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# Inverse Volatility Products Almost Worked

And people like them so much they keep coming back for more.

By [Matt Levine](#)

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We have talked a couple of times this week about the unpleasantness experienced on Monday by investors in inverse volatility products like XIV (the VelocityShares Daily Inverse VIX Short-Term ETN, an exchange-traded note issued by Credit Suisse) and SVXY (the ProShares Short VIX Short-Term Futures ETF, an exchange-traded fund). These products were bets that volatility would go down. On Monday volatility went up. Specifically the VIX (the CBOE Volatility Index) went up by 116 percent in one day. The people who had bet that volatility would go down lost almost all of their money. That is altogether fitting and proper. When you bet that a thing will happen, and the incredibly extreme opposite of that thing happens, then you should lose your money. You can complain, but we don't have to listen to you.

So in the broad sense those products worked as intended. For instance, if you bought XIV at noon last Friday, you paid about \$119, when the VIX was about 15. At 4 p.m. on Tuesday, when the VIX was at about 30, your XIV was worth \$7.35. The VIX had gone up by 100 percent; your XIV note had gone down by about 94 percent. There is some tracking error, because the XIV

isn't *exactly* meant to provide the negative of the return on the VIX -- it provides the negative of the return on a blend of short-term VIX futures <sup>[1]</sup> -- but basically the XIV going down by 94 percent when the VIX went up by 100 percent seems about right.



But if you zoom in a bit you can find ... certain glitches. If you bought XIV at 4 p.m. this *Monday*, something odd happened. You paid about \$99 for it. But at that point the VIX was at about 35. The VIX had more than doubled from its Friday afternoon levels, but XIV was down by only about 20 percent. And if you then held XIV until Tuesday afternoon, you lost about 93 percent of your money, even as the VIX actually *fell* by about 14 percent, back to 30. If you bought XIV on Monday afternoon to bet that volatility would go down, *you were right*. But you lost almost all of your money.

That is, you were right that volatility would go down. You were wrong to buy XIV to express that view. But *a lot* of people did. Bloomberg tells me that 5 million shares of XIV -- about \$500 million worth -- traded between 3 and 4 p.m. on Monday, at a volume-weighted average price of \$98. <sup>[2]</sup> The VIX was above 30 for almost all of that time. People who bought XIV in the last hour of trading on Monday lost more than 90 percent of their money within 24 hours, even though they were basically right, or at least not grievously wrong, about the short-term direction of the VIX. Bloomberg tells me that another 28 million shares -- some \$800 million worth -- traded after hours on Monday, at an average price of about \$29. At that point the value of XIV -- its "closing indicative value," the amount of money that Credit Suisse owed you under the terms of the ETN -- was \$4.22. <sup>[3]</sup> Its closing indicative value on Tuesday was \$5.32. If you bought XIV on Monday after the close, its value actually went up. But its *price* collapsed. You paid \$29 for a thing that was worth \$4.22; you ended up with a thing worth \$5.32 that traded at \$7.35.

Why ... why did you do that? You should not have done that! The closing indicative value is published on the XIV web page. Paying seven times that value, or 20 times that value for that matter, was a bad plan! Still it is the sort of bad plan that can plausibly be chalked up to the complexity of the instrument rather than to, you know, the vicissitudes of life. XIV's trading price didn't catch up to its underlying value for several crucial hours; eventually trading was halted on Tuesday morning and it reopened Tuesday afternoon much closer to its actual value.

4 People who bought XIV at 4 p.m. on Monday because they thought that the VIX was too high were right about that; they were just wrong that the trading price of XIV accurately reflected the level of the VIX at that time. That is a mistake -- a fairly glaring mistake -- but a sort of understandable one. For people who bought XIV on Friday, it worked exactly as intended: They lost almost all of their money, and they should have. For people who bought XIV late on Monday, it did *not* work as intended: They lost almost all of their money, but they shouldn't have. 5

Let's zoom in on another detail that doesn't look great:



That's the price of March VIX futures on Monday between 3 p.m. and the close. It was not that high, and then suddenly it was. Why is that? Well, why does anything happen, people were calm

and then they panicked, etc. But there is also probably a technical reason for it, which has to do with how short-volatility products like XIV and SVXY are hedged.

