Key aspects of risk management for repos

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FOR FINANCIAL MARKETS

Key aspects of risk management for repos

1. valuation of collateral
2. revaluation of collateral
3. initial margin/haircut
4. margin maintenance
5. default procedures

valuation of collateral

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valuation of collateral

- basic question: how much would you get if you had to sell?
- think about liquidation value, not “market value”
- think about the process of selling what you are holding
- be careful about buying securities you do not normally trade
- technical issues --- incorporate all value (eg accrued interest)
- pricing issues
  - how liquid is the market --- speed & size of trading?
  - when using quotes, remember price varies with size

revaluation of collateral

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revaluation of collateral

- mark-to-market v mark-to-model
- mark-to-market = liquidation value
- mark-to-model can help with credit risk, but not liquidity risk

initial margin/haircut

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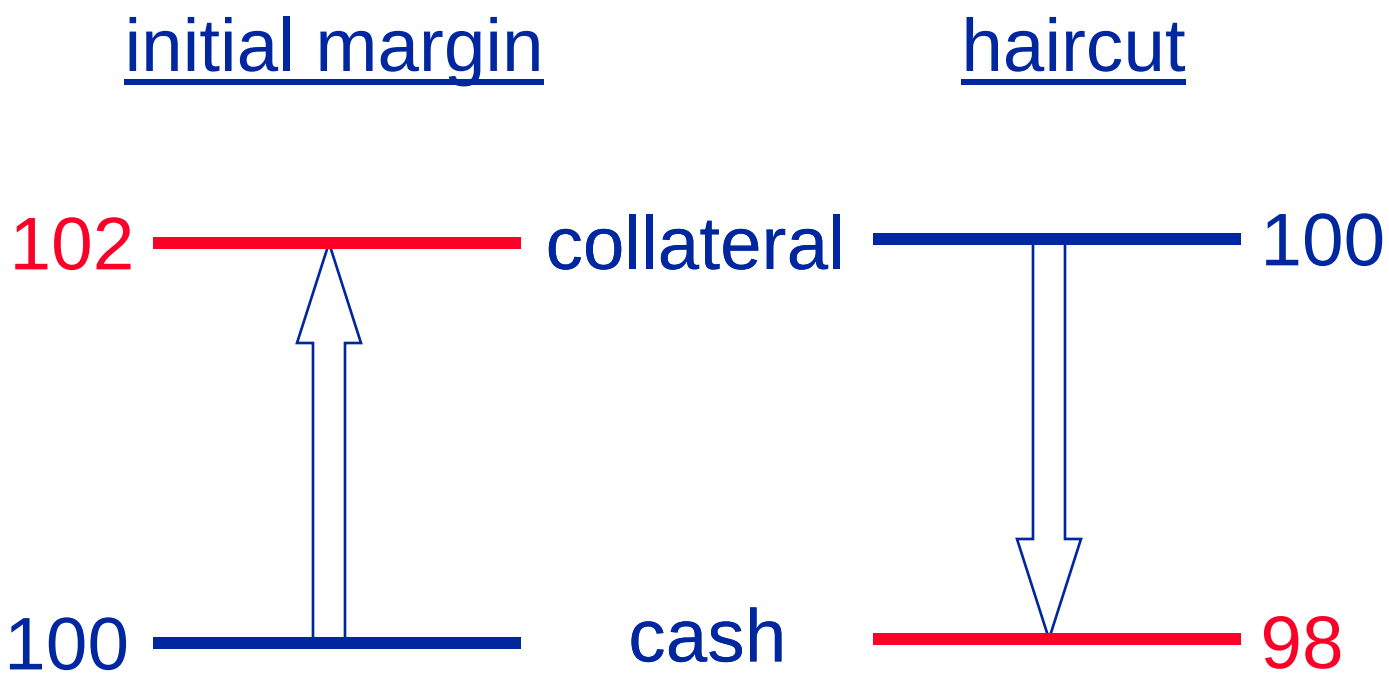
initial margin/haircut

