Deep Learning for Exchange-Rates Prediction

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Abstract

Our research project aims to develop an improved model for foreign exchange prediction of reserve currencies. This model integrates fundamental and technical analyses and uses deep learning method for the prediction.

In general, two approaches to forecast financial market dominate in practice: technical and fundamental analyses. Technical analysis is concerned with the dynamics of the market price and volume behaviour itself, rather than with the fundamental economic nature of specific assets that are traded. Fundamental analysts assume that prices in financial markets are based on economic principles, and that prices may be predicted based on fundamental and publicly available economic data, such as earnings and market share, interest rates, cost trends, competitive forces, and so forth. Innovative computational methods create impetus for integration of fundamental and technical analyses in order to improve accuracy of financial prediction, in particular exchange rates forecasting,

Conventional methods of forex forecasting have been proven effective until the beginning of the 90's. However, recently the demand for improved methods has increased. It is dictated by the downturn in success of traditional technics. Among the prediction models, artificial neural networks are popular tools for financial decision-making because of their adaptive and generalizing abilities while providing high accurate prediction. Over the last decade Deep Learning has proven being a robust and efficient mechanism for a variety of application areas. There are few applications of Deep Learning in finance. We investigate the effectiveness of deep networks to predict change in foreign exchange rates using state-of-the-art Deep Learning framework and a proper use of exchange rate data together with macroeconomic indices as inputs to the models.

By exploring both improved modelling and latest state of the art in machine learning, our expectation is that we can reach significant improvement of the exchange rates prediction accuracy in brief and short perspectives.

References

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• Galeshchuk S. (2014). Neural-Based Method of Measuring Exchange-Rate Impact on International Companies Revenue. Proceedings of the 11th International Conference on Distributed Computing and Artificial Intelligence, AISC, Vol. 290, 529-536.

Curriculum Vitae

Svitlana Galeshchuk got her PhD in Economics in 2015 at TNUE (Ternopil National University in Economics). Her thesis was devoted to Ukrainian currency market and exchange rate operations. Her Fulbright tenure (USA) as well as an additional MSc thesis at Lille 1 University (France) were focused on machine learning for financial prediction. Thus, she has gained valuable expertise in market theory and machine learning. It galvanized her to integrate acquired knowledge and skills in order to create ambitious but feasible project aimed to craft better monetary policy in EaP economies for their integration with the European Union. She is currently Assistant Professor at TNUE and Researcher in the Faculty of Accounting and Finance.

FMSH Fellowship (16/09/16-15/10/16)

After a 9-month Fulbright stay held at Nova Southern University in Miami (USA), Svitlana Galeshchuk will now extend her postdoctoral studies at LIG, University of Grenoble Alpes, with the support of a 3-month Fellowship awarded by FMSH (Fondation Maison des Sciences de l'Homme). Her work program at LIG is to progress towards her long term project, by improving her skills in machine learning and by discovering alternative Artificial Intelligence approaches. During her stay, she is expecting to work with LIG researchers interested in Financial Markets, Machine Learning, Multi-Agent Systems, Data Science and Performance Evaluation. During her stay, she will also discuss possible further cooperation according to available instruments.