

# Blackie's Risk Manual



## little exercises about the risk around us

*dadoh se u potragu za sobom samim*

(I)

### ON THE NATURE OF REALITY

*jer bitište čovječje doduše nema provide*

**Our reality is basically probabilistic.** In this very moment it is a **distribution of probable events** - meaning the future should be viewed not as a fixed outcome that's destined to happen and capable of being predicted, but as a range of possibilities. This is what most people tend to overlook, or forget. They concentrate on just one outcome, which they linearly draw from near past. This linear procedure goes in chains, like this: A causes B which causes C, or clean probability in mutually independent events (roulette).

Our reality is a complex system. Complex systems exhibit fractal/chaotic dynamics, highly unpredictable changes from order to chaos, where microscopic research of the parts will not give an answer about the system behaviour. Crowds. Two is a company, three is a crowd. Complex systems are prone to disruptions by seemingly small events, which balloon in feedbacks like a snowball. They are prone to entropy, where order needs energy to be sustained. Left alone, the easiest path of the system is towards energy dispensing – increasing disorder - entropy. That means, in our affairs, we are dealing with **asymmetry**.

Seeing a reality through the lens of the probability is a proper everyday training. This is what mathematicians call the stochastic view. Greek - stochastes, a diviner. So, we have like known information, those we are able to estimate – this is the list of events that might happen. All aspects of our reality is probabilistic, not just professional ones. If we can estimate how likely each one of them is – then we can construct a probability distribution (don't forget this when your child is sick, because you are dealing with human body – very complex system).

Still, there's a big difference between probability and the final outcome. Because, finally, in the future, **only one event from our distribution will happen**. Which one? This is where all the problem exists. Unlikely things happen – and likely things fail to happen. Probabilities are likelihoods and very far from certainties (Pareto, 80/20). And there is no certainty.

So, basically, we must train yourself in **seeing our reality as a probability distributions**, all the time. Moreover, we must try to identify all the probable/and possible events in the distribution, and then assign some degree of probability to every one of them. IMPOSSIBLE.

Because remember – in majority, you are dealing with complex systems.

Complex systems – think of human body, traffic, or a financial market - perfect example of a complex system. It is an open system, where objects interact in ever-changing ways, fighting for a scarce resource. System is self-directed, without central authority, with self-injected power to change from order to chaos. It is fast, non-linear and highly variable.

It has internal and external feedback loops. Those are – information and memory, or more important - BIAS.

There are **mean-reverting** (balancing) loops, **self-feeding** feedback loops (amplifiers) and **variable delays** – all of that combines in strikingly complex dynamics.

Very powerful mean-reverting feedback loops are found in physical world, but also in financial markets – temperature of the body, height of men, valuations, boom/bust cycles, profit margins, debt capacity.

And there are mad, self-reinforcing feedback loops – bacteria growth, herd mentality, speculation, yield- chasing. Until population equation kicks in.

The behaviour of the overall system can change dramatically depending on which loop becomes dominant – but that also can change in a non-linear way (and with variable delays).

There is additional question in those matters – what kind of distribution should we use?

Gauss, normal – yes in inanimate, symmetric and linear matters....medicine, sometimes...but in general...I doubt.

There are two more, which I find perhaps more promising – power and Cauchy distribution. And they are opaque. But enhances you in everyday risk awareness. Both of them involves complexity, not linearity.

(II)

## OUR LINEAR BRAIN DRIVEN WITH PRECONCEIVED NOTIONS/BIASES

*Had – nevid; bez sluha čuvši gluhima nalikuju*

Reality clearly ignores that our brain is trained for a linear world. Our biggest energy user is designed that way thru the ages of human history – when main activities - collecting/harvesting food/hunting - were linear. One field, two field, double crop, etc.

Because of our linearity, **we intuitively don't understand exponential growth, power of compounding and probabilities**. Consequently, because of not understanding probabilities, **we can't understand risk**. It is our major blind spot.

