# M339W: August 22nd, 2022.

## Important Prerequisite Material.

- Basics of derivative securities from M339D
  - → (prepaid) forwards
  - → calls / puts
  - → spreads, strangles, straddles
- Arbitrage Portfolio Def'n.
- Binomial Option Pricing
- Covariance Formula
- Normal Distribution

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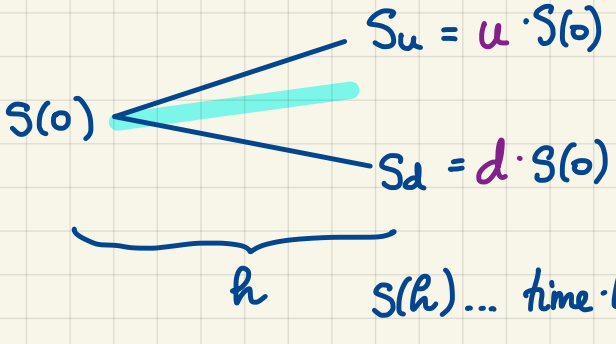
## Binomial Asset Pricing Model.



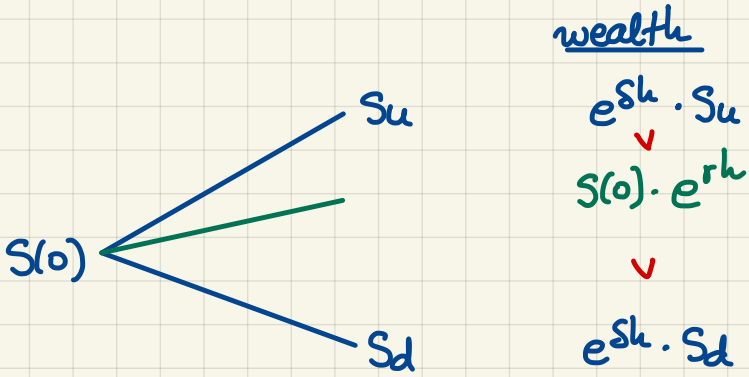

$u > d$

$S(h)$ ... time-$h$ stock price

- $r$ ... continuously compounded, risk-free interest rate, i.e., the accumulation f'tion: $a(t) = e^{rt}$
- $\delta$ ... dividend yield

  Per share owned, the shareholder gets $\delta \cdot S(t)\,dt$ in dividend payments over the time period $(t, t+dt)$.

Assume immediate and continuous reinvestment of dividend in the same stock.




$$e^{\delta \cdot h} \cdot S_d < e^{rh} \cdot S(0) < e^{\delta h} \cdot S_u$$

$$e^{\delta h} \cdot \cancel{S(0)} \cdot d < e^{rh} \cdot \cancel{S(0)} < e^{\delta h} \cdot u \cdot \cancel{S(0)}$$

$$\boxed{d < e^{(r-\delta)h} < u}$$

The no-arbitrage condition for the binomial asset pricing model.