

*To Minh Chau To :  
a memorable presence  
over these past five years*

**Five-Year Report  
1996–2001**

by Georges Dionne  
Chairholder

## **Brief historical account**

In June 1996, the *École des HEC (Hautes Études Commerciales*, hereafter referred to either as the School or HEC) announced the creation of its Risk Management Chair, intended to attract internationally renowned professors and to step up research and student training in the field of risk management. Breaking with the usual pattern, HEC did not wait to obtain external financing before setting up its chair. It invested internal funds to offer a quick response to the needs of a financial milieu in full expansion. It did, however, begin a strategic search for a partner willing to provide ongoing financial support to the Chair's continuity and development by means of a capitalized donation. This strategy led to the 2000 Fund Raising Campaign in which risk management was featured by HEC-*Université de Montréal-École Polytechnique* as a leading research project. The Chair is in fact part of the RÉAGIR (*Réseau d'aide à la gestion intégrée des risques*) project. The results of the fund-raising campaign will be reported in May 2002.

The avant-garde initiative of HEC's director has put us in a position to train highly qualified risk managers who are in great demand in various markets. It has also allowed us to stay on the cutting edge of research on the different forms of risk management: financial risks, insurance risks, and the integrated management of corporate risks-to name only a few.

In this first five-year report, we present the Chair's mission and principal fields of research and training. We then describe the principal activities carried out in the 1996–2001 period. In conclusion, we identify the priorities we had set for the five-year period.

## **Mission, fields of research, and objectives**

The Chair has a threefold mission :

1. To train top-quality managers and researchers capable of measuring up to international competition and aspiring to become leaders ;
2. To develop knowledge through research projects defined in collaboration with industrial partners engaged in risk management ;
3. To transfer risk-management tools to business enterprises in different markets.

The Chair also manages the School's in-house journal *Assurances*. This journal is one of the Chair's prized instruments, allowing it to publish the results of its research work on the insurance and risk-management problems arising in different milieus. It is obviously not the Chair's only instrument for circulating research results. Other more academic works continue to be published in international scientific journals.

The Chair focuses on three fields of research and training:

1. Risk management for firms ;
2. Risk management for individuals ;
3. Risk management for insurance.

## **Problem**

The main research problem is concerned with the various interrelations between different individual and collective risks. For too long, with rare exceptions, risks of different dimensions have been studied and evaluated without taking into account their interconnections and without calculating the global or aggregate risks present in different portfolios. This observation applies not only to the financial portfolios of large financial

institutions which are obliged to carefully evaluate their aggregate or global risks, but also to those of large firms needing to coordinate their insurance choices with their financial choices and to individuals who can no longer see their investment risks as necessarily independent of the other risks to which they are exposed: occupational accidents, their retirement funds or erosions of their personal worth.

As we have already mentioned, the research program includes three fields. In the following pages, we briefly describe the main orientations of the Chair's research endeavours and its principal activities in connection with these orientations.

## **Fields of research**

### *1. Risk management for firms*

Risk management in business firms has become very popular in various circles. Large banks have set up research and risk management departments; some financial institutions are investing considerable resources in training their personnel to reorient their management strategies according to their portfolio's global risk; financial advisers and consultants are proposing different formulas for measuring risks ; governments are wondering how to regulate these new risks or how to monitor the business enterprises affected by such risks... In brief, everyone is looking for ways of adapting to the new realities of these markets.

The definition of the concept of risk has also evolved a great deal over recent years. To be specific, the traditional notions of portfolio diversification and market risk have been challenged by several researchers and practitioners in the field of finance. For several years, derivatives have been experiencing strong growth as relatively cheap instruments of diversification, but they are now perceived as potentially dangerous causes of large financial losses or bankruptcies.

Credit risk is an example of a risk which was not truly of much concern during the 80s when the markets were in full growth. Now that these markets have attained a certain maturity, we realize that all these individual risks of non-payment represent a serious collective risk for banks, for they are, among other things, vulnerable to the same economic fluctuations. What is even more disturbing for financiers is that we do not truly know how to measure and integrate these new risks into short- and long-term management: we have no instruments allowing us to integrate them into the price of credit. One solution is to develop portfolios of credit risks. Similar situations can be documented on capital risk, risk to liquidity or other forms of financial risk.

Uninsurable environmental risks are another form of poorly diversified risk. Taking such risks into account has an effect on the whole matter of risk management in firms according to their credit status and their international diversification.

Finally, insurers' portfolios have themselves become very risky. In the view of many, the traditional reflex of passing on big risks and collective risks to reinsurers no longer represents an attractive diversification, and reinsurers are themselves having trouble diversifying their portfolios. Financial products have become substitutes or complements of some forms of reinsurance, but managing such products in a context where the global risk contained in company portfolios can be properly measured still remains very problematic.

In 1996-1997, our work in this field focused on two subjects. One was concerned with managing companies' civil liability risks as they apply to pollution risks. How can strategies be defined in a constantly evolving legal and technical environment? Two postdoctoral students serving as fellows with the Chair worked on this question during that academic year.

One of the projects they worked on had to do with managing companies' civil liability risks as they apply to pollution hazards. We were particularly interested in what effect the new regulations were having on firms' prevention efforts and on their investment levels. The main conclusion of the research is that extending the liability of

firms to banks can increase both the compensations paid to victims and the prevention activities of firms. What distinguishes our results from previous ones showing that the extension of liability always reduced prevention is that, in our analysis, prevention activities are proven to be investment activities and not only running expenses. On the other hand, it appears that the extension of liability to banks always increases the probability of bankruptcy for companies. This research will be published in the *Journal of Public Economics*.

In 1997-1998, the major project concerned credit risk. We developed a credit-risk model designed to integrate credit risk and market risk in order to calculate banks' risk-bearing value. This research was financed by the MITACS program and the CIBC. Our project was prepared in collaboration with The Fields Institute of Toronto University. Three young professors from HEC were participants : Jean-Guy Simonato, Geneviève Gauthier, and Patrick Soriano.

In 1998-1999, our research work found an empirical interdependence between decisions concerning salary policy and those related to corporate financing. Companies which attract the best workers are those with the highest debt. Companies with the highest debt offer lower entry salaries but have the steepest jumps in temporal profit. These results are explained by problems of asymmetric information on both markets: the qualities of new workers are not perfectly observable by companies nor are the profits of these latter perfectly observable by banks.

In 1999-2000, our research team (Geneviève Gauthier, Patrick Soriano, Jean-Guy Somonato, Michel Denault, and Georges Dionne) undertook a large scale (theoretical and applied) project to explain the basic reasons for credit spreads differentials. The team uses a portfolio of more than 125,000 bonds and detailed information about Moody's credit ratings to propose an empirical explanation of bonds' yields based on credit, market, and liquidity risks.

Another project touched on integrated risk management in non-financial firms. We carried out a project allowing us to pinpoint the significant determinants explaining why

gold-producing companies cover fluctuations in the sales price of gold. Special attention is also being paid to the relations of complementarity and substitution existing between corporate mergers and acquisitions and risk management.

In 2001, in collaboration with a Canadian bank, two aspects of credit risk are studied in greater detail :

1. Explanation of the probability of defaulting on commercial loans, and
2. Identification of factors explaining the rate of recovery in cases of default.

## 2. *Management of individual risks*

Individuals are constantly confronted with risks: risks of automobile or occupational accidents, lotteries, pollution, illness, fire, bankruptcy, death (suicide), retirement... These risks are more or less correlated and more or less a matter of choice. Often, individual risks are not observable (antiselection) by various parties involved (bank, insurance company, doctor) and they are influenced by unobservable individual behaviours (moral hazard) in most markets.

It is surprising to note that very few researchers have proposed behaviour models taking into account simultaneously these different risks and behaviours in a context of asymmetric information. This remark also applies to practitioners who often offer financial products which do not truly take into account the global portfolios of their clients. All too often, only the financial portfolios are considered and (more or less freely chosen) uninsured risks are ignored.

Our goal is thus to analyze how accounting for the different risks (whether insurable or not) contained in an individual portfolio can influence the choices of prevention activities and assets. The natural point of departure is the traditional portfolio-choice model which is capable of handling several financial risks at a time. This model can be extended to take into account different assets over which decision-makers have more or

less control, but which have an effect on the profitability and risk of individual portfolios. Group life insurance and retirement funds are two examples. The bank-insurance link is another one. Naturally, this link can be analyzed as a problem of distributing complementary financial products, but it can also become a source of risk management. For example, it is a well known fact that saving behaviours can have an influence on incentives to prevent accident risks.

Another concern deals with the measurement of individual risks. Are individual portfolios truly diversified when the behaviours of individuals or of their portfolio and account managers can influence their accident rates? Can we speak of aggregated or global risk in an individual portfolio? If so, how can it be measured?

In 1996-1997, a research project, related to a doctoral thesis, was concerned with the measurement of global risk in an individual-risk portfolio and on the effect exogenous variation in an asset's risk might have on the composition of the portfolio after the optimal reactions of the portfolio's holder have been taken into account. Another project connected with another doctoral thesis studied the perception of risk-averse decision-makers. The thesis showed that the choices expressed by decision-makers are strongly influenced, not only by traditional measurements such as mathematical mean and variance, but also by their general perception of risk. This is why various paradoxes are brought to light in many simple experiments. A third doctoral thesis was studying whether individuals' behaviour in preventing work accidents will depend not only on their attitude towards risk but also on their (unobservable) perception of the (often non-financial) consequences of accidents on their welfare.

