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A World of Risk a Decade on – And a new Road Map to Understand It “The 5 Quadrants”

Risk Management Background Note

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We published the Four Quadrants, a World of Risk and a Road Map to Understand it a decade ago, and the paper has anchored INSEAD’s Risk Management courses ever since.

So, in 2021, it was time to ask a few questions; “has risk management changed?” “Does the risk classification model still hold up?” “Have we learned anything new in the past decade?”

Turns out, we omitted a major risk genre – fraud and criminal intent. Welcome to the Five Quadrants, a revision of the original paper with updated examples and an additional risk category. With the new quadrant, the odds of slipping on that risk-banana-peel have just dropped markedly.

For risk managers, we add fraud, ransomware, and deception to the original risk model. It is no longer sufficient to think of risk only in terms of complexity (simple or interconnected) and distributions (normal or fat). It is time to invoke your Minority Report sleuth-detection skills and catch the criminals before they catch you.

Electronic copy available at: <http://ssrn.com/abstract=3890047>

This updated background note was written by Claudia Zeisberger, Senior Affiliate Professor of Entrepreneurship & Family Enterprise at INSEAD, and David Munro, Founder of Volatility Research & Trading, and is based on the authors’ work with clients, research and publications dealing with the classification of risks. The original paper was published in 2010 by INSEAD.

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The 5 Quadrants –Risk Thinking in a Business Context

To progress, mankind must take risk. By reaching just beyond our capacity, we build new businesses, solve seemingly insurmountable problems, come up with astounding inventions.

“Only those who will risk going too far can possibly find out how far one can go.”

T.S. Eliot

“...if you’re gonna dine with them cannibals, sooner or later, darling, you’re gonna get eaten....”

Nick Cave

But we often do an abysmal job of weighing the cost vs. the benefit of a risk. Large or indeterminate risks are frequently assumed for negligible gains if the risk is perceived as “unlikely”. Tiny risks with the potential to yield significant gains are sometimes avoided just because the risks are so visible.

“I don’t think much about risk. I just do what I want to do. If you gotta go, you gotta go.”

Lillian Carter

A Methodology to Classify Risk

Attempting to classify, rank and understand the different types of risk we face in our businesses, investments and in day-to-day life is not easy. Degrees of magnitude are difficult to sort if outcomes are non-linear, subject to crowd valuation and part of complex systems. We need a broad framework to understand risk, and a roadmap to guide us when we get lost.

It is safe to assume that all our MBA students will face risk management responsibilities at one point in their career. Every decision involving growth and the pursuit of a better life (for yourself or others) involves risk. The broad framework of risk offered below, with four major classifications, will not only help with case studies in class, but will also offer guidance for future risk management challenges.

Of course, the mere act of classifying risks, while necessary, is not sufficient. Methodologies or tools are needed to reduce or eliminate unwanted risk and, perhaps more importantly, to embrace those risks with attractive risk-reward characteristics.

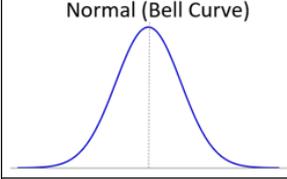
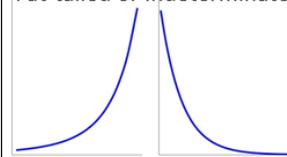
The Five Quadrants

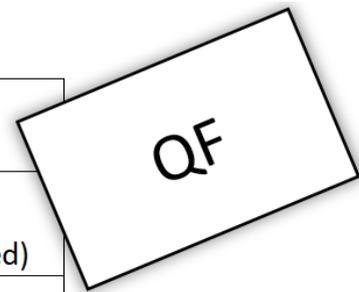
The idea of classifying risk by distribution of observations (normal or fat-tailed) and our ability to understand the interconnectedness of the risk (simplicity or complexity) was suggested by Nassim Taleb. The classification concept is excellent, but we feel it has not been well developed. The main take-away is to “stay away from the fourth quadrant” where statistics and models fail. This paper is intended as a guide for assigning risks to quadrants and for risk managing them optimally.

