

Democratizing Machine Learning

Internalizing the Externalities of Overfunding on Crowdfunding Platforms

Visibility in Organic Search: Why Should Managers and Investors Care about It?

Disruptive Ways of Public Affairs Work




## **Impressum**

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Gestaltung  
Novensis Communication GmbH  
Bad Homburg

3. Ausgabe, 2019  
Auflage: 200 Stück (Print) / 2.000 Stück (E-Paper)

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Printed in Germany  
ISSN 1866-1238

## Editorial

# Democratizing Machine Learning

Carsten Binnig

Machine learning (ML) is today an important component of a large number of technical and social products. Whether we ask intelligent language assistants such as Apple's Siri on our smartphone for a kid-friendly restaurant with free parking, ask Google for a political fact check, or use autopilot functions in a vehicle, intelligent software is always behind it. The ever-increasing amount of data, which we collect about our world, has led to a paradigm shift: Instead of manually coding all the steps of knowledge processing, learning algorithms are used that allow systems to automatically recognize the structure of our world in data and to supplement their knowledge.

This paradigm shift is just beginning. On the one hand, in addition to user-generated data (business transactions, e-mails, pictures), the amount of data and the number of data sources in the area of machine-generated data are growing steadily. Experts predict that by the

year 2020, 50 billion devices worldwide will be connected via the Internet of Things, which will generate continuous data that can be used to learn from. On the other hand, the spread of data-driven products is increasing rapidly. In addition to applications in the corporate sector (e.g., the prediction of failures of machines in production but also of complex autonomous systems), data-driven applications are already having an impact on the social or private sphere of individuals (e.g., healthcare). In the future, therefore, we will all have to interact, directly or indirectly, with intelligent systems.

However, there is already an alarming shortage of well-trained data scientists and ML experts, which is about to further increase in the future since more and more companies are moving towards using ML to solve a multitude of problems using data-driven methods. If learned systems are to be fully effective, then we have to make them much easier to build.



**Prof. Dr. Carsten Binnig**  
**Professor for Data Management**  
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One promising approach to overcoming this bottleneck is Automatic Machine Learning (AutoML), which simplifies the creation of data-driven products. However, existing AutoML methods are not suitable for use by domain experts. One reason for this is that AutoML methods do not cover the entire life-cycle for creating ML models, i.e., from data integration to actual model building to model evaluation.

Another important point, despite the problem of automating ML training is that decisions of trained ML algorithms differ from human thinking and their decision-making processes. This is essentially due to the different strengths of people compared to machines: While people often have little data (experience) but can rely on "common sense", ML algorithms score particularly with replicability and scalability with regard to complex but recurring tasks. Thus, a current direction is to

investigate on how results of ML models can be explained to humans and how humans can interact as well as correct ML models.

Finally, for making ML usable in practice many other perspectives are important. For example, it is important to examine how to design ML models to increase the confidence and acceptance of users. In this context, an interesting question is whether models can capture the ethics of decisions and reflect our "gut feeling" for good and bad decisions. Other challenging questions are the economic aspects of ML and whether users are willing to pay for properties such as fairness or transparency.

The Data Science Institute will be a great catalyst to work on evaluating these new directions, to democratize ML, as well as to promote and exchange ideas between practitioners and researchers.

## Research Report

# Internalizing the Externalities of Overfunding on Crowdfunding Platforms

CROWDFUNDING PLATFORMS HAVE BECOME A VALUABLE ALTERNATIVE TO TRADITIONAL SOURCES OF FINANCING. HOWEVER, SOME PHENOMENA ON CROWDFUNDING PLATFORMS CAUSE UNDESIRABLE EXTERNAL EFFECTS THAT CAN ADVERSELY INFLUENCE THE FUNDING SUCCESS OF PROJECTS. ONE SUCH PHENOMENON IS PROJECT OVERFUNDING. IN ORDER TO INTERNALIZE THE EXTERNALITIES OF OVERFUNDING, WE PROPOSE A FUNDING REDISTRIBUTION APPROACH FOR IMPROVING OVERALL FUNDING RESULTS. TO EVALUATE THIS CONCEPT, WE DEVELOP AND DEPLOY AN AGENT-BASED MODEL.

