Smith Queen's MFin
MFIN 841
Financial Technology and Innovation
Fall 2020

Course Instructor: Ryan Riordan

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Course Overview

Technology has undeniably changed how financial markets and institutions function. Every part of the financial value chain is being "disrupted" by nimble technology-based innovators. The payment system is digital, currency is electronic and investment advisors are being replaced by algorithms. Where one-on-one relationships used to determine success and failure, the ability to process and act on massive amounts of data is taking over. Securities trading and origination typically the turf of large institutions is being taken over by technology. Not only has technology impacted finance – innovations like indexing and fee-based advisors are fast changing the market for advice. Social Media has changed the landscape and speed of information dissemination. High frequency and algorithmic trading take advantage of fast access to information and technology to trade in milliseconds. Technology and financial innovations can be used for good or not so good purposes. For instance, it can be used to exploit behavioral biases such as underweighting catastrophic events - think of the financial crisis!

The course will study both the good and bad, regulatory aspects, and whether or not these innovations are exploiting or supporting "social welfare". All of these aspects are changing the skills required to be successful in modern finance. We will also cover how finance has changed and is changing, the skills required to be successful and what the

future may bring. Where possible we will link new phenomena to classical finance theory and highlight where predictions and reality have diverged.

About the Instructor

Ryan Riordan is an Associate Professor and Distinguished Professor of Finance at Smith School of Business. Ryan studies how investors and exchanges use technology, in particular high frequency trading systems, and the impact of these systems on the quality of financial markets. Too much technology, or its misapplication, can result in markets that are unstable and expensive. Not enough technology can mean investors do not meet their investment targets. He is also looking at a broader question: Is faster price discovery better for markets? He is exploring the impact of ever faster price discovery on other important market factors, such as liquidity, short-term volatility, and long-term price discovery and efficiency. His work has been published in the Journal of Finance, Journal of Financial Economics, Review of Financial Studies, Journal of Banking and Finance, Journal of Financial and Quantitative Analysis, Journal of Financial Markets, and the Journal of the Association of Information Systems. His work has won awards such as the Michael J. Brennan Award for the best paper published in the Review of Financial Studies, and the Philip Brown Prize for the best paper published using Sirca data. In 2015 Ryan was awarded a SSHRC grant and the Smith School of Business New Research Award.

Before starting at Queen's, Ryan was an assistant professor at University of Ontario Institute of Technology and assistant professor at the Karlsruhe Institute of Technology. He earned his PhD from Karlsruhe Institute of Technology and MBA from the Sprott School of Business at Carleton University. Before embarking on an academic career, Ryan worked as a trader and risk manager at HSBC Trinkaus in Dusseldorf, Germany.

Learning Objectives and Methods

The course is designed to present students with an alternate lens on finance, particularly financial markets, trading and investing, by extending the theoretical models and lessons of classical finance. This course will provide a fresh view on what may change and what may not. The class will revisit classic economic theories, how they may be changing, and potentially new economic theories and results. Innovations in trading including, high frequency and algorithmic trading, automated markets, and market speed bumps will be examined from a market welfare perspective. How automation affects the investment and portfolio management process and business will also be discussed.

The course will be delivered in a novel fashion with a combination of recorded lecture snippets, live tutorials, readings, presentations, and activities that will require the active participation of students. The course will depend heavily on active group participation and a desire to think outside of the box. Programming skills are not required but an openness to acquire these skills is a prerequisite. At the end of the course students will have knowledge of how technology supported innovation in financial services is changing financial intermediation. Students may also have an idea and a prototype for a FinTech start-up of their own. This is encouraged but is certainly not the only goal of the course.

Course Materials

<u>Recommended material</u>

Subscription to the Wall Street Journal and/or the Financial Times. Some other excellent financial magazines such as The Economist and Business Week also provide good applications of what you will learn in the class.

