# Equities

## “Do Financial Markets Reward Buying or Selling Insurance and Lottery Tickets?”: Author Response

March 1, 2013

I would like to thank Nassim Taleb for reviewing my article. Taleb makes some interesting points, a few of which are incorrect, starting with his perception that I recommend selling insurance. I have made no such recommendation. On the basis of my survey, I concluded that (1) various forms of selling financial catastrophe insurance earn positive longrun returns but (2) they tend to suffer sharp losses in bad times. Taleb’s main argument is that we do not have enough data to warrant the first conclusion (which goes against his prior beliefs), and surprisingly, he misses the opportunity to underline the second conclusion, which is the real benefit of the long-option strategies that he favors. Perhaps our conclusions differ because they rely on different types of analysis. Taleb has great confidence in his prior beliefs; he is highly certain about things that I consider, at best, plausible speculations supported by anecdotes rather than empirical analysis. In contrast, my survey drew deliberately balanced conclusions from a wide-ranging set of theories and empirical evidence.

I am a “two-handed economist” to a fault, trying to see both sides of any argument. This is also true when it comes to the title question posed by my article. The literature on this topic is one sided: Most researchers take it as a given that investors like positive skewness, insurance, (and thus overpay for these features). and thus overpay for these features). Therefore, when I reviewed the literature, I was delighted to find Taleb taking the other side and controversially arguing that investors prefer negative skewness (which would make skewness and many options structurally underpriced and many long-volatility strategies outperform in the long run).[1]

Taleb’s initial point—that I used too many arguments and too much evidence (like the guy with the most alibis in a detective novel)—is a strange one. This argument belongs in Taleb’s own “graveyard of silent evidence.” What investigator would not prefer to have more evidence—say, a witness as well as fingerprints? In real life, the obvious suspect tends to be guilty—even if this reality does not make for the most interesting detective novel. Of course, one should want to analyze both sides of the issue, and indeed, the goal of my article was to investigate both the costs and the benefits of taking tail risks.

The main theoretical arguments that Taleb disputes are twofold.

• In rational finance, investors require higher long-run returns from investments that perform poorly in bad times. This compensation should be especially high for such asymmetric payoffs as short-volatility and carry-seeking strategies and other forms of selling financial catastrophe insurance. Conversely, investors are willing to pay for downside protection and accept lower long-run returns for “safe haven” assets. In contrast, Taleb claims that investors dislike gradual bleeding even more than occasional blowups.[2]

• In behavioral finance, the prospect theory of Daniel Kahneman and Amos Tversky proposes that people overweight low-probability events, which could explain the richness (low average returns) of both insurance and lotteries.[3] In contrast, Taleb argues that people underweight low-probability events, which generally supports being long out-of-the-money (OTM) options and volatility as a long-run strategy.[4]

If a survey of theoretical studies shows Taleb standing alone against some major theories, a survey of dozens of empirical studies provides an even more extreme score: all to none.[5] After reviewing the evidence, my verdict sides with the majority, and Taleb’s letter does nothing to change it.

I address eight specific issues raised by Taleb, with several of which I sympathize.

First, his basic idea that investors dislike bleeding rings true, especially for delegated asset managers. Still, this effect seems to be empirically overwhelmed by other forces (e.g., bearing left-tail risk should be rewarded because most investors dislike it). Volatility selling, carry seeking, and selling financial catastrophe insurance appear to earn higher average returns than opposite strategies, consistent with a positively compensated risk.

Second, average returns are not everything. Taleb would be on firmer ground if he stressed that the terrible timing of losses would make selling financial catastrophe insurance an unappealing strategy despite positive average returns. However, Taleb seems to believe that this argument is not needed because, according to his strong prior beliefs and against all published evidence in the literature, such insurance selling will lose money in the long run.

Third, large amounts of data (Taleb quotes 2,000 years’ worth) are needed to make conclusive judgments about market pricing of rare

events.[6] I agree with Taleb in that evidence over a period with a too benign environment can be misleading (the peso problem). But we must also consider the possibility that ugly left-tail episodes may be overrepresented in a given sample, such as the quarter century that covers both the 1987 and the 2008 financial crises as well as several others.

Fourth, the analysis in my article, as in all empirical investigations of these issues, was sensitive to the time periods and assets used.

• Taleb says that I excluded the crucial 1987 crash from my analysis. As just noted, including both 1987 and 2008 might make a sample period too "crash heavy." Still, I would have loved to include 1987 evidence in my empirical analysis. However, all the option-trading indices that were available to me start a few years after 1987. I am unsure whether this data unavailability is a coincidence reflecting immature option markets in the 1980s or whether it reflects commercial convenience in the choice of a starting date for public indices. There is a chance that Taleb is onto something, but that does not change the main result. *Academic studies that include the 1987 crash document deeply negative long-run returns for long OTM index option positions.*[7]

• Taleb thinks I should have included "bank loans" when discussing carry trades as close cousins to volatility-selling strategies. For Figure 3, I chose examples of carry trades and volatility-selling strategies with particularly ugly drawdowns in 2008. Further, the text highlighted the toxic nature of these asymmetric strategies (large losses concentrated in bad times, when investors can least afford them); I hardly implied that they are "safe," as Taleb insinuates.