Earlier four-quadrants risk literature classifies risk by significance of impact and likelihood of occurrence, which is useless since we frequently understand neither in advance.

QUADRANT 1

Predictable Gaussian World (Simplicity and Normal Distribution)

Distribution	Payoff	
	Simple (win/lose)	Complex (interconnected)
Normal (Bell Curve) 	Coin toss; Height Q1	Q3
Fat-tailed or Indeterminate 	Q2	Q4



A Gaussian world is safe. Expect no big surprises. Events and observations are normally distributed.

There are two categories of observation in the first quadrant:

1. Binary
 - a. Outcomes are of the yes/no, black/red, head/tails variety.
 - b. In a heads/tails coin toss, a sufficient number of tosses (let's say 1,000) will lead to a normal distribution – the classic bell-shaped curve.
 - c. No single outcome can dramatically change the mean.
2. Small Range

- a. The distance from the minimum possible reading to the maximum possible reading is small.
- b. Measure the height of enough MBA students (let's say 1,000 again) and you will end up with a relatively small range and a normal distribution.
- c. No single outcome can dramatically change the mean. Add the tallest MBA student in the world (213 cm?) to the 1,000-student average of 178 cm, and the average increases to just 178.03. No drama.
- d. While height, weight and commuting time conform to this "no single reading can significantly change the average" concept, the wealth of an individual does not. The average net worth of a French adult is \$280,000. Take 1,000 Frenchmen, add the \$150 billion net worth of Bernard Arnault to the group, and the average net worth of the 1,001 sample jumps to \$150 million. The distribution of the wealth of individuals is not normal and therefore this data series does not belong in Q1. (Wealth tends to follow a power law distribution).

Everyone likes a Gaussian world – normally distributed and safe – where predictions without errors are easy. Such perfect environments are every risk manager's dream.

Risks are binary or cover a small range of possibilities and are not life-threatening. Only probability is important – not magnitude.

Much scientific and academic research is based on a Gaussian Quadrant 1 environment (Black-Sholes pricing model) due to the high degree of predictability.

Examples of Q1 Risks:

Binary

- Roulette: Red/Black
- Coin toss: Heads/Tails
- Digital Options: Win/Lose
- Mortality: Life/Death
- Elections: Win/Lose (with a recent bias to stray into Quadrant F)

Small Range

- Height or weight of people
- Commuting time (subway uncertainty in the absence of terrorist threats)
- Length of a movie
- Daily temperature range in Singapore
- Longevity
- Automobile insurance claims

Q1 Checklist

- One additional extreme reading cannot change the average significantly.
- No leverage exists.
- Out of 1,000 coin tosses, you can be extremely wrong many times (guessing tails yet heads wins) and not be devastated.
- The payoff is “Simple.”
- The distribution is “Normal.”

Risk Management Tools:

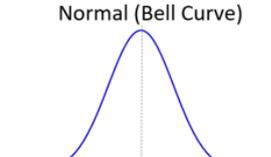
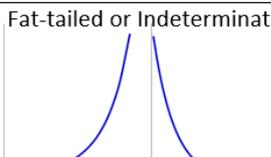
“At-Risk”-type (VaR) risk management models are perfect for such risks since probabilities derived from historical data work well. There are no outliers or surprises.

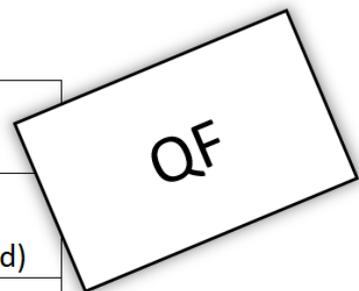
Or

Fire your risk manager if you only play in Quadrant 1; you won’t need them.

