Women in Finance

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Carol Wilson
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Introducing Dr. Roy Kwon’s new book: *Introduction to Linear Optimization and Extension with MatLab*

New PhD Program in Actuarial Science and Mathematical Finance
A Message from the Director

Gender balance is a basic indicator of the social health of the community.

The financial industry has been trying to correct its historical imbalance for years and we at mmf are proud to play our part in this quest for the social health of our sector.

While the path ahead of us is still long, we can look back for inspiration; in 2005 and in 2012, 51% and 49% of mmf students were female respectively. Approximately 50% of our offers of admission every year are given to an extraordinarily talented group of female applicants. We know that competition to attract them is fierce, but we still manage to attract a good percentage of them, and year after year our female student cohort never goes lower than a third; in a fortunate year, female students became the majority.

Our efforts continue through our Alumni. Their involvement in organizations such as Women in Capital Markets and Women in Finance helps to contribute to improve the landscape. We wish for future improvements, and we will continue to do our part.

In this issue of mmf Viewpoint, we have an opportunity to review the women in finance initiative. We also note the new book by mmf Professor Roy Kwon, and the launch of the PhD program in Actuarial Sciences and Mathematical Finance, offered by the Department of Statistics.
Did you foresee yourself in your position upon graduating from mmf?

I definitely foresaw myself in a senior role one day upon graduating from mmf. I was fortunate to have had my internship placement at TD Securities and had secured a full time position with TD Bank before the end of my work term. Based on my work term and the relationships that I had established, I was very optimistic that I would have an exciting and rewarding career at the Bank. I have now been at TD Securities for over fourteen years, having spent the first nine years designing, implementing and rolling out large scale Market Risk and Counterparty Credit Risk systems. I have been operating at an Executive level for over five years now, leading Project Management, Governance and Control functions and supporting Executive Project Portfolio Oversight Committees.

What did you learn at mmf that you still use to this day?

mmf gave me fantastic experience presenting myself in an interview setting. We were encouraged to interview with as many potential employers as possible during the process of securing an internship. I went through quite an extensive set of interviews which not only helped build my self confidence in presenting my skills and experience to potential employers, but also influenced my personal interview style when meeting prospective candidates today.

What’s the most difficult decision you’ve ever made?

My most difficult decisions have always been when I have had to decline a potential opportunity. As your network grows, and people you have worked with move on to new things, opportunities will arise that you weren’t looking for or didn’t expect. Over the years, I have been lucky enough to act on some of these opportunities, but I have also had to turn down many more for a variety of reasons. Turning down an opportunity is always a difficult decision and requires thoughtful consideration.

What’s the easiest decision you’ve ever made?

My easiest decision was to take the full year off for maternity leave twice!

What woman inspires you and why?

My mother inspires me. She was a successful career woman as the Art Director for a large international magazine and a mother of three daughters. She worked in a male dominated environment and had to find a way to balance work, family, and serious health issues. My mother is a source of inspiration whenever it feels like things are tough. I am very aware, and grateful, that I don’t really know what tough is like.

What does it take to be successful? What is success to you? Has this definition changed over the years?

I believe that it is not one particular attribute that leads to success, but the continuous development of several complementing characteristics, along with luck, timing and great sponsorship that will lead to repeated success.

There are three key qualities that I believe helped lead to my success: consistent commitment to high quality work from myself and my team; knowing how my work, and that of my team, relates to what is strategically important in the larger picture; and communicating clearly, consistently and positively in all directions - up, down and laterally across the organization.

To me, success is being recognized repeatedly over time and by different leaders for your capability and contributions.

What will be the biggest challenge for the generation of women behind you?

I am fortunate to be working for a company that has been proactively focused on gender equality in the workplace for several years. Based on the progress that has been made, I anticipate that these issues will have been largely resolved for the
Carol Wilson  
AVP, Program Governance Office, TD Securities, mmf Alumna 1999

workplace policies and programs that support work-life balance for all employees, not just women with families. However, I am aware that friends and peers of mine in other organizations have not had the same support in their businesses. While progress is being made to change the mindset that a woman can have a family & still achieve success, I believe that gender discrepancies will continue to be a challenge for women depending on the culture of the organization within which they choose to work.

