

# Terri van der Zwan

Erasmus University Rotterdam  
Erasmus School of Economics, Econometric Institute; Tinbergen Institute

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**Email address:** t.vanderzwan@ese.eur.nl

**Personal website:** <https://sites.google.com/view/terrivanderzwan/about>

**Research interests:** financial econometrics, time series econometrics, asset pricing, empirical macroeconomics, and machine learning methods.

## Education

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### Erasmus University Rotterdam

*Ph.D. candidate in Financial Econometrics*

Sept. 2019 – Present  
Rotterdam, The Netherlands

Job market paper: “Multiple Shock Impulse Response Functions”.

*Academic advisors:* Prof. Dr. Michel van der Wel and Prof. Dr. Erik Kole.

### University of California San Diego

*Research visit*

Sept. 2022 – Dec. 2022  
San Diego, CA, United States

Host: Prof. Dr. Allan Timmermann

### Erasmus University Rotterdam

*M.Sc. Econometrics and Management Science*

Sept. 2016 – Feb. 2018  
Rotterdam, The Netherlands

**Cum laude distinction**, Majoring in Quantitative Finance, GPA: 8.4/10.

Thesis: “Macro or Fundamental? Comparing the Drivers of Equity Returns” (Graded: 9.2/10).

### Erasmus University Rotterdam

*B.Sc. Econometrics and Operations Research*

Sept. 2013 – Aug. 2016  
Rotterdam, The Netherlands

Majoring in Quantitative Finance, GPA: 7.7/10.

## Research

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### Job market paper: Multiple Shock Impulse Response Functions

*Van der Zwan, T.*

This paper introduces the multiple shock impulse response function, a tool to investigate the effects of simultaneous shocks within one period. The concept generalizes individual shock impulse response functions, accounts for the dependence between shocks, and is particularly useful when contemporaneous relations are ambiguous. It is applicable to various multivariate time series models. Simulation studies underscore its necessity for accurately interpreting the total effect of simultaneous shocks and mitigating potential temporal aggregation issues, as summing individual responses can lead to over- or underestimation of the total effect. We further illustrate the relevance by assessing a monetary policy shock alongside uncertainty shocks in lower credit rating countries in the Euro area during the European debt crisis. We find that the interaction between the shocks amplify the effects compared to a monetary policy shock alone, and that multiple shock impulse response functions are necessary as simply summing individual impulse responses result in significantly different responses.

*Winner Ph.D. Paper Competition of the European Central Bank Conference on Forecasting Techniques (2023)*

### Heterogeneous Macro and Financial Effects of ECB Asset Purchase Programs

*jointly with Erik Kole and Michel van der Wel (2023) – Tinbergen Institute Discussion Paper 2021-109/III*

Central banks resorted to asset purchase programs to replace conventional policy measures, which became ineffective

after interest rates approached the effective lower bound. We investigate their effects on financial markets and focus on heterogeneous transmission using a Bayesian structural vector autoregression analysis. Since financial markets react directly to policy announcements, we base our identification scheme on market surprises at the announcement time. We find evidence of a stimulating effect on the economy, declining government bond yields, increasing stock prices, increasing value-growth spread and a reduction in stress in corporate and sovereign debt markets after an asset purchase shock. We disentangle the effect among industry sectors and EMU countries and find that the effect is heterogeneous, with financial stocks and the economy of Southern Euro area countries being the most positively affected.

*Honorable mention at the Early-Career Scholars Conference of the Society for Financial Econometrics (2022)*

## **Equity Risk Factors for the Long and Short Run: Pricing and Performance at Different Frequencies**

*jointly with Erik Hennink and Patrick Tuijp (2023) – Tinbergen Institute Discussion Paper 2021-062/III*

This paper introduces a general linear multifactor asset pricing methodology that integrates systematic risk measured at different frequencies into a single pricing equation. Our setup allows investors with different investment horizons to experience varying levels of systematic risk, potentially due to delayed stock price reactions to systematic factor news. We find that the outperformance of Fama-French factors compared to macroeconomic factors in the cross-sectional fit of expected returns disappears when accounting for these horizon effects. The results show that different factors are priced at different horizons and that optimal portfolio compositions are horizon-dependent.

## **Presentations**

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International conferences and seminars, poster session marked with \*.

**2023** *12th European Central Bank Conference on Forecasting Techniques\**, Frankfurt; *AFA Annual meeting (AFA)\**, New Orleans, Louisiana, US.

**2022** *Midwest Econometrics Group 2022 Conference*, Lansing, Michigan, US; *Seminar at Rady School of Management*, San Diego, California, US; *Annual Congress of the European Economic Association (EEA-ESEM)*, Milan, Italy; *Annual Meeting of the Society for Financial Econometrics (SoFiE)*, Young Scholar Post-Conference, Cambridge, UK; *8th Annual Conference of the International Association of Applied Econometrics (IAAE)*, London, UK; *4th International Conference Quantitative Finance and Financial Econometrics (QFFE)*, Marseilles, France; *Annual Society of Non-linear Dynamics Symposium (SNDE)*, hosted online; *Econometric Institute PhD conference*, Rotterdam.

**Invited talks:** Macro Seminar of University of Houston, November 14, 2022.

**2021** *8th Annual Conference of the International Association for Applied Econometrics (IAAE)*, hosted online; *European Meeting of the Econometric Society (EEA-ESEM)*, ESEM part, hosted online; *ESE Female Network Event*, hosted online; *Econometric Institute seminar*, hosted online.