In 1997-1998, a model for computing the value at risk (VaR) of individual portfolios was developed; it includes shares and options. During 1998-1999, our work focused on individuals' prevention activities. In collaboration with a postdoctoral fellow and two Belgian researchers, we developed a model (Proper Risk Behaviour) capable of solving an important paradox found in the literature. Up to that point, researchers had failed to explain why risk-averse individuals could choose to practice less prevention than those who were risk-neutral.

Another research in collaboration with a doctoral student has allowed us to propose necessary and sufficient conditions to explain how individuals with utility functions dependent on states of nature will react to lotteries. This research will be published in the *Geneva Papers on Risk and Insurance Theory*.

In 1999-2000, our work focused on individuals' perception of lotteries. We have specifically shown that the new models proposing transformation functions of the probabilities are not truly useful in explaining the different paradoxes connected with theories of choice in a context of uncertainty. Indeed, most models are limited to explaining one paradox at a time, which means that they are not very useful in predicting the behaviour of individuals in complex risky situations. This part of our research is fundamental, as very few researchers are capable of predicting individuals' lottery choices. The behaviour of compulsive players creates substantial social costs. This research was published in *Journal of Risk and Uncertainty*.

In 2000-2001, we produced two working papers on optimal portfolios : one, concerning portfolio choices when risk measurements are general, was published in *Economics Letters*. We also proposed a separation theorem which extends that of Ross to all concave utility functions, by imposing a more general restriction on the dependence between risky assets (regression dependence) than that of the covariance between financial assets.

### 3. *Management of insurance risks*

The study of optimal insurance decisions in different markets has also too often been carried out without taking into account the risk portfolios of individuals, firms, and insurers. For example, is a firm's insurance claim for operating losses or pollution risks a function of its debt ratio? Do the companies that buy these forms of insurance obtain better financial terms with banks? Who will be ultimately responsible before the courts in the case of legal prosecution for an environmental accident leading to the firm's bankruptcy? The bank or the polluter? Must the liability insurance of large firms be priced according to their financial portfolio or must it be limited by taking into account actuarial factors dependent only on insurable risks? Finally, how should the aggregate risks of vehicle fleets be insured?

At the Chair, we are conducting several research projects on insurance risks. In 1996-1997, in collaboration with the Insurance Bureau of Canada and several insurers representing more than 70% of the automobile insurance market, we have undertaken a vast study on insurance fraud. Three reports have been produced. We have studied the effectiveness of fraud indicators. It is interesting to note that the methodology needed to identify defrauders is similar to that used to identify those who do not pay their debts, which does not necessarily imply that the latter are defrauders. On the other hand, this result can suggest that acts of opportunistic fraud may not stand alone and may generate portfolio risks for insurers, similar to those banks experience with credit.

Another project, integrated into a doctoral thesis, studies how the economic situation can have an effect on arson in firms. Once again, there is a long-term aggregate relation interconnecting individual risks and this relation may influence the global risk in insurers' portfolios.

Our team has completed two important studies on traffic safety financed by the FCAR-MTQ-SAAQ program. The first analyzed the effect on accidents of the SAAQ's change in public insurance pricing (introduction of demerit points in 1992) and the second analyzed the effect of changes in regulation (1991) on new drivers obtaining

their driver's license. The first project shows that using pricing as an incentive reduces accidents and violations. On the other hand, the 1991 changes which can be described as administrative rather than as incentives have had no effect at all on traffic safety.

Two new projects on trucking risks were started up in 1996-1997. One analyzed the behaviour of truck drivers and the other studied the risk management of trucking firms. The two projects are very closely related, since the accident risks of drivers are influenced by the prevention efforts of their employers and a trucking firm's effectiveness in risk management will depend on its own prevention incentives which can, in turn, have an effect on the behaviour of drivers.

Finally, a research report was published in December 1996 on insurance demand by large insurance companies. It shows that risk-neutral firms that take out insurance obtain better financial conditions from banks. This report is now published in *Economic Theory*.

In 1997-1998, our team continued the two projects on the risks affecting trucking firms. A new project to study insurance fraud has been set up in collaboration with the large Canadian insurer. A masters student wrote her thesis while serving as an fellow in an insurance company. Her project consisted in studying how long-term car rentals influence the anti-theft behaviour of drivers. She shows that rented cars are stolen more often than purchased cars, yet insurers do not reflect this difference in their insurance rates.

In 1998-1999, a project studying management of a life insurance company's balance sheet was underway. A masters student did a cost-benefit analysis which shows how future contracts can be used to manage the balancing of assets and liabilities.

We have developed a model using the demerit points of trucking firms and truckers to measure the risks associated with fleets. The model proposed to the SAAQ decentralizes the management of prevention to trucking firms by pricing vehicle licenses

according to the demerit points accumulated by trucking firms and truckers. Trucking outfits will thus be doubly motivated to make their operations safe. This approach also has administrative advantages for the SAAQ which lacks information on whether the holders of drivers licenses actually work as professional drivers. It does indeed know the categories of licenses held by individuals but does not know if these individuals drive professionally or who their employers are.

In 1999-2000, we developed a model using the demerit points of trucking companies and drivers to measure the risks associated with fleets. The model proposed to the SAAQ decentralizes the management of prevention to trucking firms by pricing vehicle licenses according to the demerit points accumulated by trucking firms and truckers. Trucking outfits will thus be doubly motivated to make their operations safe. The model is now published in a very good actuarial journal, the *Astin Bulletin*. It has been presented to the *Société française des statisticiens* as well as to the French insurance industry and further developments are underway for next year.

Finally, in collaboration with a student from the *Université de Paris X*, we are setting up a system to detect insurance fraud in the portfolio of one of largest French insurers.

A 2000-2001 project had to do with the presence of moral hazard and antiselection in the portfolios of insurers. In general, it is practically impossible to identify the two problems simultaneously without using dynamic information or information which includes at least several different dates. To illustrate this, let's take the case of the replacement value introduced in the 90s. The Insurance Bureau of Canada asked us to identify the reasons why there are more car thefts when owners have the additional replacement value clause. There were three possible explanations open to us :

1. The replacement value is chosen by bad risks, a phenomenon linked to antiselection ;
2. The policy-holders with this additional clause are less cautious, a hypothesis related to ex-ante moral hazard ;

3. The policy-holders with this additional clause prefer to have their car stolen during the months just before expiry of the clause (24 months in Canada), an element concerning ex-post moral risk.

By using rather sophisticated electronic techniques which can take into account the make of the car and the dates of the contracts, we showed that the replacement value was significantly related to insurance fraud and that it had no notable effect either on anti-theft measures or on the declaration of risks. Claims auditing thus turns out to be the most important factor in reducing the number of thefts associated with the replacement value.

During the past year, we were invited as experts on questions connected with the deregulation of automobile insurance. First, we attended a conference on the deregulation of insurance rates in the United States. We were among some ten experts invited by the *Brookings Institute* to give their opinions on this matter. Our mandate was to highlight experiences outside of the United States: in France, in Canada, and in Japan. He next helped prepare France's case in a dispute on the bonus-malus for car insurance, which was pitting this country against the rest of Europe. Europe wants to abolish the French bonus-malus, advancing the pretext that it is harmful to competition. We have shown that the French bonus-malus might have properties promoting traffic safety and that it should not be eliminated without something to replace it. Moreover, it is completely unwarranted to claim that this pricing system is counter competitive.

## **Collaborators**

Several of HEC's colleagues have participated in a number of the Chair's research projects :

Michel Denault, quantitative methods department ;  
Robert Gagné, economics department ;  
Geneviève Gauthier, quantitative methods department ;  
Paul Lanoie, economics department ;  
Jean-Guy Simonato, finance department ;  
Patrick Soriano, quantitative methods department.

Researchers who are very respected on the international scene have also published several articles or chapters of books in collaboration with the holder of the Chair :

Neil Doherty, University of Pennsylvania ;  
Louis Eeckhoudt, FUCAM, Belgium ;  
Claude Fluet, UQAM ;  
Christian Gollier, *Université des Sciences sociales de Toulouse*, France ;  
Christian Gouriéroux, CREST, France ;  
Jean Pinquet, *Université de Paris X-Nanterre*, France.

Finally, the Chair has supervised five postdoctoral fellows over the past five years :

Yves Alarie, postdoctoral fellow, CRT, *Université de Montréal* ;  
Bénédicte Coestier, now professor at *Université de Paris X-Nanterre*, France ;  
Kaïs Dachraoui, now researcher at Statistics Canada ;  
Philippe Godfroid, now researcher at FUCAM, Belgium ;  
Sandrine Spaeter, now professor at *Université de Strasbourg*, France.

Four of them have written articles with the holder of the Chair.

## **State of financial resources provided by HEC**

As already indicated, it is HEC which has financed the Risk Management Chair since its creation in 1996. The \$125,000 granted annually covers the research and other activities of the Chair. The chairholder's allowance and payment for his release from teaching duties are from other school sources.

Surpluses are accumulated and kept aside for special projects or as a contingency fund to finance graduate students and professionals in lean years from other research financial sources. The accumulated surplus amounts to \$72,068.92.

