Are neural networks the future of financial modeling?

Clairfield's Giuseppe R. Grasso has spent his career examining big questions on big data

Giuseppe R. Grasso is co-founder of Clairfield Italy and has led many important transactions over his long career in M&A, particularly in the industrial segment. But Giuseppe has always had a side interest in what we might call the history of knowledge, from the early Italian economists of the 1700s with their theory of money to big data analytics. At university he studied economics with a particular interest in history of economic thought and models of the economy based on artificial intelligence.

Giuseppe's interest in the data points that show when a company is thriving led to the establishment of a research arm called KF Economics (KFE) in 2006. This was about the time of the Basel II banking regulation framework, which required capital feasibility studies in banking. Capital risk was becoming a hot topic. Giuseppe called on his university contacts to help develop algorithms to determine how sound companies were. Guided by these algorithms, KFE studies thousands of data points of Italian midmarket industrial companies to identify key factors behind their successes and failures and identify trends.

KFE partnered with Bureau van Dijk (acquired by Moody's in 2017) and served a client base that consisted mainly of Italian companies that used the rating to assess the creditworthiness of their customers. Some banks also used the program, as did some government bodies, including customs duties authorities, who were thus able to extend credit for the payment of duties as goods moved throughout Europe.

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SEVENDATA

KFE eventually attracted investor interest. In 2021, KFE sold a 60% stake to SevenData, a marketing technology company, while Clairfield Italy retained a minority stake in KFE. SevenData will put KFE expertise to use in further developing its own advanced decision-making system for credit-risk analysis, improving the predictive ability to identify an entity's default risks based on neural network models, the most advanced area of machine learning and artificial intelligence.

The development of KFE closely mirrors the evolution of data science. The original KFE model relied on logistic regression, which was the first statistical technique used in machine learning and is limited to numerical input. Today it has been replaced by other methods. The new methodology relies on neural networks and, rather than being based on numbers as in logistic regression, it encompasses more numerous and diverse data points. Indeed it can be said to be based on "knowledge" itself. Neural networks thus provide a rating model that is far more accurate than the logistic regression model. Even more importantly, they permit the ratings of companies that do not provide public financial statements. In Italy, these "private partnerships" encompass over 80% of all companies—some 3.7 million companies— so being able to assess them is truly revolutionary. Using information including the sector, number of employees, and location, and comparing this data with the information from similar businesses that do have publicly available balance sheets, allows the machine to make deductions about creditworthiness in a process called "supervised learning." Giuseppe compares the process to how a smartphone photo gallery can determine which of its pictures are of cats, based on all the previous information it has learned about images of cats. For M&A, the tool can be used to assess the probability of a liquidity event, or conversely, business failure, taking into consideration the average age of the owner and the board of directors, industry, and size, among other data points.

As an M&A practitioner, Giuseppe is a firm believer in the benefits of technological innovation in the M&A process. Today's technologies expand one's knowledge and help make global connections. There are many online deal matchmakers, for example. He does not believe this is the end of careers in investment banking, however. Predicting the best buyers has far more variables than what machines are able to deal with right now. And crucially, the final and critical mile is still about human connection and trust.

What's in the future for KFE? Together with Equita, majority shareholder of Clairfield Italy, the team is developing three activities. The first activity revolves around Equita's role as an important stockbroker that mediates eight percent of volumes on the Italian stock exchange. The KFE neural network model will allow Equita to aggregate stock activity and track market trends based on stock exchange flows. The second activity relates to Equita's investor research. As anyone who reads investor reports knows, ninety percent of most reports are comments on figures and peer comparisons, which, if automated, would allow analysts to concentrate on their value-add and judicious conclusions. Lastly, the KFE neural networks can determine how news affects stock trends and provide clients with timely information in order to act. It would be dangerous indeed for the tool to make direct stock recommendations, but it can be used to synthesize the direction of news trends in order for the trader to make her or his own judgment call.

What is exciting to Giuseppe today in terms of AI is how it provides the power to connect almost infinite dots in a way that was unthinkable 10 years ago. AI provides a bird's eye view of the world and a lot of power goes along with such quasi-omniscience. The management of knowledge creates new knowledge. As Giuseppe says, "You are studying how a shape can be formed, rather than the area of a triangle."

Giuseppe also recognizes what to be wary of in the use of predictive technology. It has been demonstrated that algorithms have the same biases as their creators, and this must be accounted for to avoid prejudices when assigning credit ratings. And in contrast to the industrial revolution, which created many new factory jobs and pulled entire societies out of rural poverty, the AI revolution will eliminate many mid-level jobs. The productivity rise will be huge but it will displace people who need not only means to live but a sense of purpose. For millennia these two needs have been intertwined but they are likely to be decoupled in the future.

How can society handle such an enormous change in how we live? Giuseppe believes some form of universal basic income, perhaps tied to incentives, such as study or volunteer work, may be the best solution. We can foresee a tremendous increase in the concentration of power and wealth in a small number of hands, which history has shown us is a threat to democratic institutions. However Giuseppe's hope is in another lesson to be learned from history, which is that competitiveness and innovation have always contributed to shifting the seats of power. ∎