INTERVIEW WITH DR. JEAN-FRANÇOIS BÉGIN

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Financial markets and datasets come in all shapes and sizes; accordingly, statistical models and methods used as decision-making tools need to be adapted to the reality of each market. Dr. Jean-François Bégin's research group uses statistical methods and models to characterize risk in the financial and insurance industries. His versatile research program focuses on both theoretical and empirical aspects of risk assessment, with specific areas of interest that include financial modelling, financial econometrics, filtering methods, high-frequency data, credit risk, and option pricing.

What early life experiences may have foretold your path into science?

As a young child I played a lot of Monopoly and I won most of the time. I took an early interest in economics and finance. And I've always been very curious. Curiosity is one of the main things you need to be a successful researcher.

What is the goal of your research program?

The main aim is to provide the financial industry's decision makers with the right tools to make decisions. Statistical methods and models will help them make decisions that are in the best interest. Changes brought about by these decisions could have a large impact on everyday life, e.g. government policy, risk-mitigation strategy, retirement scheme.

We have so many different sources of data available to us (e.g., market data, accounting data, high-frequency data). How do we take this information and put it into an objective model? Then, how can we use the model to help us make the best decision (e.g., reduce the financial risk borne by Canadian individuals and entities)?

What makes financial derivatives such an appealing source of data?

A financial derivative is a security whose value is dependent on something else; its payoff is driven by the value of another asset, an underlying asset. Financial derivatives are a goldmine of information on risk factors. In theory, the price of such derivatives contains a great deal of information about the underlying risks in financial markets. One could draw a parallel between the price of these financial securities and insurance company premiums. On the one hand, insurance premiums could be analyzed to come up with the probability of having an accident. One could also look at actual accident rates to get another estimate of risk. Or one could use both sources of information to capture the risk more efficiently.

By combining two sources of information you can get a better picture of the risk involved. This requires flexible models and statistical methods – that's where I come in. I am using financial derivatives to get information about the risk as well as the underlying risk – in this case the stock market or bond prices. I'm using the big data revolution to create new models that are more complicated than previous ones.

Why is joint estimation such a powerful tool?

What's interesting about the derivative products on the market is that they behave differently than the underlying assets but they are interrelated. Thus, we can isolate the risk; that's what makes these derivatives so unique.

There are a lot of different risks in our financial system, such as the risk of stock market volatility or a crash. By using these derivatives, we can pinpoint the actual risk. We are improving risk assessment by using different sources of information.

What motivates you most, the process of modelling financial information or the outcome?

It's a bit of both. Developing new statistical methodology is really interesting, but the modelling outcomes can ultimately help people make better decisions. My work has the potential to reshape the way we see and understand risk.

For instance, my paper on the impact of systemic risk in the financial services sector looked at the risk in 2008 of a complete collapse of the financial markets – we came very close to having a systemic event at that time. The paper concluded that the systemic risk coming from banks has a great impact on the insurance sector, but not the other way around. From a policymaking standpoint, control of systemic risk requires better regulation of the banks. The mathematics behind this type of analysis is really interesting, but even more interesting is how the results can impact policymaking.

What type of impact does your work have, and who are your research users?

I focus on several areas in different fields. The most impactful research I've done so far is on risk compensation. In finance, a generally accepted idea is that diversification reduces risk, but we demonstrated that this may not be true. The fact that assets can act in a way that is independent of what is happening in the overall market makes diversification less efficient. This finding changes how people think about their investments, e.g. they realize that they were unaware of the risk they were taking. It's an important impact if it changes the way people invest their money.

Another impactful area of my research involves the use of high-frequency data – e.g. data that's collected every second. We use these data as a new source of information to help investors understand the risk and invest more efficiently.

Congratulations on becoming a Fellow of the Society of Actuaries. What does this mean to you?

To become a Fellow requires successfully completing a series of exams and some professional courses, meeting all requirements to become a professional actuary. Having this designation is fairly uncommon in academia – there are only a few professors in Canada that hold this designation.

Our Department has five faculty members in actuarial science and two of us are Fellows. This professional status brings a lot of attention and credibility to the Department and it also reflects the Department’s interest in more than just the theoretical aspects of actuarial science. It keeps us connected with members of the industry, which helps direct our research toward hot issues in the industry, such as protecting companies from cyber risk and proposing new designs for pension schemes.

Why is SFU the right home for your research program?

I wanted to work in a real quantitative department and be with colleagues who understand the quantitative aspect of my work. What's nice about SFU is that actuarial science and statistics comprise their own Department rather than being grouped with mathematics. A statistics department helps me because most of the challenges I have involve technical issues. The actuarial group is focused on risk management and risk taking. And the actuarial research in the Department is all highly applied, which is important for me.

What approach to supervising trainees do you admire most?

Something I really appreciated about my own training was that it was done in a highly collaborative manner. Instead of two supervisors for my Masters and PhD, I had the opportunity to work closely with six different mentors, each of which used a different approach. I would like to re-create this set up for my own students.

What educational background and personal traits do you look for in prospective trainees?

I don't require trainees to come from a certain academic discipline, but I do look for a quantitative background. So, they could be computer scientists, mathematicians, physicists – as long as they are comfortable with equations, models, and computers. They need to be interested in the application of their work, and with writing computer codes and dealing with big datasets. Most importantly, they need to be capable of independent thinking and very curious.