UNIVERSITY OF TORONTO
Office of the Vice-Provost, Planning and Budget

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MEMORANDUM

February 26, 2002

To: Planning and Budget Committee

From: Derek McCammond, Vice-Provost, Planning and Budget

Item Identification

Establishment of the Risk Management Institute by the School of Graduate Studies.

Sponsor

Derek McCammond, Vice-Provost, Planning and Budget

Jurisdictional Information

The Committee recommends on plans and proposals to establish academic units, including Centres and Institutes.

Highlights

As the attached S.G.S. synopsis (page 2) notes, the "significant potential at the University in the broad area of risk management is at risk of being over-shadowed by developments at the best U.S. universities. To achieve its full potential in this area, the University of Toronto must coordinate its activities in this area." The establishment of the Risk Management Institute will provide a nexus for activities of faculty across a number of disciplines, including Mathematics, Statistics Engineering, Computer Science and Management, and for programs such as the Master of Mathematical Finance Program.

Creation of the Institute will:

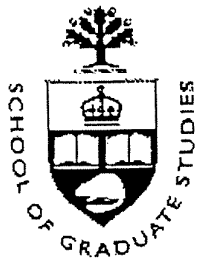
1. Promote and coordinate the delivery of graduate programs in the area of risk management (including mathematical finance) at the University of Toronto.
2. Provide a leadership role in interdisciplinary and interdivisional research initiatives in the area of risk management.
3. Provide a prominent interface with the commercial sector to facilitate the establishment of research partnerships and the dissemination of research results.
4. Promote links between financial risk management and other areas of risk management.

Resource Implications

There are resource implications for the proposal. These include the salary of a half-time Director and of an administrative assistant, in addition to office space. SGS will cover all of the interim costs until there is sufficient endowment income for this purpose. Funding for the operations of the Institute and for Endowed Chairs within the Institute are a Campaign priority for SGS.

Recommendation

That the Planning and Budget Committee recommends to the Academic Board, approval of the establishment of the Risk Management Institute, within Division III of the School of Graduate Studies, effective immediately.



RISK MANAGEMENT INSTITUTE

UNIVERSITY OF TORONTO

May 30, 2001

1. OBJECTIVES:

Our goal is the creation of an institute at the University of Toronto that will:

1. Promote and coordinate the delivery of graduate programs in the area of risk management (including mathematical finance) at the University of Toronto.
2. Provide a leadership role in interdisciplinary and interdivisional research initiatives in the area of risk management.
3. Provide a prominent interface with the commercial sector to facilitate the establishment of research partnerships and the dissemination of research results.
4. Promote links between financial risk management and other areas of risk management.

2. RATIONALE:

Risk management, as applied to financial investments, has received considerable attention over the past decade and has evolved as an academically credible field of activity that has also achieved respectability in the commercial sector. The University of Toronto has significant strength in the broad area of Mathematical Finance and Risk Management spread over its three campuses. These individual centres of excellence include: the Finance Program in the Rotman School of Management, RiskLab at UT Mississauga, the Master of Mathematical Finance program at the School of Graduate Studies and the Master of Arts in Financial Economics to be offered jointly by the Department of Economics and The Rotman School. The activities in the Mathematical Finance Program and RiskLab are supported by individuals in the Departments

of Mathematics, Statistics, Engineering, Computer Science and Management. In the broader area of risk management, the Department of Statistics has a strong program in Actuarial Science (with two new appointments to augment the 3 faculty already holding tenure-stream appointments) and the Department of Mechanical and Industrial Engineering has internationally recognized expertise in the area of process reliability and maintenance.

The University is uniquely positioned at the centre of financial activity in Canada, with the head offices of most Canadian financial institutions and insurance companies close at hand. The Fields Institute of Mathematical Sciences is another centre of significant academic activity in this area, that sponsors seminar series and colloquia in the area of mathematical finance and risk management.

This growth of the interest in mathematical finance and risk management in departments that have traditionally not been associated with this field, is a result of the ever-increasing complexity and sophistication of the mathematics and science involved. Financial institutions are now hiring mathematicians and physical scientists to do their risk analysis. The area has become very multidisciplinary. Much of the scientific analysis that has led to the advances in financial risk management has potential applications in other areas of risk management as well. Ultimately, the evaluation and mitigation of risk should involve an holistic treatment that simultaneously takes into account all risks in an integrated financial framework.

