

The Rationale of Risk-Taking

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Abstract

In an instance of Wittgenstein's ruler, this paper shows how, often, the irrationality observed in human risk-taking is more representative of the irrationality of the assumptions limiting the scope of human activities and of their payoffs, rather than of the irrationality of human behavior.

Whose irrationality?

Risk aversion and risk propensity are not the consequence of limits in human rationality, but of the limitations applied to the study of human rationality. Here are three examples.

The "irrational risk aversion" observed by researchers in participants taking a single gamble becomes "rational growth-rate maximization" when the gamble is played multiple times and ergodicity becomes a relevant concept (Peters 2009). **The irrational was not the behavior, but the assumption of limiting activities over time.**

The "irrational over-estimation of small probabilities" observed in many studies transforms in "rational avoidance of risks of ruin" once fat-tailness of consequences is considered (Taleb 2018). **The irrational was not the behavior, but the assumption of limiting the distribution of payoffs.**

Similarly, this paper proposes, the "irrational risk-taking" observed in activities in which participants have the option between choosing to increase safety or payoff – a phenomenon called risk homeostasis – is irrational only if the scope of risks and payoffs is limited to the activity considered and disappears once this limitation is lifted. **The irrational is not the risk-taking, but the assumption of limiting the scope of risks.**

Risk homeostasis

The introduction of the ABS (Anti-Lock Braking System) would have made driving safer, *if drivers kept driving at the same speed as they did before*. In practice, drivers reacted to the increased safety by driving faster, resulting in increased death rates (UDoT, 2009).

When given the option to perform an activity they were already performing before a bit more safely or a bit more effectively, people often choose the latter. They increase the likely payoffs while keeping the perceived

risk constants – a phenomenon called risk homeostasis – as opposed to keep the payoffs constant and reduce the perceived risk associated with the activity.

In appearance, risk homeostasis is irrational. Why driving faster when doing so increases the probabilities of dying? Isn't rationality the pursue of survival?

In reality, risk homeostasis is rational. Not taking risks is a risk in itself, for taking *some* risks is necessary to obtain the resources needed to mitigate other risks.

For example, the payoff of driving faster is more time available afterwards: a precious resource which can be then used to mitigate other risks. For example, more time spent at work might reduce the risks of ending up jobless, more time spent at home might reduce the risks of a divorce and more time spent with friends might reduce the risks of social ostracization.

Life is a complex set of activities, in which participants receive a payoff influenced by their risk-taking and which can then be used to mitigate other risks. The brain is a great tool to choose the optimal risk-taking level at any given activity, to balance the risks of performing that activity with the risks of performing it not effectively or efficiently enough, with the ultimate purpose of minimizing the overall risk its host is exposed to.

Of course, there are instances in which risk-homeostasis leads to sub-optimal decisions, such as in cases in which fragile protections to low-magnitude stressors make participants underestimate their risk exposure – a phenomenon called the Fence Paradox.

References

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