

From: "Daniel Sabba (DEUTSCHE BANK SECURI)" <[REDACTED]>
To: undisclosed-recipients;;
Bcc: jeevacation@gmail.com
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No One Expected to Lose This Much on Swiss Francs: Matt Levine
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By Matt Levine
(Bloomberg View) -- One does not normally see sharp right angles in financial charts, but you could pretty much cut yourself on this chart of the volatility of the Swiss franc against the euro:
Source: Bloomberg (as are the rest)
One straightforward takeaway is: Whoa, that volatility is super high! But perhaps a more useful takeaway is: Whoa, it was super low for a really long time! This is of course because the Swiss National Bank capped the franc's value against the euro: The SNB wanted a price of no less than CHF 1.20 per euro, and the euro itself wanted a price of no higher than CHF 1.20 for reasons of its own, so the result was pretty much a peg at slightly above 1.20. In the 12 months ending on Wednesday, the euro traded in a range of 1.20095 to 1.23640 francs: That chart looks more jagged than it is, because you're standing too close to it. Here, I've zoomed out by two days: Those two days -- yesterday and today -- really put the previous year in perspective.
Goldman Sachs Chief Financial Officer Harvey Schwartz said on this morning's earnings call that this was something like a 20-standard-deviation event, and while the exact number of standard deviations is of course a subjective matter, that's unquestionably the right ballpark. Over the 12 months ended on Wednesday, the daily volatility -- that is, the standard deviation of daily returns -- of the euro/franc relationship was a bit over 1.7 percent; over the last three months of that period the volatility was less than 1 percent. On Thursday, the

euro ended down almost 19 percent, or call it 11 to 20 standard deviations, depending on what period you use.

An 11-standard-deviation daily move should happen once every ... hmmm let's see, Wikipedia gives up after seven standard deviations, but a 7-standard-deviation move should happen about once every 390 billion days, or about once in a billion years. So this should be much less frequent. Good news I guess, Switzerland won't be un-pegging its currency for at least another billion years, go ahead and set your Swatch by it. This is obviously dumb. You can't predict the next billion years based on the last one year of data. A billion years ago, how much were your euros worth? The franc was not volatile for a reason, and then it became volatile for a reason, and those reasons were mostly related to the policy actions of the Swiss National Bank, and those actions were and are comprehensible by the human mind, as long as that human mind didn't just robotically consider one year of historical data price data and nothing else. Most forecasters, who have human minds, did not predict that the SNB would remove its cap this quarter, or even this year, but they thought it might happen in 2016. No one was waiting until 1000002015.

On the other hand! Imagine being a retail foreign-exchange broker and letting your customers day-trade Swiss francs with lots of leverage. How much leverage would you feel comfortable giving them? Well, if volatility is less than 1 percent, then that means that 95 percent of the time their positions will move by less than 2 percent in a day. So if you required 2 percent margin -- that is, you demand \$2 of cash from them for every \$100 worth of Swiss francs that they trade -- you'd feel pretty safe. That would mean that, 95 percent of the time, customers couldn't lose more than their equity in a day -- so if they lost money and skipped out on you, you'd be able to liquidate their positions without losing any of the money you'd lent them.

On the other hand when the euro/franc moves by 19 percent in a day, they're gonna get utterly smoked, and so are you. This is roughly the boat in which FXCM Inc. finds itself. Like many other retail foreign exchange brokers, it offered 50:1 leverage on FX trades. And yesterday its "clients experienced significant losses" on the Swiss franc move, and "generated negative equity balances owed to FXCM of approximately \$225 million." And now it's in talks with Jefferies Group for a large cash infusion to fix the problem. FXCM is also distinguished by just an unbelievable sense of irony:

FXCM Chief Executive Officer Drew Niv, in remarks published in Bloomberg Markets magazine's December issue, said individual currency traders are enticed by the chance to control large positions with little money down.

"Currencies don't move that much," he said. "So if you had no leverage, nobody would trade."

Hahaha so true until it's so, so not. Some dumb fake math: FXCM's clients are out \$225 million of negative equity on these trades. Pretend they were all EURCHF spot trades, so the clients all lost about 19 percent yesterday. And pretend they'd all posted 2 percent margin on their Swiss franc trades, so they're

now at negative 17 percent. That would mean that the notional size of those trades was about \$1.3 billion, and that the margin posted against them yesterday was about \$26 million. And now it's negative \$225 million.

