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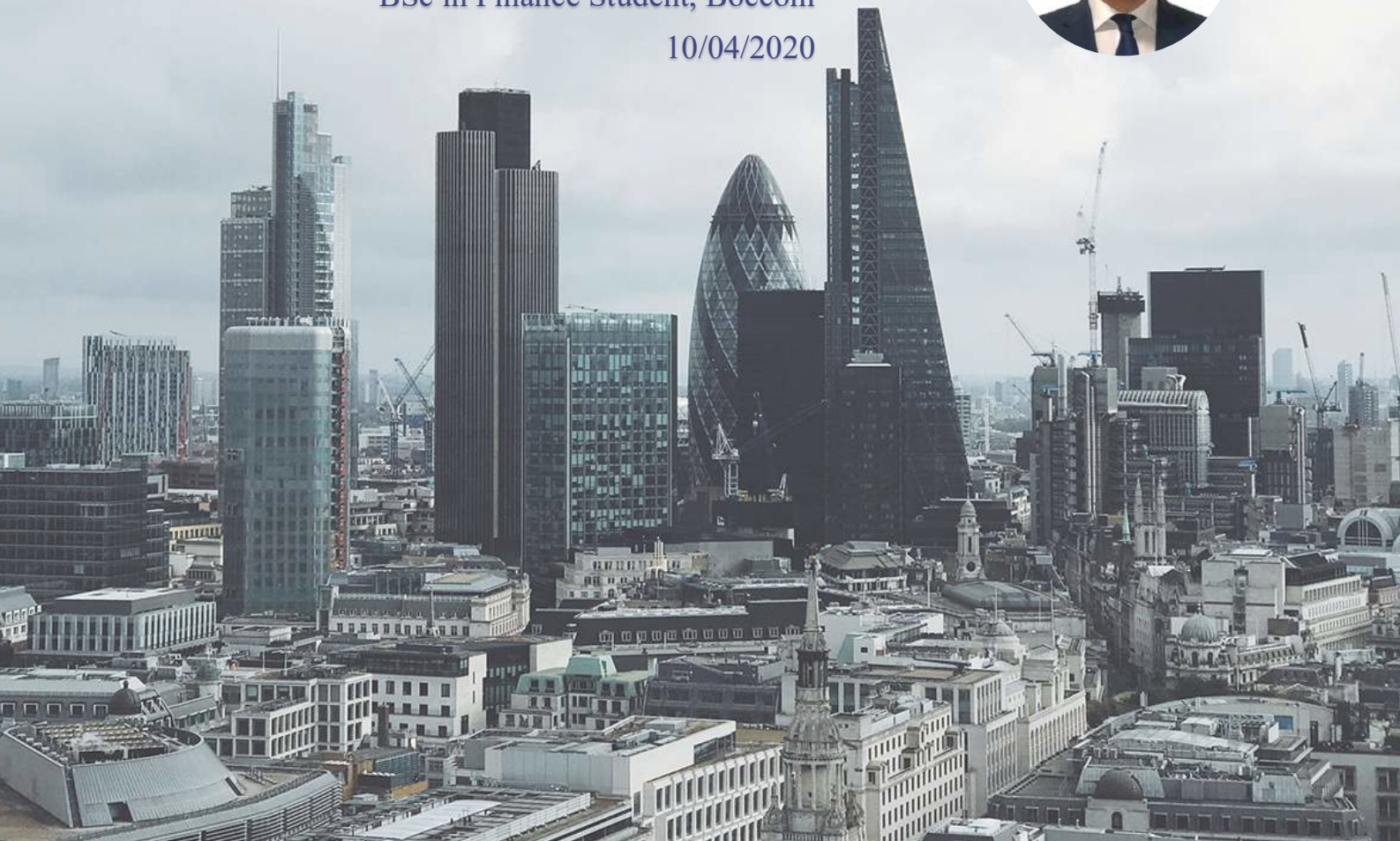
INVESTMENT
MANAGEMENT
SOCIETY

AI AND FINANCIAL SERVICES

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10/04/2020



AI PAYS DIVIDENDS

AI is giving the world of trading, and the financial industry as a whole, a way to better satisfy customers who want faster and more convenient ways to optimize processes and invest their money.