Jascha-Alexander Koch

Jens Lausen

Moritz Kohlhasse

### Introduction

Asking a large crowd of people to support an initiative is not a new concept but the far-reaching connectivity of the Internet has turned this concept into a serious alternative to traditional ways of financing. The fast and dynamic ascent of crowd-based approaches to acquire capital, like crowdfunding, crowdinvesting, or P2P lending, has attracted attention not only of capital-seeking individuals but also of academic research. However, literature discussing the question of how crowdfunding can serve best all of its stakeholders or of how to deal with possible negative externalities is quite scarce. A relevant example for negative externalities on crowdfunding plat-

forms is project overfunding. In the case of overfunding, a crowdfunding project collects much more funding compared to the actual funding goal, which is a consequence of individuals' funding behavior. In this context, it has been discussed that overfunding can cause negative externalities for other valuable projects which are overshadowed by overfunded blockbuster projects and, thus, suffer the disadvantage of collecting not enough money for reaching their funding goal (Kim et al., 2016; Liu et al., 2015). In order to internalize these externalities, we follow economic theory and propose a funding redistribution mechanism for crowdfunding platforms. Specifically, we address the research question of whether

a taxation mechanism is able to improve overall funding results. On that account, we propose the introduction of an on-platform "taxation" mechanism that allows for redistributing funds to valuable underfunded projects improving overall funding outcomes. Since no data is available for evaluating the effect of our taxation approach and real tests would be costly for platforms, we propose an agent-based model (ABM). The ABM simulates a real platform system for analyzing the behavior of different agents.

### Simulation: Applying a "Tax" to Overfunding

We apply a simulation to analyze the consequences of introducing a tax on overfunding. Therefore, we follow the four steps proposed by Gupta and Prakash (1993) for the process of internalizing externalities: (i) the (negative) externalities need to be recognized, (ii) the perpetrator and the potential victim must be identified, (iii) for each party, costs and benefits of internalization need to be evaluated, and (iv) the costs and benefits of internalization need to be assigned. For the assignment of costs and benefits, the policy maker needs to decide which mechanism to use.

Regarding these four steps, we argue the following: (i) Research has already recognized negative externalities resulting from overfunded projects on crowdfunding platforms (Kim et al., 2016; Liu et al., 2015). (ii) However, not the projects or initiators are the perpetrators that cause the negative externalities but the funders who are the active deciders and choose to concentrate on blockbuster projects.

By this focus, some projects become more visible and overshadow other projects. The victims of such behavior are projects that do not achieve sufficient funding. But also the funders of these projects can be seen as victims because their favored projects cannot be completed. (iii) We argue that funding is beneficial when it helps a project to reach its funding goal, i.e., the required amount of money. Funding that exceeds this goal is mainly provided because individuals are attracted by the funding compensations, i.e., attractive rewards (Koch, 2016). Hence, funders continue funding although the goal is already reached. This part of funding, however, increases the visibility of this blockbuster project on the platform which distracts attention from other projects. Consequently, the funders need to carry the costs of putting only blockbuster projects in the middle of interest. (iv) According to our approach, individuals who continue funding will have to pay an additional tax  $\tau$  on their funding. If the funding goal has been reached and a funder focuses on a reward for which s/he has to give an amount of funding  $z$ , the funder has to pay  $z(1 + \tau)$  instead of  $z$ . Thus, the tax will counter the buy-side pressure that focuses on the rewards. The resulting tax yield is redistributed to those projects that have closely missed their funding goal so that these are finally successfully funded – starting with the project closest to its goal (in absolute terms). The tax has an important advantage over funding caps or maximal funding amounts because the funders are still allowed to fund the projects of their interest and do not lose their favorite options.

### Simulation Results

We apply sensitivity analysis using the ABM for estimating an appropriate level of the tax to enhance overall funding outcomes. Figure 1 provides the result of this analysis for different levels of a tax for overfunded projects. First, we are able to show that the rate of successfully funded projects increases due to the redistribution (a). Moreover, we track both the sum (b) and the rate of successfully raised funds (c). While the sum of successfully raised funds is the amount of money invested into successfully funded projects, the rate of successfully raised funds is the share of funds that is given to projects that finally reach their funding goal. In other words, if this rate is 85%, 15% of the collected money is refunded because the related projects did not reach their funding goal. While the first graph (a) reveals a positive consequence from introducing a tax (rising rate of successfully funded projects), the second (b) and third graph (c) give indication that the tax

also leads to negative effects (decreasing sum and rate of successfully raised funds).

While a rising rate of successfully funded projects is good for project initiators, a decreasing amount of raised funds is bad for platforms since their revenues are directly linked to the sum of successfully raised funds. Moreover, funders profit less from crowdfunding as the tax becomes some kind of transaction cost that is a hurdle to transactions, i.e., funding contributions. As a consequence, neither a tax of zero nor a high tax can be seen as an optimum.

