

# How I Learned to Stop Worrying and Love the Future

*by Michael Frank, May 4<sup>th</sup>, 2013*

I used to spend a lot of time worrying about various (and seemingly not-unlikely) existential threats to the future of humanity (or most of it, anyway), such as the following:

- Global thermonuclear war between two or more of the major nuclear powers, resulting in hundreds of millions of immediate deaths, followed by a nuclear winter causing billions more premature deaths from starvation, exposure, and radiation sickness.
- Massive worldwide famine triggered by two or three consecutive years of severe climate-change-induced droughts that simultaneously hit all of the world's major breadbasket regions and deplete our reserves of grain and livestock; this resulting in hundreds of millions to billions of deaths, and possibly increasing global tensions enough to trigger the aforementioned war as well.
- Global resource crisis caused by declining production of petroleum and other key resources, resulting in snowballing failures of industrial production and transport systems, and a reduction of our capacity to produce enough food to feed the world's billions, thus contributing to the likelihood of the aforementioned famine and war scenarios.

But now, I don't worry about these scenarios nearly as much, and I am more optimistic that, 50 years from now (say), I will find myself in a future where none of them have happened; certainly, a number of smaller crises and even wars may have happened in the meantime, but on the whole, human civilization will be continuing to grow and prosper. What is the reason for my newfound optimism?

The answer comes from my philosophical system, which I call Metaversalism. There is much that is interesting to say about Metaversalism, and I won't take the space to develop it in detail in this short essay, but the essence of it is simply this:

1. There are compelling, fundamental rational and scientific reasons to believe that all possible (*i.e.*, computable) universes exist (in the Metaverse, which is the abstract realm of the mathematically possible) and that our own universe, despite seeming "special" to us (since we are in it) is nothing more than just one of these possibilities; but all of them are equally "real" in their own right.

2. Because all possibilities exist, the notion of objective probability, as applied to future events, is, strictly speaking, an illusion. In other words, the apparent degree of probability, whether it is greater or smaller, of a possible future outcome does not actually affect at all whether that outcome exists or not—since all possible outcomes, or future states of our universe, already exist in the Metaverse. The perceived probabilities of future events are always only subjective, that is, conditioned on the subjective perspective implied by some specified observational scenario. There is no such thing as an “unconditioned” probability about future events, since implicitly, you are always conditioning on *something*. *E.g.*, when I assert that the probability that, when I flip a coin on my desk, it will come up heads, is 50%, I am implicitly assuming that (for example) it is not the case that my entire office (including the coin, desk, and myself) will be reduced to a subatomic plasma while the coin is still in the air. But, recent experiments at the Large Hadron Collider [have suggested](#) that the quantum vacuum of our universe is unstable. At any moment, a phase transition to a new vacuum state (which would destroy all existing matter) could sweep through our solar system and disintegrate everything; we would never even see it coming, since it would travel at the speed of light. It’s thought that the half-life of our universe, even if it is unstable, is billions of years at least, so that the probability of this phase transition hitting during any particular coin flip is very small. But, suppose that instead, the half-life of the vacuum was only, say, 1 second? If the quantum vacuum was much more unstable, it could be the case that once every second, there is a 50% probability that our entire world will be destroyed by a vacuum decay front that originated a long time ago in some distant part of the universe that happens to sweep through our space during that second. In other words, in that scenario, the “true” probability distribution for our coin flip (supposing it stays in the air 1 second) is actually: 50% - world destroyed by vacuum decay before coin even lands; 25% - coin lands heads; 25% - coin lands tails. We can’t rule out *a priori* that the vacuum’s half-life is any greater than 1 second, because our own existence in fact provides zero evidence to support that - since our particular universe (where we happen to have miraculously survived all  $\sim 4.3 \times 10^{17}$  seconds since the big bang) still exists, with certainty, in the Metaverse, even if we ascribe it only an astronomically tiny probability like  $2^{-4.3e17}$ —so, the mere fact of our existence is no evidence at all that our survival up to this point had any particular probability greater than zero. Even though the quantum vacuum is probably not all *that* unstable to such an extent as we posit in the above scenario, the mere fact that we can *conceive* this scenario is already enough to demonstrate that any probabilities that we may think we can calculate (such as for the outcome of a coin flip) are never truly objectively valid, but instead are always implicitly conditioned on some assumptions, such as the assumption that a specified observer will still be around after the experiment to observe the result, or the assumption that a particular model of how probability mass flows in configuration space is valid. (You could take any model of physics and modify it by supposing that every second, 50% of the probability mass flows into a “dead-end” state, without conflicting with experiment.)

