Investor Sentiment

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平均報酬率

- 錯誤的算法：算術平均。

  第1年報酬率=100%、第2年報酬率=-60%，
  平均報酬率=(100%-60%)/2 = 20%？

- 平均報酬率的計算方式: 幾何平均

$$\overline{R} = \left[(1+R_1)(1+R_2)\ldots(1+R_N)\right]^{\frac{1}{N}} - 1 = \left[\prod_{t=1}^{N}(1+R_t)\right]^{\frac{1}{N}} - 1$$

R_t：第t期的報酬率

$\overline{R}$：1到N期的平均報酬率

風險:報酬率標準差

- 風險是指報酬率的不確定性，一般以標準差(standard deviation)，報酬率標準差的計算方式如下：

$$\sigma = \sqrt{\frac{1}{N}\sum_{t=1}^{N}(R_t - \overline{R})^2}$$

Σ：1到N期的報酬率標準差

R_t：第t期的報酬率

$\overline{R}$：到N期的平均報酬率

基本定裡

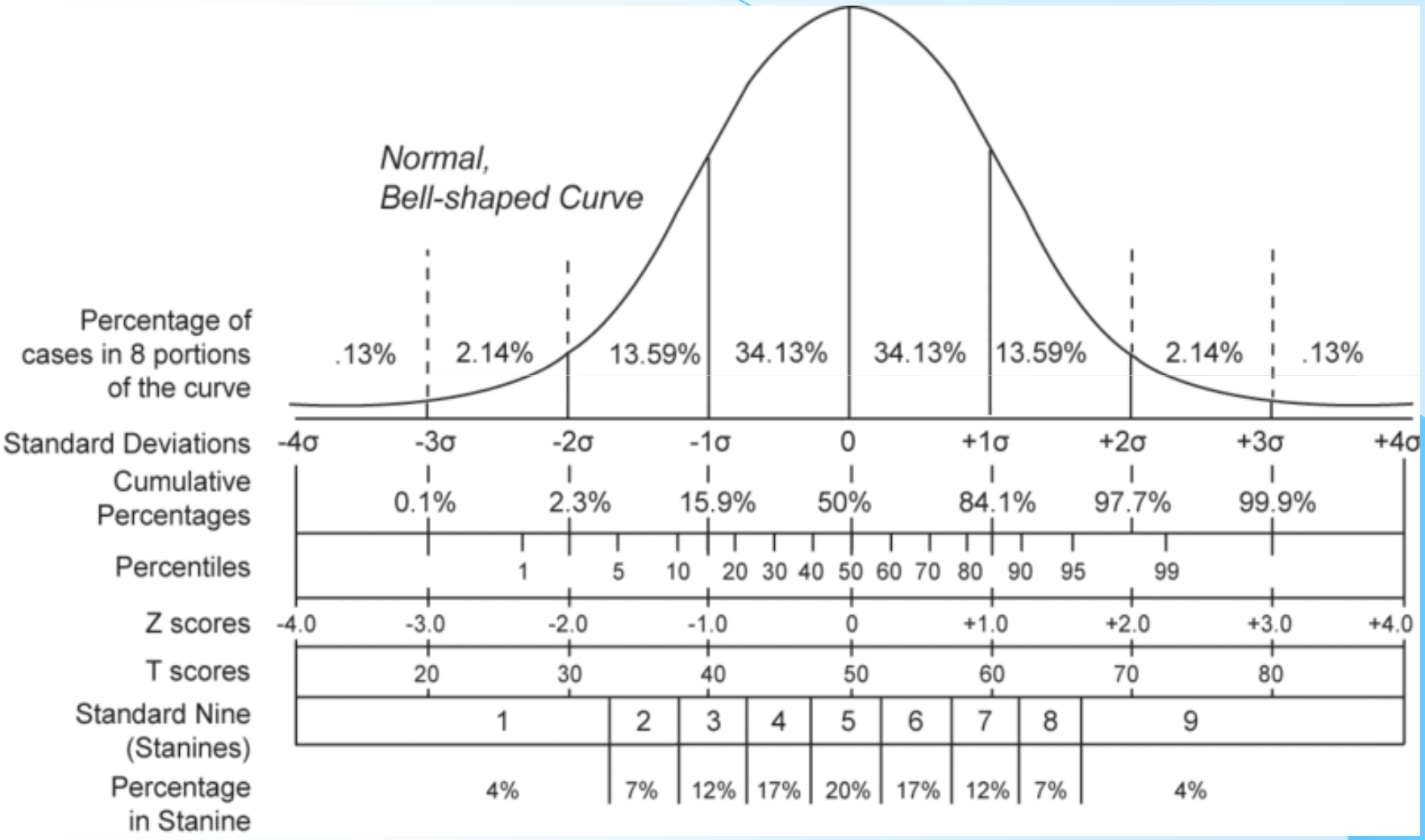
- 1年有250交易日，年平均報酬率= 10% ，年平均報酬率標準差=18% 。日平均報酬率≒0.04% (大約為10%/250)，日平均報酬率標準差≒0.114% (18%/ √250) 。