In the case of rising taxes, there is an effect that reduces funding activity because a certain number of funders will refuse to spend the higher amounts for the rewards. For very high taxes which start to eliminate overfunding completely, the rate of successfully funded projects will even decrease again because less tax yield is available for redistribution. Nevertheless, low taxes do

not have a great negative impact on funding activity. Moreover, opposed to the negative effect of increasing taxes, we expect an important positive effect for platforms: Higher rates of successfully funded projects (a) is likely to attract additional project initiators. In turn, funders are attracted because of a well-diversified portfolio of projects on the platform. Finally, the overall effect from a tax might even be positive for the platform operators, which redeems the lower sum of raised funds (b). Additionally, the funders may decide to fund earlier in order to avoid the additional costs. This effect would reduce funding hesitation at least if the project is close to its funding goal. In order to find the optimal tax level, an evaluation formula is needed to counterbalance the negative and positive effects of the tax. Applying such evaluation functions, the optimal tax can be calculated from simulation outcomes and the ABM can be used as a decision support tool.

### Conclusion

Our results show strong support for applying the proposed approach since the rate of successfully funded projects increases while the sum of successfully funded money only slightly decreases for low tax levels. In this sense, we deliver an interesting example of market engineering in the field of online crowdfunding platforms. Of course, in ABMs, simplifications are needed and a system's complexity has to be reduced by applying reasonable assumptions. We invite researchers and practitioners alike to further consider potential optimizations of crowdfunding models in order to improve benefits of crowdfunding for all stakeholders concerned.

### References

**Gupta, A. K.; Prakash, A.:**

On Internalization of Externalities. In: Working Paper, 1993.

**Kim, J.; Lee, M.; Cho, D.; Lee, B.:**

Are All Spillovers Created Equal? The Impact of Blockbusters and the Composition of Backers in Online Crowdfunding. In: Proceedings of the 37<sup>th</sup> International Conference on Information Systems (ICIS); Dublin, Ireland, 2016.

**Koch, J.-A.; Lausen, J.; Kohlhase, M.:**

Towards Internalizing the Externalities of Overfunding – Introducing a “Tax” on Crowdfunding Platforms. In: Proceedings of the 26<sup>th</sup> European Conference on Information Systems (ECIS); Portsmouth, UK, 2018.

**Koch, J.-A.:**

The Phenomenon of Project Overfunding on Online Crowdfunding Platforms. Analyzing the Drivers of Overfunding. In: Proceedings of the 24<sup>th</sup> European Conference on Information Systems (ECIS); Istanbul, Turkey, 2016.

**Liu, J.; Yang, L.; Wang, Z.; Hahn, J.:**

Winner Takes All? The “Blockbuster Effect” in Crowdfunding Platforms. In: Proceedings of the 36<sup>th</sup> International Conference on Information Systems (ICIS); Fort Worth (TX), US, 2015.

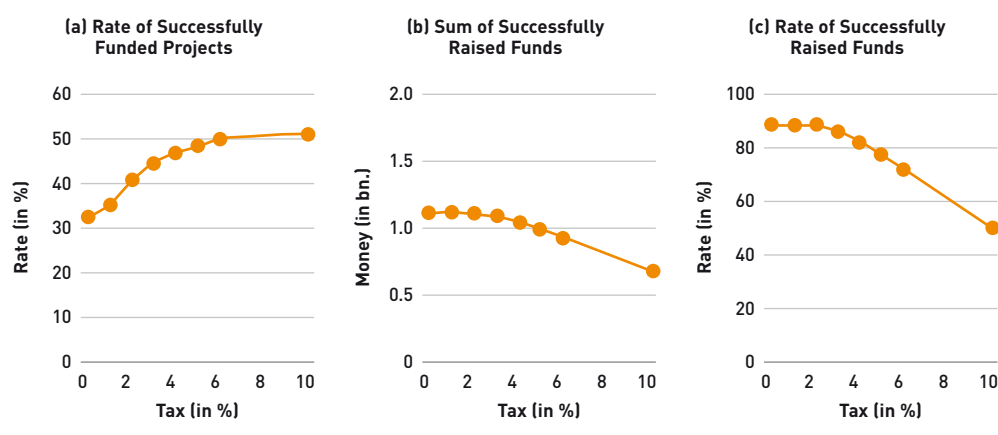


Figure 1: Sensitivity Analysis Results Considering Different Tax Levels

## Research Report

# Visibility in Organic Search: Why Should Managers and Investors Care about It?

AS WE INCREASINGLY RELY ON SEARCH ENGINES AS AN IMPORTANT SOURCE OF INFORMATION TO SUPPORT OUR DECISIONS, SEARCH ENGINES BECAME AN IMPORTANT VENUE FOR FIRMS TO ATTRACT ATTENTION AND SECURE THE LONGEVITY OF THEIR OPERATIONS. THIS ARTICLE DISCUSSES THE RESULTS OF OUR EMPIRICAL STUDIES ON HOW TO CAPTURE A FIRM'S VISIBILITY IN ORGANIC SEARCH AND HOW IT AFFECTS ITS SHORT- AND LONG-TERM FINANCIAL PERFORMANCE.