The main operating expenses are those generated by the secretary's pay and the salaries of research professionals (payments to other institutions). Postdoctoral fellows, doctoral and masters students are mainly financed by research grants or scholarships offered by external organizations. The Chair also handles the competitive examinations for the *Fondation Mercure's* scholarship program in risk management (four fellowships of \$4,500 granted to students at the masters level) and fellowships received from the private sector. These fellowships are administrated by the Student Services of HEC.

In its early days, the Chair shared a secretary with the journal *Assurances*, each paying for half of the work week. When this journal fell into financial difficulties, the Chair agreed with the School's Director that it would bear a part of the journal's secretarial costs. The Chair also finances a part of the editor-in-chief's salary: a sum of \$10,000 per year.

The Chair paid to purchase graduate students' computer equipment and the chair holder's laptop. All the conferences organized by the Chair and the journal produced surpluses which were then reinvested in the journal. The only conference that the Chair financed was the *Risk Theory Seminar* of the *American Risk and Insurance Association* in April 2001. This was a purely academic international conference where only participants having already made a presentation could attend. The delegates pay for their transportation and lodging, but the host university normally pays reception costs.

The Chair also financed transportation from the hotel to the university during the three days of the conference, using the services of a bus rental outfit.

In conclusion, the results indicate that the original (annual) \$125,000 in funding allotted to the Chair's activities-not counting the chair holder's allowance and payment for his release from teaching duties- was enough to finance research activities over the first five years.

## **Principal activities for the 1996-2001 period**

1996-1997

The first activity of the year was to get the Chair up and running. Mrs. Claire Boisvert, was recruited as a part-time secretary, and it was she who set up the office and quickly got things running smoothly.

The journal *Assurances*, founded in 1932 by Gérard Parizeau, was ceded to the School by Sodarcac in the fall of 1996, and thus became the School's property in November 1996. The Risk Management Chair has assumed responsibility for managing the journal, though the two entities do have separate budgets. The chair-holder is also the editor of the journal.

The second important activity was thus to integrate the journal with the School and to ensure that the former was properly managed. In order to maintain the journal's program of activities (such as its circulation in the industrial milieu) while modifying its mission to reflect the fact that it was now being produced in a university milieu, it was decided to recruit an editor-in- chief with experience in the insurance milieu who was well acquainted with the journal. Mr. Rémi Moreau, the former director of *Assurances*, accepted our invitation and this enabled us to keep producing the journal without any interruption as it was being modified. The journal's annual report contains more detailed information on the integration of the journal with both the School and the Chair.

During the 1996-1997 academic year, the Chair hosted two postdoctoral students who engaged in research on serious risks such as those connected with the environment: (1) Bénédicte Coestier did her doctoral studies at *Université de Paris-X Nanterre*. Her internship in Montreal was financed by France's *ministère des affaires extérieures*. Her research had to do with optimal dynamic banking contracts in a context of environmental risks. Specifically, she studied arbitration between insurance contracts and contingent debt contracts as well as the consequences of extending environmental risk liability to banks financing investment projects; (2) Philippe Godfroid did his doctoral studies in a joint program between the *Université Catholique de Mons* (Belgium) and the *Université de Toulouse* (France). His internship in Montreal was financed by Quebec's *Ministère de l'Éducation*. His main research subject concerned the profiling of individuals' willingness to pay for protection against risks according to their behaviour patterns when encountering risk.

The Chair also hosted the nine-month visit of Mrs. Olfa Ghali, a doctoral student from the *Université de Tunis III*, in order to supervise her research on estimating the parameters for the distribution of motor vehicle accidents. Her data base came from a Tunisian insurance company. She was mainly interested in measuring what effect Tunisia's new bonus-malus system was having on accident rates. She has now submitted her thesis to the *Université de Tunis III* and Georges Dionne is her thesis director.

The Chair has collaborated in creating three new courses in finance: one at the doctoral level entitled "Uncertainty and Information," one at the masters level entitled "Risk Management and Insurance," and one at the undergraduate level entitled "Risk Management." The first two were taught by Georges Dionne during the 96-97 academic year and the third was offered for the first time by Martin Boyer in January 1998.

In its first year, the Chair was involved in the organization of an international symposium and a congress. More than 95 participants from the academic milieu and the insurance industry attended the international symposium on car insurance: "Automobile

Insurance: Traffic Safety, New Drivers, Risks, Insurance Fraud, and Regulations." This symposium was organized jointly with the *Centre de recherche sur les transports de l'Université de Montréal*. More than 20 guests from the United States, Europe, and Canada presented their research findings at that symposium. A book containing the majority of these presentations was published by the Kluwer Academic Press in 1998 as part of the Wharton School collection, Huebner International Series on Risk, Insurance and Economic Security. Moreover, six articles presented at the conference have been published in *Assurances* in the form of two symposiums. This was a self-financed activity.

Another important activity was the organization of the 37<sup>th</sup> Congress of the *Société canadienne de science économique*. This Congress was attended by some one hundred speakers and attracted more than 175 participants to HEC. The Chair was more particularly involved in setting up a round table on the topic "Venture Capital and Technological Innovations" which grouped the following participants: Mr. Michel Patry, then HEC's director of research ; Mr. Marc Beauchamp, president of Investissements Novacap Inc.; Mr. Bernard Coupal, CEO of T<sup>2</sup>C<sup>2</sup>; Mr. Denis Dionne, president of Sofinov, and affiliate of CDPQ; and Georges Dionne.

#### 1997-1998

The primary activity of the year consisted in consolidating the Chair's place at the School. A series of seminars was proposed in collaboration with GReFi and professors from the Finance Department. The various seminars given over the years are listed in the appendix.

The second important activity was to consolidate the development of the journal *Assurances* within the School and to ensure it was being properly run. In order to maintain the journal's program of activities (such as its circulation in the industrial milieu) while modifying its mission to reflect the fact that it was now being produced in a university milieu, it was decided that two types of articles would be produced : articles

vetted by external reviewers and general articles reviewed by the director of the journal and the editor-in-chief.

A postdoctoral student doing research on environmental risks was hosted by the Chair in the 1997-1998 academic year : Sandrine Spaeter completed her doctoral studies at *Université de Strasbourg*. Her stay in Montreal was financed by the RCM<sub>2</sub>. Her specific research topic was arbitration between insurance contracts and contingent debt contracts as well as the consequences of extending environmental risk liability to banks financing investment projects. She produced three research documents during her stay with the Chair, two of which have been accepted for publication in very prestigious journals : *Economic Theory* and *Journal of Public Economics*. She is now assistant professor at the *Université de Strasbourg*.

The Chair has collaborated in creating three new courses in finance: one at the MBA level entitled "Risk Management and Insurance," and two at the certificate level entitled "Management and Analysis of Personal Insurance and Calculation of Annuities," and "Risk Management and Insurance Companies." Georges Dionne has taught the MBA course twice and it is now being handled by other professors.

#### 1998-1999

In collaboration with the Department of Accounting and the journal *Assurances*, the Chair organized a conference on risk management and accounting matters related to the use of derivatives. This conference took place on 6 November 1998. More than 130 participants attended.

It was decided that the journal *Assurances* should publish more thematic issues. In the current year, the July 1998 issue was devoted to the future of the financial services sector in Canada and the October 1998 issue, to the Quebec automobile insurance no-fault system for bodily injuries. Finally, articles from the conference on derivatives and their accounting implications were published in the April and January 2000 issues.

During the 1998-1999 academic year, the Chair hosted a postdoctoral fellow conducting research on financial risks and their prevention : Kaïs Dachraoui who completed his doctoral studies at the *Université de Montréal*. His fellowship at HEC was financed by RCM2. The specific research topic was portfolio choices and prevention on the part of individuals. He collaborated on the definition of a concept called "Proper Risk Behavior" and studied the effect of increased risk on portfolio choices. He has published three research working papers at the Chair and submitted four articles to international scientific journals One was published in *Economic Letters* and another is under review for publication in the *Journal of Risk and Insurance*.

#### 1999-2000

The main activity in 1999-2000 was the creation of the School's *Laboratoire de calcul en finance et assurance* (LACFAS). The project was the idea of the Chair's director who also prepared the application for its funding from the Canadian Foundation for Innovation. The principal motivation for this request stems from the fact that several of the School's young researchers were dissatisfied with the computer support available for their research activities. A second motivation was to make various data bases available to the young researchers from the four teaching departments involved. The School has obtained \$3.3M which will provide the laboratory's twenty researchers with access to the best computer equipment available for doing high speed calculations. Moreover, the funds will make it possible to acquire most of the data bases available for advanced research. For example, a portfolio of more than 125,000 bonds is now available as well as Moody's data bases, Compustat, Datastream, CRPS... In addition, the laboratory is in the process of developing a collaboration with Montreal's Institut de finance mathématique in order to finance long-term data bases. LACFAS groups researchers from four of the School's departments (accounting, finance, applied economy, and quantitative methods).

In collaboration with the *Institut international de recherche* and the journal *Assurances*, the Chair organized a conference on integrated risk management in non-financial firms. This conference took place on 13 and 14 April 2000.

The holder of the Chair has been very active in setting up the activities of the *Fonds Gérard-Parizeau*, a fund financed by the Parizeau family. Mr. Gérard Parizeau's two sons, Jacques and Robert, are very active in managing the fund and its principal activities. A competition has been set up to award the Gérard-Parizeau Prize and a conference was organized.