Actually let's start with a difference between them. SVXY is an exchange-traded fund: It's a pot of money, and its managers manage the pot of money by selling VIX futures to try to obtain -1 times the daily return of an index of short-term VIX futures, minus some fees. If the futures go up, the pot loses some money, and shares of the fund are worth less; if the futures go down then the shares are worth more. The pot of money owns the short futures positions, and the shareholders of the fund participate in their performance. XIV, on the other hand, is an exchange-traded note. It is just an obligation of Credit Suisse: Credit Suisse promises to give investors a daily return equal to -1 times the daily return on that index of short-term VIX futures. The ETN doesn't hold any futures; it's not a pot of money that Credit Suisse manages on behalf of its investors. It is just a debt of Credit Suisse; if the VIX futures go down then Credit Suisse owes investors more money, and if they go up it owes them less.

In practice, though, Credit Suisse hedges the ETN, and one would expect its hedge to look much like the actual futures that a similar short-volatility ETF would hold. [\[6\]](#) (That is, its trading for its own account should look similar to how SVXY trades for its investors' account.)

Pseudonymous financial blogger Kid Dynamite [explains the expected hedge strategy here](#), and I will adopt some of his numbers. [\[7\]](#) Simplistically let's say that as of Monday morning XIV had 15 million shares outstanding at a value of \$100 per share, or a \$1.5 billion net asset value. [\[8\]](#) That means that Credit Suisse's hedge would be to be short \$1.5 billion of VIX futures at a VIX of around 15. [\[9\]](#) (One convenient fancy way to describe this is that it is short \$100 million of VIX futures *vega*, where vega just means the dollar value per VIX point.) If VIX futures then go down to 14, XIV's net asset value is now \$1.6 billion. [\[10\]](#) But now Credit Suisse is only short \$1.4 billion of futures, and has to go sell \$200 million more worth of futures, at 14, to remain hedged. If instead VIX futures go from 15 to 16, XIV's net asset value is now \$1.4 billion. But Credit Suisse is now short \$1.6 billion of futures, and has to go buy in \$200 million of futures to remain hedged.

If instead VIX futures go from 15 to 20, XIV's net asset value goes to \$1 billion, and Credit Suisse has to buy in \$1 billion of futures to remain hedged. [\[11\]](#) But meanwhile the managers of SVXY also have to buy in lots of futures, because their fund has also shrunk. And so does everyone else who has short-VIX products like this outstanding. And as they buy more futures, they push up the price of the futures. But as the price of the futures goes up, the net asset value goes down, and they have to buy in more futures, which pushes up the price of the futures, which pushes the NAV down, which can keep going, in the extreme case, until they've bought in all the futures and the NAV has gone to zero. XIV and SVXY did not quite get to that extreme case on Monday, but they got about 96 percent of the way there.

One question is: *When* do they buy in those futures? The XIV ETN is priced based on the closing value of the futures each day. [12] To match that settlement method, Credit Suisse could buy in its futures at the close on Monday. (The normal way to do this is using trade-at-settlement futures, where you can lock in the closing price of the futures that day, though alternatively you could just try to buy futures right at the close. [13] ) There is an obvious problem with that approach, which you can see in the chart above: If a lot of people need to buy in a lot of VIX futures at the closing price, the closing price is going to be a lot higher than the price during the rest of the day. [14] This is unpleasant for Credit Suisse: Not only does it have to buy a lot of futures right at the close, but also it *doesn't know how many futures it needs to buy*, because every time it buys futures it pushes up the futures price and forces itself to buy more futures.

The other way to buy in the futures is: not at the close. That is, when it got to about 3 p.m., and VIX futures prices were well above where they had closed the previous day, Credit Suisse could start to be reasonably confident that it would need to buy in some futures that day. Why not do some of it now? If Credit Suisse had bought futures at 3 or 3:30, it could have paid 18 or 20 for them, instead of the 28-ish closing price. [15] There are three big advantages to that:

1. By not doing all of its buying at the close, Credit Suisse takes some pressure off the close, which makes the ramp into the close a bit less steep, which leads to a lower settlement price for VIX futures, which leads to a higher net asset value for the XIV ETN, which preserves a little bit more of the ETN investors' money.
2. Taking pressure off the close also makes the close more *predictable*: If VIX futures don't ramp too steeply, then Credit Suisse can better figure out *how many* futures it needs to buy (which, again, is a function of the closing price), so it can stay hedged more easily.
3. If Credit Suisse buys a chunk of its futures at 20, and they *do* close at 28, [16] then the XIV ETN is synthetically buying the futures from Credit Suisse at 28 that Credit Suisse bought at 20. [17] That is ... potentially a lot of profit? Like: A *lot* a lot of profit? [18] Of course if the futures close at 15, it's potentially a lot of loss, but at some point late Monday you probably had some reason to suspect that the close would be up.