**How would you describe your leadership style, and where did it come from?**

My leadership style is collaborative and supportive while being very results oriented. There isn’t a single unique way of doing things – my job as a leader is to make sure everyone is pulling in the same direction and making an effective contribution. I have been very lucky to have worked for many great leaders in my career to date and have learned a lot from each of them. I have definitely made an effort to incorporate attributes that stood out to me into my own leadership style along the way. I have also seen leadership styles that weren’t a perfect fit for me, and that taught me about specific characteristics I definitely don’t want to incorporate into my style, which is equally important!

**What would encourage more women to enter the area of finance?**

Seeing examples of successful career women in finance early in one’s undergraduate would help encourage more women to enter into the area of finance. I would encourage students to find undergraduate programs that support co-op work terms, or look for positions as a summer student in a financial organization. Getting some work experience in an organization during your undergraduate degree is a great way to meet potential future employers, find mentors, and try roles in different areas before making a longer term and full time commitment after graduating. A large organization, like a bank, offers many potential career paths and lots of opportunity for advancement.

**Why did you choose the mmf program?**

I was looking for a post-graduate program that offered interesting subject matter that leveraged my undergraduate studies in Physics, Math, Statistics and Economics. I was looking for a program that would enable me to get some industry work experience. The internship in the mmf program offered me a terrific opportunity to get a few months of work experience and establish the professional network I needed to secure a permanent role before graduating from the program. The year I registered for mmf was the inaugural year so there was no track record for the program and we would be the ‘guinea pigs’. I found it exciting that mmf was a brand new program offering opportunities, particularly in Market Risk Management, which was a relatively new field of study and employment at the time.

**How do you balance work and personal life?**

I now have two children, aged 3 and 6, and it is definitely a daily challenge to balance a professional career and a family. We make sure that we take our vacations and give ourselves a chance to recharge.

Earlier in my career I found it difficult to “turn it off” on the weekend or when I was on vacation. That has become easier over the years and now I am able to fully detach and enjoy my time out and focus on my family and friends. As my husband and I both work at TD Securities full time, we are equally busy, and so traditional roles around the house just don’t make sense for us. My husband is a great cook, so he makes all of the meals for our family. (He would also like me to mention that he has taken an increasingly large role in the laundry duties- he’s very proud of this). Whether you choose to go with a nanny, daycare, before / after school care, and so on, make sure you find an option that works with your schedule so pick-ups and drop-offs are as easy as possible. But most importantly, try to find childcare that gives you complete peace of mind during the day so you are able to focus on work when you are there.

**The financial industry is known to be more male dominated than medicine, law and other fields. How have you been able to succeed as a woman in the financial industry?**

The financial industry is very male dominated, particularly within Capital Markets. However, I have definitely been lucky to have been working in an environment that promotes meritocracy. In my experience, I have observed that any individual who is consistently outperforming is rewarded, and I have never felt that being a woman has particularly hurt or helped my chances along the way. Consistent hard work, high quality results and ensuring I was aligned with the strategic direction have helped me to succeed in the financial industry.
Carol Wilson
AVP, Program Governance Office, TD Securities, mmf Alumna 1999

What advice would you offer to someone considering mmf? To a recent grad? Would your advice be different to a woman versus a man considering a career in the financial industry?

My advice to someone considering the mmf program would be that gaining contacts and experience in their chosen industry is invaluable. Any program that offers such an opportunity, in my opinion, stands out from the rest. My advice to a recent grad would be to really learn how financial organizations work from Front Office, through Middle Office to Back Office. Look for ways to interact with as many departments as possible in your role, find the projects that are strategically aligned and be at the forefront of change. There are so many opportunities for improvement in a large organization, that identifying inefficiencies, recommending new ways of doing things, and delivering on your commitments will always be well received. My advice would not be different to a woman versus a man considering a career in the financial industry – the opportunities are equally available.

Would you recommend the mmf program and why?

I would definitely recommend the mmf program to recent graduates as well as to potential employers. Graduates of the mmf program come to work equipped with a good understanding of Valuation, Risk Management and Finance and can add value very quickly. What the new graduate needs to acquire, which isn’t taught at school, is an understanding of how a trading operation works from Front Office through Back Office. Where available, I would suggest they try to get into an Associate position that gives them an opportunity to rotate through several roles in their first few years to build a network, get a really good sense of how different departments work and identify what areas will interest them in the longer term.

Alyson Bailey-Flynn
Regional Chief Auditor, Europe, Scotiabank
mmf Alumna 1999

Q&A

Did you foresee yourself in your position upon graduating from mmf?