It's good to occasionally remember that a margin loan is a put: If you let your customer buy something for \$100, and you lend them \$98 of the purchase price, and then the price of the thing falls to \$81, then guess what, you own the thing! Also you've lost \$17. I mean, you can call the customer and ask for more money, it can't hurt. But you're not going to, like, feel full of joy and confidence while you're making that phone call. This is FXCM's problem, and also the more acute problem of various other retail FX brokers who are just plain donezo. But the problems extend beyond retail brokers. Deutsche Bank had "approximately \$150 million in losses," Barclays had "tens of millions of dollars of in losses," and Citi also seems to be out more than \$150 million. But you have to feel a little for the traders who racked up those losses. They were not taking crazy risks. A \$150 million loss translates into a position equivalent to something like 700 million euros against the franc, not that huge against Deutsche Bank's 1.7 trillion euro balance sheet. The historical daily standard deviation of such a position would be about \$8 to \$18 million, for a "value-at-risk" of about \$19 to \$43 million. So a loss of several times that amount in one day would be ... surprising.

In practice, though, even this estimate is too high; Deutsche Bank's total reported foreign exchange value-at-risk at the end of September was just 14.2 million euros. So its wrong-footed Swiss franc bets must have been even safer-looking (less volatile) than that. For instance, of course: If you sold puts on the euro struck at 1.15 Swiss francs, well beyond the level protected by the Swiss national bank, then those puts looked very very unlikely to ever cost you anything. They had a very low and very stable value. Until yesterday. Then they lost you tons of money.

Here is Tracy Alloway on bank value-at-risk models and the currency move:

The move from the SNB constitutes a classic VaR shock following a period in which banks have seen their VaR estimates slip further and further lower following an historic period of low volatility.

As realized volatility gets lower, estimates of future volatility -- and so estimates of future losses -- get lower.

And so position limits get higher, as banks feel safer with the risks they're taking, because, on a historical basis, they don't look that risky. And then the risk that didn't look risky becomes the one that gets you.

By which I just mean that it is obvious in hindsight that the "natural" level of the euro was way below CHF 1.20. Since, you know, the current level is less than 1 franc.

Bloomberg EURCHF <Curncy> HVT as of Jan. 14 shows 1.743 for 260-day volatility (conventionally, one year of trading days). For 65-day volatility (three months of trading days), it shows 0.931.

For normally distributed data! Which ...

Anyway if you don't like lazy Wikipedia'ing, Wolfram Alpha says that the two-tailed p-value for 11 standard deviations is about 4×10^{-28} , or about once every 2.5 billion billion billion days, or, I mean, you know, not very often.

I'm being super sneaky with that dollar sign. The volatility of the USDCHF relationship was more like 7 or 8 percent through Wednesday: The Swiss franc was effectively pegged to the euro, but the euro/dollar relationship, and thus the franc/dollar relationship, was reasonably volatile.

In general, if you asked me why 2 percent margin on retail FX trades is OK, I would scratch my head at you. It seems low, doesn't it? But basically the regulatory standard is 2 percent for major pairs and 5 percent for others. (See, e.g., page 15 of FXCM's 10-K -- the risk factor saying that regulators might increase margin requirements, and that that might hurt FXCM's business. Oops, in the event.)

That negative equity is versus total customer equity of about \$1.3 billion as of the end of September, according to page 45 of FXCM's most recent 10-Q, which is full of delights. FXCM's average retail client does 2.2 trades per day, for a total of 406,190 trades per day over 184,000 active accounts. That's like 26 million retail trades per quarter, and FXCM reports \$977 billion of retail trades last quarter, so I guess the average trade is for about \$37,000. Which would require about \$740 of margin, at 50-to-1.

USDCHF was off like 18 percent, so that works too. I'm pretending also that everything was delta-one to spot currency prices. I'm sure that in fact there were bunches of crazy options trades, etc.

And that they had no offsetting trades, which seems unlikely. Everyone does 2+ trades a day!

That is, an \$800 million notional spot EURCHF trade would have lost about \$150 million on the euro's 18.77 percent move down yesterday, so DB's losses were sort of equivalent to that. And \$800 million is around 694 million euros (now!). Obviously Deutsche's actual trades weren't just hundreds of millions of euros of spot EURCHF.

That is, \$800 million notional times a daily vol of between 1 percent (last three months) and 2.3 percent (last 395 trading days, or about a year and a half, the longest period Bloomberg HVT will give me).

This is super fake, just one-tailed 99 percent (2.33 standard deviation) likelihood using the historical volatilities from the previous footnote. Banks typically use longer lookbacks for their VaR calculations.

To contact the author on this story:

Matt Levine at [REDACTED]

To contact the editor on this story:

Zara Kessler at [REDACTED]