QUADRANT 2

Risk Models CAN Work – Simple Payoffs with Fat or Indeterminate Tails

Distribution	Payoff	
	Simple (win/lose)	Complex (interconnected)
Normal (Bell Curve) 	Q1	Q3
Fat-tailed or Indeterminate 	Coconuts Q2	Q4



As with Q1, the payoff is simple. The outcome either happens or it doesn't. The difference with Q2 is that we don't understand the distribution very well – numerous tame observations can be followed by one observation with a dramatic and potentially devastating impact. And we don't know when the dramatic event will take place. Often, we don't even anticipate it.

At first glance, we usually fail to recognize the presence of a Q2 risk. Yet if we stop to think about it for a moment, the risk becomes apparent, and we can define it. We can easily understand and estimate the possible outcomes of a potential tail event.

We just can't predict HOW FAT the tail will be nor WHEN it will occur. If "size matters" and "timing is everything," then we have a problem in Q2. The good news is that Q2 risks are manageable.

To compare Q2 to Q1, let's look at two fruit trees:

	Apple tree (Q1)	Coconut Tree (Q2)
Number of fruits that can potentially fall	Several hundred to thousands	20
Ability to predict when they will fall	High – many per day when ripe	No idea. When you least expect it
Weight of fruit	100gm	2,000gm
Height of fruit on tree	3m	25m
Impact if one hits you on the head	Surprise	Concussion or death
Risk management	Wear a hat, but really not necessary	Don't sit under the coconut tree. Place a strong wire skirt around the tree trunk (high up) to catch falling coconuts.
Simple or complex system	Simple – an apple either falls or it doesn't	Simple – a coconut either falls or it doesn't.
Normal or fat-tailed distribution	Normal – one apple won't hurt you (might keep the Doc away)	Fat-tailed – just one can kill you

Examples of Q2 Risks

- Coconut uncertainty (≈ 150 deaths/year by this superfood)
- Most linear financial products (without leverage)
- House burning down (Insurance doesn't help with keepsake contents)
- Shark attack (discovery channel!). "Only" ≈10/year.

- Falling airplane parts (don't ask about "blue ice")
- Tsunamis (they come in waves)
- Nine eleven
- Oil Spills (BP's Deepwater Horizon in April 2010)
- Subway uncertainty (for cities where terrorism is a threat)
- Champagne corks (~24 die annually, likely putting a damper on the celebrations)

Risk Management Tools

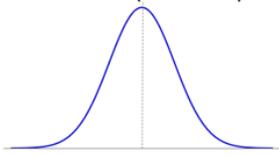
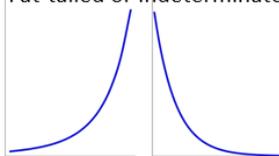
- Know the risks – define them – raise awareness.
- Rules-based solutions. Plan what to do, if and when.
- Reduce, cap, mitigate, avoid or
- Buy insurance (but make sure the insurer can pay. And read the small print)

While the payoffs in Q2 are simple (happens/doesn't happen), risk solutions can be difficult. If the risk solutions are simple, such as avoidance (don't go outside, don't work in a high rise, don't swim in the ocean) there is often a significant opportunity cost.

Risk	Avoidance	Defense
Coconut uncertainty	Don't sit under the tree	Skirt to catch falling coconuts
Linear financial products	Use a stop-loss (weak but cheap)	Buy a "crash put" (strong but expensive)
House burning down	Install sprinkler system Build a moat	Buy fire insurance
Shark attack	Don't swim in the water	Swim in a fenced/netted area
Falling airplane parts	Don't go outside	Don't live under air routes
Tsunami	When the tide goes way out, head for higher ground or stay in the water far offshore	Build your house or resort on a cliff (but think about erosion)
Nine eleven	Don't work in high-rises. Don't teach flying to students who don't want to land	Equip everyone above the 30 th floor with a quick-release parachute.
Oil spills	Engineering building codes	Alternative energy sources
Subway uncertainty (where terrorism threat is possible)	Don't take the subway	Increase surveillance
Champagne corks	Don't hang out with party-goers	Duck