Gabriela Alves Werb

Bernd Skiera

### Introduction

The Internet gave us an unprecedented possibility of easily accessing many different sources of information before making any decision. While this increased access to information is generally welcome, the flipside of the coin is that the number of sources available can quickly become overwhelming. For example, a search for “buy running shoes” in Google returns more than 400 million links, making it virtually impossible for a person to browse through all of them. Whether it is to compare among different products, investment opportunities, or corporate business partners, search engines help us to dwell in this territory by working as a sorting mechanism. Search engines aim at placing the most relevant links for us within the top ranks, helping us to sort the wheat from the chaff.

According to Forrester Consulting (2016), more than 70% of B2C (business-to-consumer) customers already use search engines both for discovery and consideration purposes. Similarly, Snyder and Hilal (2015) report that 80% of B2B (business-to-business) customers use search engines to support their business purchase decisions. These results suggest that firms that succeed in being sorted as “wheat” by search engines, i.e., being placed in a top rank, are in a differentiated position of drawing attention to themselves. While it is possible for firms to pay search engines to place their links in top ranks within the sponsored links, organic links still attract the most attention, concentrating about 95% of all clicks (Jerath et al., 2014). As a result, organic search clicks became the most important source of online

traffic for firms in several industries in the past years (SimilarWeb, 2016).

Achieving top ranks can enable firms to gain visibility and stand out from the competition, attracting more attention from customers, investors, and potential business partners. Conversely, failing to do so may threaten firms' ability to sustain long-term performance, as highlighted by Overstock's CEO in a recent earnings call: “an unusually large amount of traffic actually comes from SEO [search engine optimization], and [...] when Google sneezes, we catch pneumonia” (Byrne, 2017). Indeed, as ranks in organic search are subject to frequent changes, especially in periods of updates to search engines' algorithms, firms' visibility in organic search can be very volatile, even for

large and prominent firms. Figure 1 displays changes to visibility in organic search for Amazon and eBay over four years measured by Searchmetrics' weekly SEO Visibility Index.

Given the increasing pressure on marketing managers to demonstrate the contribution of marketing to a firm's performance and firm value, it is imperative to understand to what extent and through which mechanisms a firm's visibility in organic search impacts its short- and long-term performance.

### Visibility in Organic Search

We define a firm's visibility in organic search as a firm's ability to achieve prominent ranks in the organic results of search engines. Therefore, the more prominent the organic

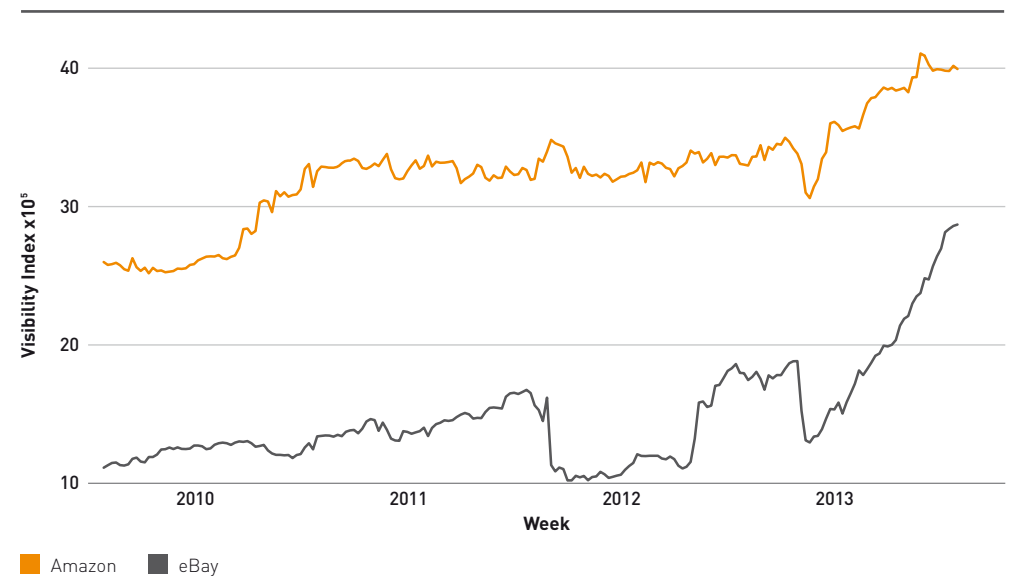


Figure 1: Volatility in Firms' Visibility in Organic Search

search ranks a firm attains for the search terms that are relevant to its business, the higher is its visibility in organic search.

