

FTRM: Fin-Tech Risk Management

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Abstract—Financial Technologies (Fin-Tech) bring many opportunities for business and consumers, but also new risks in a still low-regulated system. Due to increased direct connections between operators, in digitally innovated banking and finance also traditional financial risks may increase and/or spread more easily.

Developing models which fit the new context is thus a crucial need for financial stability and consumer protection.

Keywords: Fintech; Risk Management; Artificial intelligence; Systemic risk; Contagion risk; Network models; Predictive accuracy.

I. INTRODUCTION

Financial Technologies (Fin-Tech) arise when new technologies, such as big data analytics, artificial intelligence (AI) and blockchain are applied to develop new financial services. Fin-Tech brings many opportunities for business and consumers, but also new risks. In digitally innovated banking and finance also traditional financial risks may increase and/or spread more easily.

For example, the direct connection between borrowers and lenders in peer-to-peer lending platforms creates new potential credit contagion channels. Also market risk management becomes more challenging in robot advisory asset management, where investment strategies are implemented through trading algorithms. Operational and cyber risks emerge instead in innovative payments such as blockchain.

An effective way to assess risks in the Fin-Tech context is based on the use of network theory to measure interconnectedness. Indeed, networks allow to represent

relationships between economic agents and to define the position of individuals, companies or assets in the financial system through centrality measures. For example, a network-augmented credit scoring model based on balance sheet similarities between the borrowing companies was applied in [1], while [2] improved credit risk models by clustering SMEs based on latent risk factors, deduced from financial ratios. Both the cited works were applied to peer-to-peer lending data, as well as [3], who applied a binary spatial autoregressive model where the spatial component is a matrix of connectivity between companies based on trade flows.

The growth of Fin-Tech also affects market risk. New markets with peculiar features, such as the cryptocurrency one, are indeed characterised by possible bubbles and high interconnectedness. Applying and extending econometric models to fit nascent markets is thus increasingly relevant. Recently, [5] applied an extension of the Diebold and Yilmaz (2014) methodology with a generalized vector error correction model (VECM) to measure pairwise and system-wide connectedness of Bitcoin exchange platforms. Another recent work by [6] proposed a new class of time-varying parameter models for dynamical networks, that can sensibly improve link predictions in financial applications.

Also in the context of innovative payments there is an increasing need for developing new risk models. Protection of investors is indeed crucial in innovative payments such as Initial Coin Offering (ICO), where funds are raised through the use of blockchain based digital currencies (cryptocurrencies). Predictive textual analytics methods can be applied to discriminate between successful and fraudulent activities, improving the assessment of operation risks in blockchain payments [7].

II. CONTRIBUTIONS

The first paper is entitled “Seasonality Modeling through LSTM Network in Inflation-Indexed Swaps” (Giribone, 2020) and proposes a forecasting model for inflation seasonality based on a Long Short-Term Memory (LSTM) network: a deep learning methodology particularly useful for forecasting purposes. The study shows how the CPI predictions, conducted using a Fin-Tech paradigm, can be integrated in the respect of traditional quantitative finance theory.

The second contribution (Agosto et al., 2020) is “A New Proposal to Improve Credit Scoring Model Predictive Accuracy” and introduces a new predictive accuracy measure which, due to its construction, is based on objective criteria and less computational intensive than its main competitors (e.g., AUROC and Somers’ D). A very key point in the application of Machine Learning (ML) and Artificial Intelligence (AI) methods is indeed the evaluation of their predictive accuracy, especially in banking and Fin-Tech sectors where data have to be exploited to draw conclusions and predict future trends.

The third work presented in the session is entitled is “A data-driven approach to measuring financial soundness throughout the world” (Bitetto et al., 2020). The authors develop a new index to measure financial soundness of countries, using macroeconomic data and two complementary techniques: Principal Component Analysis (PCA) to model country/variables interaction, for each year, and Factor Analysis (FA) to model country/time interaction, for all variables. This measure is shown to be more robust than synthetic indices based on expert-judgement assumptions.

The fourth contribution is “Lost in translation: soft information, sentiment and lending decisions” by Cerchiello et al. (2020). The research question motivating this work is the following: which is the role of sentiment in the lending applications? The empirical findings show that sentiment can influence loan decision or rather act as a moderator in loan decisions when distance between evaluators and decision-makers is present.

The last work is entitled “Unity is strength? Credit risk in corporate networks” (Agosto and Tanda, 2020) and studies the impact of belonging to a corporate network on companies’ individual default risk assessed through a credit scoring model. The findings show that belonging to a network can translate into a common dependence (or, to the contrary, resilience) on sectorial and macroeconomic factors, and in a within-network effect: possible contagion effects between companies in the network, but also possible commercial and financial advantages of being linked to other firms.

III. CONCLUSION

The FTRM special track collects contributions with the aim of proposing new models and techniques to assess risks arising in the Fin-Tech context.

Methodological proposals and original applications allow to introduce interesting ideas for future work in this challenging research domain.

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