Environmental risk is an area that is receiving significant attention from the insurance industry. Damage due to extreme weather events such as major storms and droughts have long been recognized as environmental risks requiring some hedging strategy. More recently, utilities such as electrical power and natural gas suppliers are finding that in the deregulated markets of today, there is a need for more powerful tools of risk assessment and a need for strategies for risk mitigation. The Institute for Environmental studies at the University of Toronto has already begun to document tools of analysis and strategies for the management of environmental risk.

The significant potential at the University in the broad area of risk management is at risk of being over-shadowed by developments at the best U.S. universities. To achieve its full potential in this area, the University of Toronto must coordinate its activities in this area. With a strategic deployment of resources, we believe that the University of Toronto can be the leading institution in Canada for risk management, and one of the best in North America.

3. CURRENT STRENGTHS:

3.1 The Faculty

Currently our greatest strength lies in the numerous individuals who are active in the area of mathematical finance. These include:

Department of Mathematics:
Claudio Albanese
Robert Almgren
(cross appointed to Computer Science)
Luis Seco

Faculty of Applied Science and Engineering:
Michael Carter
Andrew Jardine
Joseph Paradi
Burhan Turksen

Department of Computer Science:
Ken Jackson
David Penny

Department of Economics
Angelo Melino
Xiaodong Zhu

Institute for Environmental Studies
Rodney White

Department of Statistics:
Sam Broverman
Andrey Feuerverger
Jeremy Quastel (joint with Mathematics)
Sheldon Lin

Rotman School of Management:
Oded Berman
Laurence Booth
John Hull
Dmitry Krass
Tom McCurdy
Alan White
Alexandra MacKay

Industrial Associates:
Michel Crouhy, V.P., Global Analysis, CIBC
Gregory Nudelman, General Manager, Global Analysis, CIBC
David Finnie , Bank of Montreal

Alex Levin, Bank of Montreal
Ron Dembo, CEO, Algorithmics Inc.
Dan Rosen, Director of Research, Algorithmics In

3.2 RiskLab

RiskLab is a research facility at the University of Toronto at Mississauga, directed by Professor Luis Seco. It acts as the central base for a worldwide consortium of similar computer laboratories known as RiskLab International. The facility provides an infrastructure of hardware and software with which to carry out research and development activities related to the management of financial risk. Graduate students and postdocs are funded through RiskLab by grants and contracts from governments and companies.

3.3 The Master of Mathematical Finance Program

The Master Program in Mathematical Finance is a self-funding, one year program directed at recent graduates from science and engineering programs with four-year undergraduate degrees, masters degrees or Ph.D.'s. The Program has three important elements: conventional lecture courses, a computer laboratory and an internship program. The academic courses provide focused education in the areas of financial engineering including finance, applied mathematics, statistics and numerical methods.

The laboratory component of the Program is carried out in the University of Toronto's AlgoLab (Algorithmics Laboratory for Teaching Risk Management) which was made possible by a donation from Algorithmics Inc. In this laboratory, the students learn and practice the technical skills that are required for the practical application of theory. Student projects involve the development of algorithms for portfolio management, including data analysis, instrument pricing and risk management.

The internship program provides the students an opportunity to engage the real world of financial institutions while still registered in the program. It also offers prospective employers with the opportunity to evaluate potential employees, while benefiting from the inflow of fresh ideas with each new generation of students.

The Program is halfway through its third year of operation with an enrolment of 19 students. To date all students have been placed in internship positions and all graduates have been placed in jobs in very short order. Companies that have participated in the internship program include: The Bank of Montreal, Algorithmics Inc., The Bank of Nova Scotia, TD Bank, CIBC, The Royal Bank, Canada Trust, Manulife Financial, Ontario Power Generation, Redpath Sugars, Ontario Financing Authority, Aurion Capital, YMG Capital, Fanatically Financial, TransCanada Pipelines, Canada Export Development Corporation and Ontario Teachers' Pension Fund. Expansion of the internship program to more insurance and commodities companies is planned.