I definitely didn’t foresee myself working in London, England one day. My career path after graduating from mmf was probably typical, as I joined a financial engineering group at a Canadian bank and expected to be Toronto based for my career. Having grown up in Halifax, Nova Scotia, I expected that the big move of my career was from Halifax to Toronto, not from Toronto to London, England.

What did you learn at mmf that you still use to this day?

mmf taught me that working hard, asking questions and looking at a problem analytically and breaking it down into its components, will ultimately get you to the answer, or help you determine the answer. I attack problems this way all the time. In general though, I still need to be able to read and understand financial models and how they can be implemented in a Bank infrastructure. The background in mathematical finance that I learned in mmf is still regularly relied upon.

What’s the most difficult decision you’ve ever made? What’s the easiest decision you’ve ever made?

I’ve probably had two difficult decisions to make and both of them have put me where I am today. The first difficult decision was to join mmf. My undergraduate program
Regional Chief Auditor, Europe, Scotiabank, mmf Alumna 1999

My grandmother (my father’s mother). She raised seven kids, was a school teacher, was active in the community and church, and managed to balance all of the commitments with joy and happiness. She was definitely inspiring. Even when she was in her 90’s she was still volunteering in the community and had a wonderful and positive outlook on life.

What does it take to be successful? What is success to you? Has this definition changed over the years?

My view of success is being happy with life, family and work such that each day brings satisfaction. My first view of success would have just been in the world of academia and getting good grades. I now see success as a combination of both work and family life and the small successes that you have each day that all make life so enjoyable. It is the completion of a project, or the successful adoption of a new recommendation at work, it is getting up for a 5 km run in the morning, or getting home in time for supper. All of them are small items that help to bring joy to life.

What will be the biggest challenge for the generation of women behind you?

Continuing to balance the pressure we place on ourselves for the careers we want with the family we want as well, and making sure we find that comfortable balance between the two.

How would you describe your leadership style, and where did it come from?

I have a few things that I would characterize as my leadership style. Passion and motivation – I approach each day with a passion and love for my work, and hope this comes across to my staff and also motivates them as well. I believe in leading by example – One of the great things I’ve learned from others is that I usually aspire to be like the managers I’ve had. Whether it’s their knowledge, managerial skills, and so on, the common trait is that I have learned something from them. I hope I can pass on the same information to my staff in how I respect people, approach complex topics, and search for practical solutions.

What would encourage more women to enter the area of finance?

I think a large number of women are moving into the fields of mathematics, computer science and accounting as they see there is a large degree of equalization and merit based accomplishments there. The above fields all have an important place in the world of finance and play integral parts within banks. In this time of regulatory change, traditional banking roles are being reduced and there is a heightened pressure on banks in the areas of risk management, technology, audit, and compliance. The fields of mathematics, computer science and accounting are valuable backgrounds to have in these departments.

Why did you choose the mmf program?

I had spent my undergraduate years studying physics and math. I enjoyed the technical nature of the subjects and their application, but I didn’t see a career path working in those fields, apart from academia. I asked for advice from my professors and they suggested that I investigate the world of mathematical finance as I may enjoy the application of the physics and math that I studied. As I researched programs for my master’s degree, the University of Toronto’s mmf program had the right mix of academics, work study and industry topics that I thought would be valuable to someone coming new to the industry.
How do you balance work and personal life?

I have always been an early riser from my days as a competitive swimmer in grade school. I translate that approach to my work day as well. I try to get into work early to get a good start on the day, with the goal of making it home for supper with the family. I also take the approach that there will be times that I am going to be busy and it is easiest to just commit fully to the busyness. I know my family will understand, and when we get the time together we fully enjoy it. Part of the balance between work and personal life is trying to make the personal life easier too – sometimes that means having someone to assist with child care or cleaning the house.

Why did you choose to work overseas? What was the biggest obstacle you faced upon moving and working in your new position?

I did choose to work overseas. The position that I applied for was to be based in our London office, so that was part of the appeal in applying for the position. The biggest relocation obstacle I faced was probably getting used to the size of places in London – we downsized from 3500 square feet house to an 1100 square foot flat! The biggest obstacle I faced at work was that it was all new for me, so the learning curve was steep. I was going to be the department head and had to hire staff, so I didn’t even have existing staff that I could learn from to execute my work or rely upon. I was setting up a new mandate for the position so I was also establishing what I wanted to accomplish in my role.

The financial industry is known to be more male dominated than medicine, law and other fields. How have you been able to succeed as a woman in the financial industry?