- if price is uncertain or market turnover is low, buy collateral for less than its “market value”
- in other words, over-collateralise
- ask for an initial margin or a haircut
  - initial margin --- value of collateral expressed as a premium over value of cash (eg 102%)
  - haircut --- value of cash expressed as a discount under the value of collateral (eg 2%)

initial margin/haircut



initial margin/haircut

initial margin in GMRA

$$\text{initial margin} = \frac{\text{Market Value of collateral}}{\text{cash}}$$

$$\text{initial margin} = \frac{102}{100} = 102\%$$

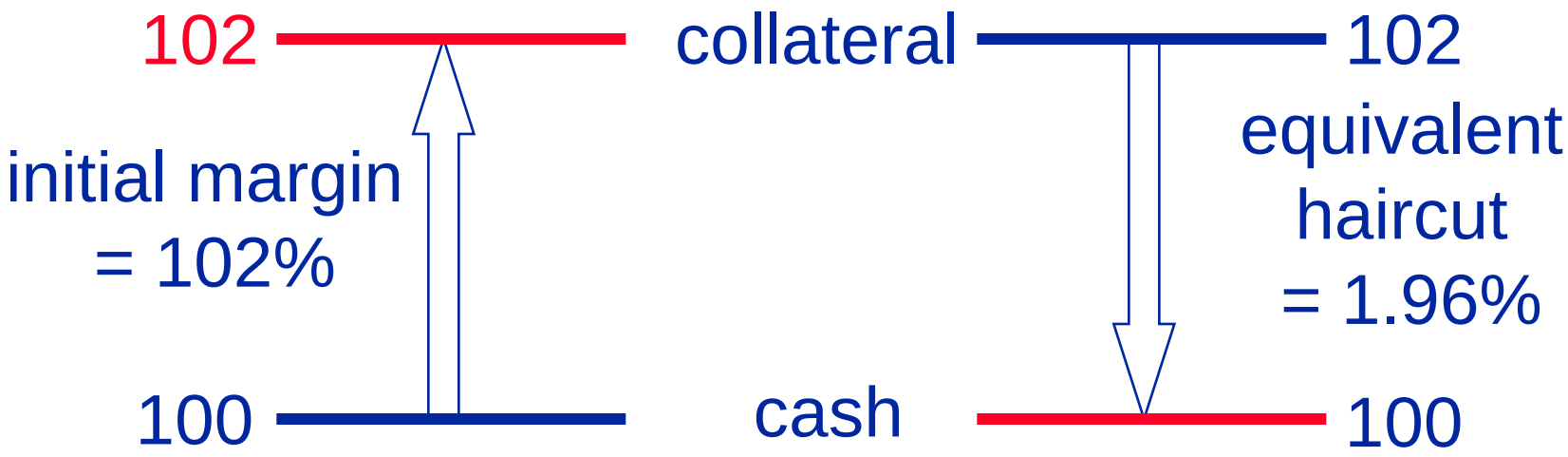
initial margin/haircut

haircut in GMRA 2011

$$\text{haircut} = \frac{\text{Market Value of collateral} - \text{cash}}{\text{cash}}$$

$$\text{haircut} = \frac{102 - 100}{100} = 2\%$$

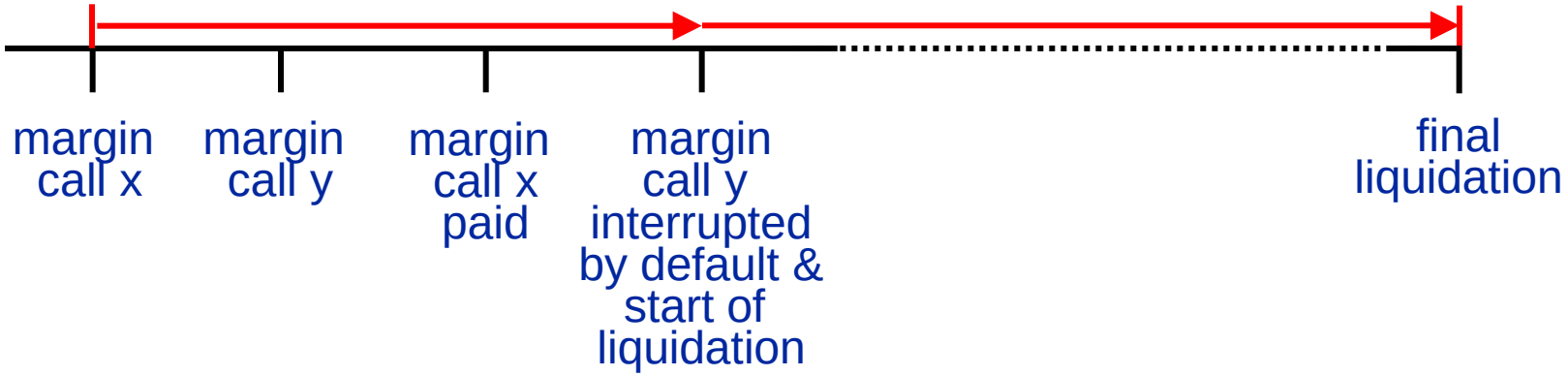
initial margin/haircut



initial margin/haircut

How wide should initial margin/haircut be?