The visibility in organic search should also account for the fact that certain search terms might matter more than others. For instance, Google Trends reports the number of worldwide searches in Google for “running gear” to be over 50 times higher than for “sumo gear”. For a retailer, it becomes then more important to achieve prominent ranks in searches related to “running gear” since there is a higher demand for these products. Therefore, the firm rank for “running gear” should have a higher weight in determining the firm’s visibility in organic search.

Prior research shows that top ranks in organic search results have higher click-through and conversion rates (e.g., Yang and Ghose, 2010). In addition, Drèze and Zufryden (2004) find that a firm’s visibility in search engines affects its overall online visibility. These results suggest that firms with higher visibility in organic search are likely in a better position to attract and convert customers, increasing their customer base. Furthermore, by having their links appearing in more prominent (i.e., more visible) positions, firms can increase the awareness of their brands. As we tend to prefer items on the top of a list regardless of their actual relevance (what is known as position bias), higher visibility in organic search may additionally strengthen our perceptions and associations with the firms’ brands. Finally, higher visibility in organic search may help firms to capitalize more than their competitors on periods of economic expansion

since higher visibility enables firms to capture a larger share of the increased demand. Conversely, higher visibility in organic search can insulate firms in periods of economic contractions since higher visibility helps firms to stand out from the competition and signals a lower uncertainty to potential customers and investors.

However, some of the outlined effects may also run in the opposite direction. For instance, firms whose brands have a high awareness will likely be considered more relevant by search engines and, as such, have higher visibility. Also, while current visibility affects current click-through rates, past click-through rates are likely to be one of the determinants of current visibility. Because both current and past click-through rates are driven by the unob-

served attractiveness of a firm and its brands, it is challenging to measure the entire chain of effects using observational data.

### Visibility in Organic Search and a Firm’s Performance

While the importance of visibility in organic search is not subject to debate among marketers, it is to date unclear to which extent a higher (lower) visibility in organic search can enhance (hurt) a firm’s performance. Even if firms cannot entirely influence their visibility in organic search, as organic ranks are determined by search engines’ proprietary algorithms, understanding and quantifying the effects is crucial to aid managers in marketing strategy, risk management, and investment allocation decisions.

Based on the effects proposed in the previous section, we expect that higher visibility in organic search translates into higher revenues and cash flows. Also, because firms do not need to pay the search engine for organic clicks, firms with a higher share of clicks coming from organic search should be able to generate more profits.

While these effects mostly hinge on the short-term, it is possible that visibility in organic search also enhances firms’ long-term value. For instance, by increasing brand awareness and reputation, higher visibility in organic search can lead to more future purchases. In addition, by reducing switching to competition, higher visibility in organic search can reduce the volatility (i.e., the risk) of future cash flows.

Furthermore, by enabling firms to capitalize more in periods of economic expansion and insulating them in periods of economic contraction, visibility in organic search may contribute to reducing firms’ systematic equity risk. Systematic risk expresses firms’ vulnerability to shocks that affect the whole market, such as a financial crises, wars, or interest rates. It is important because systematic equity risk is difficult to influence and cannot be reduced by portfolio diversification (Madden et al., 2006).

The relationships depicted in Figure 2 suggests that visibility in organic search helps to reduce the overall volatility in a firm’s stock returns as well as a firm’s systematic equity risk. Whereas these relationships could be partially driven by other intangible assets that are highly correlated with visibility in organic search, they remain after

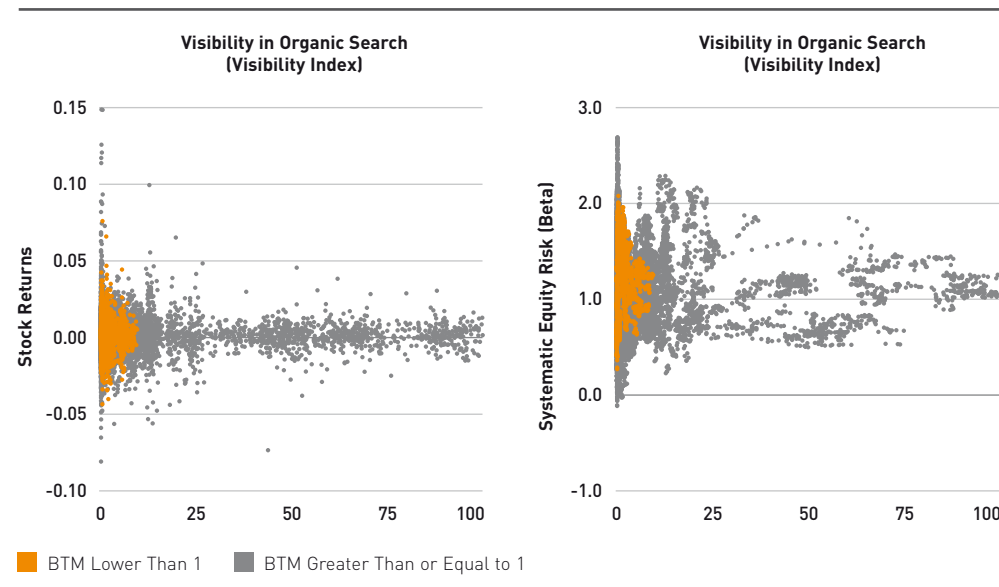


Figure 2: Firms with Higher Visibility in Organic Search Have a Lower Equity Risk