$$\mu_N = \frac{1}{N}\mu \qquad \sigma_N = \frac{1}{\sqrt{N}}\sigma$$

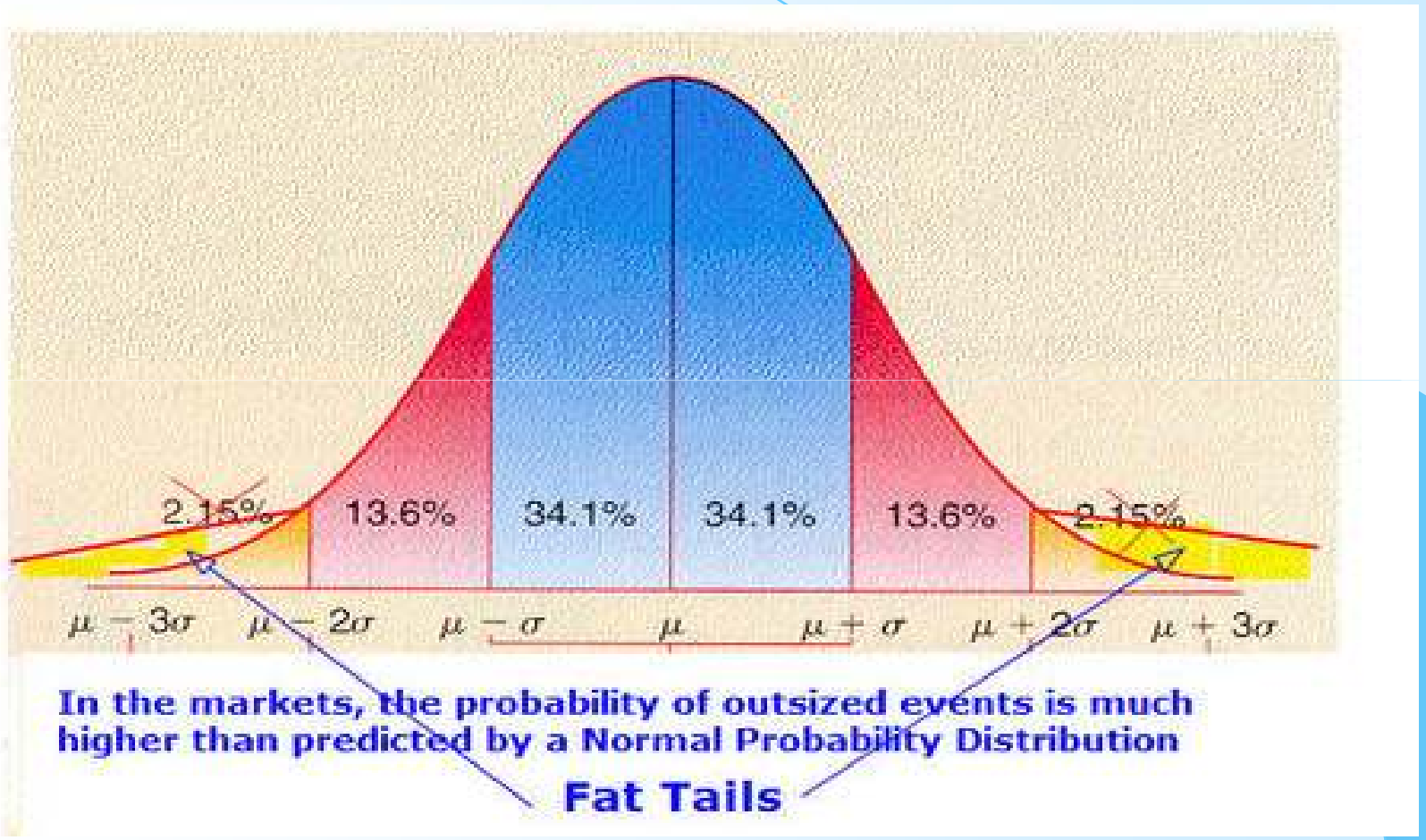
Shit Happens!

