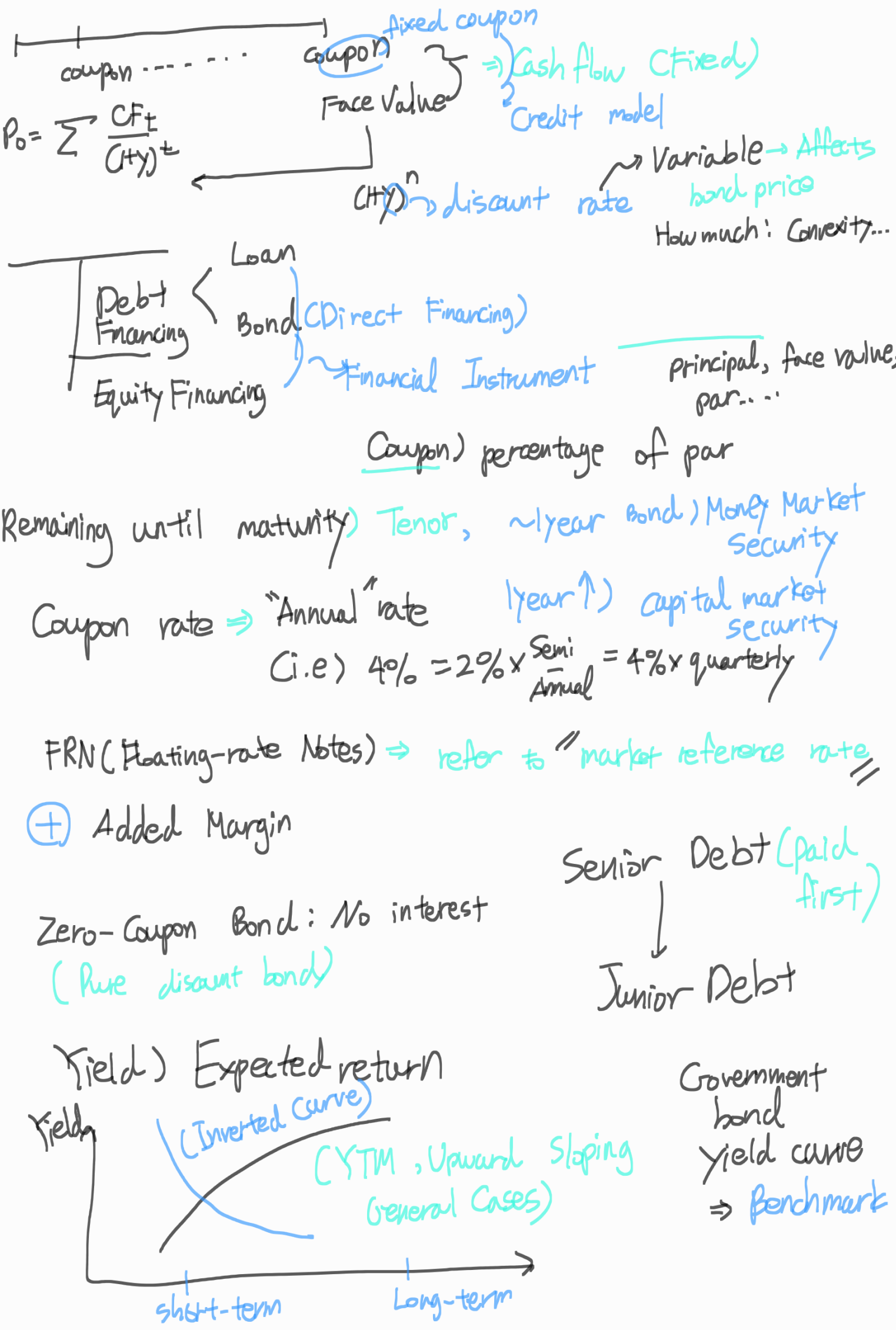

coupon ····· coupon
fixed coupon
Face Value
⇒ Cash flow (Fixed)
Credit model
$P_0 = \sum \frac{CF_t}{(1+y)^t}$
$(1+y)^n$ → discount rate
Variable → Affects bond price
How much : Convexity...
Debt Financing
Loan
Bond (Direct Financing)
Equity Financing
→ Financial Instrument
principal, face value, par...
Coupon) percentage of par
Remaining until maturity) Tenor, ~1year Bond) Money Market Security
Coupon rate ⇒ "Annual" rate
1year↑) capital market security
i.e) 4% = 2% × Semi-Annual = 4% × quarterly
FRN (Floating-rate Notes) ⇒ refer to "market reference rate"
⊕ Added Margin
Senior Debt (paid first)
Junior Debt
Zero-Coupon Bond : No interest
(Pure discount bond)
Yield) Expected return
Yield
(Inverted curve)
(YTM, Upward Sloping General Cases)
short-term
Long-term
Government bond yield curve
⇒ Benchmark

