Knight Capital Group: Did an Accidentally Evil Computer Knock Down a Trading House?

By Henrich Greve

Knight Capital Group (www.knight.com) is a trading house that helps others access financial markets by executing their trades. It serves as a designated market marker, which means that it provides buy/sell orders so that others can always execute a trade against it, for more than 600 securities on the NYSE and NASDAQ stock exchanges. It also serves as a market maker for many other securities. Because market making and trading are key activities in financial markets, requiring reliable and honest dealing, it is no wonder that its web site carries the slogan "The Standard of Trust."

So what is one to think of the incident that took place on August 1, where a flurry of trades from Knight led to it accumulating a trading position of $7 billion, far more than it could sustain, leading to a concerted effort to drive the position down to a less risky level? In its rush to reduce its risk exposure, it inevitably sold some of its holdings cheaply (also known as a fire sale), and ended up losing $440 million. Even against the standards of losses that we have become used to in this financial crisis, it was a very bad day for Knight. Since then, Knight has been able to find investors with fresh capital of $400 million, essentially the same amount that it lost, which will stabilize the firm if it suffers no more catastrophic losses.

It has also investigated the reason for the sudden surge in purchase orders. Here the information is a little unclear, but Wall Street Journal reports an unexpected reason: A botched update of computer systems. What seems to have happened is that the new computer systems were installed and worked correctly, but they were not installed on all trading platforms (each system has to be replicated across all trading platforms). This led to old systems trading on some platforms while new systems traded on others, and apparently it was the old systems that went awry. Exactly how this is possible is unclear because the old systems had obviously worked well before, but a possible reason is that the old systems no longer posted their trades to the risk management system, so the contribution of their trades to the total risk went undetected. This explanation is speculative, but if the reports that the new system functioned well are correct, then the huge buildup of buy orders suggests that there must have been some information being dropped from the risk assessment system.

This tale of computer error starts and ends with human error. People failed to install the new system across all trading platforms, and people failed to stop trades when NYSE trading-floor officials noticed the unusual trades and warned Knight that it was the source of unusual trading movements. But the key point here is that the computer systems were so fast and effective in their work that there was little time to stop them once they got going. This is a phenomenon well known from research on organizational accidents. It is also a major cause of misconduct, as I have noted in work with colleagues Don Palmer and Jo-Ellen Pozner. In the case of Knight, the trades were arguably so hazardous that it is a judgment call whether the firm has upheld its duties for proper risk management (lawsuits, anyone?). However, assigning responsibility will be difficult because these trades were accidental, and the accident occurred in the interface between fast and faulty computers, and slower humans trying to catch up.

Clearly this story has important lessons for how organizations think about management of risk and quality control, especially as they make more and more of their key systems automatic. It is also a reminder that financial markets contain human traders, who can be quite faulty in their judgments, and replacing them with computers sometimes makes the judgments even worse. And finally, if you have ever had a software upgrade go bad, think of Knight Capital and how much worse it could have been: I doubt you have ever experienced a computer upgrade that withdrew money from your bank account and distributed it to strangers.

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