

Understanding Uncertainty Shocks and the Role of the Black Swan:

A Non-Technical Summary

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Understanding Uncertainty Shocks and the Role of Black Swans measures the uncertainty that arises from our imperfect understanding of the economy. Much of that uncertainty comes from the probability of extreme events, events which we have never observed before. These are the black swans. This line of work uses macro data to estimate the probabilities of future economic outcomes. Using Bayesian techniques, we can compute uncertainty, not just about what outcomes will be, but also uncertainty about our own imperfect estimates. A productive emerging literature shows that changes in uncertainty or changes in the probabilities of extreme, negative events have the potential to explain business cycle fluctuations, equity risk premia and debt puzzles. Yet, belief-based theories have not eclipsed the standard paradigm. One reason is that, without direct evidence about what agents believe, many question whether beliefs fluctuate cyclically, how much and why. Typically, economists assume that when the economic environment changes, every person instantly knows that it changed and by how much. The only uncertainty is about what event will be drawn from a known distribution.

When the financial crisis was unfolding, did uncertainty rise simply because everyone understood that the variance of macro and financial outcomes just increased? Or did some part of our uncertainty arise from doubting our beliefs: Although we used to think we more-or-less knew what the probability of macro and financial events was, recent events made us less sure? The black swan research agenda is based on the premise that real people do not know the true distribution of outcomes, when it changes or how it changes. They observe economic information and estimate the probabilities of outcomes. Much of the risk they face comes from not knowing if their estimates are correct.

Our findings teach us why uncertainty is volatile and counter-cyclical, and why macro uncertainty, micro uncertainty, higher-order uncertainty and disaster risk, all move in sync. The key mechanism is that new data causes agents to re-estimate all the parameters that govern their probability distribution of macro outcomes. While all the parameters have some effect on the distribution, the parameters that govern skewness are particularly important for uncertainty. Small revisions in estimated skewness whip around conditional probabilities of unobserved tail events (black swan risk). Our measures, based on real-time GDP data, reveal that changes in black swan risk explain most of the shocks to various forms of uncertainty. These results unify this belief-shock literature, motivate its assumptions of large, counter-cyclical shocks, and provide some understanding for why, and under what circumstances, such belief shocks arise.