The Gérard-Parizeau conferences are part of the activities of the *Fonds Gérard-Parizeau*. Each year, when the Gérard-Parizeau Prize is given out, a speaker of international repute is invited to discuss a current topic of both theoretical and practical relevance. It was decided that the conference to accompany the first prize presented to a personality in the insurance sector would treat risk management and, more particularly, the management of credit risk by banks. We are currently witnessing fundamental reform in the international regulation of methods for calculating the capital banks require to protect themselves against the losses associated with credit risk. The speaker was Mr. Michel Crouhy, first vice-president for risk modelling at the CIBC. He is actively involved in the discussion of various complex questions accompanying this reform.

The director of the Chair has been elected secretary of the Risk Theory Seminar of the American Risk and Insurance Association. HEC has been chosen to organize the 2001 meeting of this group of international researchers.

In the fall of 2000, the Chair's holder terminated his work on a reference book on insurance; this book has been published by Kluwer Academic Press as the *Handbook of Insurance*. A soft cover edition went to press in 2001. To make this edition affordable to graduate students, it was in part financed by the *Geneva Association for the Study of Risk and Insurance*.

The *Handbook of Insurance* is a reference book on insurance and risk management. This book of more than 1,000 pages contains articles by thirty-five of the most highly respected international specialists. Destined to become an important source

of information on the evolution of the developments in research observed over the past thirty years, it also highlights the findings of recent research.

Written by the chairman of the *Fédération française des Sociétés d'Assurances*, Mr. Denis Kessler, the book's preface is very eloquent :

*The work accomplished by Georges Dionne and the authors who contributed to this project is of vital importance to anyone who is interested in the development of insurance. It lays the foundations of a new knowledge base — practically a new discipline: that of the science of risks, which is likely to lie at the heart of our future.*

The *Handbook of Insurance's* table of contents is available on the Chair's web site : <http://www.hec.ca/gestiondesrisques/handbook.html>. It took more than four years to complete this book which was undertaken in response to a request from the University of Pennsylvania's Huebner Foundation.

2000-2001

During a conference held at the Conservatoire National des Arts et Métiers in Paris, the Chair's holder was awarded the *Spécial 2001 Risques-les Échos* for the *Handbook of Insurance*. On that occasion, he spoke on the new issues involved in risk theory to an audience of more than 200 representatives of insurance companies and the academic milieu. A summary of the text of that speech was published in *Les Échos, le Quotidien de l'Économie* on Wednesday 23 May. The prize was handed to him by Mr. Denis Kessler, chairman of the *Fédération française des Sociétés d'Assurances* and by Mr. Nicolas Beytout, editor of the *Échos*. The full text of this speech will be published in the fall issue of *Risques*.

The Risk Management Chair organized the Risk Theory Seminar for the American Risk and Insurance Association. The researchers who participate in this seminar become members of the Risk Theory Society, a group of first-line researchers on risk ,

insurance, and risk management. The RTS is a self-financing arm of the American Risk and Insurance Association (ARIA). Its goal is to encourage the members of ARIA to develop top-quality research in the field of risk theory and risk management. To become a member of RTS, a researcher must see one of his articles accepted among the ten presented at the annual meeting and attend the Society's meetings regularly. The Society's members are researchers from Belgium, Canada, France, Israel, and, above all, from the United States. More than 40 researchers from this prestigious group met in April 2001 at the School. Further information can be obtained on the Society's web site at [www.aria.org/rts](http://www.aria.org/rts). The Chair's holder was elected chairman of the Risk Theory Society for the 2001-2001 period.

The chair-holder organized a transatlantic "webcast" on venture capital involving ESSEC in France and HEC in Canada. Representatives of venture capital societies and of high-tech businesses on both sides of the Atlantic met to discuss their knowledge before two audiences in both business schools.

Georges Dionne gave his inaugural speech before the Royal Society of Canada on 6 April 2001 at McGill University. He was introduced by Mr. Jean-Marie Toulouse, Director of HEC.

Another noteworthy activity involved increasing the circulation of the journal *Assurances*. A three-year electronic subscription worth \$5,000 per year was obtained from the Canadian Insurance Institute. It gives the 9,000 members of the Institute access to the journal *Assurances* on their web site; this access is protected by an access code. A request for funds has also been sent to the Canadian Fund for Magazines in view of building an international distribution network for *Assurances*. We are still awaiting a response to this request.

## **Publications**

The past five years have been productive ones: 54 working papers were produced by different collaborators. The Chair's holder published (had accepted) 31 peer-reviewed articles in scientific journals ; 4 of these articles were rated 'A' by the School. 4 articles were also published in professional journals, along with 7 chapters of books and one book review. The Chair has produced 6 research reports, including 4 submitted to the *Société de l'assurance automobile du Québec*. These documents are listed in the appendix.

The Chair's holder supervised the publication of two volumes. The first, produced in collaboration with Dr. Claire Laberge-Nadeau, stems from a conference on automobile insurance held at the School in 1997. He co-chaired the conference on automobile insurance and traffic safety which, as part of the 25th anniversary of the CRT, attracted about 100 participants. The book arising from the conference was published by Kluwer Academic Press. It contains 22 chapters totaling 382 pages. Several of these chapters were written by American ( seven ) and European (three) researchers. This book covers four important subjects (asymmetric information, insurance fraud, young drivers, and automobile insurance regulation) which should serve to up date the academic discussions on these topics.

The second volume is the *Handbook of Insurance* published in 2000 by Kluwer Academic Press and printed in a soft cover edition in 2001. This second edition was partially financed by the *Geneva Association*. The *Handbook of Insurance* was used in two courses at the University of Georgia during the summer of 2001. This book of more than a thousand pages contains comprehensive articles (28 chapters) written by thirty-five of the most highly respected international specialists. Destined to become an important source of information on the evolution of the developments in research observed over the past thirty years, the book also highlights the findings of recent research.

## **Training**

When the Chair was created in 1996, there was not a single doctoral student in finance and the department had a pressing need for staff to supervise the research work of M.Sc. students. The Director of the School had asked the holder of the Chair to make a special effort to develop training for the School's graduate students in finance. The appendix to this report lists the students that the holder has supervised since 1996 as well as the students currently under his supervision. Since the month of September 1997, the holder of the Chair has been running the doctoral program in the Department of Finance. The Department now counts nine students, five of which are writing their thesis. Three new doctoral courses have been created: "Uncertainty and Information," by Georges Dionne ; "Numerical Methods in Finance," by Jean-Guy Simonato and Geniviève Gauthier ; "Financial Behaviours," by Pascal St-Amour. Moreover, the holder of the Chair is supervising two doctoral theses in France, one in Tunisia, and five at the School.

Five postdoctoral fellows have been hosted by the Chair since 1996 : two came from France, one from Belgium, and two from Canada. During these fellowships, they produced 12 working papers ; 7 of which have been published or accepted for publication in scientific journals. The three European fellows have university positions, Kaïs Dachraoui is a researcher at Statistics Canada and Yves Alarie is continuing his research program.

Several risk management courses have been created in the School's various programs since the Chair was set up.

M.Sc. :            6-218-98 :    Risk management and insurance

M.B.A. :            53-202-96 :    Management of exchange risks  
                          53-218-96 :    Risk management and insurance

B.A.A. :            3-202-97 :    Risk management

Certificate	30-218-98 :	Risk management and business insurance
	30-214-98 :	Risk and analysis of personal insurance and calculation of annuities

The holder of the Chair was involved in the preparation of all the course outlines listed above and he has also taught the M.Sc. course (which is now run on a quota basis) regularly and the M.B.A. course twice.

The Chair has been active in integrating Martin Boyer into the Department of Finance. It gave him a start-up budget of \$10,000 and invited him to publish his research work in the Chair's working papers. The holder of the Chair has also set up a research team grouping professors from the Department of Finance and the Department of Quantitative Methods (Jean-Guy Simonato, Geneviève Gauthier, Michel Denault, and Patrick Soriano). This team worked on an important project with the CIBC of Toronto, in order to develop its "Credit VaR" as part of Canada's MITACS funding program. After this project, the team started another more academic project on the interest rates spreads. These researches were presented under the "research" component at the strategic workshops held over the last three summers at the School. This same team is now preparing an international conference on credit risk which will take place at the School in the spring of 2002. The official organizing committee for the conference is composed of Philippe Jorion, professor of finance at the University of California, Michel Crouhy, vice-president of risk management at the CIBC, and Georges Dionne.

Finally, the holder of the Chair is a member of a FCAR research team along with Paul Lanoie and Robert Gagné, professors at the School's *Institut d'économie appliquée*. Two new professors at the School will be integrated into this team when the application for refunding is made this fall; they are: Pascal François of the Faculty of Finance and Benoît Dostie from the *Institut d'économie appliquée*.

## **Public Profile**

Since June 1996, the holder of the Chair has made 73 seminars, including academic seminars at the universities of : Chicago, Michigan, Paris X and Strasbourg. The list of presentations can be found in the appendix.

Last May, the chair-holder was the guest speaker for the *Fédération française des Sociétés d'Assurances*. He gave a speech entitled "New Issues in Risk Theory" at the *Conservatoire national des Arts et Métiers* in Paris before an audience of more than 200 representatives of insurance companies and the academic milieu.

The holder of the Chair headed the Canadian Economic Association in 1997. He has been the secretary-treasurer of that association since 1998. He is also director of the Collection of the Canadian Economic Association which has published two books since 1996.