**Second**, let's resolve it – **we are highly subjective**, with preconceived notions, and confirmation bias. Another way to name it – affinities, biases, wishful thinking, overconfidence, normalcy bias, survivorship, hindsight bias. We tend to explain away inconvenient facts.

Our brain is functioning on models, but not on reality and facts, and that makes us slow to react. We are weighting wrongly. This is very important in life-threatening situations, when we are refusing unusual evidence, believe in normalcy, and are late to react.

**Third**, our brains are hard-wired, **trained on patterns, and not for analysis**. Analysis takes too much energy on our body levels, and time...so we are taking shortcuts, even when they are very wrong. Analytical thought is hard, and we must be trained for it.

Repetitive knowledge is not an analytical thought. What is worse, after making hard decision, **we are lacking energy to defend it against our emotional attacks**. So, it is easier to use others opinion, and suspend our own process of thought. To add some sugar on it, we have (just like human egg mechanism) a tendency to **shut-off our brain** after we formed/took some opinions/views - even if new facts/knowledge is just too convincing towards the opposite.

**Fourth, we think dramatic, and not quantitative**, we react harder on negative news and when we find it, we share it. We overpay for what the herd deems zero-risk, and that ideal does not exist.

**Fifth**, we reach for **most available information** (better if they are quantitative), and use those selectively, without doing further research.

**Sixth** – we are prone to framing – choosing default options –social pressure, social norm.

Quite a lot of things to train on.

(III)

### **BATTLE WITH OUR DEFICIENCIES**

*niti zbori, niti krije nego znamenuje*

OK, reality is semi random, non linear, highly accommodative and complex, with changing (variable) distribution types that should be applied. It is probabilistic.

So, the crucial thing is to **think in terms of probability distribution**. Do your research, collect known information, those you are able to estimate – those are the probable events in distributions. If you can estimate how likely each one of them is – you can construct a probability distribution. There are black swans, unknown in this very moment. Most often you can not quantify (assign probabilities).

Here, philosophical methods about cognition might help - my personal thesis testing motto - that question again and again

– **WHAT CAN I KNOW WITH REASONABLE CERTAINTY**, and what I just can't know?

Expectations vs reality. It is kind of uncertainty principle as a starting position.

Take it on the other way – with how many future events I can steer forward with absolute certainty?

Soon, you realize, that you can (with reasonable certainty) know rather limited amounts of reality.

And helping question - the difference between

- **WHAT CAN I REASONABLY KNOW** and **WHAT I THINK I KNOW**

Because here lies the rub.

Decision-making procedure:

data – comparison – calculation - thesis - data - testing/distribution – challenging - signs

Method that I like to apply in building the thesis – **put an idea (choice) on a paper, and make a list of**

**PRO**

**CONTRA**

I realized that I actually created a probability distribution, intuitively weighting the probabilities.

Or like a tree - we have a **choice, possible events** (distribution) and valued outcomes (**risk** - risk/benefit preferences).

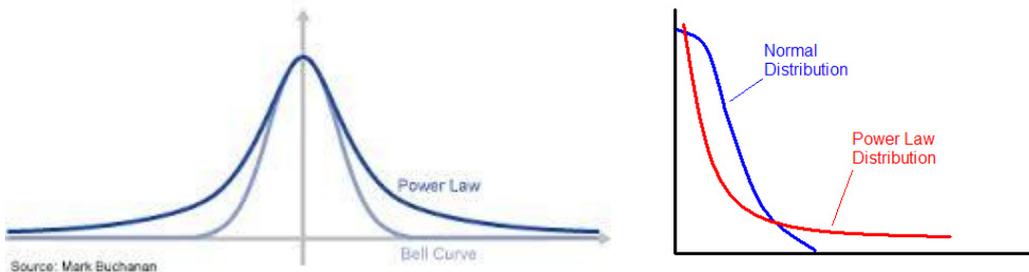
Future - above all the probable events in the distribution, **only one of those will happen**. So, check data, seek for the signs of the one that will happened at the end – let's call it **signs method** – and drive slowly in that direction. By updating our initial understanding through new information (unbiased), we improve our understanding. Follow the signs.