QUADRANT 3

Complexity & Normal Distributions – Think Engineering

Distribution	Payoff	
	Simple (win/lose)	Complex (interconnected)
Normal (Bell Curve) 	Q1	Moon Landing Q3
Fat-tailed or Indeterminate 	Q2	Q4

QF

Quadrant 3 deals primarily with physical laws where normal distributions apply. Outcomes can be predicted with a high degree of certainty. No leverage is involved. The consequences of being wrong are extreme, yet the likelihood of error is small. Errors are most often human, not physical (exceeding O-ring temperature guidelines in the Space Shuttle Challenger, pilots attempting to land in bad weather instead of diverting to a safer airport), so risk management involves hiring smart engineers, rational operators and making systems resilient.

Examples of Q3 Risks

Physics, Engineering and Infrastructure

In quadrant 3, numerous independent parts work together to form a complex interdependent whole. The independent parts are usually mechanical in nature and conform well to traditional statistical methods.

Biology and Social Systems, though complex and often interconnected, ARE NOT in Q3

Distributions can stray far from the bell-shaped “normal” where biological or social systems are concerned. The spread of SARS can be limited to Hong Kong one day, and then spread throughout Canada the next day after one infected Hong Kong carrier hops on a plane to Toronto [revisiting this in 2021, the SARS example almost looks quaint considering Covid19 – but as relevant as ever]. The growth of social media connections is exponential, not normal. When a video goes “viral”, power distributions are at work.

Q3 Auto Example

An automobile is made up of thousands of independent parts (nuts, bolts, hoses and wires) that form many independent systems (electrical, engine, fuel, cooling, drive train and brakes) that interact to make a complex car. Each of the independent systems has simple statistical properties that can be replicated (mass produced) with tiny margins of error. The result is thousands of complex vehicles where the expected performance can be forecast with precision. The performance distribution is normal, yet the system is complex.

Q3 Lunar Exploration Example

The first human landing on the moon – clearly a complex undertaking – involved the interaction of gravity, orbits, earth spin, pressure, oxygen, electrical, mechanical, propulsion engineering and numerous other parts and systems. Computing power was laughable by today’s standards. Yet the landing was precise and without incident. The lunar landing was a truly complex task where the expected result fell within an exceedingly small range of possibilities.

Risk Management Tools – Resilience and the Many R’s

Q3 risks can only be managed by introducing sufficient redundancy and buffers into a complex system.

The role of resilience in integrated risk management has gained much traction in recent years. As Walter Ammann noted in his presentation to the 2009 Global Risk Forum in Davos (as of 2021, Ammann is the President of the Foundation Global Risk Forum GRF Davos):

- “Resilient systems reduce the probability of failure, the consequences of failure and the time needed for recovery.
- Resilience reflects a concern for improving the capacity of physical and human systems to respond to and recover from extreme events
- Resilience is both inherent strength and the ability to be flexible and adaptive after environmental shocks and disruptive events.”

The building blocks of a resilient system, referred to in various research papers as the 3, 4 or 5R’s, (R⁶ ?) are:

- Redundancy
- Reliability
- Robustness
- Resourcefulness
- Rapid response
- Regulation

Q3 Ransomware attack response and prevention (from the R⁶ perspective)

R1 – Redundancy. Have a backup system in place that renders the ransomed data redundant. Conduct a pre-mortem (we will be attacked – what will we do about that?).

Doesn't solve for the potential release of client data, but the pre-mortem should also assume that eventuality.

R2 – Reliability. Test your backup system periodically to ensure it works.

R3 – Robustness. Keep software patched and updated. From the 5quadrants website, Equifax “failed to renew 324 security certificates, including 79 that were used to monitor business critical domains,” allowing cybercriminals to access the personal data of 148 million people.

R4 – Resourcefulness. Usually refers to finding a solution on the fly. By the time you've been infected, it's usually too late to be resourceful, so plan ahead instead.

R5 – Rapid response. Shut down the attacker and deploy your backup immediately.

