

I Trained Rats to Trade, and Win, on Wall Street



Rattraders is an experiment in which I trained lab rats to trade in the foreign-exchange and commodity-futures markets. With the help of these rodents, I managed to outperform some of the world's leading human fund managers. My motivation was to find out what kind of highly paid jobs will eventually be replaced by machines—or, as was the case here, by rats. Like the work of many in this field, my research indicates that all jobs that do not require human-to-human interaction may be replaceable. I focused on

brokers because of their high earnings, but the job itself seems to be based on pattern-recognition capabilities and the ability to avoid distractions. I figured that rats might be up to the task.

Pulling it off would be hard work, so I broke the experiment down into three steps:

STEP 1: LAYING THE TICKER TRACKS

The first part of the experiment was to create the so-called ticker tracks. I gleaned information from various futures and foreign-exchange markets to generate sounds that would correspond to real-time price data. According to research, rats respond especially well to the piano, so I chose this instrument for the audio clips. I composed them with Sonification Sandbox, a program provided by the School of Psychology at the Georgia Institute of Technology (the software is an ideal environment for transforming data into sound, a process known as sonification).

The sound changed in connection with the price movement: When the price went up, the pitch rose; when the price went down, the pitch fell.

Depending on how long it took for the next trade to happen (time between trades varies between a second and a minute), I used different kinds of piano modulations.



STEP 2: TEACHING THE TRADE

I started with 80 Sprague-Dawley lab rats, 40 males and 40 females, intending to breed the best of them to create the most genetically fit traders. In Skinner boxes, widely used in animal experiments, the rats trained separately for five hours daily (thanks to Anna, Gerda, and Dirk, who did great work with them). All told, the process took about three months.

To train the rodents, I produced ticker tracks for about 800 different market situations (I restricted these to USD/EUR futures, though rats may become experts in any segment of the market). We played 100 of these tracks for the rats every day, in hopes that they'd eventually seek out sound

patterns unrecognizable to humans and predict the next market move after the last sound they heard.

Whenever they listened to a sound, the rats had to press either a green or a red button—green if they expected the prices to rise, red if they expected the prices to drop. When they were right they received a small amount of food (the good rats became fat very fast); when they were wrong they received a minor electric shock. Soon some rats were performing outstandingly well, showing a strong ability to remember the patterns they were listening to. We needed them to react to real-time data, however, and to get there we needed to find the most gifted traders.

After 12 weeks, we had four very reliable rats: Ms. Kleinworth, Ms. Coutts, Mr. Morgan, and Mr. Lehmann (we were quite surprised that he made it). Their performance was comparable to that of the world's best fund managers. Their ability to recognize sound patterns generated by the market's ticker tape was incredible.

STEP 3: DEVELOPING A PEDIGREE

After extensive training we wanted to learn whether the talent was genetically rooted, so we bred the top traders with each other. After only 20 days, we had 28 new rats (15 males and 13 females), and we soon



Mr. Morgan



Ms. Kleinworth



Mr. Lehmann



Ms. Coutts

THE TEAM

After 12 weeks, there were four very reliable rats. Their performance was comparable to that of the world's best fund managers.

started to train again (even reducing the training time). The results were astounding: The second generation of top traders had a much better performance than their parents, but further research will be necessary to confirm this finding of ours.

I am now working on software that generates real-time ticker tracks so I can put the system to the ultimate test (market conditions in the real world). If the performance is good, I will keep the experiment going and either set up my own hedge fund managed by my rats or train them to work for banks.

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