Maximilian Matthe

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RESEARCH OVERVIEW

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. I believe that understanding these relationships can provide novel solutions to 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

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. Financial Economics (MMF), Goethe University Frankfurt   2017

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

PUBLICATIONS

[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

[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

evomap – a Python toolbox for mapping evolving relationship data

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

TEACHING EXPERIENCE

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*)

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

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

Programming:	Python, R, C++, Java(Script), PHP
Data Science:	Git, GPU / Cloud Computing, Colab, Pytorch, Tensorflow
Languages:	German (native), English (fluent)

ACADEMIC REFERENCES

Bernd Skiera

Professor of Electronic-Commerce

Department of Marketing

Goethe University Frankfurt, Germany

Email: skiera@wiwi.uni-frankfurt.de

Daniel M. Ringel

Assistant Professor of Marketing

Kenan-Flagler Business School

University of North Carolina at Chapel Hill, USA

Email: dmr@unc.edu

Oliver Hinz

Professor of Information Systems &

Chair of efl – the Data Science Institute

Goethe University Frankfurt, Germany

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ABSTRACTS

[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.

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