R6 – Regulation. Micro Trend says that “the ransomware business model exists only because malicious actors behind it continue to be paid. If payment were taken off the table, the ransomware business model would collapse.” KYC and AML are requirements for dealing in Fiat currencies. Why not cryptocurrencies? Almost 100% of ransoms ask for settlement in Bitcoin. That's an obvious nail asking to be hammered. A ransom attack should be a federal crime and dealt with on a community, not individual basis.

Above all, don't click on that unsafe link or download suspicious email attachments. Most ransom attacks result from human error and naivety.

Questions We Need to Ask:

Why are Quadrant 3 tails thin? Is it because we are truly playing in the land of normal distributions, or is there simply insufficient historical data or laboratory research to form a statistically significant distribution? Many distributions appear normal until the fat tail hits.

Are Q3 risks so safe that sound models, rational operators and resilient systems are sufficient to remove the risk of extreme events, or do we suffer from the illusion of control?

Are Environmental risks (biodiversity loss, extreme weather events, failure of climate-change mitigation and adaptation, man-made disasters and natural disasters Q3 or Q4 risks?

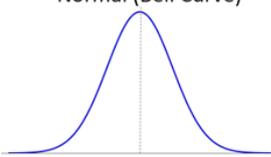
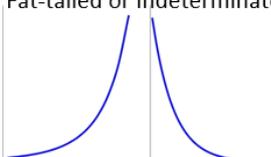
Top Q3 risks

- Engineering
- Surgery
- Utilities – electrical grid
- Cyberattacks – ransomware, data theft (QF?)
- Water supply
- Nuclear accidents

- Global supply chains
- Information infrastructure breakdown

QUADRANT 4

Risk Models Don't Apply – Complex Systems & Fat or Indeterminate Tails.

Distribution	Payoff	
	Simple (win/lose)	Complex (interconnected)
Normal (Bell Curve) 	Q1	Q3
Fat-tailed or Indeterminate 	Q2	Leveraged Finance Q4

QF

- Q4 extreme risk events are infrequent, yet their impact is massive (same characteristics as our Q2 coconut). In fact, their infrequency often lulls us into a false sense of security and overconfidence in our ability to avoid catastrophe.
- The complexity and interconnectedness in Q4 is enormous, yet risks are often invisible or ignored.
- Leverage – often excessive – is usually present in Q4.
- Our ability to forecast the timing and magnitude of Q4 risk events is poor – approaching the impossible. The world is just too complex and too interconnected to figure out how a Q4 risk will materialize. So, we mistakenly try to forecast harder, with more inputs and better models.
- Risk models don't work in Q4.
- Since risk models don't work, the modelers try to tweak and calibrate models to make them work better. (We have a tendency to make small incremental changes – iterations – in our attempt to find solutions instead of completely discarding bad models and starting afresh with a clean slate).

- Modelers try to modify and adapt risk measures that work in Q1 (VaR) to account for leverage, unpredictability and fat tails (expected loss), but they just introduce the illusion of control. We think we can model and risk manage fat-tailed Q4 risks, but we can't.
- Nassim Taleb refers to Q4 as "Extremistan".
- The social impact of a Q4 fat-tail event is enormous (people lose jobs, houses, retirement funds, have heart attacks, get arrested and spend time in jail, governments fail, new laws and regulations are introduced).

