

# Maximilian Matthe

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## RESEARCH OVERVIEW

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My research studies contemporary marketing problems via the lens of modern data science. In particular, I investigate the relationships among market actors, such as competing firms, consumers with similar behavior, or consumer-brand interactions. My research identifies and studies these relationships to develop novel solutions for practical marketing challenges, such as competitive analysis, branding, positioning, or targeting.

Substantive interests: Competition, market structure, strategic market analysis, market evolution

Methodological interests: High-dimensional data analysis, mapping, unstructured data, machine learning

## EDUCATION

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Doctoral Candidate, Marketing, Goethe University Frankfurt, Germany 2023 (expected)

jointly affiliated with *efl – the Data Science Institute* [\[link\]](#)

advisors: Bernd Skiera (Goethe University Frankfurt, Germany) and

Daniel M. Ringel (University of North Carolina at Chapel Hill, USA)

Visiting Doctoral Scholar, University of North Carolina at Chapel Hill, USA Fall 2018 & Spring 2019

invited by Daniel M. Ringel

M.Sc. Money and Finance (Financial Economics), Goethe University Frankfurt 2017

B.Sc. Mathematics and Economics, University of Wuerzburg 2015

## PUBLICATIONS

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[1] **Matthe, Maximilian** / Ringel, Daniel M. / Skiera, Bernd, “Mapping Market Structure Evolution”.

*Marketing Science*, forthcoming. [\[Browser Tool\]](#), [\[Python Package\]](#).

- Finalist, American Statistical Association (ASA) Statistics in Marketing Doctoral Research Award 2022 (result pending)

## WORKING PAPERS

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[2] **Matthe, Maximilian** / Mahlow, Orian M. / Ringel, Daniel M. “Politics in Flux: Dynamic Party Positioning and Voter Support”.

- [3] **Matthe, Maximilian** / Ringel, Daniel M. / Skiera, Bernd, “Identifying Consumers’ Information Needs in Online Search”, *Job Market Paper*.

## **PUBLISHED SOFTWARE**

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evomap – a Python toolbox for mapping evolving relationship data

Based on [1], pre-release version available. [[GitHub](#)], [[Documentation](#)], [[CoLab Tutorial](#)].

## **TEACHING EXPERIENCE**

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*Predictive Modeling in Marketing* (Master’s Level) Summer 2022

Co-instructor with Honorary Prof. Martin Schmidberger

Taught as a hybrid on-/offline seminar. Evaluation: **5.7/6**

*Empirical Customer Data Analysis* (Bachelor’s Level) Fall 2021

Co-instructor with Honorary Prof. Martin Schmidberger

Taught as a fully online seminar. Evaluation: **5.6/6**

*Marketing Analytics* (Bachelor’s Level) Fall 2017 – Spring 2021

Teaching assistant for Prof. Bernd Skiera & instructor for selected sessions

*Real Analysis & Linear Algebra* (Bachelor’s Level) 2017

Teaching assistant

Supervised Bachelor’s / Master’s thesis projects: 14

## **ACADEMIC PRESENTATIONS** (*Presentations by co-authors are not listed*)

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2022 Joint Statistical Meetings, Washington D.C., USA (*scheduled*)

Annual Conference of the European Marketing Academic (EMAC), Budapest, Hungary

2021 Research Seminar, University of Cologne, Cologne, Germany

Symposium on Statistical Challenges in Electronic Commerce Research (SCECR), Spain (online)

Artificial Intelligence in Management Workshop and Conference (AIM), USA (online)

INFORMS Marketing Science Conference, USA (online)

Annual Conference of the European Marketing Academy (EMAC), Spain (online)

2020 Symposium on Statistical Challenges in Electronic Commerce Research (SCECR), Spain (online)

INFORMS Marketing Science Conference, USA (online)

2019 Annual Conference of the European Marketing Academy (EMAC), Hamburg, Germany

***Finalist for the best paper award based on doctoral work***

## **AWARDS AND SCHOLARSHIPS**

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2022 ASA Statistics in Marketing Doctoral Research Award, Finalist (*result pending*)

- AMA-Sheth Doctoral Consortium, Fellow
- EMAC Doctoral Colloquium, Fellow
- 2021 Research grant, efl – the Data Science Institute, funding for dissertation project (23,200€)
- Research grant, DFG – German Science Foundation, based on dissertation projects (with Bernd Skiera, ~ 200,000€)
- 2020 Research grant, efl – the Data Science Institute, funding for dissertation project (22,800€)
- 2019 Finalist, EMAC 2019 Best Doctoral Paper Award (EMAC 2019)
- Travel grant, DAAD, for research visits at UNC at Chapel Hill (~15,000€)
- Travel grant, “Forschungstopf” by Goethe University Frankfurt (2,000€)