Nowadays, one of the most interesting subfields of AI used to extract value from unstructured data is Natural Language Processing (NLP).

It enables computer programs to understand an unstructured text by making inferences and providing context to language, just as human brains do. This technology has several possible use cases ranging from fraud detection to financial risk management and quantitative trading.

More specifically, to what extent quantitative trading – the process of analysing huge data sets to identify profitable strategies – AI may play a leading role. Indeed, AI-powered computers can process complex data more quickly and efficiently than humans. The resulting trading processes help in automating trades and saving valuable time.

Moreover, quantitative data obtained by financial news, blogs, or even social media, influence computerized trading bots to take action exploiting sentiment analysis, to automatically recognize and study affective states and subjective information. Therefore, sentiment analysis can be used to identify a positive or negative impact from an article. Concretely, the inference generated by an NLP application needs to be translated into a decision, which leads to safe and profitable investments.

Despite not being close to achieving a full semantic and contextual understanding of financial news, the field of NLP has made significant progress enhancing efficiency in financial institutions operations. For instance, making use of the Google Natural Language API, which enables users to classify and extract meaning from text or even generating readable and accurate content. Distinguishing human emotions, for instance, an ironic tone or a joke is also an essential feature for

this tool. Likewise, the Behaviour and Emotion Analytics Tool (BEAT), a platform developed by Deloitte, monitors customers' voice interaction and identifies the potential problematic relationships through NLP.

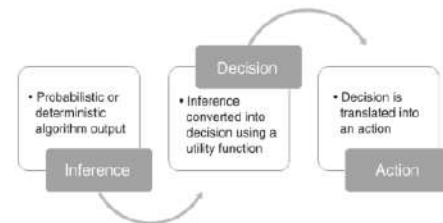


Figure 1. Flow of inference into decision and action

Source: *Big Data and Machine Learning in Quantitative Investment*

According to Tony Guida, author of *Big Data and Machine Learning in Quantitative Investment*, “there is no perfect one-size-fits-all approach in any machine learning problem and as many alternatives as possible should be explored before settling on a final methodology”.

Having said that, an interesting example of a company leading the way in this field is Kavout, an AI platform using machine learning and predictive analytics to identify potential short-term winners and losers. Its quantitative analysis model (Kai) incorporates more than 200 correlation metrics and assigns a figure for every single stock. This “Kai score” is an affordable index of the probability to outperform the overall market in the next month.

As reported by Benzinga, which monitored the performance from its inception in 2012 to 2017, the “top picks” portfolio has registered a compound annual growth rate (CAGR) of 21.9% - largely exceeding the S&P500's 13.3% - while showing less volatility than other stock indexes.

FOCUS ON MACHINE LEARNING (ML)

AI and, more specifically, Machine Learning (ML) unveils novel opportunities for the financial world. The “issue” of constantly increasing the amount of alternative data (projected to grow fivefold from 2018 to 2024), especially the unstructured one,



could potentially be solved by introducing these exceptional instruments. The pattern analysis, the identification of new themes or signals, and the drawing of conclusions become easier with their use. Furthermore, according to Preqin, it already gives a competitive advantage to the AI hedge funds, as shown in *Figure 2*.