Examples of Q4 Risks

- Lehman – leveraged and interconnected financial system risks leading to a systemic meltdown. No one knew that Lehman was a party to so many trades. Without government action (printing money) many banks and investment dealers in the US (and many in parts of Europe) would have gone bankrupt and anarchy would have prevailed. A clear Q4 risk.
- AIG – agreed to insure credit risks that exceeded their capital by more than 10 times. The risk was simple (a debtor either defaults or it doesn't), yet the conditions leading to defaults were unpredictable. Complexity and leverage – definitely Q4.
- Bubonic plague, SARS, Covid-19 – any virus spread by air or contact. Fast, modern transportation allows viruses to spread more rapidly than ever before. Traditional statistics of mean and standard deviation cannot help us when the spread of viruses reaches the logarithmic or power distribution phase. Vaccines, isolation and mask-wearing help where models fail.
- Q4 risks, once they reach a breaking point, become systemic and need a centralized solution.
- Economic systems are Q4 phenomena.
- Leveraged financial products. If you bought a Greek government bond at par with 10 times leverage, and the bond's price drops (yields rise) by 10% within one month, your investment has gone to zero.
- Short gamma (short, short-dated options).
- Complex or "structured financial products". Even the issuers often fail to understand the complexities of their products.
- Lloyds of London names. High net worth individuals wrote insurance policies for centuries and generated a substantial and steady income. When the US courts ruled in favor of asbestos-related injuries, which Lloyds names had insured in what are now regarded as badly worded policies, names were "called" and many went bankrupt. A better-worded contract that capped claims would have placed Lloyds' names in Q2.
- The internet – not all Q4 risks are bad. Many of the most influential inventions and innovations are Q4 surprises. Complex, interconnected systems, significant leverage and major impact. (think: the hand phone, fax machine, computer)

Risk Management Tools – Are There Solutions to Q4 Risks?

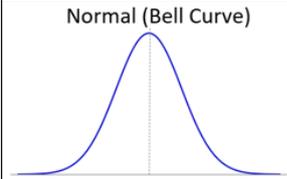
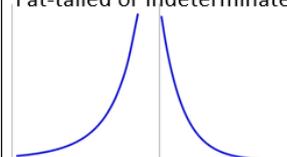
It is important to accept the fact that we cannot manage or model the risks in Q4. We must get out of Q4!

- Reduce the impact of relationships and complexities we do not understand.
- Chop the tails:
 - Limit the downside contractually.
 - Buy “crash puts”.
 - Change the risk profile to that of Q2 or Q3.
- Many banks, hedge funds, businesses and individuals have gone to zero (or less) by a misguided belief in their ability to model Q4 risks.
- Do NOT rely on statistics or models.
- Employ the resilience guidelines discussed in Q3 – build in redundancies. (Humans have two kidneys but only need one), make your business robust (some parts of the business do well in an economic downturn), become resourceful and act quickly.
- Reduce leverage.
- **A Simple Q4 Housing Scenario**
- Identical houses are offered for sale in the same neighborhood for \$1 million each.
- Conservative Joe from Q2 has been saving all his life and pays cash for his \$1million house. He has bad memories of the 1993 Toronto real estate market when prices collapsed by 60%. Joe buys his house with 100% equity.
- Aggressive Fabio from Q4 has no cash, applies for and receives a \$1million mortgage from the local bank. Fabio has just finished reading a best-selling book on “How to Profit from the Coming Real Estate Boom with No Money Down” (foreword written by Donald Trump). This is a small town, and the bank has 10 depositors who have each placed their \$100k retirement savings on deposit. Deposit insurance has not been invented. Fabio buys his house with 100% debt.
- Housing prices collapse by 60%.
- Q2 Joe is not happy, but his life doesn’t change. He still lives in his house. No drama.
- The bank repossesses Q4 Fabio's house, and tries to sell it at auction in a falling market. The 10 bank depositors get wind of this, all try to withdraw their cash simultaneously and create a run on the bank. The bank has insufficient cash and declares bankruptcy. The depositors lose 60% of their retirement savings and will have to work longer, retire later and perhaps live in a depressing trailer park. Fabio buys a nice house for \$400k at a forced auction.
- Who wins and who loses in Q4?

- The depositors thought they were being conservative by placing their money with a bank, but they took on leveraged and interconnected complex risk that was difficult to map. They had limited upside potential (the interest paid on their deposits), while their downside was the loss of all their savings. (Remember, we’re assuming no government-sponsored deposit insurance).
- Fabio thought he was being aggressive, but he really just purchased a simple call option on a house with tremendous appreciation potential for free. He had positive asymmetric risk – no downside and unlimited upside.
- Over the course of history, many of the largest personal fortunes have been made by leveraged long real estate portfolios. And many of the most spectacular bank failures have been a result of mortgage lending. Both play in Q4.