controlling for book-to-market (BTM) ratio. The book-to-market ratio proxies for a firm's share of off-balance sheet assets – a value lower than one indicates a market value higher than the value of the assets recorded in the firm's books.

If the effects of visibility in organic search also extend to future periods, then its long-term value will be less evident according to accounting measures, such as revenue or profit, which are backward looking in nature (Rust et al., 2004).

Therefore, to obtain a full picture of the value of visibility in organic search to firms' shareholders, it is important to focus both on current (e.g., revenue, cash flow) and expected future (e.g., market value, equity risk) performance.

### Empirical Results

In a study with more than 1,000 firms of different sizes and industries over almost seven years (Alves Werb et al., 2019), we find that half of the studied firms have the risk of losing up to 54% of their current visibility in organic search within one year, with 95% confidence. We also find that, on average, a 1% loss of visibility in organic search in a given week is associated with a 1.9% revenue loss within the next 4 weeks.

The results of another study with 127 publicly listed firms from the S&P 500 Index (Alves Werb, 2019) suggest that a 1% improvement in a firm's visibility in organic search leads, on average, to a 0.01% increase in shareholder value, after controlling for firm-specific risk factors, market-wide and industry-specific

shocks. For a typical firm in the analyzed sample, a 1% improvement in visibility in organic search translates into approximately USD 2.1 million more returns for shareholders in the long-term. The results of the second study also indicate that a firm's visibility in organic search substantially reduces a firm's systematic equity risk, also known as beta (-0.02984,  $p < 0.01$ ).

### Implications for Marketing Managers and Investors

Overall, we find theoretical and empirical evidence that a firm's visibility in organic search is a valuable marketing asset with long-term benefits. The measured effects suggest that managers should closely monitor and report the evolution of firms' visibility in organic search, as well as consider the risk of losing visibility in risk management policies.

In addition, losses (gains) of visibility in organic search can help managers to detect the early stages of a decreasing (an increasing) customer interest in the firm's brand and products. Managers can then use these signs to set in motion actions to understand the reasons behind such a shift in a timely manner. Furthermore, given the evidence that visibility in organic search drives shareholder value above and beyond current period performance, the findings suggest that investing in SEO can make financial sense to promote shareholder value.

For investors, the findings suggest that, all else being equal, they should rate downward the stocks of firms that are affected by visibility

losses in organic search. In addition, investors could potentially reduce their exposure to the overall market risk by investing in "organic search winning" firms. In particular, given that many SEO monitoring tools provide a measure of a firm's visibility on a granular level (usually daily or weekly), monitoring this metric should come at a rather low cost, nevertheless providing valuable information.

### References

#### Alves Werb, G.:

Visibility in Organic Search and Shareholder Value. Working Paper, 2019.

#### Alves Werb, G.; Doppler, C.; Skiera, B.:

Visibility-at-Risk: An Approach to Measure a Firm's Risk of Losing Visibility in Organic Search. Working Paper, 2019.

#### Byrne, P. M.:

Q2 2017 Overstock.com, Inc. Earnings Call, 2017.

#### Drèze, X.; Zufryden, F.:

Measurement of Online Visibility and Its Impact on Internet Traffic. In: Journal of Interactive Marketing, 18 (2004) 1, pp. 20–37.

#### Forrester Consulting:

Why Search Plus Social Equals Success, www.catalystdigital.com/wp-content/uploads/WhySearchPlusSocialEqualsSuccess-Catalyst.pdf, 2016.

#### Jerath, K.; Ma, L.; Park, Y.-H.:

Consumer Click Behavior at a Search Engine: The Role of Keyword Popularity. In: Journal of Marketing Research, 51 (2014) 4, pp. 480–486.

#### Madden, T. J.; Fehle, F.; Fournier, S.:

Brands Matter: An Empirical Demonstration of the Creation of Shareholder Value Through Branding. In: Journal of the Academy of Marketing Science, 34 (2006) 2, pp. 224–235.

#### Rust, R. T.; Ambler, T.; Carpenter, G. S.; Kumar, V.; Srivastava, R. K.:

Measuring Marketing Productivity: Current Knowledge and Future Directions. In: Journal of Marketing, 68 (2004) 4, pp. 76–89.