Another question is what distribution in terms of general uncertainty levels we should use? It is important.

Normal/power - I would say more to power and Cauchy, with variable variances....so not concentrate yourself on Gauss. This will give you the feeling of broader possibilities, **asymmetry, and higher fat tail events**, which is good in managing risk...They use Gauss distribution because when coefficient of variation is low/one, various distributions can be fit to normal...

It is very hard to determine a proper distribution. Problem of statistical sample, and our addiction to patterns. Power distribution – where large is rare and small is common.

Exhibit 1:  
The Bell Curve vs. the Power Law: The Importance of "Fat Tails"



So, you can smell it – RISK of mistake. Uncertainty in all humans undertakings.

That phase is for another step – little risk analysis.

(IV)

## RISK

*sjediniđba skrivena od bjelodane moćnija*

First, **risk is not a single number**. Risk is not about what happens **but about what could happen and what the consequences could be**. Russian roulette is statistically a 5:1 winner . . . until you lose.

Russian roulette in the Deer hunter is a premier risk management example for me. If you think about that episode, it explains so much.



*About our reality - testing*

Helping hand in **PRO/CONTRA list** - as I consider - there are:

- internal knowns,
- internal unknowns, and
- external knowns,
- external unknowns.

I make a list of those for **investment case assumptions, and investment case risks**. And it is better to be where the sum of those is smaller.

Asking myself the first question – **what can I know with reasonable certainty** – leads me to -

**Simplicity** is the primary wisdom, and **robustness**/resilience is the second one....Taleb has a good one – antifragility.

- **Take risks you understand**, don't go too far, taking complex unknown risks or ones that you possibly can not know. **Think about how the distribution is known to you.**
- Make reasonable estimates, if possible, concentrate to probabilities.
- Know the negatives first.
- Try to name black swans. Define positive/negative ones.

In economic matters, beware – closed vs open system – closed systems are very rare, and economic theory assumes countries operate as a closed systems. That's why recent monetary policies are mistaken.

Complex, global issues can be reasonably known at very basic level, trying to determine and anticipate main trends (direction - credit cycle, demography, incomes, outlays)...but not much on broad equity market index, or a specific complex company level – like VW scandal.

Then, questions about fragility of the system, main tendencies, most powerful ones (demography, debt cycle), and exponential functions all around us - **and their sustainability**....something that out linear-sequential brains just can't cope with on long-term:

- non-linearity, compounding
- asymmetry
- level of robustness
- fragility and the possibility of collapse
- systemic risk
- big change – collapse – is not a singular event, it is a process -
- risk is cumulative

So, taking all that into account – how you can measure risk with a single number?

### **Measuring risk**

*i za učitelja imaju masu, ne videći da su oti mnogi ništavni, a malobrojni vrsni*

**Volatility** is very deceiving measure of risk (paradox of stability) - risk is positive function of growing stability). **Volatility is agnostic to value.** I personally call volatility measures as a **barometer of ignorance.**

Measure of risk is **possibility of loss**...we take volatility because it is at hand, easily collectable and accessible, with a lot of visible data. Mistake.

Paradox of stability - stability breeds instability - self-reinforcing feedback loop – than we have herding - investors blind to valuations and intrinsic value. Seeing only one side – benefit – they accept a lot more risk than they realize.

We are prone to put one simple solution/measure to explain vast complexity.

In financial markets -

**risk is not a single number. It is, in complex matrix (for various reasons), overpaying for an asset.**

Measure of risk is multidimensional, it should take into account:

- **valuations,**
- **probability/possibility of loss,**
- **consequences of risk event**
- level of complexity in the position,
- difference between what I can reasonable know and what I can't possibly know,
- level of system fragility (leverage, liquidity, accumulated debt and economic activity, direction of credit cycle),

**In financial markets - risk – it is primary overpaying for an asset.** As I can see it, **valuation is a primal measure - most strongly correlated with actual subsequent market returns on the investments.** Risk is not a single number derived with induction (past market prices data series).