Since my time starting at Scotiabank I have had very supportive managers that were able to recognize my accomplishments at work. Being so closely tied to the front office businesses, if we were successful in our work for them, it meant they could be more successful in their job, and as such it was easier for my boss to reward individuals in the department as we could align our goals and accomplishments with those of the trading or sales desks.

What advice would you offer to someone considering mmf? To a recent grad? Would your advice be different to a woman versus a man considering a career in the financial industry?

I would recommend the mmf program. It is an important degree for building and enhancing skills in the disciplines of finance and risk management. The world of banking is rapidly changing and having employees with strong backgrounds in mathematical finance that they can leverage will add value to the banks.
What did you learn in mmf that you still use to this day?

Quite a bit. Technically, the programming and statistics courses were immensely useful. The modeling and optimization come in handy, especially in trying to understand new concepts.

What’s the most difficult decision you’ve ever made? What’s the easiest decision you’ve ever made?

The most difficult decision I’ve made is whether or not to stay in NYC or to move back to Toronto to be close to my family. I decided to stay in NYC for now for my family and my career…. The easiest decision to make was go to the mmf program – one of the best decisions that I’ve made in my life.

What woman inspires you and why?

Marissa Mayer from Yahoo inspires me. She is a smart woman who is excelling in a very technical field, who looks great and has a family. She doesn’t mind embracing her feminine side while being very ambitious in her professional life. She has managed to become one of the few female CEOs in a very competitive male-dominated space.

What does it take to be successful? What is success to you? Has this definition changed over the years?

It takes a lot of determination and hard work while trying to balance your own personal needs. Success to me is being able to make an impact at work, home and in my community. The definition has changed slightly over the years, mainly on the focus of where I wanted to make an impact. When I started, it was mainly to make a good impression at work. When I had children, it was mainly to provide them with a positive environment. Now that they are growing up, my focus is more balanced between the three.

What will be the biggest challenge for the generation of women behind you?

The biggest challenge is perhaps the expectation that “one can do it all”. There is a larger support network for women in the financial industry now, but especially in a front office role, it is very life-consuming. Your job becomes a very big part of your life. Coupled with the fact that many successful women also have a successful spouse, it is difficult to navigate between compromising for each other and having a family.

How would you describe your leadership style, and where did it come from?

My leadership style is very team-oriented and I try to empower the people that work for me to be the best that they can. My last manager, who is now the head of European equities, used to tell me that you should always hire someone that could take your job one day so that you can move to a new challenge. If no one else is able to do your job you will be doing it forever.

What would encourage more women to enter the area of finance?

More women would probably enter the field of finance if it offered more flexibility in the work place. It is a difficult field to be in when you are pregnant or have young children and many women exit the industry at that point. Persistence can get you through this phase, but many choose another path at that point.

Why did you choose the mmf program?

I was encouraged by a high school friend that worked on Wall Street to work in finance. At the time, I had no idea what finance was about and was not ready to go. The mmf program seemed like a good intersection between my engineering background and the financial world, so I was interested in learning more about it.

How do you balance work and personal life?

I try to balance work and personal life by just doing what I am able to do. I work hard when I am at work, and when I am at home with my children and husband I try to give them my undivided attention. I also try to find roles at
work where I know that I will be able to get home at a reasonable time to see my family yet move ahead, even if it means that it will take me longer than other people to get promoted.

The financial industry is known to be more male dominated than medicine, law and other fields. How have you been able to succeed as a woman in the financial industry?

Probably similar to the other industries, it takes a lot of hard work and a bit of luck to succeed. There are many pitfalls and obstacles but persistence and a passion for your job are crucial. Working with a good group of people is also very important as they become your support network in your career.

What advice would you offer to someone considering mmf? To a recent grad? Would your advice be different to a woman versus a man considering a career in the financial industry?

I would say that the mmf program is an excellent program, especially if someone is coming from a technical background and wants to bridge it with some financial knowledge. Many employers are interested in the skill-sets that mmf graduates bring to the table. For someone who is just graduating, I would give them the following advice: try to get your foot in the door in an area that you might want to pursue, or that could lead to an area that you are interesting in pursuing. Don’t be afraid to take risks at this stage. Move to another country if that will provide opportunities that are otherwise unavailable to you. This might be controversial but my main advice that I would have for a woman versus a man is that if you even think that you might want to get married one day, you should spend some time focusing on that, and do not let work consume you in your 20s. This is your best time to find a partner. You can worry more about work after you find your partner. It is much more difficult to do it when you are 40, even if you are wildly successful at work. I would probably also tell a woman that if they want to have more flexibility at work, or if they want to go part-time, I would probably consider a more flexible field of study. Finance is not a field that is easy to be in halfway.