The holder is director of the journal *Assurances* and is a member of the editorial committee (or associate editor) of five international journals, one of which is rated "A" in the School's scale. These five journals are :

- *Journal of Risk and Uncertainty* ;
- *Journal of Risk and Insurance* ;
- *Risques* ;
- *Geneva Papers on Risk and Insurance Theory* ;
- *Annales d'économie et de statistiques*.

In march 2002, he will become a member of the board of directors of the Canadian Economic Association.

The holder of the Chair has received several prizes since 1996 :

- Research prize : Prix Pierre Laurin, for scientific contribution over the 1996-1998 period, HEC-Montreal in 1998.
- ACFAS Prix Marcel-Vincent in 1999, recognizing the achievements of someone working in the social sciences. Awarded to a researcher who has made an outstanding scientific contribution. It recognizes, in particular, the originality, scope, and impact of achievements.
- Elected member of the Royal Society of Canada in 2000.
- Chairman of Risk Theory Society, American Risk and Insurance Association in 2001.
- Special prize from *Risques-Les Échos* (France) for the publication *Handbook of Insurance* in 2001.

Over the past year, he has been invited as an expert on questions concerning the deregulation of automobile insurance. First, he participated in a conference on the deregulation of insurance rates in the United States. The Bookings Institute invited some ten experts to come and give their opinions. The chairholder mandate was to highlight experiences outside of the United States, notably in France, Canada, and Japan. He next helped prepare France's case in a dispute on the bonus-malus in car insurance pitting this country against Europe. Europe wants to abolish the French bonus-malus, advancing the pretext that it is harmful to competition. It was shown that the French bonus-malus might have properties promoting traffic safety and that it should not be eliminated without something to replace it. Moreover, it is completely unwarranted to claim that this pricing system is counter competitive.

## **Research and Infrastructure Grants**

The holder is regularly financed by CRSH and the FCAR-team program. He is also heavily involved in the concerted traffic safety program financed by SAAQ, MTQ, and FCAR. Since June 1996, he has received close to \$1.7M in research grants. The main projects are listed in the appendix.

In 1999-2000, the chair holder piloted the School's CFI (Canadian Foundation for Innovation) grant application. He obtained \$3.3M for the creation of LACFAS, a new laboratory for financial and insurance calculation. More than twenty of the School's professors participated in this project.

## **Conclusion**

We have here presented the fruits of our work during the first five years of the Risk Management Chair. During those years, we focused on the formation of top-notch human capital, by means of challenging teaching and close supervision of groundbreaking research. Most of our students wrote articles based on their thesis or dissertation. In 2001, the School awarded one of the Chair's students its prize for the best M.Sc. thesis. A great deal of energy has also been spent on keeping risk management courses in step with the rapid evolution of markets.

Special attention has as well been given to the supervision of the School's young professors, whether by exposing them to seminars and conferences or by integrating several of them into research teams.

Numerous collaborations have been carried out with two Canadian banks, with Canadian and foreign private insurers, and with parapublic bodies such as the Société de l'assurance automobile du Québec. Several students were able to complete their theses thanks to internships in these firms.

We would say, in conclusion, that the report reflects the balance sheet of a Chair whose accomplishments are rooted in academic research marked by a diversity of practical concerns. HEC's Risk Management Chair is very well positioned on the international scene and has nothing to envy any other Canadian university in the field of risk management.

I would like to thank all those who have helped me over these past five years. I want, in particular, to underline the exceptional collaboration of Mrs. Claire Boisvert and Mr. Rémi Moreau.

# **Appendix**

**List of Joint  
GReFi/Risk Management Chair Seminars**

**Publications, reports and  
working papers**

**Students supervised, financed and  
those having completed their studies**

**List of conferences given by  
the holder**

**Leading research projects**

## **Joint GReFi/Risk Management Chair Seminars**

- 04-06-01 Edwin J. Elton, New York University, New York, "On the Valuation of Corporate Bonds Using Rating Based Models."
- 04-04-01 Jan Ericsson, *Université McGill*, Montreal, "The Valuation of Corporate Liabilities: Theory and Tests."
- 03-15-01 Christian Gouriéroux, CREST, Paris, "Un modèle de tarification des options qui généralise Black and Scholes et la valeur à risque des portefeuilles."
- 11-30-00 Adam Reed, Wharton School, Philadelphia "Costly Short-Selling and Stock Price Adjustment to Earnings Announcements."
- 11-08-00 Minh Chau To, HEC–Montreal, "Dynamic Optimal Futures Hedging with Jump Risk and Stochastic Interest Rates."
- 11-01-00 Monique Jeanblanc, *Université d'Évry Val d'Essonne*, Évry-sur-Seine, "Optimal Portfolio Management with American Capital Guarantee."
- 10-18-00 Huntley Schaller, Carleton University, Ottawa, "A Revealed Preference Approach to Understanding Corporate Governance: Evidence from Canada."
- 10-11-00 Nicolas Nalpas, *Université de Paris I Panthéon-Sorbonne*, Paris, "Lottery Dependent Expected Utility Theory as a Solution to the Equity Premium Puzzle."
- 09-27-00 Nabil Tahani, HEC–Montreal, "Évaluation des options sur les écarts de crédit sous GARCH."
- 04-19-00 Ben Siu Cheong Fung, Canada Bank, "Uncovering Inflation Expectations and Risk Premiums from Internationally Integrated Financial Markets."
- 04-12-00 André Rolland, Arthur Andersen, Paris, "L'application des valeurs à risque pour les entreprises non financières: spécificités et modalités d'application."
- 04-05-00 Kris Jacobs, Université McGill, "Asset Market Data do not Imply High Risk Aversion: Reassessing the Evidence on Asset Pricing Puzzles."
- 02-23-00 Christopher C. Finger, RiskMetrics Group, "Conditional Approaches for CreditMetrics Portfolio Distributions."

- 02-16-00 Christian Gouriéroux, CREST et CEPREMAP, "Analyse des sensibilités des valeurs à risque".
- 02-09-00 Vasumathi Vijayraghavan, *Université Paris Dauphine*, "Does Issuing Stock Index Linked Debt Create Shareholder Value? Evidence from the Paris Bourse."
- 01-19-00 Tom McCurdy, University of Toronto, "Modeling Volatility Dynamics."
- 12-01-99 Glen R. Waddell, Purdue University, "Executive Compensation and Project Selection: Incentives Under Contingent-Compensation Schemes."
- 11-03-99 Pascal St-Amour, *École des Hautes Études Commerciales*, "Une analyse empirique de la richesse agrégée, de la consommation et des choix de portefeuille."
- 10-13-99 Martin Boyer, *École des Hautes Études Commerciales*, "Attention médiatique et réglementation de l'assurance responsabilité."
- 10-06-99 Michel Poitevin, *Université de Montréal*, "Incitations, structure organisationnelle et étalonnage."
- 09-29-99 Kaïs Dachraoui, *École des Hautes Études Commerciales*, "Comportement cohérent face au risque."
- 09-22-99 Geneviève Gauthier, *École des Hautes Études Commerciales*, "Précision de l'estimateur martingale empirique pour les prix d'option."
- 04-07-99 Ramazan Gençay, Olsen & Associates, "Real-Time Trading Models and the Statistical Properties of Foreign Exchange Rates."
- 03-31-99 Michel Crouhy, CIBC, "Measuring Credit Risk: A Comparative Analysis of Credit VaR Models."
- 03-31-99 J.S. Butler, Vanderbilt University, "Estimating Value-at-Risk with a Precision Measure by Combining Kernel Estimation with Historical Simulation."
- 12-16-98 Christian Sigouin, Université Concordia, "Investment Decisions, Financial Flows, and Self-Enforcing Contracts."
- 11-25-98 Marie-Claude Beaulieu, Université Laval, "A General Model for Payoffs to Offsetting Positions in a Stock Market Index and Related Entities."
- 11-18-98 Georges Dionne, *École des Hautes Études Commerciales*, "Déterminants de la dette et effets de la dette sur les structures salariales."

- 11-11-98 Abolhassan Jalilvand, Concordia University, "Why Firms Use Derivatives: Empirical Evidence from Canada."
- 10-28-98 Susan Christoffersen, McGill University, "Fee Waivers in the Money Market Mutual Funds."
- 10-23-98 Van Son Lai, *Université Laval*, "An Accurate Analysis of Vulnerable Loan Guarantees."
- 10-07-98 Jean-Guy Simonato, *École des Hautes Études Commerciales*, "Une approximation analytique pour le modèle d'option GARCH."
- 09-30-98 Martin Boyer, *École des Hautes Études Commerciales*, "Financement par dette quand le prêteur ne peut pas se commettre."
- 03-20-98 Germain Montagner, Structured Derivatives Credit Agricole–Indosuez, New York, "Credit Risk."
- 02-11-98 Christian Gouriéroux, Laboratoire Finance–Assurance CREST (France), "L'économétrie des frontières efficientes (de choix de portefeuille)."
- 11-19-97 Simon Gervais, Wharton School, "Apprendre à être optimiste."
- 11-12-97 Richard Chung, Concordia University, "Are the Market Effects Association with Index Revisions Robust?."
- 10-29-97 Martin Boyer, *École des Hautes Études Commerciales*, Déjeuner d'Archimède : "Taxation optimale de l'assurance en présence de fraude."
- 10-15-97 Jean-Guy Simonato, *École des Hautes Études Commerciales*, "L'évaluation d'options Américaines GARCH par une chaîne Markov."
- 10-08-97 Jean Roy, *École des Hautes Études Commerciales*, "La réglementation des activités financières: pour une évolution dynamique et prudente."
- 06-05-97 Jean-Charles Rochet, *Université de Toulouse*, "La politique économique des systèmes d'assurance santé publics."

