required contributions will be limited to the lesser of:

- (a) the maximum amount permitted under the *Income Tax Act* in that calendar year; and
- (b) 250% of the maximum annual pension benefit payable under the Plan.

For the period from July 1, 1997 to June 30, 2002, 50% of the contributions required of each member shall be made on behalf of the member from the assets of the Plan.

Pension Benefits

The amount of annual pension payable to a member will be:

- (a) 1.4% of Best Average Salary up to the Average Year's Maximum Pensionable Earnings times years of pensionable service, plus
- (b) 2.0% of Best Average Salary in excess of the Average Year's Maximum Pensionable Earnings times years of pensionable service.

Best Average Salary means the annualized average of the 48 highest months of earnings while a Plan participant. Average Year's Maximum Pensionable Earnings means the pro-rated average Yearly Maximum Pensionable Earnings as defined in the Canada Pension Plan, in the same 48 months as are used to calculate Best Average Salary.

Pensions in payment will be increased from July 1st each year on a pro-rated basis (using the number of months the pensioner has been retired in the twelve months) by the excess over 4.5% of the average annual rate of return earned on the assets of the Plan over the previous five calendar years, subject to a maximum of that year's rate of increase in the Consumer Price Index.

Appendix D — Summary of Plan Provisions *(continued)*

Effective July 1, 1997, if there is any year where the percentage calculated under the excess interest formula exceeds the rate of increase in the Consumer Price Index, the excess will be used to provide a supplementary increase to the pensions in pay for which the annual pension increase in any of the three previous years was based on the excess interest formula. The July 1, 2000 increase was 1.74%, which was equal to the increase in the CPI for the 1999 calendar year.

In addition, Members on LTD will have their salary adjusted each July 1st by the percentage increase applied to pensions in payment. This increase will be applied from the later of July 1, 1990 or the July 1st following disability.

Bridge Benefits

Faculty members who first attain 80 points between July 1, 1996 and December 31, 1996 and who elect to retire on December 31, 1996, will receive a bridge benefit equal to the greater of \$7,500 or \$249.29 per year of credited service. The bridge benefit is payable from the member's early retirement date and ceases at age 65 or death, if earlier.

Faculty members who first attain 80 points prior to July 1, 1996 and who elect to retire between July 1, 1996 and June 30, 1997 or who first attain 80 points between July 1, 1996 and December 31, 1996 and who elect to retire between January 1, 1997 and June 30, 1997, will receive a bridge benefit equal to \$249.29 per year of credited service. The bridge benefit is payable from the member's early retirement date and ceases at age 65 or death if earlier.

Staff members who retire at the request of the university between June 30, 1996 and December 31, 1996 and who have attained 80 points, will receive a bridge benefit equal to \$249.29 per year of credited service. The bridge benefit is payable from the member's early retirement date and ceases at age 65 or death, if earlier.

Effective July 1, 1997, members who retire early and have attained 80 points will receive a bridge benefit equal to \$19.00 per month per year of credited service accrued to June 30, 1996 to a maximum of 20 years of service. The bridge benefit is payable from the later of the member's early retirement date and age 60 and ceases payment on attainment of age 65 or death, if earlier.

Death Benefits

(a) Prior to Retirement

On the death of a member prior to retirement, his beneficiary or estate is entitled to receive a death benefit equal to his required contributions accrued to December 31, 1986 accumulated with Net Interest on the Fund.

In addition, his beneficiary or estate shall receive the commuted value of the member's pension accrued after December 31, 1986, plus any required contributions made after December 31, 1986, accumulated with Net Interest on the Fund, in excess of 50% of the commuted value.

(b) After Retirement

The benefit is payable for life, but guaranteed for seven years in any event. In the case of a married member, 50% of the benefit is continued to the spouse for life and at least the remainder of the guaranteed seven years' payments will be made.

Prior to July 1, 1997, the normal form of benefit was as described above with a five-year guarantee in place of the seven-year guarantee.

Alternative forms of pension are available in actuarial equivalent amounts and for married members who retire after December 31, 1987, the automatic form of pension will be an actuarially reduced benefit which continues 60% of the pension to a surviving spouse for life.

Termination Benefits

If a member terminates employment prior to retirement, he may elect to receive one of the following:

Appendix D — Summary of Plan Provisions *(continued)*

- (a) A refund of his Required Contributions, with Net Interest on the Fund.
- (b) A transfer of the greater of twice his Required Contributions plus Net Interest on the Fund and the commuted value of his deferred pension to another registered pension vehicle. Such a transfer may only be made when there is an agreement in writing that such monies will be paid in the form of deferred pension benefits payable at retirement in the event that such member terminates his membership in that subsequent pension arrangement at some future date, or that such monies will only be transferred to another registered pension vehicle which in turn can make the same guarantee.
- (c) A deferred pension, payable at Normal Retirement Date, equal to the pension earned up to the date of termination.

After January 1, 1988, if the member has over 2 years of membership in the Plan, he may elect only (b) or (c) in respect of benefits earned after January 1, 1987.

If the member has attained age 45 and has 10 or more years of employment, he may elect only (b) or (c); or he may receive a return of contributions with interest prior to January 1, 1965 subject to the 5% withdrawal charge, plus benefits under (b) or (c) for service after January 1, 1965.