That's a good trade! It's good for Credit Suisse's own wallet, and it's good for its customers. I suspect it is nonetheless a stomach-churning trade for a bank in Credit Suisse's situation for one simple reason, which is that it *looks* a bit like trading ahead of the clients. If you are synthetically selling VIX futures to your own ETN at 4:15, and you are buying those futures at 3:30 or whatever, and you are buying them at 20 and selling them to the ETN at 28, then holders of the ETN might start to throw around ugly words like "front-running." They would, I think, be wrong: Credit Suisse has no actual customer order to buy VIX futures, just a derivatives product priced based on the closing value of those futures. If it chose to hedge that product, that was its own

business, and it could do that hedging however it liked. XIV's prospectus says as much, very clearly. <sup>[19]</sup> "It is possible that we, our affiliates, or third parties with whom we transact could receive substantial returns with respect to these hedging activities while the value of your ETNs decline or become zero," it says. I think this trade would be fine and lovely and I would do it all day long, but others might disagree. <sup>[20]</sup>

In practice I think that banks these days have lost a lot of their appetite for market risk (what if the futures closed at 15 and they lost hundreds of millions of dollars by pre-hedging?) and reputational risk (what if the futures closed at 40 and they *made* hundreds of millions of dollars by pre-hedging while their customers lost everything?), so Credit Suisse -- or whoever bore the ultimate risk of XIV -- probably hedged as much as they could at the closing price in the trade-at-settlement market. But that market got pretty illiquid over the course of Monday afternoon, which meant that issuers who were hedging short-volatility products were probably themselves buying a lot of VIX futures going into the close, or even earlier.

Or later. Another question about the futures is, *how many* futures should the XIV and SVXY and other issuers buy? Remember, there is a feedback loop; how many futures you have to buy depends on how high the futures prices are, and vice versa. After the fact the answer was calculable, but in the wild trading of Monday afternoon you might have overshoot or undershot the right amount. Actually *overshooting* would be hard: In the event, when VIX futures almost doubled, short-VIX products should have bought in something like 96 percent of the underlying futures. There could never be a circumstance where they'd have to buy in more than 100 percent -- if the funds go to zero, you buy in all the futures, then you stop -- so on a day like Monday there just wasn't much room to overshoot.

On the other hand they could have undershot. And that would be great! If they ended Monday short more futures than they were supposed to be, then they would have had to buy in those extra futures on Tuesday morning -- when the futures were much lower than they had been at the close on Monday. <sup>[21]</sup> Being too short going VIX futures into Tuesday, when VIX futures opened down, worked out great for you.

*Something* worked out great for SVXY, anyway. On Monday, the relevant index of VIX futures was up 96 percent, XIV's indicative value -- which is guaranteed by Credit Suisse to be -1 times the index return -- was down 96 percent, and SVXY's net asset value -- in which ProShares tries its best to return -1 times the index -- was down about 96 percent. <sup>[22]</sup> On Tuesday the index was down 26 percent, XIV's indicative value was up 26 percent, and SVXY's net asset value was *up 187 percent*. That's a weird number! SVXY is an inverse ETF. If VIX futures had *gone to zero* on

Tuesday -- the lowest they could ever go -- then you'd expect SVXY to be up 100 percent. Being up 187 percent in a day seems impossible. The only way to do it is by enormous slippage from the index: Either SVXY's managers bought in their futures on Monday afternoon at prices well below the closing price, or they bought in their futures on Tuesday morning at prices well below Monday's close, and either way that slippage from the closing price showed up in Tuesday's net asset value as a big profit. And so they did not provide SVXY shareholders with the short-VIX exposure that they expected.

You cannot really blame them for that. For one thing: It worked out great for the shareholders! Instead of being down 95 percent from Friday through Tuesday, they were down 89 percent; perhaps they don't find that very comforting but they should. <sup>[23]</sup> For another thing, the market for VIX futures on Monday afternoon was crazy, and it would have been hard for SVXY's managers to give their fund *exactly* the experience of buying in all the futures at the closing price. They had no choice but to buy in some of those futures either earlier on Monday or later on Tuesday, in either case at a price lower than the "correct" price.