- 報酬率的機率分佈:
  - Normal Distribution?
  - Fat Tail Distribution?

Normal Distribution



Fat Tail Distribution



Big Bang:150億年前（年前），Benchmark: 1.5×10^{10}

a. $|X-\mu| \geq 5\sigma = 2\times0.287\times10^{-6}$

Assume: 250 trading days per year → 7000 Years

b.1998.08.04: -3.5%

08.25: -4.4%

08.31: -6.8%

1998.08.31: Probability= $\frac{1}{2\times10^{7}} = \frac{1}{2000萬}$ → 80,000 Years

1998.08.04 + 08.25 + 08.31:Probability= $\frac{1}{5000\times10^{8}} = \frac{1}{5000億}$

→ 2,000,000,000 Years

c. 1987.10.19: -29.2%

Probability= $\frac{1}{10^{50}} \longrightarrow 4\times10^{47}$ Years

Manias / Panics

Mob. Psychology

Rational individuals and irrational whole.

BOE:1694

1.2M £ × 8% + 4000 £

Governor and the Company of the Bank of England.

1.群眾不理性與善變

irrationality & vicissitude of the crowd. Martin

2.herding and winner's curse: 個人的行為，會受到他人的影響。

Newton. South Sea Company：成立於1711年

中南美洲貿易 *BOE.* { 心理實驗 / 自我實現的預期

a. 1720年，接受認股

Banker (Martin) . 認購£500

“When the rest of the world are mad, we must imitate them in some measure”.

b.* Issac Newton, 1720年Spring:

“I can calculate the motions of the heavenly bodies, but not the madness of people”.

* 1720年4月20日，出清South Sea股票，獲利£7000（100%）

* Summer: 再度投資，損失£20,000

1841年，

Charles Mackay, Extraordinary Popular Delusions and the Madness of Crowds.

BOE

S.E.: Proposed 6% → 5%

結果，1720 proposed to take over £30,981,712（3千1百萬£） for 5% until 1727.

發行股票，給10%股利

Bubble Company競相發行股票→資金排擠→S.E.請求政府取締→Burst the Bubbles

Tronics Boom

1959-1962:

IPO Craze

- Astron
- Dutron
- Vulcatron
- Transitron
- Circuitronics
- Supronics
- Videotronics

P/E Miracle

- P/E for “ Shoelaces Inc. “ is 6.
- “Electronics & Silicon Fourth – Burners” has a P/E of 42

1. Reward / Risk Ratio $= \frac{\overline{R_P}}{\sigma_P}$

2. Treynor Index $= \frac{\overline{R_P} - \overline{R_F}}{\beta_P}$ ， $\overline{R_P} - \overline{R_F}$ =Risk Premium

3. Sharpe Index $= \frac{\overline{R_P} - \overline{R_F}}{\sigma_P}$ ， $\overline{R_P} - \overline{R_F}$ =Risk Premium

4. Jensen Index=Jensen's α

$$(R_P - R_F) = \alpha_p + \beta_P \times (\overline{R_m} - R_F)$$