## OTHER

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Programming: Python, R, C++, Java(Script), PHP

Data Science: Git, GPU / Cloud Computing, Colab, Pytorch, Tensorflow

Languages: German (native), English (fluent)

## ACADEMIC REFERENCES

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Bernd Skiera	Daniel M. Ringel
Professor of Electronic-Commerce	Assistant Professor of Marketing
Department of Marketing	Kenan-Flagler Business School
Goethe University Frankfurt, Germany	University of North Carolina at Chapel Hill, USA
Email: <a href="mailto:skiera@wiwi.uni-frankfurt.de">skiera@wiwi.uni-frankfurt.de</a>	Email: <a href="mailto:dmr@kenan-flagler.unc.edu">dmr@kenan-flagler.unc.edu</a>

Oliver Hinz

Professor of Information Systems &

Chair of efl – the Data Science Institute

Goethe University Frankfurt, Germany

Email: [ohinz@wiwi.uni-frankfurt.de](mailto:ohinz@wiwi.uni-frankfurt.de)

## ABSTRACTS

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[1] “Mapping Market Structure Evolution” (with Daniel M. Ringel and Bernd Skiera)

A common element of market structure analysis is the spatial representation of firms’ competitive positions on maps. Such maps typically capture static snapshots in time. Yet, competitive positions tend to change. Embedded in such changes are firms’ trajectories, that is, the series of changes in firms’ positions over time relative to all other firms in a market. Identifying these trajectories contributes to market structure analysis by providing a forward-looking perspective on competition, revealing firms’ (re)positioning strategies and indicating strategy effectiveness. To unlock these insights, we propose EvoMap, a novel dynamic mapping framework that identifies firms’ trajectories from high-frequency and potentially noisy data. We validate EvoMap via extensive simulations and apply it empirically to study the trajectories of more than 1,000 publicly listed firms over 20 years. We find substantial changes in several firms’ positioning strategies, including Apple, Walmart, and Capital One. Because EvoMap accommodates a wide range of mapping methods, analysts can easily apply it in other empirical settings and to data from various sources.

[2] “Politics in Flux: Dynamic Party Positioning and Voter Support” (with Orian Mahlow and Daniel M. Ringel)

Like brands, political parties must position themselves against their competitors to capture market share, that is, votes. Likewise, these positions need are not static but rather frequently change in response to external events or shifts in public sentiment. Understanding when/how such changes in party positioning occur and how they relate to voter support can provide campaign managers with valuable insights for their positioning or branding strategies. Despite this relevance, marketing research has mainly developed approaches for studying brand positioning and given little attention to political parties. To fill this gap, we introduce an approach for estimating high-frequency time series of party positions from textual data. Our approach leverages recent innovations from natural language processing and market structure analysis (transformer models and dynamic mapping). We apply our approach to thousands of parliamentary speeches in Germany over 24 years and use these estimates to quantify party positioning along various dimensions, such as their temporal consistency or degree of differentiation. Our text-based estimates uncover multiple significant shifts in Germany’s political landscape, such as the con-/divergence of competing parties. We show that these shifts in party positioning can substantially help to predict shifts in voter support, measured via weekly election polls, above and beyond established indicators.

[3] “Identifying Consumers’ Information Needs in Online Search” (with Daniel M. Ringel and Bernd Skiera)

Consumers routinely use search engines like Google to satisfy their information needs. These searches provide brands with ample opportunity to connect with consumers. Yet, brands first need to understand

their target consumers' information needs to create relevant content or target them via ads. Yet, identifying consumers' information needs is challenging, as consumers' online searches are typically not observable to brands. This article provides a new approach to identifying consumers' information needs. Our approach tracks consumers' search behavior via a custom-developed search simulator and uses textual data analysis to infer consumers' information needs from the recorded search queries. We apply our approach to identify consumers' information needs when searching for a new credit card. Our analysis reveals eleven broad information needs, including information on benefits, costs and fees, interest rates, specific brands, or traveling. These insights helped our practice partner target consumers who generated 10,000s of additional monthly clicks at below-average ad prices.

*Last update: July 13 2022*