This wasn't a problem for XIV because, again, Credit Suisse just guaranteed XIV holders exactly the return on the index. But if Credit Suisse was *hedging* the ETN, then it had the same problem as SVXY's managers, but for its own book. And just like with SVXY, it turned out to be a nice problem to have. Actually Credit Suisse's problem would have been even nicer than SVXY's: SVXY was trying to *match* the closing price for its investors; going over or under the closing price would be bad. Credit Suisse just had to not do *worse* than the closing price; if it bought in futures for less than the closing price that was a pure win.

Just for giggles, if Credit Suisse was hedging XIV using futures, and if its hedging of XIV slipped as badly as SVXY's hedging did, then Credit Suisse would have made almost \$100 million hedging XIV on Monday. <sup>[24]</sup> That is an entirely hypothetical number! There is no reason to think that Credit Suisse was hedging XIV in the same way that SVXY's managers were hedging their ETF, or that they got similar performance. <sup>[25]</sup> Credit Suisse isn't saying: It put out a statement on Tuesday saying "that it has experienced no trading losses" on the XIV, <sup>[26]</sup> but that doesn't mean it didn't experience any *gains*.

Anyway XIV is gone now, or as good as gone; Credit Suisse announced that it will redeem it as of Feb. 21. It is now a fraction of its former self, and it's probably a bit depressing to come into work every day and see XIV sitting in the corner with a hangdog expression and an \$80 million market cap. SVXY is still kicking though. In fact:

It lost 90 per cent of its value on Monday, but enjoyed renewed inflows of \$71.7m on Tuesday and another \$135.6m on Wednesday, according to Bloomberg data. That has lifted its total

assets from a low of just \$72m on Monday to \$427.7m at the end of Wednesday – though still a far cry from the \$1.7bn it boasted at the start of February.

It's a touching vote of confidence. People had such a great experience with inverse vol products that they couldn't wait to come back for more.

- 1 Technically, it provides the negative of the return on the S&P 500 VIX Short-Term Futures Index Excess Return Index, which is calculated based on a blend of the current-month and next-month VIX futures. You can read about how it is calculated on pages PS-30 to PS-35 of the XIV prospectus. But you don't have to! It'll be fine if you don't. At no point in this post will we discuss "the roll" or anything.
- 2 For the past year, XIV has traded an average of about 10.6 million shares a day.
- 3 Actually \$4.2217, according to Bloomberg, which also notes that its closing price of \$99 represented a 2,245 percent premium to net asset value.
- 4 It still traded at a premium for a while. Tuesday's close of \$7.35 was a 38 percent premium to its \$5.32 indicative value, versus typical premiums of less than 2 percent, and sometimes discounts, for most of the prior few months. Wednesday's close was a 12 percent premium.
- 5 People who got *short*XIV late on Monday, on the other hand, had a pretty good week.
- 6 I mean, approximately and theoretically speaking. But Credit Suisse is a big bank with a big book of index volatility. If some client comes to it and wants to get long a bunch of variance swaps, Credit Suisse might sell it those swaps and hedge that against the ETN exposure. And the prospectus allows for all sorts of hedging:

From time to time after issuance and prior to the maturity of any series of ETNs, depending on market conditions (including the level of the applicable underlying Index), in connection with hedging certain of the risks associated with the ETNs of the series, we expect that one or more of our affiliates will increase or decrease their initial hedging positions using dynamic hedging techniques and may take long or short positions in listed or over-the-counter options contracts in, or other derivative or synthetic instruments related to, the applicable underlying Index, or the S&P 500® Index. In addition, we or one or more of our affiliates may take positions in other types of appropriate financial instruments that may become available in the future.

Or for that matter Credit Suisse could have sold some or all of its exposure to XIV to some other firm, which could then do the hedging and guarantee Credit Suisse the performance. I'll assume vanilla hedging here for simplicity but that doesn't necessarily reflect reality.

- 7 His fuller explanation:

\$XIV had roughly 15mm shares outstanding, and an NAV of roughly \$100/share before the SHTF. Let's call that \$ 1.5B in exposure to short VIX futures. The XIV website shows the actual mix of FEB and MAR VIX futures that the XIV underlying is short - it usually ranges around 2/3rds 2nd month (MAR) and 1/3rd front month



(FEB), but changes as they roll their futures and as the VIX curve shifts. As of the time of this writing it's 3/4 MAR and 1/4 FEB.

So XIV has \$ 1.5B notional short VIX futures, and an NAV of \$ 1.5B (\$ 100/share). Now let's make up some numbers: Imagine what happens when the short VIX futures go up 40%. XIV now has \$ 2.1B in short futures exposure, and an NAV of only \$ 900MM (because it has lost \$ 600MM on the short futures position). So what does the XIV manager have to do? He goes out and buys VIX futures to reduce his exposure and get it back in line with the NAV.

