

# Marcin Jan ZAMOJSKI

Research fellow

[marcin.zamojski@gu.se](mailto:marcin.zamojski@gu.se) ♦ +46 317 86 12 84 ♦ [www.zamojski.net](http://www.zamojski.net)

Centre for Finance  
Box 640  
405 30 Gothenburg  
Sweden

## Keywords

financial econometrics ♦ hedge funds ♦ empirical asset pricing ♦ term-structure of interest rates ♦ observation-driven models ♦ bootstrap

## Experience

- 2016–*present*: Research fellow at the Centre for Finance, University of Gothenburg, Sweden

## Education

- 2012–2017: VU Amsterdam & Tinbergen Institute  
PhD in Finance

Thesis: *Panta rhei*, measurement and discovery of change in financial markets

Under supervision of: Siem Jan Koopman, André Lucas, Arjen Siegmans, and Denitsa Stefanova

Thesis committee: Albert Menkveld, Marno Verbeek, Bas Werker, Frank Kleibergen, Peter Spreij

- 2010–2012: VU Amsterdam, Tinbergen Institute & Duisenberg School of Finance  
Master of Philosophy in Economics (Finance track)

Thesis: Hedge Fund Innovation

Under supervision of: André Lucas, Arjen Siegmans, and Denitsa Stefanova

- 2004–2009: Warsaw School of Economics  
MSc in Finance and Banking

Thesis: Rationale Behind Randomness in the Financial Markets

Under supervision of: Andrzej Sławiński (Warsaw School of Economics and National Bank of Poland)

## Working papers and work in progress

- Filtering with Confidence: In-sample Confidence Bands for GARCH Filters

*ABSTRACT* This paper is the first to propose a robust method of computing in-sample confidence bands for time-varying parameters estimated with misspecified observation-driven models. As an example of this class, I look at the family of GARCH models which are used to estimate time-varying variances and covariances. I propose a novel bootstrap procedure and a new moving-window resampler which together generate confidence bands around estimated volatility paths. The approach accounts for various sources of uncertainty, including parameter and filtering uncertainty. I illustrate the method by applying it to S&P 500 returns. Moreover, I investigate finite sample properties of the confidence bands and their convergence in a range of simulation experiments. I find that the average coverage is close to the nominal level in finite samples and that it converges to the nominal level as the sampling frequency is increased. The procedure can be used as a smoother to substantially reduce average root mean square error of GARCH paths. The new method is easily implementable and does not significantly increase the computational burden.

PAPER @ [zamojski.net/fwc](https://zamojski.net/fwc)

SLIDES @ [zamojski.net/fwc/slides](https://zamojski.net/fwc/slides)

- Generalized Autoregressive Method of Moments  
(with Drew Creal, André Lucas, and Siem Jan Koopman)

*ABSTRACT* We introduce Generalized Autoregressive Method of Moments (GaMM) dynamics. GaMM extends Generalized Method of Moments (GMM) to a setting where a subset of the parameters are expected to vary over time with unknown dynamics. To filter out the dynamic path of the time-varying parameter, we approximate the dynamics by an autoregressive process driven by the score of the local GMM criterion function. Our approach is completely observation driven, such that estimation and inference are entirely straightforward. Moreover, the approach provides a unified framework for modeling parameter instability in a context where the model and its parameters are only specified through (conditional) moment conditions, thus generalizing previous approaches built on fully specified parametric models. We provide three examples of increasing complexity to highlight the advantages of GaMM.

PAPER @ [zamojski.net/gamm](https://zamojski.net/gamm)

SLIDES @ [zamojski.net/gamm/slides](https://zamojski.net/gamm/slides)

- Hedge Fund Innovation  
(with Arjen Siegmann and Denitsa Stefanova)

*ABSTRACT* We study first-mover advantages in the hedge fund industry by clustering hedge funds based on the type of assets and instruments they trade in, sector and investment focus, and fund details. We find that early entry in a cluster is associated with higher excess returns, longer survival, higher incentive fees and lower management fees compared to funds that arrive later. Moreover, the latest entrants have a high loading on the returns of the innovators, but with lower incentive fees, and higher management fees. Cross-sectional regressions show that the outperformance of innovating funds are declining with age. The results are robust to different parameters of clustering and backfill-bias, and are not driven by the possible existence of flagship and follow-on funds. Our results show that the reported characteristics of hedge funds can be used to infer strategy-related information and suggest that specific first-mover advantages exist in the hedge fund industry.