<u>Course Website</u>

The course website provides valuable information related to the course. On the website you will find:

- Smith Living Cases
- Readings
- Video Snippets
- Academic articles
- Posted articles from financial press, as may arise in class

Evaluation

This class will be delivered mostly asynchronously. That means that students will work through most of the material at their own pace. Nevertheless, case write-ups, presentations, and the final report write-up and presentation have specific deadlines. The final course deliverable is a presentation (and write-up) of a prototype, pitch or report. Please note: the instructor must approve topics for the final presentation

Living Case Write-ups (Individual)………………………...………. (4 * 10%) 40%

Living Case Presentation (Group)…..………………………..…………..…… 10%

Market Data Analysis (Individual)……..………...…………..……………………10%

Final Prototype/Pitch/Report (Group)………...…………..……………………40%

Week	Session	Topic	Keywords	Material	Schedule
1	Intro	Introduction to Course	Digital Capital Markets, Automated Investing		
2	I Digital Capital Markets	Trading and Markets			
		Floor and Limit Order Markets		ECN Millennials Case	
3		Evolution of Market Technology and Evaluating Market Quality			
4		High Frequency Trading and Algorithmic Trading		Knight Capital	
5		Innovative Market Structures			
6		Digital Capital Markets Wrap-Up		Data Assignment	
7	II Investing	Investing and Portfolio Management			
8		Factor Investing			
9		Big Data and Machine Learning in Investing		Robinhood	
10		Analysts, Financial Advisors, and Information Intermediaries			
11		Wealth-Tech and Robo-Advice		Attack of the Robo-Advisors	
12		Final Presentations			

Accommodations Statement

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Wellness Services (SWS) and register as early as possible. For more information, including important deadlines, please visit the Student Wellness website at: *http://www.queensu.ca/studentwellness/accessibility-services/*

Turnitin

When assignments are submitted through the dropbox on the course website, they may be processed through Turnitin.com. Turnitin is a plagiarism detection tool that checks your submission against other texts, including websites, journal articles, books, and other student submissions in order to verify the originality of the submission. More information about Turnitin will appear when you first log in to the course website.

Academic Integrity Statement

Queen's students, faculty, administrators, and staff all have responsibilities for supporting and upholding the fundamental values of academic integrity. Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility, and by the quality of courage (see www.academicintegrity.org). These values and qualities are central to the building, nurturing, and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University.

Students are responsible for familiarizing themselves with, and adhering to, the regulations concerning academic integrity. General information on academic integrity is available at *Academic Integrity @ Queen's University;* an *overview* of Smith's own *policies and procedures* are also important to review. You may also find these *frequently asked questions* on academic integrity helpful for your understanding of the concept and the regulations surrounding it. Departures from academic integrity include, but are not limited to, plagiarism, use of unauthorized materials, facilitation, forgery, and falsification. Actions which contravene the

academic integrity regulations carry sanctions that can range from a warning, to loss of grades on an assignment, to failure of a course, to requirement to withdraw from the university.

Academic Integrity and Assignment Details:

Individual Work

I will clearly indicate when students can consult with one another or with experts or resources. Otherwise, you are required to develop an original response to the assigned topic. Assignments and examinations identified as individual in nature must be the result of the student's individual effort. Individuals must not look at, access or discuss any aspect of anyone else's solution (including a student from a previous year), nor allow anyone else to look at any aspect of their own solution. Likewise, students are prohibited from utilizing the internet or any other means to access others' solutions to, or discussions of, the assigned material. If the assignment requires outside research, all sources must be properly cited and referenced; be careful to **cite all material**, not only of direct quotations but also of ideas. Help for citing sources is available through the Queen's University library: http://library.queensu.ca/help-services/citing-sources.

Group Work

I will clearly indicate when groups may consult with one another or with other experts or resources. Otherwise, in a group assignment, the group members will work together to develop an original, consultative response to the assigned topic. Group members must not look at, access or discuss any aspect of any other group's solution (including a group from a previous year), nor allow anyone outside of the group to look at any aspect of the group's solution. Likewise, you are prohibited from utilizing the internet or any other means to access others' solutions to, or discussions of, the assigned material. If the assignment requires outside research, all sources must be properly cited and referenced; be careful to **cite all material**, not only of direct quotations but also of ideas. Help for citing sources is available through the Queen's University library: http://library.queensu.ca/help-services/citing-sources. The names of each group member must appear on the submitted assignment, and no one other than the people whose names appear on the assignment may have contributed in any way to the submitted solution. In short, the group assignments must be the work of your group, and your group only. All group members are responsible for ensuring the academic integrity of the work that the group submits.