#### SimilarWeb:

Search Marketing Benchmark Report, www.similarweb.com/corp/wp-content/uploads/2016/03/106-3\_Search-Marketing-Benchmark-Report.pdf, 2016.

#### Snyder, K.; Hilal, P.:

The Changing Face of B2B Marketing, www.thinkwithgoogle.com/consumer-insights/the-changing-face-b2b-marketing/, 2015.

#### Yang, S.; Ghose, A.:

Analyzing the Relationship Between Organic and Sponsored Search Advertising: Positive, Negative, or Zero Interdependence? In: Marketing Science, 29 (2010) 4, pp. 602–623.



## Insideview

# Disruptive Ways of Public Affairs Work

INTERVIEW WITH STEFAN MAI

**During the last days of May 2019, people had the possibility to elect a new European Parliament. More than at the previous European Elections, the way of campaigning has changed. Companies and associations, private people and celebrities have decided to promote the idea of a common and unified European Union in public. Does this new disruptive way of political communication also affect your work?**

Yes it does. More than ever before, we observe that political communication does not only happen in the lobby of parliaments. Today's political communication involves Social Media and a wide range of digital instruments besides the classical instruments, such as one-on-one meetings, position papers, or newspaper articles. Most recently, we could witness that influencers have begun to talk about politics on YouTube and have tried to influence politics. As people nowadays spend a lot of time online, politicians have recognized that it is important to communicate more than before via Social Media. Some do so with more success than others. For these reasons, we decided during the last years to

take our public affairs work to another level. We established the digital public affairs platform FinanzAgenda ([www.finanzagenda.de](http://www.finanzagenda.de)) and a Social Media account on Facebook ([www.facebook.com/finanzagenda](https://www.facebook.com/finanzagenda)) to interact with politicians and politically interested people.

**How do politicians react to this new digital public affairs work?**

In 2017, after the federal elections in Germany, Quadriga University and Union Investment published a study on digital campaigning during the elections in Germany (<https://www.finanzagenda.de/finanzagenda/Auf-den-punkt/Quadriga-Studie-zum-digitalen-Wahlkampf-2017-Implicationen-fuer-Politik-und-Public-Affairs.html>). This study illustrated that all political parties used Social Media to promote their position publicly and concluded that digital media may influence political actions. And this is still the case. Most of the members of German Parliament use Social Media to interact with people, their voters. Social Media channels also offer Union Investment new ways to interact



**Dr. Stefan Mai**  
Head of Executive Board Office and  
Head of Public Affairs  
Union Investment

directly and in public with politicians. It is important for us to be recognized as a transparent and reliable partner for politics. In our articles and posts, you can always distinguish between our position as a company, and information and positions from public sources. Furthermore, on our webpage FinanzAgenda, you can find our position papers on political issues which are currently important for us on national and European level. Moreover, you will find facts and figures as well as reports on the latest events or meetings we had with politicians.

This kind of work is honored by politicians and people who work in the political sphere. Politicians appreciate this way of transparent public affairs work. And until today, Union Investment is the only financial firm who does this kind of transparent digital public affairs work.

**The US elections were influenced by digital bots. Have you observed similarities during European elections?**

You are right. Newspapers reported after the US

elections that social bots may have influenced the elections through Social Media. But, for example, Facebook learned from this experience. They have increased the capabilities to take down fake accounts, reduce false news, increase ads transparency, disrupt bad actors, and support an informed and engaged electorate. To run electoral ads or ads about highly debated and important issues related to the European Elections, advertisers are now required to confirm their identity and include additional information about who is responsible for their ads. From my point of view, this is at least a first step in the right direction.

**Which latest political issues impact your work the most?**

On national level, we are mainly influenced by the legislative ideas on a review of the private pension regulation. The issue which is of utmost importance to us at the European level is the European Commission's legislative proposal on sustainable finance.

**Thank you for this interesting conversation.**

# Infopool

## News

### Call for Papers “2<sup>nd</sup> Personal Finance Workshop”

Prof. Hackethal and Dr. Thomas Pauls (layer 3), the Department for Financial Services (Justus Liebig University Giessen), and the Giessen Graduate Centre for Social Sciences, Business, Economics and Law (GGSL) organize the 2<sup>nd</sup> Personal Finance Workshop on August 1<sup>st</sup> and 2<sup>nd</sup>, 2019, at Castle Rauischholzhausen. The idea of the workshop is to strengthen the community and to provide a platform to discuss ongoing research in the area. Research projects in their early stages are particularly welcome. For further details see:

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnx0aG9wYXVsc3xneDo2ZWMyODM2MDZmZDY2YzVl>.

