



Presenting:

Nassim Taleb's Black Swan and Decision Analysis

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DAAG Conference 2010

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Nassim Taleb's Black Swan and Decision Analysis

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By
Jack Kloeber
Kromite, LLC

Have you ever seen a black swan?



A Black Swan (*Cygnus Atratus*) in the Singapore Botanical Gardens. Img by Calvin Teo (Own work).
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We found black swans showing up in art, literature, TV....

- From Wikipedia, the free encyclopedia
- Jump to: [navigation](#), [search](#)
- **[Black Swan](#)** is the common name for *Cygnus atratus*, an Australian waterfowl.
- **Black Swan** may also refer to:
- **[\[edit\]](#) Arts, literature, TV, and film**
- Books and stories:
 - *The Black Swan* (1932), pirate adventure novel by [Rafael Sabatini](#)
 - *The Black Swan (Mann novella)* (1954), short book by Thomas Mann
 - *The Black Swan* (1994), work of short fiction by [Grace Andreacchi](#)
 - "Black Swans" (1997), essay by psychologist [Lauren Slater](#)
 - *The Black Swan (Lackey novel)* (1999), fantasy novel by Mercedes Lackey
 - *Black Swan Green* (2006), novel by David Mitchell
 - *The Black Swan (Taleb book)* (2007), book about uncertainty by Nassim Nicholas Taleb
- TV and Films:
 - "Black Swan", an episode from the American TV series [FlashForward](#)
 - *The Black Swan (film)*, a 1942 swashbuckler film adapted from the novel by Rafael Sabatini
 - "The Black Swan", [Curb Your Enthusiasm](#) episode
 - *Black Swans* (2005), Dutch drama
 - *Black Swan (film)*, a psychological thriller currently being filmed by Darren Aronofsky
- Paintings:
 - The Black Swan (1896), 38 cm × 47 cm (15 in × 19 in) pastel by [William Degouve de Nuncques](#)

Many Black Swans in music

- From Wikipedia, the free encyclopedia
- [\[edit\]](#) Music
- Albums:
 - [The Black Swan \(Bert Jansch album\)](#)
 - [The Black Swan \(Story of the Year album\)](#)
 - [The Black Swan \(The Triffids album\)](#)
 - [Black Swan \(album\)](#) by English rock band Athlete
- Songs:
 - ["Black Swan" \(song\)](#) on Thom Yorke's 2006 album *The Eraser*
 - "Ride a Black Swan", song on Zwan's 2003 album [Mary Star of the Sea](#)
 - "Black Swan", bonus track on some versions of Megadeth's 2007 album [United Abominations](#)
 - "Black Swan", song from the Tori Amos album [Under the Pink](#)
 - "Black Swan", song on [Amber Asylum](#)'s 2000 album *The Supernatural Parlour Collection*
 - "Black Swans", song on [Lacrimas Profundere](#)'s 1999 album *Memorandum*
- Other:
 - [Black Swan Records](#), 1920s US record label
 - [Black Swan Records \(UK\)](#), 1960s UK record label
 - "The Black Swan", nickname of 19th century singer [Elizabeth Greenfield](#)
 - [The Black Swans](#), indie rock band

And finally found what we were looking for...

- From Wikipedia, the free encyclopedia
- Jump to: [navigation](#), [search](#)
- [Black Swan](#) is the common name for *Cygnus atratus*, an Australian waterfowl.
- [\[edit\]](#) **Fictional people and places**
- [Black Swan \(comics\)](#), name of a German Marvel Comics mercenary and enemy to Deadpool and Agent X
- [The Black Swan \(pub\)](#), fictional pub in the UK soap opera *Family Affairs*
- The Black Swan, mysterious Russian-born air pirate and femme fatale in the 2000 PC game [Crimson Skies](#)
- The Black Swan, another name for the character Odile in the ballet [Swan Lake](#) by Peter Tchaikovsky
- [\[edit\]](#) **Maritime**
- [Black Swan class sloop](#), a class of sloops built by the United Kingdom during World War II, including:
 - [HMS Black Swan \(L57\)](#)
- [Black Swan Project](#), code name of a shipwreck recovery project, possibly the richest-ever
- [\[edit\]](#) **Mathematics**
- [Black swan theory](#), a term developed by Nassim Taleb to label unexpected, rare events
- [\[edit\]](#) **Philosophy of science**
- One black swan, an often cited example of [inductive categorical inference](#)

Why Black Swan?



Indicates information
taken from N. Taleb's
Book "The Black Swan"

- Until the *cygnus astratus* was discovered in Australia, there was no evidence of a black swan.
- If you have only seen white swans, why would you expect there to be a black swan?
- Question: If you do not believe there is a black swan, would you be even more convinced you are right every time you see a swan and it is white?
 - If “yes”, then this is an example of Inductive Categorical Inference

What is a Black Swan?



1. First it is an *outlier*, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility.
2. It carries an extreme impact (*good or bad*)
3. In spite of its outlier status, human nature makes us concoct explanations for its occurrence *after* the fact, making it explainable and predictable.

Summary: **Rarity**

Extreme impact

Retrospective predictability

Rare, but happen all the time!



- While Black Swans are defined as very rare, unexpected events, we find them throughout our history and they continue to define much of our lives.
 - Attacks on September 11, 2001
 - Tsunami in December, 2004
 - Near Economic collapse of 2008-2009
- We continue to live, plan, forecast, and gamble as if they do not exist.