• I cannot but smile at Taleb's cherry-picking claims given his emphasis on the 1987 and 2008 crises and his silence about bleeding experiences in the interval between them. Because I had weaker prior beliefs to start with, I tried to collect a broad range of arguments and data for my article. Apparently, I came up with too many arguments and too little data.

Fifth, it is true that variances average and standard deviations do not. Taleb objects to my shortcut in Figure 2 when plotting implied and realized volatilities as opposed to variances (which are more accurate but less familiar to lay readers). However, the evidence elsewhere in the article does not suffer from this problem. Figure 2 was provided mainly to give visual evidence that includes the 1987 volatility spike.

Sixth, it is true that the VIX is largely based on at-the-money (ATM) options whereas smallprobability events are better captured by OTM options. Empirically, however, even ATM shortvolatility positions tend to suffer sharp losses at the same time as equity markets and short OTM put positions.[8]

Seventh, Taleb thinks that linking evidence from both left and right tails (lotteries and insurance) conflates two distinct issues. I disagree, but then I consider it a question of prior beliefs rather than evidence. Perhaps it was a stretch, but I liked tying both insurance and lottery stories to skewness preferences, as well as to the evidence that in both tails, selling skewness (insurance or lottery) has been profitable in the long run.

Finally, despite Taleb's claims, I did not conclude that investors should consider selling (financial catastrophe) insurance.[9] My verdict was explicitly about the question posed by the article's title, and readers are welcome to make their own judgments. My subjective conclusion that selling insurance (and lotteries) enhances long-run average returns is balanced by the concerns about the toxic timing of losses in insurance-selling strategies (which refer partly to the same asymmetries Taleb highlights). Indeed, these unattractive characteristics are a key reason why we should expect volatility or insurance investors to receive a positive long-run reward as compensation. Taleb's strong prior beliefs may not be turned by any amount of data or theories, but he should consider the possibility that his grand idea about the benefits of being long volatility or insurance is already in the price.

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[1] Nassim Nicholas Taleb, "Bleed or Blowup? Why Do We Prefer Asymmetric Pa offs?" Journal of Behavioral Finance,vol. 5, no. 1 (2004):2–7.

[2] Taleb, "Bleed or Blowup?"

[3] Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk," Econometrica, vol. 47, no. 2 (March 1979):263–292.

[4] Taleb, "Bleed or Blowup?"

[5] The score is all to none because Taleb does not provide or cite long-term empirical evidence that covers both peaceful and turbulent periods. Instead, he always refers to the (admittedly important) episodes of 1987 and 2008.

[6] Some of Taleb's examples are too extreme, emphasizing events with microscopic probabilities. For practical issues, we can consider such probabilities unknown and make decisions that do not rely on precise estimates of their magnitude. Also, it is possible to make some inferences about the probability of events too rare to observe. Although we are obviously more confident about probability estimates for which we have plenty of data, it is not true that we know nothing about the probability of events for which we have zero observations.

[7] See, for example, Joshua Coval and Tyler Shumway,"Expected Option Returns," Journal of Finance, vol. 56, no. 3 (June 2001):983–1009; Mark Broadie, Mikhail Chernov, and Michael Johannes, "Understanding Index Option Returns," Review of Financial Studies, vol. 22, no. 11 (November 2009):4493–4529.

[8] May be helpful to clarify that Taleb is even more controversial here than normally. He seems to agree with me that ATM options are structurally expensive, but he likes OTM options. The lay reader may be confused by this because virtually all the literature views OTM index puts as relatively expensive rather than attractive. Especially after 1987, these puts have had higher implied volatilities than ATM options, and they have delivered very negative long-run returns. Taleb may reasonably counter that we need infinitely more data to make statistically conclusive judgments, but he seems to go beyond reasonable when he implies that OTM options are not just attractive but also attractively priced. Taleb is clearly guided by his strong prior beliefs when he ignores all empirical studies on this topic. I am curious to hear whether he finds OTM options attractive at any price. At what cost, if any, might these options be a bad deal? (But if he is right that there is no long-run cost—in stark contradiction to the available data—I can see why we should like options, though perhaps we should then worry more about the solvency of the counterparties who are supposed to pay us our explosive gains.)

[9] Although I did cite an argument that long-horizon investors should consider selling tail insurance (see Robert Litterman, "Who Should Hedge Tail Risk?" Financial Analysts Journal, vol. 67, no. 3 [May/June 2011]:6–11), I noted that I would not address the more subtle question whether a given investor should buy or sell insurance or lottery tickets in financial markets. In practice, most investors have found it hard over time to stick with either always buying or always selling option-based tail insurance. Underweighting lottery tickets is a much more compelling strategy, but I will not discuss it here because Taleb's response focused on the left tail.

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