

Two Nobel laureates, 25 times leverage, \$4.6 billion lost in four months

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Maxim: *Beware of geeks bearing formulas.* — Warren Buffett

A model is only as good as the assumptions inside it. The investors hurt worst by formulas are rarely the ones who questioned them.

The most dangerous number in finance is the one nobody questions because it came out of a model.

Long-Term Capital Management began trading in February 1994 with what may have been the most impressive team ever assembled to run money. Its partners included John Meriwether, a celebrated bond trader, and two economists, Myron Scholes and Robert Merton, who would share the Nobel Prize in 1997 for their work on valuing options. Their models found tiny mispricings between related bonds and bet that the gaps would close, as history said they always did.

For three years the formulas worked beautifully. After fees, investors earned about 21% in the first year, 43% in the second and 41% in the third, according to the fund's [Wikipedia history](#). Because each mispricing was small, the fund borrowed heavily to make the bets worthwhile. By the start of 1998 it held about \$129 billion of assets on \$4.7 billion of its own capital, leverage of more than 25 to 1, and derivative positions with a face value of about \$1.25 trillion.

On 17 August 1998, Russia defaulted on its debt. Investors everywhere fled to the safest assets at the same moment, and the price gaps that LTCM had bet would narrow widened instead. The models had treated such a stampede as almost impossible, because nothing quite like it appeared in the data they were built on. In less than four months the fund lost \$4.6 billion. On 23 September, fearing that its collapse would spread through the financial system, the Federal Reserve Bank of New York brought 14 banks together to put in about \$3.6 billion and take control.

The mathematics was not wrong. The assumption that the future would resemble the past was.

What Buffett was warning about

Ten years later, with a far larger crisis under way, Warren Buffett returned to the theme in his [2008 letter](#) to Berkshire Hathaway shareholders. "Investors should be skeptical of history-based models," he wrote. Such models, built by what he called a nerdy-sounding priesthood using terms like beta, gamma and sigma, tend to look impressive. "Too often, though, investors forget to examine the assumptions behind the symbols. Our advice: Beware of geeks bearing formulas."

He gave a concrete example from his own business. The Black-Scholes formula, the work that earned Scholes and Merton their Nobel, is widely used to value options. Buffett called historical volatility a useful but far from foolproof concept for short-term options. Applied over long periods, he argued, the formula can produce absurd results, because past price swings say little about what a business will be worth in fifteen years.

His point was not that mathematics is useless. It was that a formula hides its assumptions behind precise-looking numbers, and precision is easily mistaken for certainty. The output of a model can

never be more reliable than the guesses that went into it, and the most important guess, about how the future will behave, is usually borrowed from the past.

The retail version of the same mistake

Few Indian investors will ever run a hedge fund. But the same mistake now arrives on a phone screen. Options strategies with names like iron condors and short strangles are sold through courses and social media, usually with a back-test showing steady monthly gains. Many of them rest on the same assumption that sank LTCM: that tomorrow's price swings will look like yesterday's.

The results are on record. Sebi's study of equity futures and options, [released in September 2024](#), found that 93% of individual traders lost money between 2021-22 and 2023-24, with aggregate losses of more than ₹1.8 lakh crore. The loss-makers lost about ₹2 lakh each on average, and only about 1% earned more than ₹1 lakh in profit after costs, as [Taxmann's summary](#) of the study sets out. Proprietary traders and foreign investors, meanwhile, booked large profits, much of it through algorithmic trading.

That contrast matters. The profitable side also used formulas. The difference lay in everything around them: capital to survive bad months, strict limits on losses, speed, and people paid to ask what the model assumes and what happens if the assumption breaks. The individual trader, by contrast, often buys someone else's formula without its fine print, and adds leverage.

Using a model without being used by it

None of this means you should ignore numbers. Retirement calculators, SIP projections, valuation models and fund ratings are all formulas, and they are useful. The habit Buffett asks for is simpler: before you trust the output, find the assumptions, and ask what happens if they are wrong.

A retirement calculator that assumes 12% a year for thirty years is making a guess about three decades of markets. Run it again at 8% and see whether your plan survives. A back-test that shows an options strategy never losing more than 2% in a month tells you about the months it was tested on, not the month a war, a pandemic or a default arrives. A fund's risk rating built on five calm years tells you little about the next crash.

Watch especially for leverage. LTCM's assumptions would have been an embarrassment without borrowed money; with 25 times leverage, they were a catastrophe. The same is true of a trader using margin to sell options. A model that is slightly wrong costs you a little. A model that is slightly wrong and leveraged can cost you everything.

And be wary of precision. A projection that says your corpus will be ₹3,47,82,000 in 2050 is not more accurate than one that says "somewhere between ₹2 crore and ₹5 crore". It only looks that way.

If you do one thing: For every financial plan, strategy or product you rely on, write down its single most important assumption, then test the result with that assumption made a good deal worse. If the outcome is one you could not live with, change the plan, not the assumption.

LTCM's partners were not fools. They were among the cleverest people ever to run money, and for three years their formulas made investors rich. What they lacked was not intelligence but doubt, and the borrowed money made sure that one wrong assumption was enough.

The lesson travels well, from Greenwich in 1998 to a trading app in Indore today. Respect the model, read its assumptions, and keep enough humility, and little enough leverage, that you can survive the day the future refuses to look like the past.

Sources

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- [Sebi: Updated study on profit and loss of individual traders in equity F&O \(23 September 2024\)](#)
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The Virtual AI Author is an AI writer for OneRightAI.

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