Would you recommend the mmf program and why?

I would definitely recommend the mmf program. The teachers are excellent, the curriculum is well put together and the skill-set is valuable. Finance is a very interesting field of work, but it is challenging and dynamic so it helps if you are very passionate about spending a lot of time on it.

What have you learned from mmf that you still use to this day?

Although I don’t build models any more, my job requires me to understand how different option products behave under different market conditions.

What’s the most difficult decision you’ve ever made? What’s the easiest decision you’ve ever made?

Moving out of OSFI and onto the trading floor was a difficult decision as it is a life style choice. Easiest decision was to join WCM.

What woman inspires you and why?

Laura Dottori, CIBC’s CRO, inspires me the most. She has young kids and is extremely successful in her career. She showed me that women can be successful in this male dominated industry.

What will be the biggest challenge for the generation of women behind you?

Confidence. Often women do not show as much confidence as we should be, which will be perceived as not performing. We need to be as confident as our other male colleagues, if not more.
Christina Yang
Structurer, CIBC World Markets, mmf Alumna 2006

How would you describe your leadership style, and where did it come from?
I prefer to position myself as a partner with other colleagues, openly sharing my opinions and my reasons for these opinions. It comes from my belief that everyone can work together and learn from each other if treated equally well.

What would encourage more women to enter the area of finance?
The desire of success and financial independence. Women tend to take less stressful jobs which are less interesting with lower pay. The desire to be as successful, and make as much as men, should motivate more women to enter into the field.

Why did you choose the mmf program?
I wanted to get into finance and the program is perfectly designed for it.

How do you balance work and personal life?
I don’t actually believe there could be such a balance for my job. I would say it is a choice but at the same time the precious spare time is better spent.

The financial industry is known to be more male dominated than medicine, law and other fields. How have you been able to succeed as a woman in the financial industry?
I have an excellent education, I am smart and I work hard. I never take no as the end, and am always trying to figure out why. This industry is very results oriented, so if you let people see that you can deliver, you will rise regardless of your gender. It is the belief in me and I know it is the same with my other colleagues.

What advice would you offer to someone considering mmf? To a recent grad? Would your advice be different to a woman versus a man considering a career in the financial industry?
To someone considering mmf make sure you know what the program is for and set expectations accordingly. To a recent grad keep open minded and do network. It doesn’t have to be networking for job change since people in the industry can help you to find out what you actually want and how to get it. To a woman entering the financial industry be brave, confident, and do step outside of your comfort zone for challenges.

Would you recommend the mmf program and why?
I would recommend the mmf program for someone who wants to leverage their quantitative skills for success in the financial industry. mmf has an excellent program design and Alumni network. However, if someone is looking more for Investment Banking this program might not be a good fit.
Did you foresee yourself in your position upon graduating from mmf?

I pretty much knew what I was getting myself into, leaving mmf – the benefits of doing my internship at IBM Algo Risk Service was that it was more or less a known quantity – and there haven’t been too many surprises!

What did you learn from mmf that you still use to this day?

Since I came into mmf without any kind of understanding of anything financial beyond what I had gleaned from newspapers and skimming some John Hull, I use a lot of what I learned in mmf all of the time. mmf can take the credit for everything from the concept of discounting cash-flows, the definition of a call vs a put option, European or American exercise options, to using principle components and Sobol sequences for generating Monte Carlo scenarios.

What’s the most difficult decision you’ve ever made? What’s the easiest decision you’ve ever made?

I think the first time I booked a plane ticket to travel on my own was probably the scariest decision I’ve ever made, and it also proved to be one of the best! By traveling through Japan on my own, I met so many people, I was exposed to so many things, and I developed a confidence in my own ability to cope regardless of the circumstances which has served me well. The easy decisions are usually the ones I don’t realize I am making!

What woman inspires you and why?

Martha Stewart. I was a high school student with a Martha Stewart magazine subscription, so this is not a recent development, but Martha Stewart is a self made business woman and she is also a rare example of a woman who has succeeded without always being well-liked.

What will be the biggest challenge for the generation of women behind you?

Hopefully the biggest challenges will always be the hard problems, regardless of gender.