So, how does the above perspective bear on thoughts about the future of human civilization? The relevance of it is that, to be meaningful, any discussions about future outcomes must ultimately be conditioned on some kind of subjective observer perspective. Just as an example, let's take my own personal perspective (although the same discussion really applies to anyone). Suppose that, in the absence of a gigadeath scenario such as we set forth at the start of this document, I assess that my personal probability of my survival to 50 years from now (the year 2063) is 50%. (I would be 93 years old by then, but perhaps by then, reaching that age will be not at all uncommon due to advances in medical science and technology.) Now, suppose that if, instead, in the interim, there happens to be a major global crisis like the above, wherein billions of people will die prematurely, and wherein the rest will face extreme hardships; suppose that in that case, my personal probability of surviving another 50 years is, given that scenario, much smaller, say only 5% (maybe a few billion mostly younger/stronger people will survive, but probably not me, since I am already middle-aged, and not among the strongest and fittest).

A consequence of those assessments is then that, *conditioned on the event of my looking back on things 50 years from now*, the probability of such a global crisis having occurred is *suppressed by a factor of ~10*. This is easily shown mathematically as follows:

Let:

$C$  = "Crisis"

- The event that a major crisis of this kind occurs in the next 50 years.

$S$  = "Survival"

- The event that I am still around in 50 years to look back on things.

We assumed that:

$$P(S | C) = 5\%,$$

$$P(S | \neg C) = 50\% \quad (\neg C \text{ denoting the event that } C \text{ does not happen}).$$

Let the prior probability of the catastrophic event  $C$  be  $P(C) = x$ .

Thus, applying Bayes' rule, we have:

$$\begin{aligned} P(C | S) &= P(S | C) \cdot P(C) / P(S) \\ &= 0.05x / P(S); \end{aligned}$$

but

$$\begin{aligned} P(S) &= P(S | C) \cdot P(C) + P(S | \neg C) \cdot P(\neg C) \\ &= 0.05x + 0.5(1 - x) \end{aligned}$$

$$= 0.5 - 0.45x,$$

so

$$P(C | S) = 0.05x / (0.5 - 0.45x).$$

For small values of  $x$  (*i.e.*, in the limit as  $x \rightarrow 0$ ), this simplifies to:

$$P(C | S) = 0.1x = x/10.$$

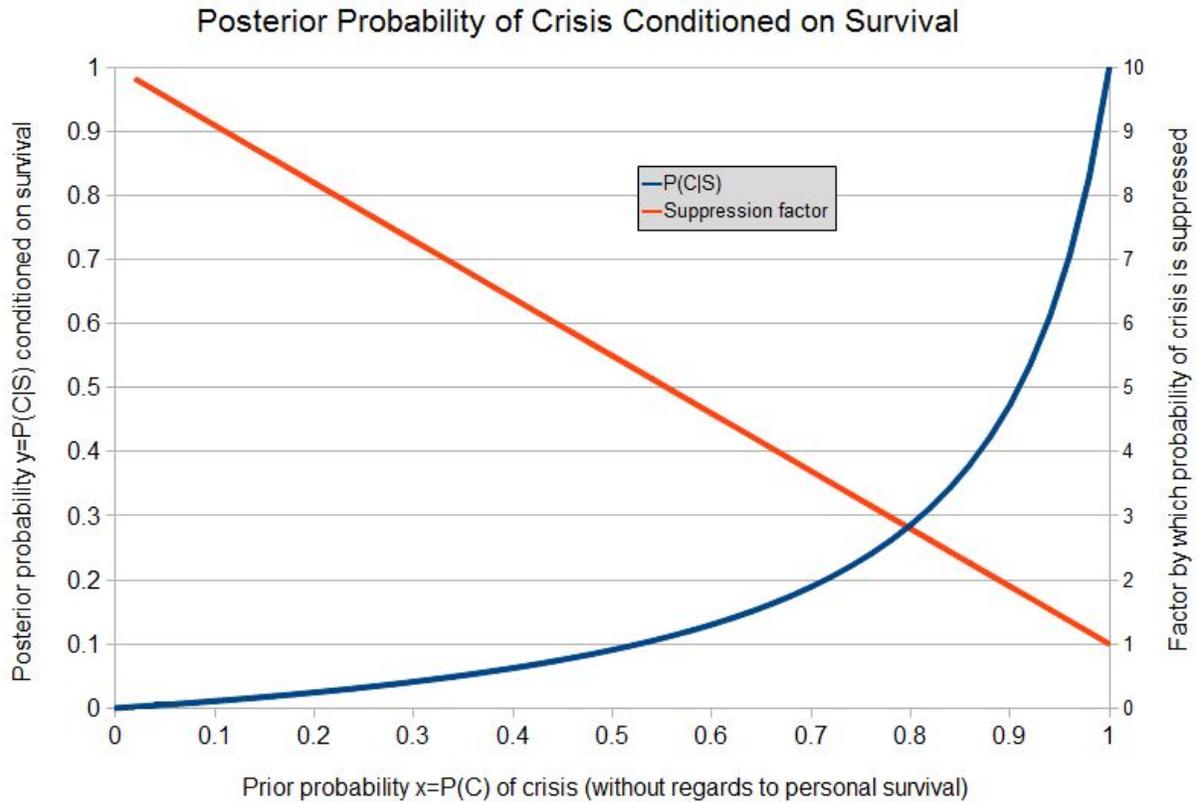
Thus, as I said, the probability of catastrophe (in my subjective perspective) is reduced by a factor of (almost) 10 if I am personally 10× less likely to survive if said catastrophe occurs—assuming only that the catastrophe was fairly unlikely to begin with. But, even if the catastrophe is assessed as being fairly likely, conditioning on one's personal survival does still suppress its probability to some extent; see the below chart. The exact factor  $f$  by which the probability of the crisis is suppressed (divided), given our assumptions, declines linearly with  $x$  according to:

$$\begin{aligned} f &= x / P(C | S) \\ &= (0.5 - 0.45x) / 0.05 \\ &= 10 - 9x. \end{aligned}$$

The more general form for the catastrophe suppression factor  $f$ , given any arbitrary likelihood ratio  $\ell = P(S | \neg C) / P(S | C)$  between your survival probabilities in the non-collapse vs. collapse scenarios, is:

$$\begin{aligned} f &= P(C) / P(C | S) \\ &= \ell - (\ell - 1)x. \end{aligned}$$

(Again, in the limit as  $x \rightarrow 0$ , we have that  $f$  approaches  $\ell$ , so that already-unlikely catastrophes will have their subjective probabilities further suppressed by a factor of nearly  $\ell$ .)



So, for example, if you assess that there is a 50% probability of a major global crisis like this happening in the next 50 years, without regards to your personal survival (that is, if  $x = 50\%$ ), and if you adopt my earlier estimates for your personal survival chances with and without such a crisis (5% and 50%, respectively, *i.e.*,  $\ell = 10$ ), then your subjective probability of your looking back on such a crisis having occurred 50 years from now gets suppressed (divided) by a factor of  $f = 5.5$ , and so only comes out to  $P(C | S) = x/f \approx 9.09\%$ ; thus, fairly unlikely.

The same basic argument applies from the perspective of *any* observer—you, your partner, your child, and even for “aggregate” observers such as entire families, clans, nations—so, *e.g.*, if you decide that what you really care about is the subjective perspective of your household, say, or your city, conditioned on its continued survival as a unit, then you can apply the same argument from that perspective, and thereby potentially suppress the assessed probability of a global disaster, from that entity’s perspective, even further.

The above considerations do not mean that we should not worry about the possibility of such disasters at all, but simply that we should focus a greater amount of our personal attention on the more optimistic future scenarios that we (or the entities that we care about) are personally more likely to be able to look back on as having occurred. In other words, in most of the scenarios in the year 2063 where you (or your family, say) will have survived until then, a gigadeath-scale global disaster will most likely *not* have occurred, so, you might as well spend your intervening time working on the assumption that there will be some more cheerful outcome.

To succinctly summarize the above argument, one might simply say, “There’s no point in worrying about the Apocalypse, since if it happens, you probably won’t be around afterwards to weep over the smoking ruins of civilization anyway.” This is all assuming, of course, that it’s relatively unlikely that you’ll find yourself looking back at the burnt-out embers of the world from some kind of afterlife—but rather than trying here to answer the begged question about whether that’s really the case or not, we’ll save that as an argument for another essay.

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May 4th, 2013 (Star Wars day - May the Fourth be with you)