Legal contract for bonds: Bond Indenture

* Source of Repayment
- General Obligation Bond: Tax
- Revenue Bond: Cash flow from project (ex: toll...)
- Secured Bond / Unsecured Bond / Asset-Backed Security

* Affirmative Covenants: Requirements issuers must fulfil ⇒ positive to investors
(ex: Cross-default
⇒ Issuers about to default, Claim ○
pari-passu ⇒ Same priority as seniors)

* Negative Covenants: Restrictions on issuers
ex: pledge of collateral (No same assets to back several debts)

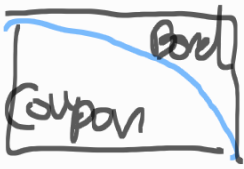
negative pledge clause
incurrence test: Additional borrowings, dividend payments restriction

Bullet structure

ex) par value $1000, 5-year, coupon rate 5%

payment: $50 $50 $50 $50 $1050

principal remaining $1000 $1000 $1000 $1000 0



Fully-Amortizing Loan

5% coupon rate, 5-year, $1000

Remaining = 1000 − 180.97 = 819.03

Payment: $230.97 $

$180.97 for principal repayment

5% from $1000 (coupon) $50 ...

Payment: $230.97

5% from remaining ($819.03)

⇒ Calculator) 5 [N] → 5 [I/y] → 1000 [PV]

[0 FV] → [CPT] [PMT] = -230.97

✯ Partial amortizing: Final payment is bigger than others

ex: 5 [N] → 5 [I/y] → 1000 [PV] → [FV -200]

→ [CPT] [PMT] = -194.08 (Anually pay -194.08, Final payment 200-194.08)

✯ Sinking-fund provisions (fund annually for par)

Pros) Less credit risk

Cons) Reinvestment risk

FRNC floaters, floating rate notes):

Market reference rate + Credit Spread

BP) 1% / 100

☆ Step-up coupon bonds)

coupon rate increases overtime

⇒ Protection against interest rising/

☆ Credit-Linked Note)

Credit↓ → Coupon ↑

☆ PIK(payment-in-kind) bond:

paying interest with bonds

⇒ higher yield(∵ credit risk)

☆ Index-linked bond) Based on index

i.e) Inflation-linked bonds

Interest-Indexed) only coupons are adjusted to inflation

Capital-Indexed: (TIPS)