## **Publications**

### **Books, articles, reports and working papers**

#### **Books**

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- Dionne, G., Balhadji, E.B., "Développement d'un système expert de détection automatique de la fraude à l'assurance automobile," 1997. Report transmitted to Bureau d'assurance du Canada.
- Dionne, G., Desjardins, D., Pinquet, J., "L'évaluation du risque d'accident des transporteurs en fonction de leur secteur d'activité, de la taille de leur flotte et de leur dossier d'infractions," publication CRT-99-28, Centre de recherche sur les transports, August 1999. Report transmitted to SAAQ.
- Lord, D., Hamidou, M.A., Laberge-Nadeau, C., Dionne, G., N'Zué, A., "Élaboration d'un plan d'actions en matière de sécurité routière en milieu interurbain au Burkina Faso," Actes de la XIe Conférence canadienne multidisciplinaire en sécurité routière; June 10-13, 2001, London, Ontario. Report transmitted to CIMA International to Banque Mondiale.

## Working papers

Number	Title	Authors
96-01	Corporate Insurance with Optimal Financial Contracting	B. Caillaud G. Dionne B. Jullien
96-02	Insurance Fraud Estimation : More Evidence from the Quebec Automobile Insurance Industry	L. Caron G. Dionne
96-03	Une évaluation empirique de la nouvelle tarification de l'assurance automobile (1992) au Québec	G. Dionne C. Vanasse
97-01	Assurance valeur à neuf et vols d'automobiles : une étude statistique	L. Bujold G. Dionne R. Gagné
97-02	Analyse de l'effet des règles d'obtention d'un permis de conduire au Québec (1991) sur la sécurité routière	G. Dionne C. Laberge-Nadeau U. Maag D. Desjardins S. Messier
97-03	Risque de santé, médecine préventive et médecine curative	L. Eeckhoudt P. Godfroid M. Marchand
97-04	Développement d'un système expert de détection automatique de la fraude à l'assurance automobile	E.B. Belhadji G. Dionne
97-05	The Non-Optimality of Deductible Contracts Against Fraudulent Claims: An Empirical Evidence in Automobile Insurance	G. Dionne R. Gagné

<b>Number</b>	<b>Title</b>	<b>Authors</b>
97-06	Development of an Expert System for the Automatic Detection of Automobile Insurance Fraud	E.B. Belhadji G. Dionne
97-07	Le consentement à payer et les méthodes de réduction du risque	P. Godfroid
97-08	Détermination des prix et des quantités d'équilibre contingents : application à des fonctions d'utilités usuelles	P. Godfroid
97-09	Diffidence Theorem and State Dependent Preferences	G. Dionne M.G. Ingabire
97-10	Insurance Taxation and Insurance Fraud	M.M. Boyer
97-11	Increases in Risk and Optimal Portfolio	G. Dionne F. Gagnon K. Dachraoui
98-01	Offre d'assurance non vie : une revue de la littérature récente	G. Dionne
98-02	The Informational Content of Household Decisions with Applications to Insurance Under Adverse Selection	G. Dionne C. Gouriéroux C. Vanasse
98-03	Information Structure, Labour Contracts and the Strategic Use of Debt	K. Dachraoui G. Dionne
98-04	Over-Compensation as a Partial Solution to Commitment and Renegotiation Problems : the Case of Ex-Post Moral Hazard	M.M. Boyer
98-05	A Rationale for Borrowing More than Needed	M.M. Boyer

<b>Number</b>	<b>Title</b>	<b>Authors</b>
98-06	Analysis of the Economic Impact of Medical and Optometric Driving Standards on Costs Incurred by Trucking Firms and on the Social Costs of Traffic Accidents	G. Dionne C. Laberge-Nadeau D. Desjardins S. Messier U. Maag
98-07	The Estimation of Deposit Insurance with Interest Rate Risk	J.C. Duan J.G. Simonato
98-08	Portfolio Response to a Shift in a Return Distribution: Comment	K. Dachraoui G. Dionne
98-09	Evidence of Adverse Selection in Automobile Insurance Markets	G. Dionne C. Gouriéroux C. Vanasse
98-10	Réflexion sur l'optimalité des contrats d'assurance	S. Spaeter
98-11	The Principal-Agent Relationship: Two Distributions Satisfying MLRP and CDFC	S. Spaeter
98-12	Environmental Risk and Extended Liability: The Case of Green Technologies	G. Dionne S. Spaeter
98-13	Poll Subsidy and Excise Tax	M.M. Boyer
98-14	An Analysis of the Title Insurance Industry	C. Nyce M.M. Boyer
98-15	Internal Control Systems and Risk Management in the Life and Health Insurance Industry: Current issues	P. André D. Côté R. Morissette
98-16	La mesure empirique des problèmes d'information	G. Dionne
98-17	Some Remarks About the Probability Weighting Function	Y. Alarie G. Dionne

<b>Number</b>	<b>Title</b>	<b>Authors</b>
98-18	Le non-respect du code de la sécurité par les conducteurs professionnels en fonction des caractéristiques des individus, des transporteurs et de l'environnement routier	G. Dionne C. Laberge-Nadeau U. Maag D. Desjardins S. Messier
99-01	Proper Risk Behavior	K. Dachraoui G. Dionne L. Eeckhoudt P. Godfroid
99-02	L'évaluation des risques d'accidents des transporteurs routiers : des résultats préliminaires	G. Dionne D. Desjardins J. Pinquet
99-03	Capital Structures and Compensation Policies	K. Dachraoui G. Dionne
99-04	Full Pooling in Multi-Period Contracting with Adverse Selection and Noncommitment	G. Dionne C. Fluet
99-05	Media Attention, Insurance Regulation and Liability Insurance Pricing	M. M. Boyer
00-01	Replacement Cost Endorsement and Opportunistic Fraud in Automobile Insurance	G. Dionne R. Gagné
00-02	Les déterminants de la gestion des risques par les entreprises non financières : une revue de la littérature	J. Cliche
00-03	Experience Rating Schemes for Fleets of Vehicles	D. Desjardins G. Dionne J. Pinquet
00-04	The Empirical Measure of Information Problems with Emphasis on Insurance Fraud	G. Dionne

<b>Number</b>	<b>Title</b>	<b>Authors</b>
00-05	Adverse Selection in Insurance Markets	G. Dionne N. Doherty N. Fombaron
00-06	L'importance de la procédure dans les choix de loterie	Y. Alarie
00-07	Credit Spread Option Valuation under GARCH	N. Tahani
00-08	Dynamic Financial Contract under Extended Liability	B. Coestier
00-09	Une mesure empirique des déterminants qui affectent la gestion des risques des entreprises non financières	G. Dionne M. Garand
00-10	Comparative Mixed Risk Aversion	K. Dachraoui G. Dionne L. Eeckhoudt P. Godfroid
00-11	Risk Management Determinants Affecting Firms' Values in the Gold Mining Industry: New Empirical Results	G. Dionne M. Garand
00-12	Optimal Financial Portfolio and Dependence of Risky Assets	K. Dachraoui G. Dionne
01-01	Stochastic Dominance and Optimal Portfolio	K. Dachraoui G. Dionne
01-02	Optimal Cognitive Processes for Lotteries	Y. Alarie G. Dionne
01-03	La perception du risque d'être arrêté chez les camionneurs et transporteurs routiers	G. Dionne D. Desjardins M.G. Ingabire R. Aqdim
01-04	Commitment and Automobile Insurance Regulation in France, Quebec and Japan	G. Dionne

<b>Number</b>	<b>Title</b>	<b>Authors</b>
01-05	The Role of Memory in Long-Term Contracting with Moral Hazard : Empirical Evidence in Automobile Insurance	G. Dionne M. Maurice J. Pinquet C. Vanasse

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## **Students supervised, financed and those having completed their studies**

<i>Currently supervised</i>		
<b>Program</b>	<b>Name</b>	<b>Nature of supervision</b>
M.Sc. HEC	Dominique Roy-Blanchette	Codirector
M.Sc. HEC	Mathieu Parent	Director
M.Sc. HEC	Rachid Aqdim	Director
M.Sc. HEC	Simon Beaulieu	Director
M.Sc. HEC	Laurence Bastien	Director
M.Sc. HEC	Yann Furic	Director
M.Sc. HEC	Karim Mimouni	Director
Ph.D. HEC	Nadia Ouertani	Codirector
Ph.D. HEC	Nabil Tahani	Director
Ph.D. HEC	Thouraya Triki	Director
Ph.D. HEC	Marko Savor	Director
Ph.D. HEC	Maria Pacurar	Director
Ph.D. Université de Montréal	Louis Caron	Director
Ph.D. Université de Paris X-Nanterre	Maki Dahchour	Director
Ph.D. Université de Paris X-Nanterre	Florence Guiliano	Codirector
Ph.D. Université de Tunis III	Oufa Ghali	Director
Stagiaire postdoctoral	Kaïs Dachraoui	Director
Stagiaire postdoctoral	Yves Alarie	Director