PAPER @ [zamojski.net/hfi](https://zamojski.net/hfi)

SLIDES @ [zamojski.net/hfi/slides](https://zamojski.net/hfi/slides)

- Dynamic Term Structure Models with Score-Driven Time-Varying Parameters: Estimation and Forecasting  
(with André Lucas and Siem Jan Koopman; financed by the National Bank of Poland)

*ABSTRACT* We consider score-driven time-varying parameters in dynamic yield curve models and investigate their in-sample and out-of-sample performance for two data sets. In a univariate setting, score-driven models were shown to offer competitive performance to parameter-driven models in terms of in-sample fit and quality of out-of-sample forecasts but at a lower computational cost. We investigate whether this performance and the related advantages extend to more general and higher-dimensional models. Based on an extensive Monte Carlo study, we show that in multivariate settings the advantages of score-driven models can even be more pronounced than in the univariate setting. We also show how the score-driven approach can be implemented in dynamic yield curve models and extend them to allow for the fat-tailed distributions of the disturbances and the time-variation of variances (heteroskedasticity) and covariances.

PAPER @ [zamojski.net/nbp](http://zamojski.net/nbp)

## Conference presentations and invited talks

### Filtering with Confidence

- 2017  
European Financial Management Association (Athens, GRE) ♦ North American Summer Meeting of the Econometric Society (St. Louis, USA)
- 2016  
SoFiE: Financial Econometrics and Empirical Asset Pricing Conference (Lancaster, GBR)  
♦ University of Gothenburg (Gothenburg, SWE) ♦ Luxembourg School of Finance (Luxembourg)

### Dynamic Term Structure Models with Score-Driven Time-Varying Parameters: Estimation and Forecasting

- 2017  
International Symposium on Forecasting (Cairns, AUS)
- 2016  
National Bank of Poland (Warsaw, POL)

### Generalized Autoregressive Method of Moments

- 2015  
European Finance Association Annual Meeting (Vienna, AUT) ♦ SoFiE Annual Conference (Aarhus, DNK) ♦ Econometric Society World Congress (Montreal, CAN)<sup>1</sup> ♦ European Economic Association Annual Congress (Mannheim, DEU) ♦
- 2014  
International Association for Applied Econometrics Annual Conference (London, GBR)  
♦ SoFiE: Skewness, Heavy Tails, Market Crashes, and Dynamics (Cambridge, GBR) ♦ NBER-NSF Time Series Conference (St. Louis, USA) ♦ Econometric Society European Winter Meeting (Madrid, ESP) ♦ Workshop on Score Driven Models (Tenerife, ESP).

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<sup>1</sup>Presented by a co-author

- 2013  
Workshop on Score Driven Models (Amsterdam, NLD).

## Hedge Fund Innovation

- 2014  
American Finance Association Annual Meeting (Philadelphia, USA)<sup>1</sup> ♦ Annual Meeting of the German Finance Association (Karlsruhe, DEU) ♦ FMA International: Consortium on Research in Hedge Funds, Trading Strategies & Related Topics (London, GBR)<sup>1</sup> ♦ Annual Cambridge/DSF-TI/Wharton Seminar (Amsterdam, NLD)<sup>1</sup> ♦ International Conference on Macroeconomic Analysis and International Finance (Rethymon, GRC)<sup>1</sup>.
- 2013  
European Finance Association Annual Meeting (Cambridge, GBR) ♦ Mathematical Finance Days (Montreal, CAN) ♦ Luxembourg Asset Management Summit (Luxembourg)<sup>1</sup>.

## In press

### Hedge Fund Innovation

- Global Arc (Winter 2013), *The Secret Behind Innovation of Young Hedge Funds*
- Les Echos (November 20, 2012), *Les Hedge Funds doivent apprendre à gérer la fin de l'âge d'or*

## Honours and grants

- 2015  
Research grant from the National Bank of Poland worth approx. 10,000EUR (*with André Lucas and Siem Jan Koopman*).
- 2013  
*Hedge Fund Innovation* was a runner-up for Commonfund Prize for Best Paper relevant to Foundation and Endowment Asset Management at the European Finance Association Annual Meeting (Cambridge, UK).  
*Hedge Fund Innovation* received Honourable Mention at Mathematical Finance Days (Montreal, CA).

## Teaching and other academic activities

- (2017) Financial Econometrics (graduate level; MLE, GMM, time-series, volatility, asset pricing, forecasting)
- (2017) Master thesis supervision (4 students total)

- (2013, 2014, 2015, 2016, 2017) Bachelor thesis supervision (39 students total)
- (2013, 2014) TA for 'Excel for Finance' (pre-graduate level)
- (2013, 2014) TA for 'Excel bootcamp' (pre-graduate level)
- (2013) TA for 'Institutional Investments and ALM for Business Administration' (graduate level)
- (2013) TA for 'Private Equity and Behavioral Corporate Finance' (graduate level)
- (2012) TA for 'Private Equity and Venture Capital' (graduate level)
- (2012) TA for 'Advanced Econometrics II' (graduate level; IV, GMM, MLE, Logit)
- (2012) TA for 'Advanced Econometrics III' (graduate level; time-series, Kalman Filter, GAS)
- (2011, 2012) Student representative to the Education Board of the Tinbergen Institute
- (2011) RA for Albert Menkveld
- (2011) RA for Ingolf Dittmann and Lili Dai
- (2010, 2011, 2012) Vice-president of the Student Council at the Tinbergen Institute