// But guarantee Face Value

10% inflation   10% inflation

FV)1000 → principle → principle

1100   1100·1.1 = 1210

↓   ↓

=33$ coupon 1100·3% $36.3

4 Deferred coupon bond:
Do not begin giving coupon right now

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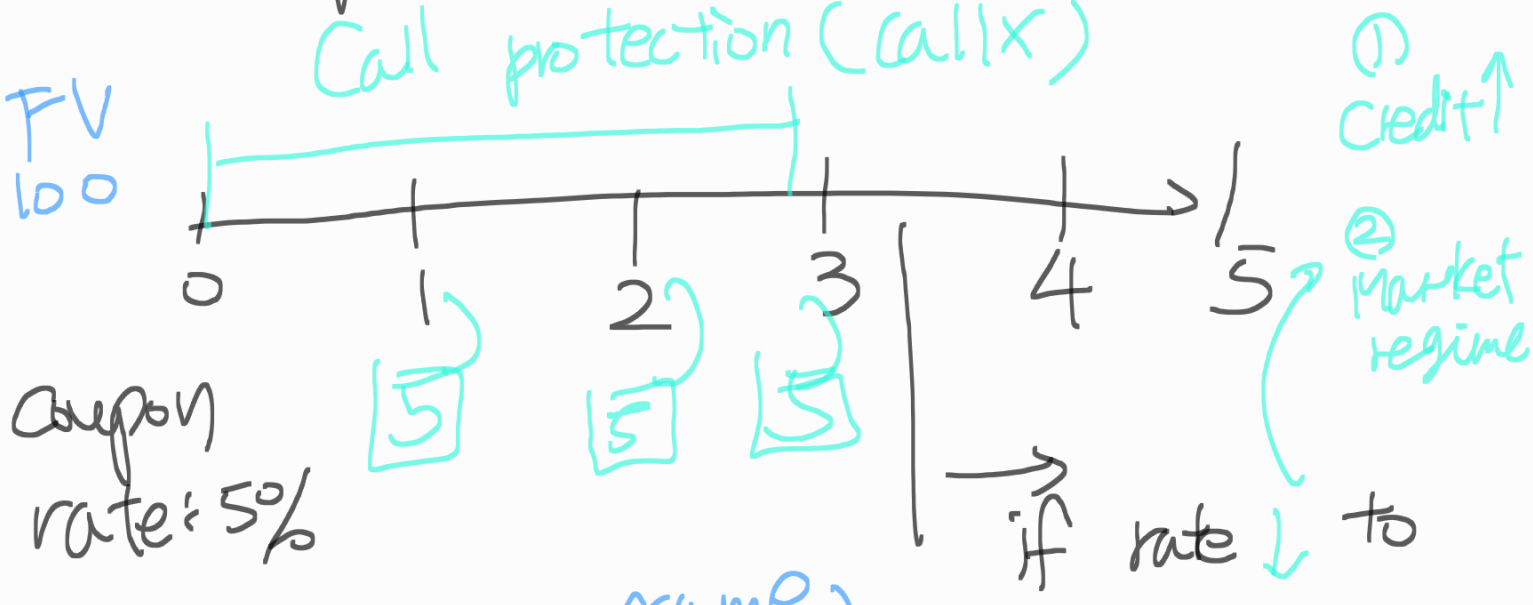
4 Contingency Provisions ⇒ Options + Bond

- Callable Bond) issuers can repay in advance (when rate↓)

(Call protection period)



Straight Bond (same rate)

— Callable Bond

= Call option Value

⇒ so, straight is more expensive

- Putable Option: investors can demand issuers to pay earlier

- Convertible Bond: $\frac{\text{issue price}}{\#\text{ of stocks}}$ (Conversion ratio) = price of each stock (Conversion price)

Conversion value = (# of stocks) · (Market price)

- Bond with Warrants
  (can buy stocks by a fixed price without giving up bond)

- CoCo ⇒ Automatically Bond → stocks

	Issuer	Currency	Market
Domestic	A	A	A
Foreign Bond	B	A	A
Euro Bond	C	A	B

Foreigners come from other country ⇒ issue bond for the country

	Coupon	Maturity
T-Bill	zero	Less than 1 year
T-Note	semi annual	2, 3, 5, 10 year
T-Bond		10~

open market operation

AAA
AA
A
BBB
) Investment Grade

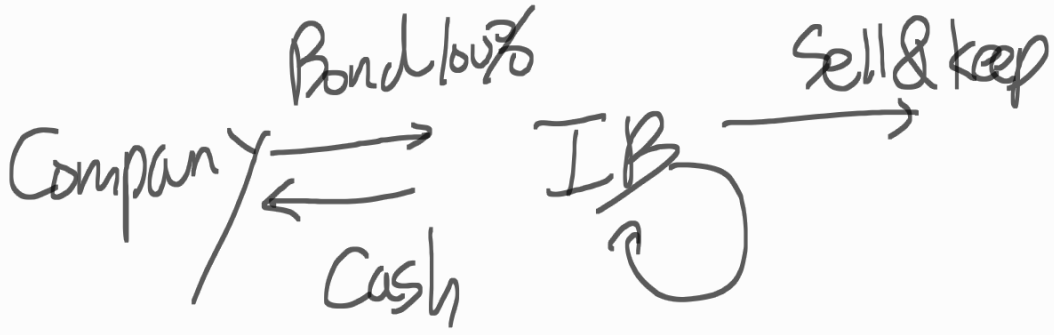
B
:
) Speculative Grade

↓ Fallen Angel

Primary market (Newly issued bonds sale)