### 3<sup>rd</sup> SAFE Market Microstructure Conference

Together with the Research Center SAFE at Goethe University Frankfurt, Prof. Gomber (layer 2) is organizing the 3<sup>rd</sup> SAFE Market Microstructure Conference to stimulate the discussion on current developments in the field. The two-day conference will be held on August 19<sup>th</sup> and 20<sup>th</sup>, 2019, on the Campus Westend of Goethe University Frankfurt.

### Successful Application for Research Funding

The Chair of Prof. Gomber (layer 2) successfully applied for external research funding to analyze the effects of the recently introduced requirement for banks and brokers to separate research services from execution services (so-called “research unbundling”). The two-year project, which is funded by the Frankfurt Institute for Risk Management and Regulation (FIRM), will particularly investigate whether the unbundling of research and execution services has unintended and potentially negative effects on capital costs and financing risks for small and medium-sized enterprises (SMEs).

### Special Award at the DZ BANK Career Awards 2019

Prof. Dr. Peter Gomber (layer 2) received a donation for the Chair of e-Finance for the highest number of submissions to the DZ BANK Career Awards 2019.

## Selected efl Publications

### Adam, M.; Toutaoui, J.; Pfeuffer, N.; Hinz, O.:

Investment Decisions with Robo-Advisors: The Role of Anthropomorphism and Personalized Anchors in Recommendations.

In: Proceedings of the 27<sup>th</sup> European Conference on Information Systems (ECIS); Stockholm/Uppsala, Sweden, 2019.

### Clapham, B.:

Is There a Magnet Effect of Rule-Based Circuit Breakers in Times of High-Frequency Trading?

In: 28<sup>th</sup> Annual Meeting of the European Financial Management Association (EFMA); Ponta Delgada, Portugal, 2019.

### Laudenbach, C.; Malmendier, U.; Niessen-Ruenzi, A.:

Emotional Tagging and Belief Formation: The Long-Lasting Effects of Experiencing Communism.

In: AEA Papers and Proceedings, 109 (2019), pp. 567–571.

### Lausen, J.:

Regulating Initial Coin Offerings? A Taxonomy of Crypto-Assets.

In: Proceedings of the 27<sup>th</sup> European Conference on Information Systems (ECIS); Stockholm-Uppsala, Sweden, 2019.

### Maedche, A.; Legner, C.; Benlian, A.; Berger, B.; Gimpel, H.; Hess, T.; Hinz, O.; Morana, S.; Söllner, M.:

AI-Based Digital Assistants – Opportunities, Threats, and Research Perspectives.

Forthcoming in: Business & Information Systems Engineering, 2019.

### Weiler, M.:

The Value and Use of Accumulating Social Capital: New Insights from Social Media Networks.

Dissertation, Goethe University Frankfurt, Germany, 2019.

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## Infopool

### RESEARCH PAPER: DOES HOUSEHOLD FINANCE MATTER? SMALL FINANCIAL ERRORS WITH LARGE SOCIAL COSTS

There is compelling evidence that households do not follow the normative prescriptions of standard finance theory by not diversifying their portfolios across a large number of assets. In fact, many household portfolios contain only a handful of stocks and are tilted towards assets that households are familiar with. This study shows that the tendency of households to hold underdiversified portfolios results in a mean-variance loss that is equivalent to only a modest reduction of about 1 % per year in a household's portfolio return. However, once the authors consider also the effect of familiarity biases on the asset-allocation and intertemporal consumption-savings decisions, the welfare loss is multiplied by a factor of four. In general equilibrium, the suboptimal decisions of households distort also aggregate growth, amplifying further the overall social welfare loss. The findings of this study demonstrate that financial markets are not a mere sideshow to the real economy and that improving the financial decisions of households can lead to large benefits, not just for individual households, but also for society.

Bhamra, H. S.; Uppal, R.

In: *American Economic Review*, 109 (2019) 3, pp. 1116–1154.

### RESEARCH PAPER: HOW DO RECOMMENDER SYSTEMS AFFECT SALES DIVERSITY? A CROSS-CATEGORY INVESTIGATION VIA RANDOMIZED FIELD EXPERIMENT

Building upon the results from a randomized field experiment, this study examines the impact of collaborative filtering recommender algorithms on sales diversity. Insights suggest that the use of collaborative filters is related to a decrease in sales diversity. Thereby, filters based on purchase data are associated with a greater effect size than those based on product views. While recommenders can help to explore new products, similar users still end up exploring the same products, resulting in concentration bias at the aggregate level. Besides, absolute sales and views for niche items increase, but their gains are smaller compared with popular items. Thus, whereas niche items gain in absolute terms, they lose out in terms of market share.

Lee, D.; Hosanagar, K.

In: *Information Systems Research*, 30 (2019) 1, pp. 239–259.

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