01/30/2019.

Financial Instruments.

We abstract, and only care about

→ WHEN the cashflows happen

→ the AMOUNTS of the cashflows (the bottom-line approach)

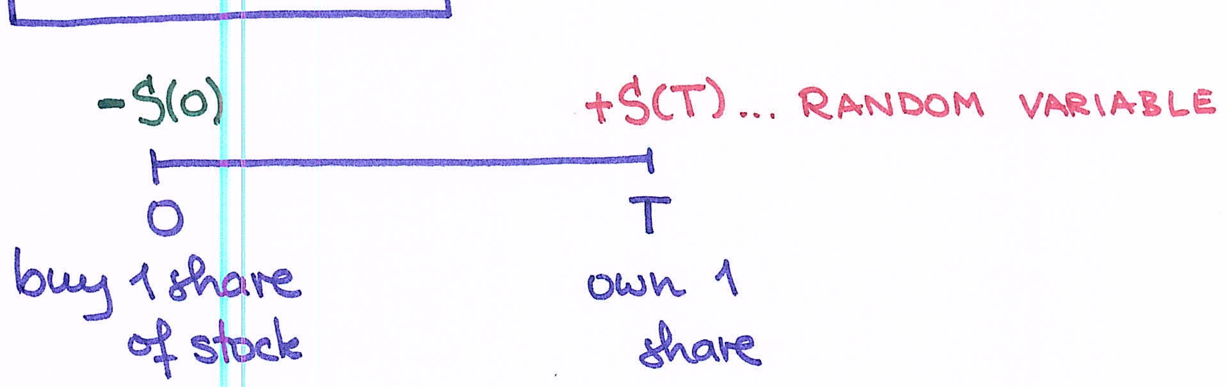
So far: fixed-income instuments, i.e.,
fixed cashflows and @ *fixed* times,
i.e., RISKLESS investments, e.g., zero-coupon bonds, savings accounts, ...

Outright Purchase of one share of stock

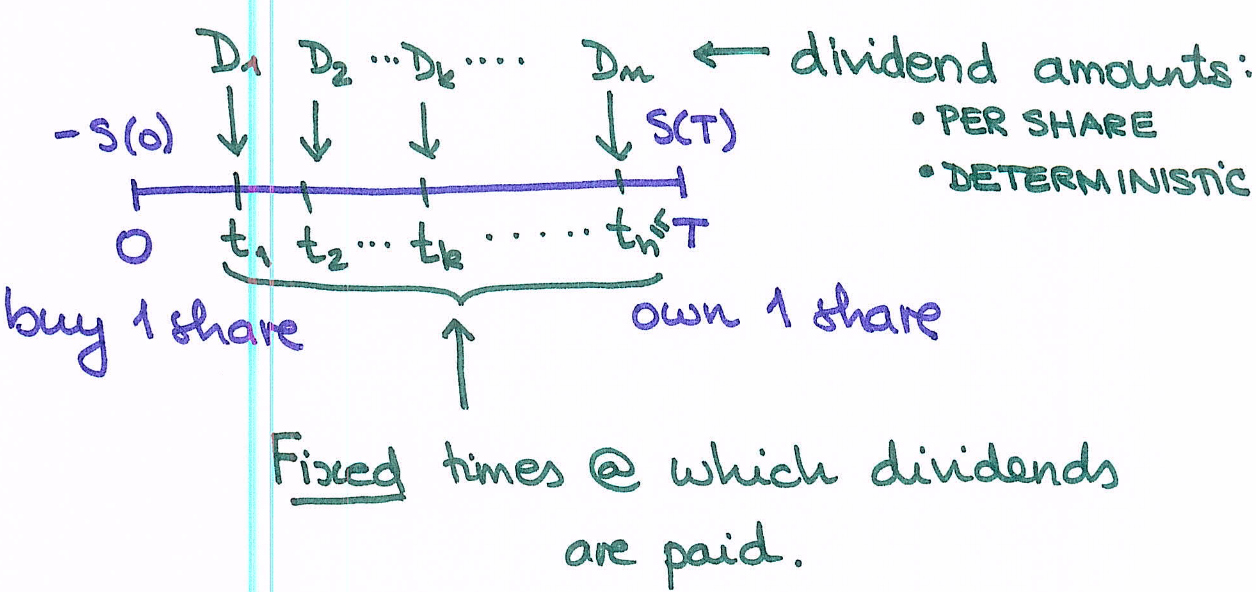
No borrowing to finance the purchase.

If the stock pays dividends, we assume a *fixed* projected dividend schedule!

Case #1. No dividends.



Case #2. Discrete Dividends



Of interest, perhaps, is the

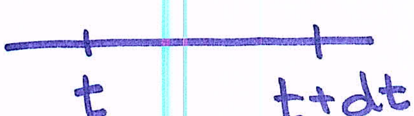
$$NPV(\text{dividends}) = \sum_{k=1}^{n} D_k \cdot e^{-r \cdot t_k}$$

Case #3. Continuous Dividends

δ... dividend yield

The dividend amount paid to the shareholders during the time interval $(t, t+dt)$ is given to be

$\delta S(t) dt$ per share owned.



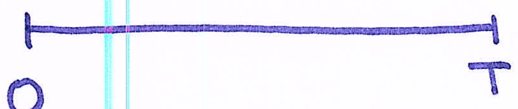
Observe: $S(t)$

Q: How would you calculate the total amt of dividend paid over $[0,T]$? You Integrate: $\int_0^T \delta S(t) dt$

↑ STOCHASTIC PROCESS.

Foreign Currencies.

D: 01/30/2019.



Invest in 1 unit of FC — Exchange back to the domestic currency.

Notation: • $x(t)$, $t \geq 0$ ... EXCHANGE RATE from the foreign currency (FC) to the domestic currency (DC); i.e., at time t we have to pay $x(t)$ in the DC to get 1 unit of the FC

• r_D ... the c.c.r.f.i.r. for the DC

• r_F ... the c.c.r.f.i.r. for the FC

At $t=0$: • Buy 1 unit of the FC.

$\Rightarrow$ We spend $x(0)$.

• We deposit the 1 unit of FC to earn interest r_F in a savings acct.

At $t=T$: • Withdraw the balance from the FC account; get $e^{r_F \cdot T}$ units of FC.

• Exchange back to the DC; get $e^{r_F \cdot T} \cdot x(T)$ in the DC