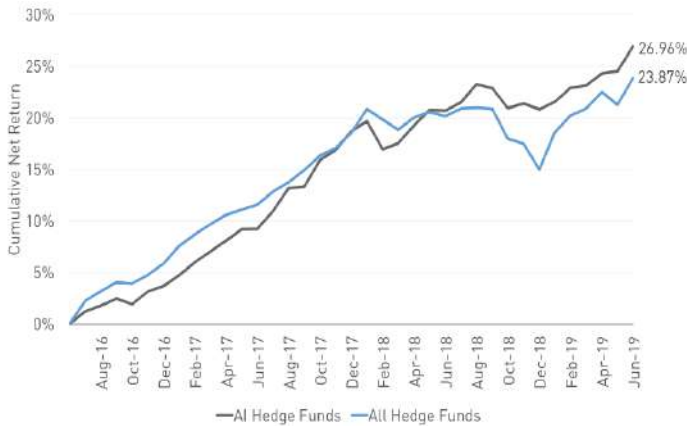


Figure 2. Cumulative Three-Year Returns: AI Hedge Funds vs. All Hedge Funds

Source: Preqin Pro

More and more fund managers are considering AI in their investment decisions. The increase in diversification and persistency of alpha sources counts among the ML’s capacity to deliver results in a changing financial environment. As we can see in *Figure 3*, ML adds flexibility to the entire trading process and adjusts it to various needs, such as data preparation, portfolio construction and execution, or simply the predictive model adaption.

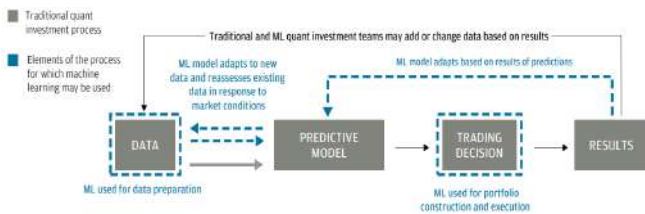


Figure 3. Applying Machine Learning to the Quant Investment Process
Source: J.P. Morgan Asset Management

However, there are also downsides of using ML, for instance, exogenous events that affect the market (since algorithms may not be prepared to predict them), such as the Covid-19 outbreak. Overfitting can be another drawback, which

focuses a lot on the past, but ultimately fails to identify future trends. Moreover, the financial data is highly randomized, therefore the ML signals appear blurred and subtle, thus harder to monetize in large volumes.

RISK MANAGEMENT EVOLUTION

Although we exacerbate ML’s importance for the return prediction, it is worth mentioning that other fields of finance could benefit even more from its application. One of them is portfolio implementation, specifically risk management. According to Robert Engle, a Nobel prize winner, the financial market risk is easier to predict in comparison to price movements. Furthermore, the best results are obtained with a blend of traditional quantitative techniques and AI.

In *Figure 4*, we can visualize the result of a survey from which we can infer the current phase of this technology. Despite its developing form, most senior risk decision-makers have gradually integrated this technique into their workflow. Amongst its key advantages, we can enumerate the enhancement of core processes and a deeper, more accurate analysis. Consequently, complex models become more manageable with the help of AI.



Figure 4. Adoption of AI tools, by industry area

“Which area of your organization do you believe has been the most effective adopter of AI techniques for risk and compliance purposes?”

Source: Chartis Research and TCS

For instance, we could have a look at fraud detection, where it brought a significant contribution. As of now, large sets of transaction data needed to be scrutinized, while nowadays

computers continually learn from previous samples and provide improved outcomes. Thus, we expect a bright near future in this field, when AI will be able to spot currently non-detectable frauds.

APPLICATION IN FINANCIAL SERVICES (FS)

Since the financial crisis of 2008, FS firms have been attempting to drive cost efficiency and maintain competitiveness to offset margin pressure. To obtain this, they have increasingly embraced technology, with greater use of AI being explored, depending on the area. In detail, from the graph below, which shows the impact of AI in banking and insurance, we can observe how the adoption changes considerably by sector.

The extensive use of AI in customer service or back-office operations can be justified by the fact that its applications can analyse data to distinguish patterns and make decisions based on them. However, both the difficulties in understanding AI and the necessity of a “human impact” slowed its development in fields like compliance.



Figure 5. “On which part of the value chain do you see the AI use case you have developed having the greatest income?”

Source: Deloitte, AI and risk management

CONCLUSION

AI will become a core component of many FS firms' strategies to perform better customer service, enhance operational efficiency and gain a competitive advantage.

Nevertheless, as stated by a recent Deloitte’s paper, despite all the potential advantages previously mentioned, the application of AI in fields like quantitative trading and risk management is still in its early stages.

Therefore, AI and its use in financial services can certainly accommodate new sources of alpha, but for the whole trading process, it still represents an evolution, not a revolution.

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