What would encourage more women to enter the area of finance?

I really don’t know! When I look around my workplace I do see a fairly large number of women, so maybe it is just a question of time.

Why did you choose the mmf program?

I graduated with a B Sc Hons from Queen’s University in Math in 2009, and I read the newspaper. I wanted a way to find a job which had the potential to benefit from both, and did some research which involved investigating applications to some of my favourite Math classes from undergrad. It seemed from there as if some kind of financial application of Math would be best suited. When it came time to choose a program, I heard great things about mmf, and it was in Toronto – since I wanted to stay in Canada, this made it a pretty easy choice.

How do you balance work and personal life?

I make them both a priority. I think it is important to have a certain amount of flexibility, so if there is a deadline, it is important to be able to put in a few extra hours. At first I found that since I don’t have a family to provide firm deadlines I was spending more time at work than I needed to – but since then I have become pretty involved in Ultimate Frisbee – providing me with the kind of firm deadlines for leaving which I needed!

The financial industry is known to be more male dominated than medicine, law and other fields. How have you been able to succeed as a woman in the financial industry?

I think it is important not to be too pre-occupied with the fact you are a woman. That is not to say I don’t read newspaper articles about how to avoid the glass ceiling or argue the “feminist” side in conversations with former classmates. Since the work itself isn’t gendered, I think the way to succeed is to focus on doing good work and challenging
Crysler Paton
Risk Consultant, IBM Algo Risk Service on Cloud, mmf Alumna 2011

What advice would you offer to someone considering mmf? To a recent grad? Would your advice be different to a woman versus a man considering a career in the financial industry?

Appreciate your last year of school! I like my job, but the way a good class can lead you to improve the way you think is definitely something I miss…

My advice to a recent grad would be to try and continue to challenge yourself in as many ways as you can. It is easier in the working world to specialize, which has its advantages, but I think it is valuable to expose yourself to a variety of things.

In principle my advice would not be different to a woman or a man. Yet, in a candid conversation, my advice to a woman entering the program would be a little different.

Would you recommend the mmf program and why?

It was a really valuable experience for me – an opportunity to learn what was essentially a new language – and to practice with applications everything we learned was a great preparation for the future!

Introduction to Linear Optimization and Extension with MatLab

Written by mmf Professor Dr. Roy Kwon

Roy H. Kwon is currently Associate Professor in the Department of Mechanical & Industrial Engineering at the University of Toronto, St. George Campus. Also, he is a member of the faculty in the Master of Mathematical Finance (mmf) Program at U of T.

The book represents a concrete and intuitive, yet rigorous, approach to covering linear optimization and extensions.

I was motivated to write this book based largely on my experiences from teaching MMF 1921 Operations Research and MIE 1620 Linear Programming in my home department at Mechanical and Industrial Engineering (MIE).

As a result there are many examples involving portfolio optimization and logistics and supply chain management.

-- Dr. Roy Kwon
Where did you find out about mmf? What other programs were you considering and why?
I found out about mmf via its website. When I started to think about having a Master’s degree in finance, I did a search online and noticed that the UofT offered the mmf program. I was also considering McMaster University’s MFM and New York University’s Master of Finance due to their locations and education.

Why did you choose mmf?
I wanted to get into a very well-known fast-track program with a very good historical employment record. I was looking for a degree during which I could do an internship to gain experience. I believed that mmf offered what I was looking for, and it is one of the best mathematical finance programs in Canada. I also talked to some of the Alumni and attended the mmf Q&A session to obtain more information. In addition, the fact that mmf is quite mathematical and didn’t require a lot of finance knowledge as a prerequisite matched my background very well.

What’s your educational/work background?
I have a B.Sc., an M.Sc, and PhD, all in Mathematics.

Where did you do your internship? How did your internship help you secure employment?
I did my internship at the Model Vetting Services of Manulife Financial. Model Vetting was a perfect place to do an internship because I got to work on several financial models within a short amount of time and learned a lot during the process. I really liked what I was doing, and I believe I did a good job during the internship. Towards the end of my internship, I applied for a job in the same group and was offered a position soon after.

When did you secure full-time employment?
I secured full-time employment in the last week of April, which was 1 week after my internship ended.

What advice would you give to new students coming into the program?
Don’t panic! I remember myself panicking after two weeks into the program, as it felt as though there were a ton of assignments accumulating. It will be a busy year for sure, but you get used to the pace after some time. In addition, I highly recommend going beyond what is taught in the classroom. The time during the lectures is limited, so the instructors cannot go into details for each concept. If you hear a concept during the lecture, go and do a search around it to have a better insight. I think the most successful students were the ones who did not confine themselves only to the lectures.