QUADRANT F

How Did We Miss That? Frauds, Scams and Ponzi Schemes

Distribution	Payoff	
	Simple (win/lose)	Complex (interconnected)
Normal (Bell Curve) 	Q1	Q3
Fat-tailed or Indeterminate 	Q2	Q4



The first four quadrants identified unique risk buckets or classifications and suggested how those risks may be effectively managed.

The risk in Quadrant F (**QF**) is that criminal elements will steal your money, possessions, identity, data, reputation of future. Your job is no longer to manage a risk but to avoid a robbery. It’s time to think like a criminal or act like the specialized police department in Minority Report and uncover the crime/criminal before it’s too late.

Examples

Theranos – Elisabeth Holmes (2015)

- Holmes, a young Stanford dropout and budding biotechnopreneur, formed Theranos, a privately held health technology company, whose goal was to provide fast, inexpensive, non-invasive (a finger prick) and accurate blood analysis using small, proprietary automated hardware devices.
- The company raised US\$ 1.4B from 16 investors, leading to a US\$10B valuation in 2014.
- The technology didn't work, blood samples were run on third-party machines, many clients/patients received dangerously inaccurate blood analysis results and investors lost everything.
- Data was not peer-reviewed or clinically verified.
- The SEC charged Theranos, Elisabeth Holmes and President Sunny Balwani with "massive fraud" in 2018 and the company ceased operation shortly thereafter.
- The fraud persisted due to blind faith and the lack of basic due diligence.

Wine fraud – Rudy Kurniawan(2013)

- developed a reputation as one of the world's preeminent connoisseurs and dealers of French Burgundy wines in the late 1990's.
- Despite spending millions of dollars on wine, Kurniawan was a counterfeiter, filling old bottles with less expensive new or old wines (often mixing multiple wines to develop a believable match to the original), counterfeiting labels, corks, capsules and bottles.
- Kurniawan's fake wines sold for US\$ 35.3M at auction in 2006, including eight magnums of 1947 Chateau Lafleur. Sotheby's learned that only five magnums of the '47 Lafleur were produced and that was the beginning of the end for Kurniawan.
- In 2012, FBI agents raided Kurniawan's home and found all the tools and materials necessary for counterfeiting wine. He was sentenced to 10 years in prison in 2013 and was released in November 2019.

Investment Ponzi scheme – Bernie Madoff (2008)

- Madoff ran a Ponzi scheme from the early 1980's where the "investments" received from foundations, trusts and acquaintances were used to pay back early investors.
- The \$30-65 billion hole was the largest Ponzi loss in history and netted Madoff a 150-year prison sentence.
- Family and friends performed compliance and auditing roles and Madoff purportedly exited all positions at the end of each month to avoid Sec reporting requirements.
- His strategy was to be long (buy) about 1/3 of the Securities in the S&P 100 index, sell out-of-the money index calls and buy out-of-the money index puts. He referred to the strategy as a "split-strike conversion." This author, with his skilled quant sidekick, tried to replicate the strategy in 2007 and determined that it could not have generated the returns claimed without a time machine.
- Many had raised the possibility of a Ponzi scheme for years, yet no one – as Harry Markopolous documented – would listen, especially the SEC. The end came during the 2008 GFC when Madoff didn't have enough cash to satisfy redemptions.

Tools of the Trade – the methods fraudsters employ to lure you in

Attempts to gain your trust

- By appointing big names to the board (Corporate Heads, Government officials, Scientists and Professors) and enlisting famous people (actors and musicians) as spokesmen. We tend to trust those who have achieved success. And the big names and famous people are often too flattered by the attendant publicity to verify the legitimacy of the company/product/claim.
- Through friends and relatives. Familiarity and friendship encourages us to let our guard down and substitute scrutiny with hope and belief.
- By overstating their abilities and accomplishments and by implying extensive subject-matter expertise. We have a general desire to believe stories and rarely suspect that we may be engaging a charlatan.
- By their confidence, sincerity, charming disposition, charismatic delivery and good looks.

