

“Black Swans: A Comment on ‘Financial Cycles: What? How? When?’  
by Stijn Claessens, M.Ayhan Kose and Marco Terrones”

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This study, obviously motivated by the financial crisis that began in 2007, is an impressive comprehensive statistical analysis of the time series of major financial variables: credit, stock prices and real estate prices. The Data base includes 21 advanced countries over five decades: 1960:1-2009:4. It yields more than 470 financial cycles. The large data base is the big strength of the paper, although the high number of cycles (almost one every other country-year, in a sense) is an early warning that the authors may be working at an excessively high frequency.

The topic and the approach are each emblematic of important mega-themes. First, the topic of financial cycles. For half a century, we monetary economists have focused overwhelmingly on the inflation/disinflation cycle. If we said monetary policy was too easy at some point, we were thinking of the dangers of inflation. If recessions resulted from monetary tightening, the motive was disinflation. I believe the result of the global financial crisis will be a paradigm shift in macroeconomics, under which financial cycles will be granted as much importance as the inflation/disinflation cycle. Of course nothing is new under the sun: scribblers of the past gave us bubbles and panics (Kindleberger), the credit cycle (von Hayek), the crash (Minsky), and debt deflation (Irving Fisher), not to mention financial markets as casinos or beauty contests (the Keynes of the *General Theory*).

The second mega-theme is the importance of casting the data net wide, with respect to time and with respect to countries. Even before the financial crisis, we were learning the importance of big data sets, welcoming the economic historians with their long time series and the econometricians with their panel study techniques. But the crisis has demonstrated the importance of a wide net for all to see. It is the reason for the great success of the recent book by Carmen Reinhart and Ken Rogoff (2009).

I want to elaborate by reminding everyone what is the proper meaning of the popular phrase “black swan.” Unfortunately, the phrase has come to be used as if to mean a very unlikely event. Managers of Long Term Capital Management in 1998 or of major banks in 2008 have suggested that they could not be expected to have allowed for such a crisis, because it was a 7-standard-deviation event, or a 5-standard deviation event. This is

nonsense. My guess is that if my normal distribution tables reported numbers out to 5 or 7 standard deviations, we would be in the realm of the probability that two major meteors hit the earth at the same time. Slightly more enlightened are people who talk about else Knightian uncertainty or “unknown unknowns;” ignorance with humility is better than ignorance without it. A still better interpretation is that distributions have fat tails (which might mean that unconditional distributions have fat tails, because conditional distributions, even if normal, have time-varying variances). Again, though, it would be nice to get beyond the Jurassic Park lesson (don’t be surprised if things go wrong), to be able to say intelligent things about the tail events.

What does “black swan” really mean? In my view, it *should* refer to an event that is considered virtually impossible by those whose frame of reference is limited in time span and geographical area, but that is well within the probability distribution for those whose data set includes other countries and other decades or centuries. Consider five examples of mistakes made by those whose memory does not extend beyond a few years or decades of personal experience in a small number of countries.

1. “All swans are white.” The origin of the black swan metaphor was the belief, which might have been held by a 19<sup>th</sup> century Englishman based on induction from a lifetime of personal experience, that all swans were white.<sup>1</sup> But ornithologists already knew that there in fact existed black swans in Australia. An Englishman encountering a black swan for the first time might have considered it a 7-standard deviation event, even when the relevant information to the contrary had already been available in ornithology books. It seems to me that it is a waste of an excellent metaphor to use the term just to mean a highly unexpected event<sup>2</sup>, and a much better use of it to mean an event that would not have been so unexpected ex ante if forecasters had adopted a broader perspective.
2. “Terrorists don’t blow up big office buildings.” Before September 11, 2001, some terrorist experts warned that terrorists might try to blow up tall American office buildings.<sup>3</sup> These warnings were not taken seriously by those in power at the time. Most Americans probably did not know the history of terrorist events taking place in other countries and in other decades. Still today, there is a large gap between the probability of a nuclear event as perceived by terrorism experts and the probability as perceived by the public.
3. “Housing prices don’t fall.” Many Americans up to 2006 based their behavior on the assumption that nominal housing prices, even if they slowed down, would not fall. After all, they never had before, which meant that they had not fallen in living memory in the United States. They may not have been aware that housing prices had often fallen in other countries, and in the US before the 1940s.

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<sup>1</sup> Mill (1843, p.188). The proposition that all swans are white goes back to ancient Roman philosophy. European explorers in 1697 discovered that Australian swans were in fact black.

<sup>2</sup> Taleb (2007).

<sup>3</sup> They included the anti-terrorism director at the National Security Council in the Clinton and Bush Administrations. Clarke (2004).