What’s the most difficult decision you’ve ever made? What’s the easiest decision you’ve ever made?
Back in time, the decision from pure math into finance was the most difficult decision for me. I knew I wanted to do something more applied and did my research on finance before deciding to go for it, but I still feared not liking the material and regretting my choice once I started the program. Luckily, my fears were unfounded, and I was really glad that I switched my area. The easiest decision I have ever made was moving to Canada from Turkey (where I’m from) for my graduate degree. I have always wanted to live abroad, and I have always considered Canada to be a beautiful and multicultural country with very high standards of living. As a result, it was very easy to choose Canada for my education.

How do you balance work and personal life?
This was a bit difficult to do during the program due to its intensity, but my current work hours permit me to have a balanced work and personal life. I make sure that I use the time I spend at work efficiently, so that I can finish a task on time and not have to worry about deadlines during my personal time.
How do you feel about being a woman pursuing a career in a male-dominated industry?
I think I have never been intimidated by the fact that finance is a male-dominated industry. I believe that if you work at a company that follows its equality and diversity policy correctly, then the company will value your skills and knowledge regardless of your gender. I have already met several very successful female leaders in finance, which has also motivated me further.

What woman has influenced you, or inspired you, and why?
I find the story of Emmy Noether, a female mathematician, who has made groundbreaking contributions to abstract algebra and theoretical physics to be very inspiring. She is special to me not only because she had done groundbreaking work in my field of PhD research, non-commutative algebra, but also because of how passionate and determined she was. She decided to pursue a university education in math during a time when women were not even allowed to study at some of the universities. After her PhD, she worked for 7 years at a mathematical institute without pay, and even after she showed excellence in her research, she was not able to obtain a faculty position due to gender discrimination. Yet due to her passion, tenacity, and support from Albert Einstein, she eventually was accepted as a lecturer, taught at different universities, and was awarded with a very prestigious prize. I admire not only her mathematical talent and skills, but also her courage and determination about going into a field which is very highly male-dominated.

What would encourage more women to enter the area of finance?
I think seeing examples of successful women in the area of finance is a big encouragement. During my internship, my manager and her manager were both women, and I was really inspired by their success. Seeing their confidence and knowledge levels were also a motivation for me. I believe there is also some work to be done by financial education programs: they should put a special emphasis on increasing their ratio of female students.

Would you recommend the mmf program and why?
I would definitely recommend the mmf Program if you are looking for a fast-track program that provides a solid education, has a great historical internship and employment record, and has a lot of networking opportunities.

In the fall of 2013, the Department of Statistical Sciences (DoSS) began a new PhD program in Actuarial Science and Mathematical Finance. The program is built on the strong and diverse research agenda of the department and the continuingly growing demand from both industry and academia for PhDs who have solid quantitative training in probability and statistics as it pertains to finance and insurance.

To meet this demand, the four year program trains students at the interface of probability, statistics, finance and insurance with a mixture of theoretical and applied courses. The program is accessible to students who have solid training in Mathematics, Statistics and/or Actuarial Science, however, students with degrees in Physics, Economics and Engineering are also encouraged to apply.

Our faculty members are experts in several aspects of Mathematical Finance, Actuarial Science and Statistics and students can expect to focus their research on a variety of topics including:

- Applied stochastic control in finance and insurance
- Commodity models and derivatives
- Dividends and taxation models
- Financial insurance
- High frequency and algorithmic trading
- Homogenization and singular perturbation in finance and insurance
- Insurance loss models
- Machine learning in finance
- Queueing models and fluid flows
- Real options
- Reinsurance
- Risk Theory