3.4 The Rotman School of Management

The Rotman School of Management has a long history of education in the area of finance. It has two masters programs in business administration, one of which is the Executive Program, directed at accomplished executives who wish to complete their programs while still engaged in their corporate duties. The School also has a Ph.D. stream, which provides the foundation for students who wish to pursue at a more fundamental level, the science and mathematical foundations of finance.

The Rotman School is known internationally for its expertise in the analysis of financial instruments. Professors John Hull and Alan White have made key contributions to the understanding of this area which is central to the discipline of financial risk management. Several new faculty members have joined the School in recent years, providing further depth and promise for continued excellence in the area.

4. PROPOSAL

4.1 The Vision

The Institute for Risk Management at the University of Toronto seeks to be the premier academic unit of its kind in the world, by uniting and nurturing interdisciplinary research and teaching that crosses the traditional boundaries between mathematics, finance and risk analysis. The Institute will promote fundamental and applied research in the area of risk management and facilitate its rapid transfer to application in the commercial sector.

Graduate course offerings in the general area of risk management and mathematical finance, delivered by various sectors of the University, will be cross-listed by the Institute so as to promote broad access to graduate students and efficient use of teaching resources.

The Participating Units will be the School of Graduate Studies, the Rotman School of Management, and the Departments of Mathematics, Statistics, Mechanical and Industrial Engineering, and Economics. There will be provision for Individuals from other units in the University to be active members of the Institute.

4.2 Personnel Assigned to the Institute

There will be a half-time director who will report to the Dean of the School of Graduate Studies. The ideal director will have strong interpersonal skills, a strong international reputation, and expertise in both the finance and mathematical areas of the discipline. The director will hold a named (endowed) chair in Risk Management and will be cross-appointed to one of the participating units and the School of Graduate Studies.

The Director will be responsible for the oversight of the Master of Mathematical Finance Program, and the associated AlgoLab, and will promote the development of Risk Management research and teaching as a multidisciplinary activity throughout the university. A full-time administrative assistant will support the Director.

A Board of Directors will meet at least annually to review the activities of the institute and to evaluate strategic opportunities for the Institute. The Board will be composed of one representative from each of the participating units and at least two representatives from industry, selected by the academic members of the Board.

In support of the teaching of risk management in all programs at the University, there will be a tenure stream Junior Chair appointed in year one and a second Junior Chair appointed in year three. These appointments will be assigned 50% to the School of Graduate Studies and 50% to one of the participating units.

4.3 Fellowship Endowment

The Institute will have a substantial endowed budget to support visiting senior scholars and post-doctoral fellows. At all times, it would be ideal to have at least one senior scholar in residence and it is anticipated that the Institute would have to pick up at most half of the salary from the endowment. In addition, there should be several postdoctoral fellows part of whose salary will be covered by the endowment. Other support for visiting scholars will come from mission-specific contracts with participating financial institutions.

4.4 Facilities

The Institute will be housed in a facility that will have office space for the Director, the three named chairs, the Director's Administrative Assistant, the Director of the Masters Program, the Administrative Assistant of the Master of Mathematical Finance Program, AlgoLab, office space suitable for 10 Ph.D.-stream graduate students, a conference room and three additional faculty offices to be assigned by the Director for adjunct faculty and visiting scholars. Ideally, this space should be located where future expansion is possible. The new information technology complex, that will have construction completed within the next couple of years, will provide an excellent location and environment for the activities of the Institute.

School of Graduate Studies

University of Toronto

OFFICE OF THE DEAN

Memorandum

To: Jack Carr, Chair, Academic Board

From: Donald E. Cormack, Acting Dean

Date: March 27, 2002

Re: The Risk Management Institute

It is proposed that the Risk Management Institute (RMI) will have tenure stream faculty appointing privileges. The appointed faculty will deliver the teaching programs of the Institute and carry on independent research.

The Director of the Master of Mathematical Finance (MMF) Program, who currently reports directly to the Vice-Dean of the School of Graduate Studies, will report to the Director of RMI. The Director of RMI will also be responsible for setting up and running new graduate degree programs: A Ph.D.-stream program and a least one additional professional masters program (similar to the MMF program) to be called the Master of Risk Management.

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