Extremistan vs Mediocristan



Experts in Risk



- Most measures of risk exclude the possibility of the Black Swan. (ask your financial advisor, or R&D portfolio head, or Chief Risk Officer).
- Case in point:
 - How many airlines (American Airlines, British Airways, Lufthansa) had a contingency plan or even a mention of a Volcanic Ash disruption of business?
 - This week's *Economist* labeled the Volcano Eruption and associated Ash cloud a *Black Swan*.



What you do *not* know!

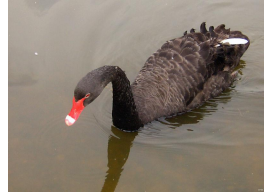
- Black Swan logic makes *what you don't know* far more relevant than what you do know. Black Swans can be caused and exacerbated by their being unexpected.
 - Pacific tsunami of December 2004.
 - Had it been expected, it would not have caused the damage it did – (warnings would have been issued, lower population at the time it hit, emergency services would have been planned.)
- The Rare Event equals uncertainty.
- “Uncertainty is the contrary of knowledge”



What Would Plato Do?

- Plato described utopia in his book “The Republic”
- Platonicity
 - Mistake the map for the terrain. Focus on pure and well defined forms.
 - We anchor onto this pure forms, giving them too much credibility - rules, models, constructs. And forget about the messier and less tractable objects.
- Platonicity is what makes us think that we understand more than we do.
- The Platonic Fold is the boundary where the Platonic mind-set enters in contact with messy reality - here the gap between what you know and what you think you know becomes dangerously wide.
- It is here that the Black Swan is produced.

Bell Curve



The Great Intellectual Fraud (GIF)

- Bell curve enthusiasts
 - Ignores black swans and even gray swans
 - Combines well in theory to ignore many Black Swans
 - Theory works well mathematically and is eloquent
 - Too often independence is assumed and variability of the sum becomes inconsequential.

Black Swan Blindness



- Newspapers
- Television
- Politics
- It is getting worse as information, the same information, get repeated many times and reinforces some facts to all, while continuing to ignore Black Swan possibilities. Actually producing some Black Swans (hiding them from view or discussion so there is no probability associated with them and they are ignored)

What are the charges made by Nassim (Nick) Taleb?



- Inductive categorical inference
- Stories take over our logic
- Platonicity
- Many have the Bell Curve mentality
- We ignore dependency in complex systems
- Tunneling
 - focusing on more and more tactical/precise modeling and forecasting, ignoring the larger issues or leaving them for “others” to deal with.
- Black Swan blindness



Actions?

- Because they are unpredictable, we need to adjust to their existence (rather than naively trying to predict them).
 1. Set yourself up to collect serendipitous Black Swans (of the positive kind) by maximizing your exposure to them.
 2. Strategy for discoverers and entrepreneurs is to rely less on top down planning and focus on maximum tinkering and recognizing opportunities when they present themselves.
 3. The reason free markets work is because they allow people to be lucky, thanks to aggressive trial and error.

What are the implications for Decision Analysis?

- Atta Boys
 - Look for biases?
 - Experts – do we use just one or many?
 - Different types of biases taken into account?
 - Encourage thinking outside of the normal box?
 - Try to include scenarios in the “model”?
 - Look at ranges when probabilities are hard to estimate or quantify?
 - Facilitate thinking about risk protection instead of confirmation of in the box thinking?
 - Risk tolerance – does our conversation help DM’s think about large scalable losses as well as large scalable gains?
 - Identify out-of-the-model risks and real portfolio diversification

What are the implications for Decision Analysis?

- Uh oh
 - Do we depend too much on bell curve thinking?
 - If it is too unlikely to assess probability, do we ignore it?
 - If it is too tough to model do we ignore, or at most model a “scenario”, with no probability and no inclusion in expected value or variation?
 - Portfolio Theory – Black Scholes, Markowitz, others

Not addressed by DA?



- Occurrences which cannot be quantified in terms of probabilities
- Scalable returns
 - Huge, disproportional returns
 - Huge, disproportional losses
- Portfolio Theory – do we diversify enough, are Black Swan-like upsides identified?
- Scenario Planning? Who does it, is it successful, will it be successful?

Great Gray Swan Example



- Boeing 787 business case:
 - Huge effort expended to estimate project time and cost.(scenarios, range estimates, many experts)
 - One year max was estimated and thought to be unbelievably pessimistic.
 - Currently 2.5 years late and at least 1.5B of unexpected costs. (complexity, new construction material, global supply chain,...)

Black Swan



- 33,000 laid off at Boeing within 6 months due to 9-11 attacks' impact on aircraft sales.
- IPOD and itunes – huge impact on CDs and other music delivery methods.



Our own studies and projects

Presentation	How is Uncertainty Addressed? Rare Events?	Set up for Positive Black Swans	Protection against negative Black Swan
National Intelligence Community			
EOD Capability			
NSA and Labs			
Kuwaiti Oil Company Planning-Prioritization			
Benefit Risk Methodology			
Felli Blobs			
Baxter Manufacturing / Baxter Portfolio Process			

Black Swan and DAAG 2010



- 33,000 laid off within 6 months due to 9-11 attacks.
- IPOD and itunes. Impact on music industry
- DA Profession? What could be a Black Swan (good or bad impact?)
- Always the mindset that a New Manufacturing plant outside of Puget Sound (2003 and beyond)
 - One being built now in Charleston SC.