***Completed scholarship***

<b>Program</b>	<b>Name</b>	<b>Nature of supervision</b>
M.Sc. HEC	Claude Lapointe	Director
M.Sc. HEC	Jo-Anne Cliche	Director
M.Sc. HEC	Frédéric Dion	Director
M.Sc. HEC	Pierre-Carl Michaud	Codirector
M.Sc. HEC	Faouzi Tarkhani	Director
M.Sc. Économie, U. de M.	Mathieu Maurice	Director
M.Sc. Économie, U. de M.	Charles Sénécal	Director
M.Sc. HEC	Martin Garand	Director
M.Sc. HEC	Amélie Dugas-Sampara	Director
M.Sc. HEC	Marie-Claude Jalbert	Director
Ph.D., U. de M.	Marie-Gloriose Ingabire	Director
Ph.D., U. de M.	Kaïs Dachraoui	Director
Ph.D., U. de M.	Yves Alarie	Director
Ph.D., U. de Paris X	Nathalie Fombaron	Director

***Masters students financed by Mercure Foundation***

<b>Name</b>	<b>Master program</b>	<b>Director</b>
Claudia Champagne	Finance	Jean Roy
Martin Garand	Finance	Georges Dionne
Éric Springuel	Financial engineering	Michèle Breton
Sophia Zaanoun	Financial engineering	J.G. Simonato & G. Gauthier
Evan Dudley	Financial engineering	Jean-Guy Simonato
Nathalie Laporte	Finance	Georges Dionne
Éric Provost	Finance	Jean Roy

Marko Savor	Finance	Georges Dionne
Rachid Aqdim	Financial applied economics	Georges Dionne
Laurence Bastien	Financial applied economics	Georges Dionne
Maher Yaghi	Finance	Pierre Laroche
Karim Mimouni	Finance	Georges Dionne
Héla Dahen	Finance	Jean Roy

***Masters students financed by TD, Chubb and La Sécurité***

<b>Name</b>	<b>Master program</b>	<b>Director</b>
Ines Chaieb	Financial engineering	Geneviève Gauthier
Simon Beaulieu	Finance	Georges Dionne
Amélie Dugas-Sampara	Finance	Georges Dionne
Mathieu Derome	Financial applied economics	Martin Boyer
Daniel Rajotte	Finance	Jean Roy
Marc-André Haché	Financial applied economics	Kodjovi Assoé
Wsiu-Chun Tan	Information technology	Jean Talbot

***Ph.D. students financed by the Chair***

<b>Name</b>	<b>Ph.D. program</b>	<b>Director</b>
Sidi Sbai Chkirid	Finance	Georges Dionne
Marko Savor	Finance	Georges Dionne
Maria Pacurar	Finance	Georges Dionne
Karim Drira	Finance	Michèle Breton
Nizar Loukil	Finance	Martin Boyer

## **Conferences given by Georges Dionne**

- "Corporate Insurance Demand with Imperfect Capital Markets," American Risk and Insurance Association Meetings, Philadelphia, August 12, 1996.
- "Evidence of Adverse Selection in Automobile Insurance Markets," European Group of Insurance Economics, Hanover, September 16, 1996.
- "La tarification de l'assurance automobile et les incitations à la sécurité routière : une application au Québec," Delta-Théma seminar, Paris, October 22, 1996.
- "Le risque moral et les contrats d'assurance à plusieurs périodes : une vérification empirique," seminar, Economics Department, University of Montreal, November 11, 1996.
- "Moral Hazard and Two-Period Insurance Contracts : An Empirical Evidence," Wharton School of Management, Philadelphia, December 5, 1996.
- "La nouvelle tarification de la SAAQ (1992) a-t-elle réduit les accidents automobiles au Québec ?," *Déjeuner d'Archimède*, HEC, Montreal, January 29, 1997.
- "An Evaluation of the 1991 Regulation for New Drivers in Quebec," international colloquium: "L'assurance automobile : sécurité routière, nouveaux conducteurs, risques, fraude à l'assurance et réglementation," HEC, Montreal, April 17–19, 1997 (with U. Maag).
- "The Effect of a New Bonus-Malus System on Accidents," international colloquium: "L'assurance automobile : sécurité routière, nouveaux conducteurs, risques, fraude à l'assurance et réglementation," HEC, Montreal, April 17–19, 1997 (with C. Vanasse).
- "Regulation of Professional Drivers and Social Costs of Road Accidents," international colloquium: "L'assurance automobile : sécurité routière, nouveaux conducteurs, risques, fraude à l'assurance et réglementation," HEC, Montreal, April 17–19, 1997.
- "Road Insurance Regulation," session moderator. International colloquium: "L'assurance automobile : sécurité routière, nouveaux conducteurs, risques, fraude à l'assurance et réglementation," HEC, Montreal, April 17–19, 1997.
- "Insurance Fraud in the Quebec Automobile Insurance Industry : New Results," international colloquium: "L'assurance automobile : sécurité routière, nouveaux conducteurs, risques, fraude à l'assurance et réglementation," HEC, Montreal, April 17–19, 1997.
- "Valeur de l'information des décisions des ménages : applications aux choix d'assurance en présence d'asymétrie d'information," 37<sup>th</sup> Annual Congress, *Société canadienne de science économique*, HEC, Montreal, May 14–15, 1997 (with C. Vanasse).

- "Nouveaux conducteurs : expérience durant la première année et taux d'accidents," 37<sup>th</sup> Annual Congress, *Société canadienne de science économique*, HEC, Montreal, May 14–15, 1997 (with D. Desjardins).
- "Différence de profils de salaire et de taux de séparation," 37<sup>th</sup> Annual Congress, *Société canadienne de science économique*, HEC, Montreal, May 14–15, 1997 (with K. Dachraoui).
- "Capital de risque et innovations technologiques," round table, 37<sup>th</sup> Annual Congress, *Société canadienne de science économique*, HEC, Montreal, May 14–15, 1997.
- "The Role of Memory and Saving in Long-Term Contracting with Moral Hazard : An Empirical Evidence in Automobile Insurance," Sardinia (Italy), June 26, 1997.
- "Résultats de recherches sur la fraude à l'assurance," *FFSA–Chaires d'assurance* (Paris), September 19, 1997.
- "Evidence of Adverse Selection in Automobile Insurance Markets," Geneva Association Meetings for European Insurance Economists (Paris), 22 septembre 1997.
- "Accroissements de risque et portefeuille optimal," Seminar GReFi/Risk Management Chair, HEC, November 26, 1997.
- "Accroissements de risque et portefeuille optimal," Université de Paris I, December 15, 1997.
- "Un test empirique du modèle Rotschild-Stiglitz," Université de Paris X-Nanterre, December 16, 1997.
- "The Role of Memory and Saving in Long-Term Contracting with Moral Hazard : An Empirical Evidence in Automobile Insurance," North American Econometric Society Meetings (Chicago), January 4, 1998.
- "PLU 6011 – Les coûts privés et sociaux des coûts des accidents routiers impliquant des conducteurs de camion – Séminaire d'intégration interdisciplinaire sur la sécurité routière," *Centre de recherche sur les transports*, University of Montreal, March 11, 1998.
- "La mesure empirique des problèmes d'information," *Société canadienne de science économique* (Quebec), presidential allocution, May 7, 1998.
- "La fraude planifiée : évidence, empirique du marché de l'assurance automobile," *Société canadienne de science économique* (Quebec), May 7, 1998 (with R. Gagné).
- "Risques environnementaux et investissement financier dans la prévention : le cas à responsabilité limitée," *Société canadienne de science économique* (Quebec), May 7, 1998 (with S. Spaeter).

- "Détermination simultanée des structures de capital et des contrats de travail : évidence empirique dans le marché français," *Société canadienne de science économique* (Quebec), May 7, 1998 (with K. Dachraoui).
- "Antisélection et classification des risques," *Société canadienne de science économique* (Quebec), May 8, 1998 (with C. Gouriéroux and C. Vanasse).
- "Les accroissements de risque et la séparation des portefeuilles financiers optimaux," *Société canadienne de science économique* (Quebec), May 8, 1998 (with K. Dachraoui).
- "Evidence of Adverse Selection in Insurance Markets," Economics Department, University of Chicago, May 13, 1998.
- "The Informational Content of Individual Decisions with Applications to Insurance Under Adverse Selection," American Risk and Insurance Association, Boston, August 17, 1998.
- "Une mesure de l'antisélection résiduelle dans le portefeuille d'un assureur," Brownbag, HEC, October 9, 1998.
- "Antisélection résiduelle dans le portefeuille d'un assureur," Economic Department, UQAM, October 16, 1998.
- "Déterminants de la dette et effets de la dette sur les structures salariales," seminar GReFi/Risk Management Chair, HEC, November 18, 1998.
- "Why the Rothschild-Stiglitz's Model is not Useful in Automobile Insurance?, Institute of Public Policy and Economics Department, University of Toronto, November 30, 1998.
- "Interactions entre production et financement des entreprises : une revue des principaux résultats en présence d'asymétrie d'information," Université Paris X-Nanterre, December 8, 1998.
- "Contrats de travail et contrats financiers : utilisation de la dette comme mécanisme incitatif," Université Paris X-Nanterre, December 8, 1998.
- "Analyse statistique des problèmes d'information : méthodologies et exemples," Université Paris X-Nanterre, December 9, 1998.
- "Endettement des entreprises : déterminants et effets sur les contrats de travail : une étude sur données françaises," Université Paris X-Nanterre, December 9, 1998.
- "Le système de points d'inaptitude et la tarification selon le dossier de conduite," Colloque sur la recherche universitaire en sécurité routière; résultats et retombées pratiques (1993-1998), Quebec, April 23, 1999.
- "L'évaluation des risques d'accidents des transporteurs routiers : des résultats préliminaires," Paris, May 4, 1999.