Herein lies the rub... As the XIV manager goes out and buys VIX futures, in massive size, in an illiquid volatility market, he drives the price up...which drives the NAV down... which requires him to buy more VIX futures... Rinse, repeat. This is why we saw VIX futures spike late in the day on Monday, and especially into the 4:15pm ET benchmark ....

- 8 Technically XIV is not a pot of money, doesn't own anything, and so does not have a "net asset value." XIV's prospectus uses the term "indicative value" for the thing that, in an ETF, would be called a net asset value.
- 9 HUGE SIMPLIFICATION THAT INDEX VOL TRADERS ARE ALREADY TYPING ANGRY EMAILS ABOUT: As Kid Dynamite notes, XIV is actually short two separate series of VIX futures, the February and March maturities, and the mix changes over time. (That is, XIV is constantly rolling its futures into the future.) In reality those futures have different prices, and the relative allocation among the two of them -- and the shift in relative values between them -- will affect the return on the ETN. But let's not care! We don't have to care! In real life, if you are trying to calculate your returns down to the basis point, you should care. But the nice thing is that when VIX goes up by 116 percent in a day, the relative allocation among first- and second-month futures just doesn't matter that much. The absolute move across the VIX curve swamps any relative differences along the curve. So I am going to unapologetically talk about "VIX futures" as a unitary thing in the text, instead of bothering about the mix between February and March futures.
- 10 That is, VIX declined by 6.67 percent, so XIV should increase by 6.67 percent, from \$1.5 billion to \$1.6 billion. (Ignoring fees, etc.) Credit Suisse has made \$100 million on its hedge (it was short VIX futures that went down by \$100 million), but it owes XIV holders \$100 million more than it used to, so overall it is flat.
- 11 That is, Credit Suisse had \$100 million of vega; at a 20 VIX that means it has \$2 billion of futures outstanding. But now XIV is only worth \$1 billion so Credit Suisse has to cut its exposure in half.
- 12 That is, the "Closing Indicative Value" is based on the closing price of the futures each day. That's the amount that Credit Suisse owes you, if the note is redeemed that day. It's also the starting point for calculating the next day's return, which matters because Credit Suisse is aiming to match the daily percentage return of the index.
- 13 Trade-at-settlement transactions are basically: If I want to buy futures at today's closing price, I will go to a TAS market maker and buy a TAS future for \$0.01 or \$0.02 or so. The market maker will then deliver me one VIX future at the end of the day, and I will pay the official closing price. (Plus the penny or two.) The market maker will try to line up people on the other side -- I'll buy some futures, and someone else will sell some futures, and we'll both pay the market maker a penny or two, and she will net us off against each other and move our futures between us at

the closing price. But if her book is unbalanced -- if more people want to buy futures via TAS than sell -- she will need to go get the extra futures by actually buying at the close.

Here is a [2014 paper](#) about TAS in VIX futures.

Here is a Bloomberg chart of TAS prices over the past few days:



Notice it's basically between  $-\$0.01$  and  $+\$0.01$  (that is, either you pay a penny to buy at the close, or you pay a penny to sell at the close). On Monday afternoon you'd pay  $\$0.10$  -- 10 times the normal price -- to buy at the close, suggesting that the TAS market was running out of liquidity on Monday afternoon.

14 In fact, let's zoom out a little. Here are the March VIX futures on Monday and Tuesday:



Monday's close wasn't just way higher than the rest of Monday; it was way higher than all of Tuesday too. That close was not just about vol being high; it was about the specific dynamics of that close.

- 15 Here I am talking about the March futures. The February futures were trading in the 20-24ish area from 3 to 4 p.m. on Monday, and ramped up to 33.2 at the close. The actual index is a blend of the two; I am talking March for simplicity.
- 16 Or 26 or some other counterfactual price in a world where Credit Suisse buys slowly over an hour or so rather than all at the close.
- 17 That is, Credit Suisse's liability -- the ETN -- prices based on the closing price of the futures; it's almost as though the ETN is buying the futures from Credit Suisse. (But it's not -- it's synthetically buying them.)
- 18 Remember in ballpark numbers Credit Suisse was short about \$100 million of vega. That is, \$100 million per VIX point. Then think about how many VIX points separated 3 p.m. and 4:15 p.m.
- 19 It warns (emphasis added):