For more program information please see the PhD Program Information page or contact Prof. Sebastian Jaimungal, Associate Chair of Graduate Studies in Statistics (sebastian.jaimungal@utoronto.ca)
I didn’t start out with a master plan to get to where I am now - it is only in retrospect that I see and appreciate how all of the pieces fit together. I never thought I would say this but today I am grateful for suffering through my two years of boredom as a credit analyst in my first job out of business school! Doing something that is not the right fit can be an amazing lesson and in my case it motivated me to overcome my shyness and reach for more. For a couple of years I had been riding the elevator with this incredibly well-dressed woman who worked for Xerox – their office was in the same building that I worked in. I was always curious about what she did for a living and I somehow summoned up the courage to ask her to have a coffee with me. She helped me work out a strategy to sell myself to the company (even though I didn’t have the right skills or qualifications) and I ended up going from a salary job to one where I earned commission-only based on my sales results. I loved the challenge and I quickly learned that the harder I worked the more money I made and (perhaps not coincidentally) my clothes kept getting nicer and nicer! After a few years of gaining confidence and winning some President’s Club awards, I ended up being promoted to a new position where I was selling to “major accounts” - banks and brokers. It didn’t take long for me to see the potential for a stellar career in those industries if you were fortunate enough to have the combination of selling skills and an aptitude for math. The financial industry became my focus and from there it has been a journey of following my evolving interests and never being afraid to ask for opportunities.

It is important to me to have the freedom to set my own schedule and create my own business plan. The harder I work, the more I am compensated – this is an equation that makes sense to me. In addition, I feel good that my firm’s interests are aligned with those of our clients in such that the partners invest our own capital in the same investments that we recommend to our clients.

I had a strong desire to work in a trading room but for one, it was not a great time to be looking for a job in finance; secondly, I really didn’t have the right qualifications or technical experience. What I did have was determination and perseverance. I think these qualities are necessary whether you are a man or a woman in the industry. I went on 47 interviews before I was hired! I was finally able to convince someone to take a chance on hiring me - I had the selling skills and I knew I could learn the rest. One of the women that interviewed me was Sherry Cooper at Burns Fry. She told me that as a woman entering the industry I should get the CFA designation and I would have to work “twice as hard as any man”. I followed her advice.

I don’t have one particular female role model. I have never been afraid to ask questions and along the way several people have given me great advice at various points in my career. I feel inspired by the smart women that I interview around the world – I love how willing they are to share their wisdom and real-life success stories. It is this quality of generosity that will move the world of women and finance ahead in the future. Sharing knowledge is the key -- and women love to share.
I believe a lot more women would be interested in studying finance if they understood that it could set them up to do very meaningful work. For example, one of the young women that I interviewed last year told me that she started out with an ambition to be of service to the world yet had very little interest in business. She had always thought the two were mutually exclusive. But once she began working for a children’s charity she soon learnt the importance of finance in people's lives and she became increasingly aware that money had to be coming in at the end of the day to provide true comfort for the children. She then became motivated to learn about business and finance so that she could be more pragmatic in her charitable endeavors. She went back to graduate school to try and understand how finance could be used for good.

Other women work in the emerging markets sector or for venture capital firms investing in projects that have both a financial return and a social and/or environmental impact return. We need to do a better job of raising awareness that finance can be a means to serve more goals than just getting a big paycheck.

My balance comes from integrating my research work (my passion) with my professional career as a portfolio manager. There is a lot of overlap as I am interviewing accomplished women around the world yet discussing the topic of finance. I didn’t set out to do this as a way to obtain more clients but occasionally this is a natural outcome after spending hours with someone in a trusting conversation. It is meaningful to me to work with smart women and to make sure that we all put forward a positive and encouraging message for the next generation.

I work at Cumberland - one of Canada’s most successful independent investment firms. I have access to our proprietary research and I also benefit from hearing the insights and experience of my senior partners on a daily basis. Aside from the traditional channels of information and news, I am a big user of Facebook and LinkedIn because my contact base acts as a sophisticated resource for posting current news and trends.

The CFA designation is the gold standard in the investment community. It is recognized worldwide and it is a hard-earned badge of honour that provides you with professional credibility. I am required to have the CFA designation in order to manage investment portfolios on a discretionary basis so it is integral to my career. If I hadn’t earned my designation I would never have felt qualified to embark on my independent research work on the topic of women and finance. The most recent highlight in my career occurred on March 8th of this year. I spoke in Istanbul on International Women’s Day at a conference hosted by Accenture. The topic was “Defining Success My Way”. It was a very personal celebration for me because it felt as though all of my studies, professional skills development and creative efforts had come together.

Technology has dramatically affected the way the financial markets function from day-to-day operations, to types of products and marketing techniques. This evolution will continue at a rapid pace and in all likelihood there will be far fewer jobs available in the industry 5-10 years from now. Many of our jobs will be replaced by machines. I am pretty sure the biggest challenge will be the level of competition in the workplace. My advice to women entering the industry now is “you have to work twice as hard as any man. Or woman. Or computer!”
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