- "Estimation des risques d'accident des flottes de véhicules," 39<sup>e</sup> Congrès annuel de la Société canadienne de science économique, Hull, May 12, 1999.
- "Prévention et changements de premier ordre : le cas des fonctions d'utilité complètement monotones," 39<sup>e</sup> Congrès annuel de la Société canadienne de science économique, Hull, May 12, 1999.
- Table ronde sur la profession d'économiste (ASDEQ-SCSE), 39<sup>e</sup> Congrès annuel de la Société canadienne de science économique, Hull, May 13, 1999.
- "Evidence of Adverse Selection in the Portfolio of an Insurer," Department of Insurance, University of Minnesota, May 28, 1999.
- "How to Detect Adverse Selection in your Portfolio," St-Paul Companies, May 28, 1999.
- "VaR de crédit avec parallélisme," Atelier de recherche transversale, HEC-Montreal, July 7, 1999 (with G. Gauthier, J.G. Simonato and P. Soriano).
- "Gestion des risques des flottes de véhicules : une application empirique au Québec," Fédération Française des Sociétés d'Assurances, Paris, November 18, 1999.
- "La mesure statistique de la fraude à l'assurance : méthodologie et résultats empiriques," Colloque sur la fraude à l'assurance, Paris, November 26, 1999.
- "Modèles théoriques de tarification de flottes de véhicules", Fédération Française des Sociétés d'Assurances, Paris, December 8, 1999 (with J. Pinquet).
- "Découvrez les nouvelles tendances en matière de gestion intégrée des risques," conférence sur la gestion intégrée des risques des entreprises non financières, IIR-Risk Management Chair, HEC-Montreal, April 14, 2000.
- "Une mesure empirique des déterminants qui affectent la gestion des risques des entreprises non financières," conférence sur la gestion intégrée des risques des entreprises non financières, HEC-Montréal, April 14, 2000, (with M. Garand).
- "Experience Rating Schemes for Fleets of Vehicles", Risk Theory Seminar, University of Minnesota, April 16, 2000, (with J. Pinquet).
- "Une méthodologie pour séparer l'antisélection du risque moral avec une application au vol de voitures", Société canadienne de science économique, Montreal, May 17, 2000, (with R. Gagné).
- "Un modèle de tarification pour les flottes de véhicules basé sur les accidents et les points d'inaptitudes", Société canadienne de science économique, Montreal, May 17, 2000, (with D. Desjardins and J. Pinquet).
- "Quelques remarques sur la fonction de transformation des probabilités", Société canadienne de science économique, Montreal, May 17, 2000, (with Y. Alarie).

- "Les déterminants significatifs de la gestion intégrée des risques des entreprises industrielles et commerciales," Fédération Française des Sociétés d'Assurances, Paris, May 25, 2000.
- "Replacement Cost Endorsement and Opportunistic Fraud in Automobile Insurance," ARIA Meetings, Baltimore, August 7, 2000.
- "L'ABC de la gestion des risques," 12<sup>e</sup> conférence des perspectives agroalimentaires québécoises : Les outils financiers au service du futur, Montreal, September 15, 2000.
- "The Role of Memory and Saving in Long-Term Contracting with Moral Hazard : An Empirical Evidence in Automobile Insurance," Geneva Meetings, Rome, September 18, 2000, (with M. Maurice and J. Pinquet).
- "L'utilisation de l'information publique et privée : l'exemple du Québec," Journée Statistique et Assurance de Dommage, Société Française de Statistique, Institut Henri Poincaré, Paris, November 29, 2000 (with M. Maurice and J. Pinquet).
- "Le risque des flottes de véhicules," Journée Statistique et Assurance de Dommage, Société Française de Statistique, Institut Henri Poincaré, Paris, November 29, 2000 (with J. Pinquet).
- "Les déterminants significatifs de la gestion intégrée des risques des entreprises industrielles et commerciales," Université de Strasbourg, December 15, 2000.
- "L'utilisation des points du permis de conduire en assurance automobile et la prévention routière," colloque Sécurité routière et assurance automobile, Maison de l'Assurance, FFSA, Paris, December 18, 2000 (with J. Pinquet).
- "Asymétrie d'information sur le contrat d'assurance automobile," colloque Sécurité routière et assurance automobile, Maison de l'Assurance, FFSA, Paris, December 18, 2000 (with M. Dahchour).
- "Regulation in other Industrialized Countries," Insurance Rate Regulation Conference, Brookings Institution, Washington, January 18, 2001.
- "Évaluation des avantages économiques et sociaux : exemples en sécurité routière," AQTR, Montreal, February 22, 2001.
- "Évaluation des avantages économiques et sociaux : exemples en sécurité routière," Center for research transportation, Montreal, March 22, 2001.
- "La mesure statistique des problèmes d'information dans les marchés d'assurance," The Royal Society of Canada, Montreal, April 6, 2001.
- "Les déterminants significatifs de la gestion intégrée des risques des entreprises industrielles et commerciales," Université Laval (Quebec), April 27, 2001.

"Une mesure empirique des déterminants qui affectent la gestion des risques des entreprises non financières," SCSE Conference, Quebec, May 16, 2001.

"Nouveaux enjeux de la théorie du risque," Conservatoire National des Arts et Métiers, Paris, May 22, 2001.

"La mesure empirique des problèmes d'information avec une implication à l'assurance automobile," Université de Paris X-Nanterre, May 28, 2001.

## **Leading research projects**

"Tarification optimale de l'assurance automobile en présence d'asymétrie d'information : modélisation théorique et tests empiriques," CRSH, \$60,000 (04-96 to 04-99).

"Gestion sociale des risques d'accidents," FCAR-team, \$205,447 (06-96 to 05-99).

"Détection systématique de la fraude à l'aide d'indicateurs et développement d'un système expert," Insurance Bureau of Canada, \$29,316 (09-96 to 05-97).

"Le non-respect du code de la sécurité par les conducteurs professionnels en fonction des caractéristiques des individus, des transporteurs et de l'environnement routier," FCAR, G. Dionne, C. Laberge-Nadeau et U. Maag, \$30,000, (11-96 to 04-98).

"L'évaluation du risque d'accidents des transporteurs en fonction de leur secteur d'activités, de la taille de leur flotte et de leur dossier d'infractions," FCAR, \$75,000 (11-96 to 10-98).

RCM<sub>2</sub>-Montreal, \$40,000 to finance one Ph.D. student and one postdoctoral fellow (97-98).

"La perception du risque d'être arrêté chez les camionneurs et les transporteurs routiers," FCAR-SAAQ-MTQ, \$70,000, 06-98 to 06-00.

"Les téléphones cellulaires et le risque d'accidents," FCAR-SAAQ-MTQ, \$156,000, 06-98 to 06-00.

"Étude comparative des nouveaux conducteurs selon qu'ils ont suivi ou pas un cours de conduite et ce, en accordant une attention particulière à la propension à prendre des risques," FCAR-SAAQ-MTQ, \$46,600, 06-98 to 06-00.

Participant, with the Fields Institute of Toronto and CIBC, to the creation of a national network of financial mathematics, \$160,000, 1998 to 2002.

RCM<sub>2</sub>-Montreal, \$40,000 to finance one Ph.D. student and one postdoctoral fellow (98-99).

Participant, with the Fields Institute of Toronto and CIBC. in framework of MITACS, to the creation of a national network of financial mathematics, \$60,000 (04-99 to 04-00).

"Épilepsie et conduite d'un véhicule routier," \$4,500, *Direction de la recherche, École des HEC.*, 02-99 to 02-01.

"Tests sur la présence d'asymétrie d'information dans des contrats dynamiques d'assurance," \$45,500, CRSH, 04-99 to 04-02.

RCM<sub>2</sub>-Montreal, \$49,000 to finance one Ph.D. student and one postdoctoral fellow (99-00).

"Analyse du risque des flottes de véhicules," \$136,000, FCAR, 10-99 to 10-01.

"Établir une méthode pour le calcul de la valeur monétaire des accidents et victimes évités dans les analyses avantages-coûts des interventions," \$49,999, FCAR, 10-99 to 10-01.

"Étude d'un plan d'actions en matière de sécurité routière en milieu interurbain au Burkina Faso," \$32,200, CIMA International, 04-00 to 06-00.

"Analyse statistique dans le domaine de l'assurance," *Fédération Française des Sociétés d'assurances* and *Université de Paris X-Nanterre*, 140 000 FF, 09-99 to 09-00.

RCM<sub>2</sub>-Montreal, \$49,000 to finance Ph.D. students and one postdoctoral fellow (00-01).

"La perception du risque d'être arrêté pour capacités affaiblies," \$99,999, FCAR-team, 07-00 to 06-02.

"Écart des taux sur les obligations," \$100,000, RCM<sub>2</sub>, 04-01 to 04-03.

"Gestion sociale des risques d'accidents," \$126,000, FCAR-team, 06-99 to 05-02.