- public offering
- private placement

① Underwritten offering



⇒ Financial intermediaries buy bonds all

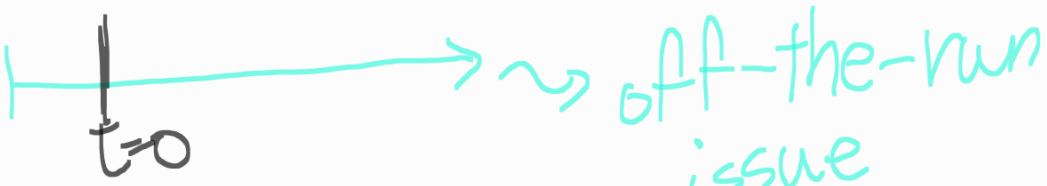
② Best effort offering

⇒ NOT ~~Buying~~ them all

Shelf-registeration) register whole

→ issue over time

Bid (purchase) price, ask/offer (selling) price ~> Dealers, Secondary Market



Distressed Debt: Security of defaulted, under bankruptcy ....

☆ Fixed-Income for Corporate Issuers.

① Nonfinancial Coporations

- Uncomitted line of credit:

  Banks can refuse to lend if circumstances change, MRR+spread

- Comitted line of credit:

  guaranteed for a period — commitment fee, need reserve, renewal risk

  Revolving line of credit: Longer term

Factoring: Sell receivables to bank

Company

Cash ←

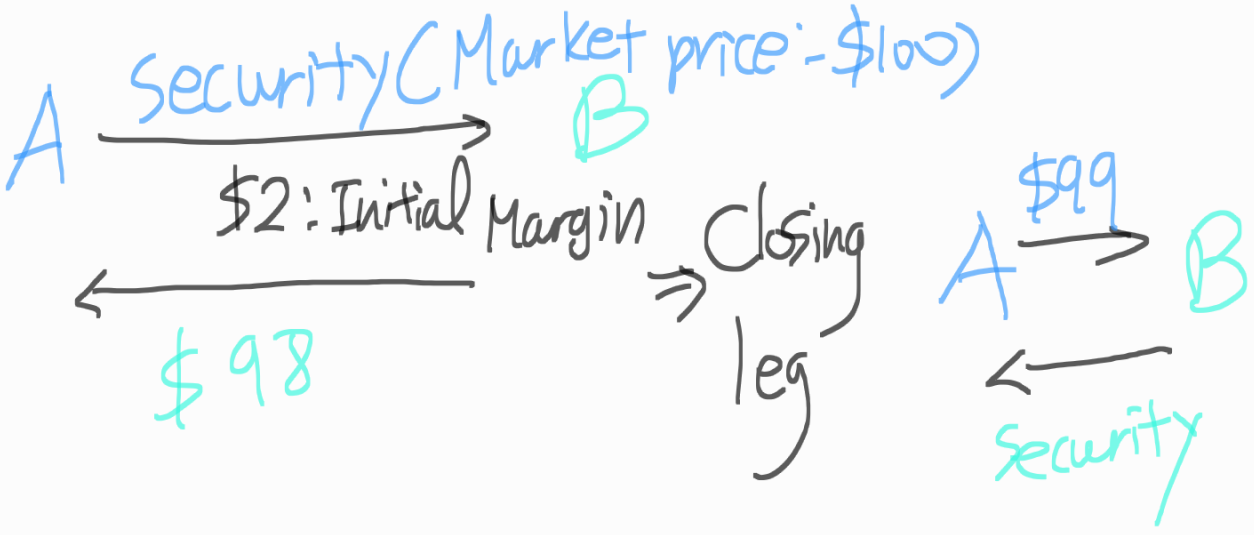
→ Investor

CP (Commercial Paper)) cheaper than bank, but rd-over risk

Financial Institution

- CD (certificate of deposit)
  - negotiable: can be sold before maturity
  - nonnegotiable: ×
- repos (repurchase agreements)
- central bank funds market
  - lending excess reserves

