Giorgio Costa

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🎓 EDUCATION

2015 – 2020	**Ph. D. Candidate in Operations Research**, University of Toronto	
	Advisor: Professor Roy H. Kwon	Thesis: Advances in risk parity portfolio optimization
	GPA: 3.98 / 4.0	Awards: $190,000 in scholarships, stipends and grants.
2007 – 2012	**B. Eng. Hons. in Mechanical Engineering**, McGill University	

📖 RESEARCH EXPERIENCE

Researcher, University of Toronto

2015 – Present   Performed quantitative research in portfolio optimization, tactical asset allocation, risk attribution and factor modelling. Specifically, this pertains to data-driven asset allocation models under uncertainty, applying mathematical optimization theory and machine learning to develop optimal robust investment strategies against adversarial or regime-dependent markets.

Journal Publications

- **Costa, G.** and Kwon, R. H. (2020). A robust framework for risk parity portfolios. *Journal of Asset Management*, 21, 447–466.
- **Costa, G.** and Kwon, R. H. (2020). Generalized risk parity portfolio optimization: an ADMM approach. *Journal of Global Optimization*, 78, 207–238.
- **Costa, G.** and Kwon, R. H. (2020). A regime-switching factor model for mean–variance optimization. *Journal of Risk*, 22(4), 31–59.
- **Costa, G.** and Kwon, R. H. (2019). Risk parity portfolio optimization under a Markov regime-switching framework. *Quantitative Finance*, 19(3), 453–471.
- Wu, D., Kwon, R. H., and **Costa, G.** (2017). A constrained cluster-based approach for tracking the S&P 500 index. *International Journal of Production Economics*, 193, 222–243.

Manuscript Preprints

- **Costa, G.** and Kwon, R. H. (2020). Data-driven distributionally robust risk parity portfolio optimization. Manuscript submitted for publication.

💼 PROFESSIONAL EXPERIENCE

Toronto–Dominion Bank, Toronto, ON

2017 – 2018   **Senior Risk Analyst**, TD Wealth – Credit and Market Risk

Developed a novel equity risk model that measures the propensity of a stock to suffer from price shocks. This model applies machine learning principles while retaining interpretability. The development included feature selection and engineering, predictive model design, backtesting, and documentation. The model was successfully validated through the TD validation process.

2016 – 2017   **Research Associate**, TD Securities – Capital Markets Risk Management

Developed a model to simulate reasonable interest rate shocks in a near-zero and negative interest rates environment. This produced more realistic Monte Carlo simulations when computing the 10-day Value-at-Risk of the Bank's portfolios. My responsibilities included research, model development, coding and implementation, and backtesting.

University of Toronto, Toronto, ON

	Course Instructor (Lecturer)		**Teaching Assistant**
Fall 2020	MIE236 – Probability	Fall 2017 – 2020	MMF2000 – Risk Management
Win. 2018 – 2020	MIE377 – Financial Optimization Models	Fall 2019 – 2020	MIE479 – Capstone Design Project
Fall 2019	ECE302 – Probability and Applications	Sum. 2017 – 2020	MMF1921 – Operations Research
Fall 2018	MIE375 – Financial Engineering	Fall 2016	MIE1621 – Non-Linear Optimization

Wood plc, Oakville, ON

2012 – 2015   **Mechanical Engineer-in-Training**

Performed computational fluid-flow simulations and stress analysis of piping systems. Prepared other engineering calculations and technical drawings. Performed project management duties on-site in Buchanan, Liberia.

⚙️ SKILLS

Programming	Julia, R, Python	**Optimization**	Gurobi, Mosek, Ipopt, CPLEX, JuMP, CVXPY
Software	Matlab, MS Office Suite	**Cloud Computing**	MS Azure, Docker