**2018-2021** *Econometric Institute seminar*, hosted online; *11th Financial Risks International Forum of the Louis Bachelier Institute*, Paris; *2nd International Conference on Econometrics and Statistics (EcoSta)\**, Hong Kong; *Netspar International Pension workshop\**, Leiden; *Finance seminar University of Amsterdam*, Amsterdam; *ERIM Seminar*, Rotterdam.

## **Professional Experience**

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### **ABN Amro Bank**

*Quantitative Research Intern*

Jan. 2018 – June 2018

Amsterdam, The Netherlands

Modeled credit proxy curves exploiting industry-specific information in Python per Basel III for Credit Value Adjustment.

### **Ortec Finance**

*Graduate Quantitative Research Intern*

Apr. 2017 – June 2018

Rotterdam, The Netherlands

Derived and implemented a framework to identify the drivers of equity returns on various investment horizons.

## Awards, Grants and Achievements

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<b>Winner Ph.D. Paper Competition of the European Central Bank Conference</b>	2023
<b>Fulbright Doctoral Award</b> ( <i>selected by NWO and Fulbright Commission</i> )	2022
<b>SoFiE Early-Career Scholars Prize, runner-up</b> ( <i>paper joint with Van der Wel and Kole</i> )	2022
<b>Travel Scholarship Awards</b> ( <i>AFA, IAAE, Society of Financial Econometrics; SoFiE</i> )	2022
<b>STOER Trust Fund</b> ( <i>funding for summer school and research visit</i> )	2021, 2022
<b>Econometric Game, finalist and team captain</b> ( <i>University of Amsterdam, VSAE</i> )	2021
<b>Sino-Dutch Scholarship of NUFFIC's Excellence and Exchange Program</b>	2018

## Other Relevant Education

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<b>Fudan University</b> <i>Sino-Dutch Advanced Language Scholarship student</i> One year advanced Mandarin Chinese Language and Culture Program.	July 2018 – Aug. 2019 Shanghai, China
<b>Shanghai University of Finance and Economics</b> <i>Exchange student</i> Exchange program, part of the B.Sc. Econometrics and Management Science.	Aug. 2015 – Dec. 2015 Shanghai, China

## Teaching

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2022: *Seminar in Applied Econometrics* (M.Sc. Econometrics).  
Supervising 4 groups of 3-5 students working for 12 weeks on an empirical econometric problem.

2021 – 2022: *Introductory Seminar Case Studies Econometrics and Operations Research* (B.Sc. Econometrics).  
Supervising 20+ groups of 3-5 students working for 2 weeks on a financial case.

2019 – present: *Thesis supervision and co-reading* (B.Sc. and M.Sc. Econometrics).

2019 – 2021: *Seminar in Financial Econometrics* (B.Sc. Econometrics).  
Supervising 4 groups of 3-5 students working for 8 weeks on an empirical econometric problem

2019 – 2021: *Asset Pricing* (M.Sc. Econometrics/Financial Economics).

2019 – 2020: *Academic Skills* (B.Sc. Econometrics).

2016 – 2017: *Teaching assistant Mathematics 2* (B.Sc. Economics and Business Economics).

2016 – 2017: *Teaching assistant Statistics* (B.Sc. Econometrics).

2016 – 2017: *Teaching assistant Operations Management* (B.Sc. International Business Administration).

## Proficiencies

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### Technical

Programming languages	Python, Matlab, Bash, LaTeX, R, Java.
Data gathering:	Bloomberg, Eikon/Datastream, various APIs.
Data processing:	pandas, Polars, NumPy, SciPy, Jupyter, R.
Machine learning:	PyTorch, scikit-learn, Keras, TensorFlow, randomForest, XGBoost.
Data visualization:	matplotlib, TikZ, ggplot, plotly.
Cloud and parallel computing:	Super Computer (Debian), SLURM, multiprocessing.
Software packages and markup:	L <sup>A</sup> T <sub>E</sub> X, MS Office, Adobe Photoshop, Adobe Illustrator.

### Languages

Dutch (native), English (fluent), Mandarin Chinese (intermediate), German (intermediate).

## Extracurricular activities

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### **Member of the ESE School Council**

Sept. 2021 – Aug. 2023

Elected staff member of the Erasmus School of Economics School Council.

### **13th Board Chinese Student Association EUR**

July 2016 – Aug. 2017

*Board Member, Internal Relations Manager and Head of Cultural Events*

Over 1,500 members, 6 committees, 35 active members.

Responsible for managing active members, organizing cultural events, a city trip for 35 people and office related issues.

## References

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**Prof. Dr. Michel van der Wel.** (*Email: [vanderwel@ese.eur.nl](mailto:vanderwel@ese.eur.nl)*).

Professor Econometrics of Macro-Finance and Vice Dean of Education at the Econometric Institute, Erasmus School of Economics, Erasmus University Rotterdam.

**Prof. Dr. Robin Lumsdaine.** (*Email: [robin.lumsdaine@american.edu](mailto:robin.lumsdaine@american.edu)*).

Crown Prince of Bahrain Chair in International Finance at Kogod School of Business, American University  
Professor of Applied Econometrics at Erasmus University Rotterdam.

**Prof. Dr. Allan Timmermann.** (*Email: [atimmermann@ucsd.edu](mailto:atimmermann@ucsd.edu)*).

Distinguished Professor of Finance at University of California, San Diego.  
Dr. Harry M. Markowitz Endowed Chair in Finance and Investing.

**Dr. Erik Kole.** (*Email: [kole@ese.eur.nl](mailto:kole@ese.eur.nl)*).

Assistant Professor at the Econometric Institute, Erasmus School of Economics, Erasmus University Rotterdam.