JOSEPH JEROME

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EDUCATION

Ph.D. in Statistics September 2017 - September 2021

University of Warwick

Optimal Investment and Consumption under Infinite Horizon Epstein–Zin Stochastic Differential Utility

Integrated Master's Degree in Mathematics (MMath) September 2013 - May 2017

University of Bath (with Erasmus year at the Complutense University of Madrid)

First class Honours (overall programme average 76.3)

Modules taken include: probability with martingales, stochastic processes and finance, discrete probability, set theory, measure theory, Markov Processes, ordinary differential equations, optimal control

A-levels August 2010 - June 2012

King Edward VI Community College, Totnes

*A*AAAB in Mathematics, Physics, Further Mathematics, Product Design and Spanish respectively.*

RESEARCH

I have recently submitted my PhD thesis at the University of Warwick, where I have been working under the supervision of **Professor David Hobson** and **Dr Martin Herdegen**. In particular I work on an infinite-horizon stochastic optimal control problem, whose objective is to jointly optimise investment and consumption with the goal of maximising a subjective *Epstein–Zin stochastic differential utility* utility function. This topic spans stochastic optimal control, backwards stochastic differential equations and financial economics. I am due to defend my thesis on the 26th November.

During my Master's degree at Bath I worked on a project using stochastic dynamic programming to optimise a sequence of medical trials. This was supervised by Dr Alex Cox.

PAPERS AND PREPRINTS

The following papers are co-authored with *Martin Herdegen* and *David Hobson*.

An elementary approach to the Merton problem

Mathematical Finance. Volume 31, Issue 4 *21 pages*

The Infinite Horizon Investment-Consumption Problem with Epstein-Zin Stochastic Differential Utility

Submitted to *Finance and Stochastics*, available at SSRN/ArXiv. *41 pages*

Proper solutions for Epstein–Zin Stochastic Differential Utility

Working draft, available upon request. *40 pages*

A SELECTION OF CONFERENCE TALKS

Lifetime Investment and Consumption with Epstein–Zin Stochastic Differential Utility

10th AMaMeF conference, *Padova, Italy* 22nd June 2021

The Infinite Horizon Merton Problem with Epstein-Zin Stochastic Differential Utility

SIAM Conference on Financial Mathematics and Engineering, *Philadelphia, Pennsylvania* 2nd June 2021

Infinite horizon stochastic differential utility (interactive online session)

XXII Workshop On Quantitative Finance, *University of Verona* 28th January 2021

Optimal investment and consumption under Epstein–Zin stochastic differential utility

Stochastic Finance at Warwick Seminar, *University of Warwick* 27th November 2020

An elementary approach to the Merton problem

13th European Summer School in Financial Maths, *University of Vienna* 31st August-4th September 2020

CONFERENCES AND WORKSHOPS

13th European Summer School in Financial Mathematics
University of Vienna — 31st August-4th September 2020

LMS invited lecture series on Fractional Calculus and Fractional Stochastic Calculus
Brunel University (via Zoom) — 15th-19th June 2020

CFM-Imperial Market Microstructure conference
HSBC, Canary Wharf — 12th-13th December 2019

12th European Summer School in Financial Mathematics
University of Padua — 2nd-6th September 2019

Fudan-Warwick Workshop on Financial Mathematics and Stochastic Analysis
University of Warwick — 1st-2nd November 2018

11th European Summer School in Financial Mathematics
Ecole Polytechnique — 27th-31st August 2018

TEACHING EXPERIENCE

Teaching Assistant *University of Warwick* — September 2017 - present
Introduction to Probability: exercise class & problem sets, Undergraduate — 2018/9, 2019/20
Probability and Stochastic Processes: exercise class & problem sets, Postgraduate (WBS) — 2018/19, 2019/20
Stochastic Processes: exercise class & problem sets, Undergraduate — 2017/18

Teaching Assistant *University of Bath* — September 2016 - May 2017
Probability and Statistics 1B: exercise class & computer lab (in R), Undergraduate — Term 1 2016/7
Probability and Statistics 1A: exercise class & problem sets, Undergraduate — Term 1 2016/7

English Language Teacher — January 2013 - August 2013
Acción Callejera Fundación Educativa, Santiago de los Caballeros, Dominican Republic
During my time at Accón Callejera I taught 9 different classes in English and Mathematics. I taught groups aged 4 - 16, all requiring different approaches.

PROGRAMMING

I have a working knowledge of Python, focusing on its use for financial statistics (using packages such as NumPy, Pandas, Scikit-learn, Statsmodels, Keras, TensorFlow, PyTorch, PyMC). Over the last couple of years, I have created a cryptocurrency-based algorithmic trading pipeline with two friends, which is now functional. I started a reading group on Python for finance, covering topics such as financial data analysis; technical analysis trading strategies; time series modelling; factor models; Monte-Carlo methods for option-pricing; econometric models for volatility-modelling; generative adversarial networks for synthetic time-series modelling; and deep reinforcement learning for trading.

I have knowledge in Bash, Git, SQL and MongoDB. I also know some Mathematica, Matlab and R.

READING GROUPS

Whilst at Warwick I have participated in reading groups on the following topics: backwards stochastic differential equations; Skorokhod embedding and model-independent option pricing; optimal transport; Monte-Carlo methods in finance; stochastic control and financial applications; Python for finance; duality in constrained optimal investment and consumption; machine learning for finance; reinforcement learning; and algorithmic and high-frequency trading. Each of these has lasted a term (or two).

EXTRA-CURRICULAR ACTIVITIES

In my spare time I play guitar, travel and am a keen amateur photographer. I speak fluent Spanish, and my written Spanish is at a good standard.

ACADEMIC SUPERVISORS

Professor David Hobson — Email address: D.Hobson@warwick.ac.uk
Dr Martin Herdegen — Email address: M.Herdegen@warwick.ac.uk