

# It's seismology, not roulette

The Swiss franc surge on January 15, when the central bank abandoned its peg to the euro, revealed continuing confusion about the role, the value and the limitations of models, says David Rowe

Some events elicit very revealing reactions. One such was the mid-January surge in the Swiss franc exchange rate versus the euro. It followed the decision by the Swiss central bank to abandon the pegged rate it had maintained since 2011. Some will recall a comment in August 2007 by David Viniar – then chief financial officer of Goldman Sachs – that one of the bank's funds had fallen victim to the impact of “25-standard deviation events several days in a row”. Clearly the urge for self-justification in the heat of a crisis leads people to say things they would never say otherwise. Strangely, however, Viniar's successor, Harvey Schwartz, described the Swiss franc move as a “20-plus standard deviation” event. It seems old habits die hard.

Even the normally sober Buttonwood columnist in *The Economist* sounded a bit silly when blogging on the topic, inferring reported bank losses from this sudden change called into question their risk modelling skill (*Risk* March 2015, [www.risk.net/2397078](http://www.risk.net/2397078)). The unspoken implication is that if banks implemented the “right” model they wouldn't experience such losses, which is plainly not true.

These and many other remarks reveal how little progress we have made in formulating a sensible and balanced public perspective on risk assessment, and especially on the role, the value and the limitations of models. When someone speaks of “20-plus standard deviation” shocks, the implicit mental framework is that the event was just a very rare, and hence largely unknowable, random realisation from way out in the tail of a stable distribution. The underlying assumption is that the process involved is broadly analogous to roulette. In fact, it is this unsupportable assumption that needs to be abandoned in favour of a more realistic mental framework.

Analogies can be very powerful mental tools, as long as they are sufficiently robust. Misleading analogies, however, can result in serious errors in judgement. If we want to think in terms of an analog between the behaviour of financial markets and a specific physical process, roulette is a dangerously misleading choice. A far better analogy would be to think in terms of earthquakes. The crucial similarity between the dynamics of financial markets and earthquakes is that both are examples of punctuated equilibria.

Most of the time there is sufficient structural stability to contain and absorb random disturbances. Not only that, such disturbances are usually the net result of hundreds or thousands or even millions of small unrelated forces, many of which cancel each other out. These are precisely the types of conditions that underlie the Central Limit Theorem and result in a roughly normal distribution.

The essential point to remember is that these conditions do not always prevail. Sometimes pressures along the fault lines in the earth's crust reach unsustainable levels. When this happens, the tectonic plates need to shift to relieve the pressure. Needless to say, the movement that occurs during such a transition is not a 20-plus standard deviation random draw from the same distribution of small seismic tremors that had occurred for years. It is a structural shift in the environment required to re-establish a new temporary equilibrium.

Similarly, pressures in financial markets can build up quietly until they reach a point where they are unsustainable. A subprime mortgage boom driven by reinforcing easy credit and rising housing prices is not sustainable forever. Virtually zero interest rate differentials between the debts of efficient and fiscally responsible countries and those of less efficient and fiscally profligate countries in a currency union can only go on for so long. A stable country's attempt to depress the value of its currency against another currency in turmoil, especially in the face of limited public support and rising costs, will eventually be unsustainable unless external circumstances change.

At a fundamental level, these events are only Black Swans in terms of their timing. They are not unimaginable in the strict sense described by Nassim Taleb. Rather, they are structural shifts that relieve mounting pressures within a system. The good news is that, as such, they are at least amenable to structural analysis of these pressures and some vague sense of how serious they need to

become to force a structural adjustment. To use Taleb's powerful metaphor again, it is sometimes possible to turn Black Swans into Grey Swans.

At least among sophisticated and experienced professionals, let's start discussing occasional large market shocks as what they usually are: structural shifts in the financial and economic environment, not 20-plus standard deviation realisations from some mythical stable random distribution. **R**



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