Appendix E ¾ Employer Certification**Employer Certification**

With respect to the report on the actuarial valuation of the Contributory Pension Plan for Salaried Employees of McMaster University including McMaster Divinity College, as at July 1, 2000, I hereby certify that, to the best of my knowledge and belief:

- a copy of the official Plan documents and of all amendments made up to July 1, 2000, were provided to the actuary;
- the membership data provided to the actuary includes a complete and accurate description of every person who is entitled to benefits under the terms of the Plan for service up to July 1, 2000; and
- all events subsequent to July 1, 2000 that may have an impact on the results of the valuation have been communicated to the actuary.

Date

Signed

Name

Title

Appendix F ³/₄ History Of Fund Yields

The following table summarizes the yields on the invested Fund for the last 20 years:

Year	Yield Based on Book Value Including Investment Income but Excluding Realized and Unrealized Gains or Losses	Yield Based on Book Value Including Investment Income and Realized Gains or Losses	Yield Based on Market Value Including Investment Income and Realized and Unrealized Gains or Losses
	%	%	%
80-81	9.16	13.43	8.64
81-82	10.83	6.97	(4.78)
82-83	10.38	11.04	40.06
83-84	7.50	13.42	(1.96)
84-85	8.70	11.81	31.41
85-86	8.20	12.17	24.70
86-87	7.54	11.84	10.45
87-88	7.65	10.85	1.28
88-89	7.80	9.74	19.31
89-90	7.83	8.88	0.23
90-91	7.64	7.21	8.22
91-92	7.71	9.74	10.51
92-93	6.27	10.13	13.67
93-94	6.04	11.24	2.75
94-95	4.45	11.72	16.09
95-96	6.55	12.56	13.67
96-97	5.22	10.32	21.53
97-98	6.57	16.68	15.38
98-99	5.55	13.57	4.91
99-00	2.08	16.47	9.32

Appendix G ³/₄ Review Of Funding Basis

In the previous sections we have individually noted the assumptions used in this valuation. While each is an important factor in determining the Plan liabilities and current service cost, the most significant elements are:

- the difference between the valuation rate of interest used prior to retirement and the rate of salary increase;
- the valuation rate of interest used after retirement;
- the assumed age of retirement;
- the assumed pattern of mortality; and
- the value placed on the fund's assets.

In addition, the maximum benefit which can be paid from a Plan is an important factor in the valuation. What follows is a description of the aforementioned factors.

➤ **Difference Between Pre-Retirement Interest Rate and Salary Increase**

As of the end of 1999, the average annual rate of return on assets invested equally in long-term Federal Government Bonds and the Toronto Stock Exchange Industrial Index exceeded the average annual increase in the Canadian Wage and Salary Index by:

in the last 5 years	13.1%
in the last 10 years	8.5%
in the last 15 years	9.0%
in the last 25 years	6.7%
in the last 50 years	3.4%

The larger spreads in the 5, 10 and 15 year periods would indicate short-term fluctuations in a long-term trend. It would seem reasonably conservative to anticipate a return on the fund which yields about 2% per annum more than the average salary increases over the long term.

Appendix G — Review of Funding Basis *(continued)*

In this valuation, a 1.0% difference between the pre-retirement interest rate (6.5%) and the long-term salary increase assumption (5.5%) would therefore seem to be an appropriate assumption given that the 1% difference accounts for

- The long term historical trend

less

- an allowance for pay increases reflecting promotion and merit.

A continued watch on the historical short term difference will be maintained to see if a re-assessment is necessary in the future. As well, the short-term outlook on expected salary increases might suggest the re-introduction of a select salary scale in the future.

➤ **Post Retirement Valuation Interest Rate**

The assumption of a yield of 4.5% per annum means that an allowance is being made in advance for the application of interest in excess of 4.5% per annum to provide for increases in pensions. Although the fund recently has experienced yields that on a cumulative basis exceed the Consumer Price Index increase by more than 4.5% per year, this high yield is not seen to be a long term trend.

➤ **Retirement Age**

The retirement age assumption is based in part on experience at other Universities and in part on the advice of the staff at McMaster. Future experience will determine the appropriateness of the retirement assumption which is that 13% of people who satisfy the Rule of 80 will retire when first eligible and that all others will retire at 65. Since the introduction of the Rule of 80, experience gains and losses resulting from actual incidence of retirement different from assumed have been relatively small. However, a large cohort of members will be reaching the Rule of 80 within the next 5–10 years and a more detailed study of the retirement pattern this cohort is likely to exhibit would be advisable in order to avoid the possibility of large experience losses.

➤ **Pattern of Mortality**

Recent studies have indicated that there has been an improvement in longevity among pensioners. The current mortality table, the Group Annuity Mortality – 1983 reflects future increases in longevity and is deemed appropriate for the purposes of this valuation. Mortality experience has produced small but consistent losses. Continued monitoring of the appropriateness of this table is warranted.

➤ **Asset Valuation Method**

By using a 5 year average ratio market to book value method of asset valuation, the Plan is able to maintain the relative stability characterized by previous methods while at the same time accounting for a portion of the existing unrealized gains in the fund. Additional conservatism is included in the method by stating that the actuarial value of assets will never exceed market value.

➤ **Maximum Pension Limits**

Maximum benefit limits must be included in any pension plan registered with the Canada Customs and Revenue Agency, and can only be increased with the approval of the Canada Customs and Revenue Agency.

The current maximum dollar limit is set at \$1,722.22 per annum and is scheduled to increase in line with changes in the average wage commencing in 2005.

It is considered appropriate and prudent to recognize these future increases and to incorporate these provisions as part of the valuation.