Standard volatility risk measurement is too stiff, too automatic to have the ability to catch real disturbing risk that hasn't hatched yet.

**Valuation - primary force** - think about it like gravitation - water comes from high to lower ground very easy....asymmetry - long up market, short and violent down market. Entropy.

**Risk management** is not if I will lose, it is when I will lose, than what will happen, will I be in the situation to act aggressively in unfavourable conditions? That means I am late.

Risk has a nasty nature - it adds up over time, it is exponential cumulative chance:

$$D = 1 - (1 - P)^N$$

D – cumulative chance of event

P – probability of event

N – number of iterations

Problem with probabilities – we can't assume our modelled probabilities as reliable guides to the future, because low-probability events occur with remarkable regularity, so it's prudent not to put too much faith in statistical or probabilistic models. Those are just models. I deem them helpful, but not final. All such models are based on induction - the idea that the recent past is a reliable guide to the future. But it is not. Unfortunately, we can't operate without induction.

At aggregate level, risk is like water in a closed system: it cannot be compressed.

Here, **better prepare for a basic fact that we operate in uncertainty**. High confidence that risk can be quantified is misplaced.

**"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so."**

The key to understanding the rising likelihood of supposedly improbable events is to understand that we operate in complex systems. In every thesis search for possible black swans, and game changers. Those are the bomb impactors.

Power or Cauchy distributions.

Infinite variance, fat tails, power laws, designation "PLM" (Pareto-Lévy-Mandelbrot) for the more general case of a random series with both independent and non-independent variables.

So, test yourself – search for biases in judgment, overconfidence, start from negatives first - **than you can miss positive**. Prepare B plans, keep your flexibility, strong your defences while you are attacking, do your homework with possibility of positive/negative black swans...

Bias - when judging the probability of the event - we search for memories for available information - we put more weight to personal/known source.

Important: the fact that **one event is presented in terms of gain and the other in terms of loss - is what causes them to be interpreted differently?**

**People are willing to run greater risks to avoid losses than they are to make gains.**

In complexity there is no perfect/absolute/ultimate predictive model – because being right depends on what others think is right, and they are changing that fast, depending on interactions and goals.

Higher rates of return require an **exponential increase in the risk profile**.

**Asceticism – abstinence that prevents increase in suffering.**

Trend – following - a form of herding, increasing with the trend duration, feedback of trend suffocates people to enter the crowd, with rationality and objectivity falling - philosophically speaking -

"In individuals, insanity is rare; but in groups, parties, nations and epochs, it is the rule."

In those terms – what is ignorance - it is firmness, lack of critical stance.

If you don't have **Plan B**, **you don't have a strategy at all**.

Massive borrowing – sensitivity to default increase, destabilizing, debt is adding to fragility of the system, and to sensitivity to interest rates.

External risk factors – structure of the market – who is defining supply, and who demand...sources of demand – leverage play – dangerous, not fundamental but "fashion" market. Trend changes easily, and - if people believe there's a problem, they'll act first and ask questions later. External risks - game changing, more violent.

Market extreme in terms of rich valuations - poor future returns.

**Other motto: markets reflect better than they predict.** By nature they are better at pricing existing information than **pricing the probability and scale of an unexpected event. Not efficient.**

Know and train **how to adapt on the framework changes** – flexibility, awareness, the art of adaptation:

- change in probabilities of extreme values, (flattening out of distribution), plus going to asymmetry?
- shift in distributions or distib parameters? asymmetry becoming more severe?

Prepare in advance – limit your risk exposure, add robustness – antifragility.

In managing risk – not to be forgotten - try to take into account risks embedded in various financial instruments. Equity vs bonds – **embedded risk, level of cyclicity** of various industries (some are just too cyclical - debt fueled mainly - for me to know when the hell will break loose, so I just avoided those).

**Collected in my research as a personal helping guide. To be continued.**

*Quotes in Croatian – Heraklit*

Zagreb, 02/2016