We expect to hedge our obligations relating to the ETNs by purchasing or selling short the underlying futures, listed or over-the-counter options, futures contracts, swaps, or other derivative instruments relating to the applicable underlying Index, the VIX Index, the S&P 500® Index, the component securities of the S&P 500® Index, or the underlying futures, or other instruments linked to the applicable underlying Index, certain exchange traded notes issued by Credit Suisse, the VIX Index, the S&P 500® Index, the component securities of the S&P 500® Index, or the underlying futures, and adjust the hedge by, among other things, purchasing or selling any of the foregoing, at any time and from time to time, and to unwind

the hedge by selling any of the foregoing, perhaps on or before the applicable Valuation Date. We, our affiliates, or third parties with whom we transact, may also enter into, adjust and unwind hedging transactions relating to other securities whose returns are linked to the applicable underlying Index. **Any of these hedging activities may adversely affect the level of the applicable underlying Index** – directly or indirectly by affecting the price of the underlying futures or listed or over-the-counter options, futures contracts, swaps, or other derivative instruments relating to the applicable underlying Index, the VIX Index, the S&P 500® Index, the component securities of the S&P 500® Index, or the underlying futures – and therefore the market value of your ETNs and the amount we will pay on your ETNs on the relevant Early Redemption Date, Acceleration Date or the Maturity Date. **It is possible that we, our affiliates, or third parties with whom we transact could receive substantial returns with respect to these hedging activities while the value of your ETNs decline or become zero.** Any profit in connection with such hedging activities will be in addition to any other compensation that and our affiliates receive for the sale of the ETNs, which may create an additional incentive to sell the ETNs to you.

- 20 It is a bit like the foreign exchange fixing scandal, where banks promised to sell clients (say) pounds at the official 4 p.m. fixing price, and would then go and buy pounds in the minutes leading up to the fixing. This hedged their exposure -- they then had the pounds to sell you -- but also tended to drive up the price of pounds. **That was actually fine** -- the regulators all said it was fine -- the problem with the FX fixing involved collusion between banks, not pre-hedging of the fix -- but it made a lot of people ornery and certainly contributed to the awkwardness of the scandal.
- 21 See the chart in footnote 14 -- the March futures closed at 27.975 on Monday, and were then below 24 all day on Tuesday.
- 22 According to Bloomberg, XIV's indicative value was \$108.37 at the close on Friday and \$4.22 at the close on Monday, a 96.1 percent decline exactly matching the 96.1 percent increase in the S&P 500 VIX Short-Term Futures Index (SPVXSP). Meanwhile SVXY's net asset value declined from \$103.73 to \$3.96; I see that rounding to 96.2 percent but it's very close.
- 23 If you were short SVXY you got burned, but then being long volatility by shorting an inverse VIX ETF is a pretty baroque way to trade. If you were doing a long XIV / short SVXY arbitrage you got particularly ruined.
- 24 That is: XIV started Monday with 15 million shares outstanding at an indicative value of \$108.37, so its total indicative value was about \$1.63 billion. Over the next two days its value declined by 95 percent, to an indicative value of \$80 million at the close on Tuesday. So Credit Suisse's liabilities on the ETN went down by about \$1.55 billion.
- On the other hand Credit Suisse was also hedged. Let's assume that the value of its hedge was \$1.63 billion on Monday morning, that is, it was perfectly hedged in futures. But let's say that it slipped in its hedging as much as SVXY did. SVXY's net asset value declined by 89 percent between Friday's close and Tuesday's. If Credit Suisse's hedge also declined by 89 percent, then it was worth \$178 million on Tuesday afternoon.
- So Credit Suisse would have gone from having a liability of \$1.63 billion (the ETN) and an asset of \$1.63 billion (the hedge), to having a liability of \$80 million and an asset of \$178 million -- a \$98 million profit.
- Again, I have no idea how Credit Suisse was hedging the ETN, so this number is unlikely to reflect its actual profits. On the other hand, again, ProShares slipped by that much while it was trying to match the close exactly, and Credit Suisse arguably had less incentive to match the close exactly.

25 Or even that Credit Suisse was actively hedging it -- again, they could have offloaded the risk and been perfectly neutral on the day. Though then whoever was hedging it could have made out pretty well.

26 "Shares of the Swiss-based bank had been down as much as 8.5 percent" before that statement, "as investors feared XIV's demise could dent its earnings." What a weird thing to fear!

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