In-House Verification

- Accountants and auditors are friends, family or non-arms-length. Financial ledgers are a closely held secret. Two sets of books are a dead giveaway (though confirming the existence of that second set may be somewhat difficult).
- Client names and sales receipts are not disclosed since they may be bogus or a fraction of what has been represented.
- Unaudited assets. How often do we read of low or no gold/trees/oil?
- Industry-standard quality control verification denied.
- In-house verification leads to fake products, fake inventory, fake sales, fake trees, fake minerals, fake books, fake profits, fake bank accounts...

Pre-IPO Sales Explosion

- A rapid jump in sales and an overstatement in revenues leading up to an IPO in mundane businesses (Lukin Coffee, Greensill Capital) suggests alchemy.

FOMO – Fear of missing out)

- Cutting-edge technology.
- The next big thing.
- Once-in-a-lifetime opportunity.
- A chance to change the world.

Create a False Sense of Urgency

- The opportunity – in its current form – is available for only a short time, so performing Due Diligence, looking too closely under the hood or peeling back the onion skin means you might miss the deal.

- The urgent need for money or commitment is one of the two Red Flags of Fraud according to Frank Abignale (the inspiration for the movie [Catch Me If You Can](#) and the TV series [White Collar](#)).

Something for Nothing

- High return, low risk, no risk or a guaranteed return.
- The fraudsters play on our gullibility. We can't resist something for nothing (or for very little).
- If it seems too good to be true, it probably is.

Blind Faith

- Investing in a concept where few details are provided (or available).
- Details are dismissed/avoided since they are too complicated, proprietary, unimportant or just noise.
- You wouldn't want to miss the forest for the trees.
- Not uncommon in the VC investment space, so not all instances of blind faith are precursors of fraud.

Exclusivity

- Few people know about this. It's our secret.
- You are being given a unique and limited opportunity and you must not discuss this with others for fear of losing the exclusivity.
- Hot tip

Guilt trip

- Psychological manipulation or coercion.
- Your caution will be your downfall.
- Your lack of trust will result in missed opportunities.

Embarrassment

- We don't like to admit we've been taken advantage of. With hindsight, a scam becomes obvious and others who are presented with the full story might consider us silly, stupid or careless.
- So we tend not to report scams, which allows their propagation.

Intimidation and Fear

- Use of aggressive tactics to intimidate, harass and silence sceptical and whistle-blowing employees and independent (external) journalists, investigators and critics.

- Invoke pledges of unwavering corporate loyalty among employees, advisors and Board members.
- Extensive use and enforcement of NDA's (Non-disclosure agreements).
- Threats of violence, lawsuits or arrest.
- Ransom payments to release data, avoid/remove computer viruses or retrieve any animate or inanimate object.

Summary

A risk is either **simple** – a coconut falls and hits you on the head, or it doesn't – or **complex** – AIG insures a credit risk, and then another, and then hundreds of billions more, which all go bad and destroy all US investment banks within a week, which threatens social systems, which gives people heart attacks, which starts congressional hearings, which destroys careers, which lands people in jail – well, we assume you get the picture. A centralized solution (spending – printing money) to a Q4 wipeout is sometimes the only solution.

And a risk is ether **normally distributed** – casinos rely on this Gaussian world – or **fat-tailed** where a virus first detected in Wuhan, rapidly makes its way to Italy, boards cruise ships, spreads global, infects 200 million people, kills an additional 4 million, closes borders, swamps hospitals, shuts down the travel and hospitality industries, creates a new era of working from home and stalls global reproduction.

Fraud makes cameos in all quadrants. Some perpetrators are ingenious and prey on unsuspecting targets, while others begin innocently and gradually enter a downward spiral of coverups and deception via a one-thing-led-to-another process. In Quadrant F, your focus, in addition to classifying risks, is to identify the tell-tale signs of deception, sleight-of-hand and fraud. If its too good to be true, it's probably not true.