Needless to say, many a decision would have been made very differently, whether by indebted homeowners or leveraged bank executives, if they had thought there was a non-negligible chance of an outright decline.<sup>4</sup>

4. “Volatilities are low.” During the years 2004-06, financial markets perceived market risk as very low. This was most nakedly visible in the implicit volatilities in options prices such as the VIX. But it was also manifest in junk bond spreads, sovereign spreads, and many other financial prices. I am convinced that one of the reasons for this historic mis-pricing of risk is that traders were plugging into their Black-Scholes formulas estimates of variances that went back only a few years, or at most a few decades (the period of the late great Moderation), when they should have gone back much farther – or better yet, formed judgments based on a more comprehensive assessment of what risks might lie in wait for the world economy.<sup>5</sup>
5. “Big banks don’t fail.” Enough said.
6. “European governments don’t default.” Greece’s recent debt troubles should not have caught anyone, least of all northern Europeans, by surprise. The same with Portugal, Spain, Italy and Ireland. And yet from the time they joined the euro, until 2009, these governments could borrow at interest rates virtually as low as Germany. There are probably a number of reasons for this, but the perception that advanced countries in general, and euro countries in particular, were fundamentally different from emerging markets and would never default was undoubtedly part of the problem. Suddenly, in 2010, the Greek sovereign spread shot up, exceeding 800% by June. Even when the Greek crisis erupted, leaders in Brussels and Frankfurt seemed to view it as a black swan, instead of recognizing it as a close cousin of the Argentine crisis of ten years earlier, the Mexican crisis of 1994, and many others in history, including among European countries.<sup>6</sup>

All of which is to say, I very much welcome the wide data net cast by Claessens, Kose and Terrones, in this and related papers.

The authors explain “...in parallel with the business cycle literature, we use a well-established and reproducible methodology for the dating of financial downturns and upturns.” Since this is an NBER conference, we should clarify that the NBER Business Cycle Dating Committee’s procedures are far from reproducible. We do not use rules of thumb (no “two consecutive quarters negative GDP growth”), nor do we rely on an econometric model. I suppose I have to say that business cycle dating is “an art, not a science.” But there are good reasons for thinking that the calling of troughs and peaks could not be subcontracted to a model or computer. I can reveal a

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<sup>4</sup> Shiller (2007).

<sup>5</sup> E.g., Frankel (2008).

<sup>6</sup> In, 2006 all Western European countries had credit ratings above those of all emerging markets. As of June 2010, the ratings of Greece and Iceland, to take two, had fallen below Chile, China, Malaysia, South Africa, Mexico, and many other emerging and developing countries. (S&P foreign currency long-term sovereign debt, obtained from Bloomberg, L.P.)

few of many possible examples of judgments that we have had to make. We put less weight on industrial production than we used to, because manufacturing is a smaller share of the economy. We now put roughly as much weight on national income as on the far more famous measure GDP (which should in theory be identical). The data set is not big enough, and probably never will be, to allow econometrics to encompass all such subtleties in a single unchanging formula. But the authors are right that the NBER business cycle methodology focuses on changes in levels of variables.<sup>7</sup>

The paper contains an abundance of results and findings. Perhaps an embarrassment of riches.

One finding is that financial declines are more abrupt than upturns. This fits the conventional wisdom regarding financial crashes, but is not what I had understood from other papers. I wonder if this finding is the result of evidently working with a frequency that is too high to pick up booms such as 2003-08. A second finding is that equity & house price cycles are (even) longer and more pronounced than others. Another is that housing recoveries take more than three years. (Reinhart-Rogoff find that it typically takes equity markets 3-4 years to recover and housing markets five years.) Another is that there has been a shortening in length of equity price cycles and housing price upturns. The authors also find positive duration dependence: the longer a cycle lasts, the more likely a reverse.

U.S. asset prices have stronger effects in EU, than vice versa. This is a familiar asymmetry. But I still wonder why. The EU is as large as the US. Most of the explanations that I used to hear (e.g., that European countries care more about stabilizing their exchange rate than does the U.S.) do not apply now that we have the euro.

Finally, “Greater trade and financial openness are significantly associated with shorter financial downturns.” I would like this to be true, and have myself found that trade openness has in the past lead to fewer and less severe crises.<sup>8</sup> But I am skeptical whether this pattern applies also to the 2008-09 crisis.<sup>9</sup>

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<sup>7</sup> Footnote 24 of the paper. Burns and Mitchell (1946).

<sup>8</sup> Frankel & Cavallo (2008). References to others with similar findings are given there.

<sup>9</sup> In Frankel & Saravelos (2010) we find that openness is not one of the Early Warning Indicators from the preceding literature that is able to predict which countries got into trouble in 2008-09 and which did not..

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