- REPO



99 - 98 = 1 Interest

A: REPO transaction B: Reverse Repo

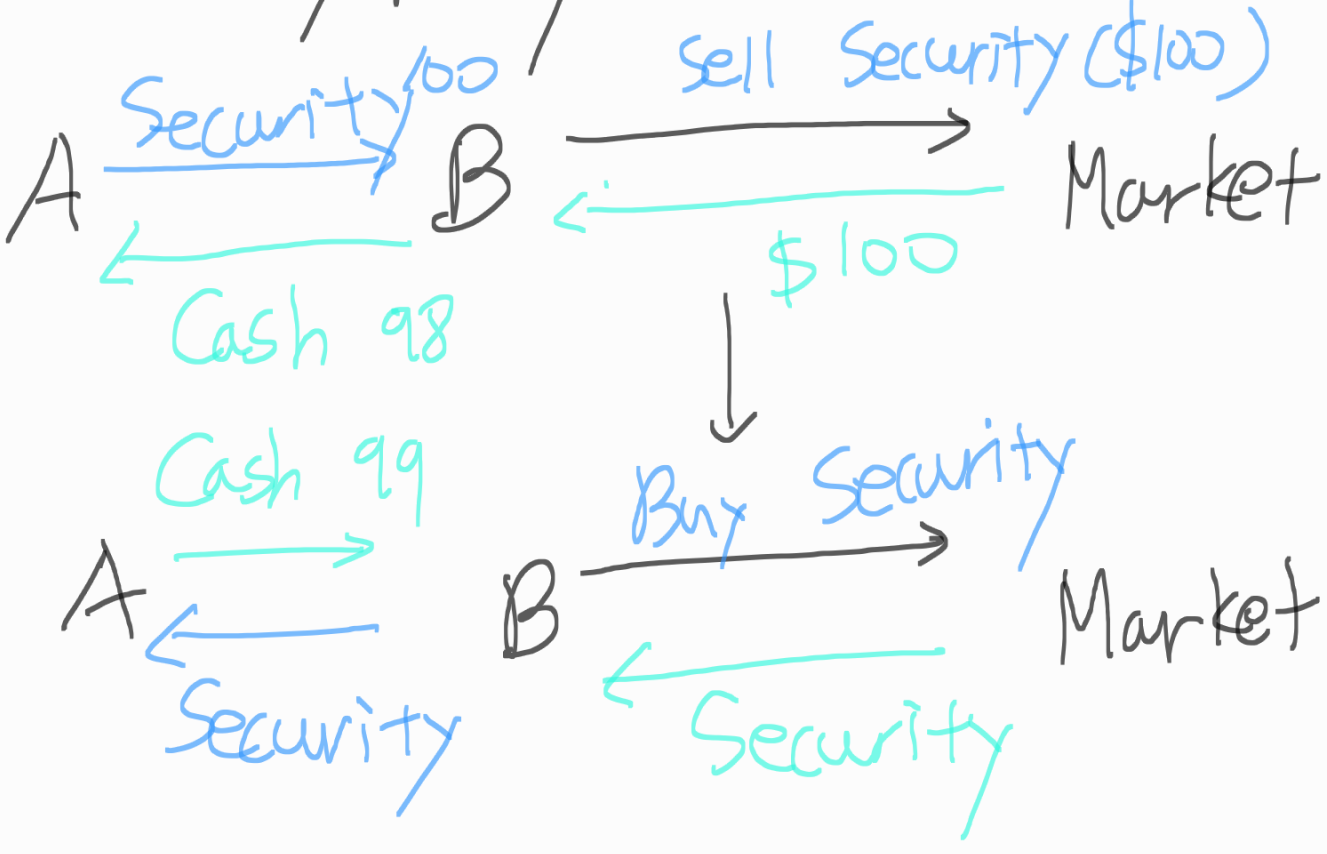
Repo rate: $\frac{\$1}{\$98} \times 360$

haircut: $\frac{100-98}{100}$ (discount rate for security)

Variation margin: Additional collateral because of ↓ value

= initial margin x adjusted purchase price

Applications

- Short-term benefit with low risks.
- Monetary policy
- 

⇒ Tool of Short-selling

Risks ↑ ⇒ Tri-party repos (risk ↓)
Bilateral repo

External debt / Domestic Debt

direct risk: Currency rate

indirect risk: government risk

Non sovereign governments bonds:

States, provincies, counties...

Agency / Quasi-government bonds:

⋮

Single-price auction: Issue at Highest rate → cutoff yield

among lowest prices

Primary dealers only