Dexter Yashuang Ding

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Research fields

Primary: Financial Econometrics
Secondary: Time Series, Empirical Asset Pricing, Continuous Time Finance

Education

University of Cambridge — Cambridge, UK
PhD Economics — Oct 2017 – Jun 2022 (expected)

- Supervisor: Prof. Oliver Linton
- Thesis title: "Essays in Volatility Modelling"
- References:

Prof. Oliver Linton
Faculty of Economics
University of Cambridge
obl20@cam.ac.uk

Prof. Alexey Onatskiy
Faculty of Economics
University of Cambridge
ao319@cam.ac.uk

Prof. Mark Salmon
Faculty of Economics
University of Cambridge
mhs39@cam.ac.uk

MPhil Economic Research — Sep 2016 – Aug 2017

- Awarded distinction, rank 7/34
- Ranked first in Time Series, Empirical Finance and Macroeconomics II, second in Panel Data and Cross Sectional Econometrics

Imperial College London — London, UK
MSc Risk Management and Financial Engineering — Sep 2014 – Sep 2015

- Awarded distinction

Lomonosov Moscow State University — Moscow, Russia
BSc Economics — Sep 2009 – Jun 2013

- Awarded first class honours, 4.8/5.0
- Learnt Russian in one year (2008) and completed the degree in Russian

Publications

A Simple Joint Model for Returns, Volatility and Volatility of Volatility
Journal of Econometrics, Forthcoming
(Job Market Paper)

We propose a model that allows for conditional heteroskedasticity in the volatility of asset returns and incorporates current return information into the volatility nowcast and forecast. Our model can capture all stylised facts of asset returns even with Gaussian innovations and is simple to implement. Moreover, we show that our model converges weakly to the GARCH-type diffusion as the length of the discrete time intervals between observations goes to zero. Empirical evidence shows that our model has a better fit, more efficient parameter estimators as well as more accurate volatility and VaR forecasts than other common GARCH-type models.

Working papers

Conditional Heteroskedasticity in the Volatility of Asset Returns

We propose a new class of conditional heteroskedasticity in the volatility (CH-V) models which allows for time-varying volatility of volatility in the volatility of asset returns. This class nests a variety of GARCH-type models and the SHARV model of Ding (2021). CH-V models can be seen as a special case of the stochastic volatility of volatility model. We then introduce two examples of CH-V in which we specify a GJR-GARCH and an E-GARCH processes for the volatility of volatility, respectively. We also show a novel way of introducing the leverage effect of negative returns on the volatility through the volatility of volatility process. Empirical study confirms that CH-V models have better goodness-of-fit and out-of-sample volatility and Value-at-Risk forecasts than common GARCH-type models.

Diffusion Limit of Real-Time GARCH

We prove that the diffusion limit of Real-Time GARCH (RT-GARCH) exists if we introduce an auxiliary process to state the system in a Markovian form. The volatility in the diffusion limit follows an Ornstein-Uhlenbeck-type process which fails to be positive with probability one. Moreover, only a degenerate diffusion limit can render an almost surely positive volatility process. As a result, we call for caution when using RT-GARCH since it lacks compatibility with existing asset pricing theories. The result also provides a new insight into how different specifications for GARCH affect its diffusion limit.

Work in progress

Asymptotic Inference for SHARV and GARCH-V Models

We establish the consistency and asymptotic normality of the Gaussian quasi-maximum likelihood estimators (QMLE) for the SHARV model of Ding (2021a) and the GARCH-V model of Ding (2021b).

Do We Need Heavy-Tailed Innovations to Model Excess Kurtosis of Financial Returns?

We conduct extensive empirical studies on S&P 100 and Dow Jones components using the SHARV model of Ding (2021). We show that even with Gaussian innovations, we can still capture the excess conditional kurtosis in financial returns. Moreover, we show that the estimated degrees of freedom when using Student-t innovations are all larger than 30 for SHARV.

Diffusion Limit of GARCH-V

Scholarships and awards

Tudor Studentship in Financial Econometrics	2021 – 2022
Wrenbury Scholarship	2021 – 2022
Cambridge Trust Scholarship	2017 – 2022
Faculty of Economics Trust Fund	2018 – 2021
Cambridge INET Scholarship	2017 – 2020

Work experience

Citigroup London, UK

Quantitative Analyst Sep 2018 – Jan 2019

- Worked with inflation linked bond traders on pricing and bid-ask spread analyses
- Modelled the dynamic correlation between realised volatility and bid-ask spread
- Built forecast models and assessed the performance for yield spreads

Bloomberg London, UK

Financial Engineer Aug 2015 – Dec 2015

- Analysed intraday profits and losses and sensitivities of portfolios consisting of OTC derivatives

- Evaluated the market data contributed by clients for the construction of volatility cube
- Worked with asset managers to reconcile valuation discrepancies

Teaching experience

Teaching assistant for Empirical Finance (MPhil) 2022
Introduction to Probability and Statistics (Preparatory course for incoming Undergraduate) 2021

Extracurricular activities

Learnt Russian in one year and finished undergraduate programme taught in Russian with honours
Volunteer of Johnson & Johnson COVID-19 Vaccine trial programme
Padi rescue diver certificate for SCUBA diving
Trinity Hall Boat Club
L'Oréal Brandstorm marketing contest 2013

Skills

Languages: English (fluent), Chinese (native), Russian (fluent), Spanish (basic)
Programming: Matlab, Python, VBA