

Lecture Notes in Business Information Processing

401

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Benjamin Clapham · Jascha-Alexander Koch (Eds.)

Enterprise Applications, Markets and Services in the Finance Industry

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Revised Selected Papers

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Preface

Advancements in information technology not only changed the way we communicate and process data but particularly paved the way to new business models, markets, networks, services, and players in the financial services industry. Electronic trading, data analytics, and FinTech offerings represent only some of these developments. The FinanceCom workshop series has been providing significant academic research in this area at the intersection of information systems and finance from the beginning and well before the rise of the FinTech concept. Research presented at FinanceCom workshops aims to help academics and practitioners to understand, drive, and exploit the opportunities associated with these information technology-driven developments in the financial sector.

After the very successful FinanceCom workshops in Sydney, Australia (twice); Regensburg, Germany; Manchester, UK; Montreal, Canada; Paris, France; Frankfurt, Germany (twice); and Barcelona, Spain, FinanceCom 2020 was held virtually for the first time due to the global COVID-19 pandemic and associated travel restrictions. Thanks to our authors, presenters, and participants, FinanceCom 2020 led to fruitful discussions about the presented papers and an exchange of ideas despite the physical distance with participants joining the virtual conference room from Australia, Europe, and the USA.

For this first virtually held FinanceCom workshop, we received 14 submissions, of which we selected 6 high-quality papers to be presented and published after their revision in this volume together with an additional invited short paper reflecting the invited talk. The selection was based on a rigorous review process accomplished with the help of a Program Committee consisting of internationally renowned researchers in the field, who also significantly helped to improve the selected papers with their comments and suggestions.

This proceedings volume is structured in three comprehensible parts, each of which contains two thematically related papers. The first part contains contributions shedding light on machine learning applications in trading and financial markets. The first paper “State-of-the-Art in Applying Machine Learning to Electronic Trading” by Rabhi et al. presents a literature review providing insights on how machine learning techniques are being used for trading in electronic financial markets. In particular, the paper examines the target areas, the applied methods, and the purpose of machine learning applications for electronic trading. Thereby, Rabhi et al. identify gaps and opportunities for further research in this rapidly evolving field, which are especially related to information representation for machine learning-powered analytics, more sophisticated machine learning techniques, and enhanced automated trading strategies. Moreover, the authors call for multidisciplinary research approaches adopted with a strong industry focus to further advance this field. The second paper “Using Machine Learning to Predict Short-Term Movements of the Bitcoin Market” by Jaquart et al. applies a variety of machine learning models to test the predictability of the bitcoin market across different

time horizons ranging from 1 to 60 minutes. Based on a comprehensive feature set, including technical, blockchain-based, sentiment-/interest-based, and asset-based features, the authors show that especially recurrent neural networks and gradient boosting classifiers are well-suited for predicting short-term bitcoin market movements outperforming a random classifier. Although a long-short trading strategy based on the classifier results generates monthly returns of up to 31% before transaction costs, it leads to negative returns after taking transaction costs into account.

The second part of the proceedings contains two contributions in the area of fraud detection and information generation in finance. The first paper “Scalable and Imbalance-Resistant Machine Learning Models for Anti-money Laundering: A Two-Layered Approach” by Tertychnyi et al. addresses the question of how to train accurate machine learning models supporting anti-money laundering provisions. In this particular use case, machine learning models need to fulfill the requirements of scalability and imbalance resistance to be valuable since they are applied to very large transaction datasets with high class imbalance due to the low number of instances indicating potentially illicit behavior. In order to achieve this goal, Tertychnyi et al. develop a two-layered approach consisting of a simple model in the first step and a more complex model in the second step, which is only applied to customers that could not be classified as non-illicit with high confidence in the first model. Besides the scalability of this approach, it also partially addresses the problem of high class imbalance since the first layer acts like an undersampling method for the second layer. In the other contribution of this section entitled “Leveraging Textual Analyst Sentiment for Investment,” Palmer and Schäfer make use of natural language processing and analyze the informativeness of the sentiment conveyed in research reports written by financial analysts for both contemporaneous and future stock returns. The results show that a portfolio trading strategy exploiting textual sentiment in analyst reports generates an average monthly factor-adjusted return of 0.7 %. Consequently, the authors conclude that analysts provide valuable information for interpreting and predicting stock price movements in their research reports. These findings emphasize the importance of including qualitative information in prediction models in the area of financial markets.

The third part of the proceedings contains two papers focusing on alternative trading and investment offerings by FinTechs. In their paper “Portfolio Rankings on Social Trading Platforms in Uncertain Times,” Bankamp and Muntermann analyze the value of portfolio rankings on social trading platforms regarding performance and especially regarding the successful management of market exposure and risk. For their analysis and in order to investigate the value of rankings as a protective function in turbulent market phases, the authors look at the stock market crash that occurred in connection with the COVID-19 pandemic in spring 2020. The findings show that portfolio rankings on social trading platforms indeed provide value for investors and protect them from extreme losses in downward periods. The second paper in this section, “What do Robo-Advisors Recommend? - An Analysis of Portfolio Structure, Performance and Risk,” by Torno and Schildmann, investigates the quality of portfolio recommendations provided by robo-advisors that automatically recommend personalized portfolios based on customers’ risk affinity and investment goals. Using 6 model customers obtaining portfolio recommendations from 36 different robo-advisors, the authors find that robo-advisors in fact provide distinct recommendations for different

risk affinities and investment horizons, yet the recommended portfolios are less distinct for differences in investment horizons and consist of a high share of equities even for short-term investments.

The proceedings collection ends with a short paper summarizing the main points of the invited talk by Pradeep Kumar Ray on “The Financial Viability of eHealth and mHealth” in light of the ongoing COVID-19 pandemic. Prof. Ray and his coauthors elaborate on the benefits of eHealth (healthcare using information and communication technologies) and mHealth (healthcare using mobile phones). Since these technological solutions allow treating patients without face-to-face contact between patients and health professionals, they are particularly valuable in pandemic situations, and, thus, their use multiplied in the COVID-19 pandemic. Nevertheless, Prof. Ray and his coauthors argue that the economic viability of eHealth and mHealth is an extremely important aspect for their successful global adoption. Therefore, the authors derive a mathematical model to compare the costs associated with eHealth/mHealth with those of traditional face-to-face, paper-based methods. The application of the model shows cost savings in eHealth/mHealth but the exact amount depends on various factors such as the nature of healthcare or the country of application.

We would like to thank Fethi A. Rabhi for his invaluable guidance during the organization of the first virtual FinanceCom workshop and its proceedings. We are also grateful to our reviewers, authors, and the Program Committee members for the extraordinary work on the contents of this volume and to Ralf Gerstner and Christine Reiss from Springer for their excellent support in producing the FinanceCom 2020 proceedings.

October 2020

Benjamin Clapham
Jascha-Alexander Koch

Organization

Location

Due to the COVID-19 pandemic in 2020, the workshop was held virtually for the first time in its history.

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