- without margin maintenance, initial margin/haircut is cover for entire potential future exposure
- with margin maintenance, initial margin/haircut hedges the liquidation gap between:
  - last margin calculation answered with a margin call & default
  - default & the end of liquidation



initial margin/haircut

liquidation gap depends on:

- counterparty risk
  - but this is only the trigger
- your operational efficiency
  - discovering default
  - decision-making in response to a default
  - efficiency of liquidation
- illiquidity of collateral
  - market impact
  - delay in liquidation
- credit risk on collateral
- cross-currency exposure
- legal risk
  - lack of documentation
  - legal certainty

initial margin/haircut

initial margin/haircut often not be taken:

- inter-dealer transactions
- very short-term repo
- government bond collateral
- voicebrokered or electronic transactions

margin maintenance

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margin maintenance

- divergence between the market value of the collateral and the value of the cash should be eliminated by margin maintenance:
  - if the market value of collateral falls, buyer calls for extra collateral or cash refund
  - if the market value of collateral rises, the seller calls for extra cash or collateral back
- different mechanism for sell/buy-backs.

margin maintenance

- ICMA Global Master Repurchase Agreement (GMRA)
- ICMA Repo Margining Best Practices 2012

margin maintenance

- either party has right to call margin equal to or greater than its Net Exposure to other party
- Net Exposure is the difference between the sum for each party of:
  - aggregate Transaction Exposures
    plus
  - Income due but unpaid
    minus
  - Net Margin

margin maintenance

Transaction Exposure with initial margin
= (Repurchase Price x initial margin) – market value of collateral

Transaction Exposure with haircut
= Repurchase Price – [market value of collateral x (1 – haircut)]

margin maintenance

what transactions to include

- if Purchase Date is today or earlier
  - means assuming settlement on Purchase Date
- if Repurchase Date is today or later
  - means not assuming settlement on Repurchase Date
  - if margin is delivered T+1 or T+2, means margins will be due after the Repurchase Date

margin maintenance

Market Value

- GMRA says “generally recognised source agreed to by the parties”
- Repo Margining Best Practices says
  - middle price quoted at close of business yesterday
  - or bid price
  - margin taker supplies price
  - but margin giver must agree
  - disagreements

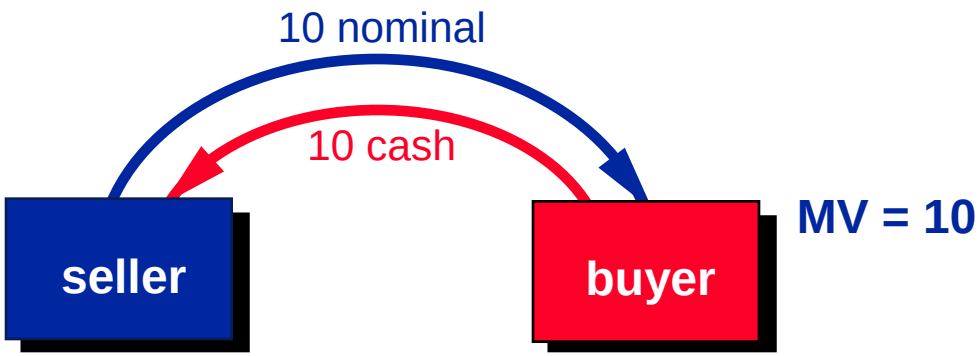
margin maintenance

Net Margin

- Net Margin = difference between margin held by each party
- repo margin not automatically returned

margin maintenance

repo for 10 cash against 10 nominal of collateral

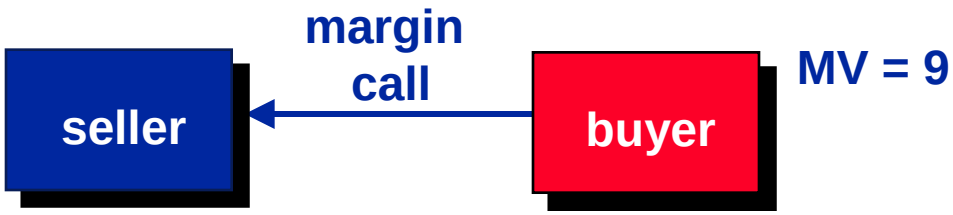


margin maintenance

collateral value falls to 9 during term of repo

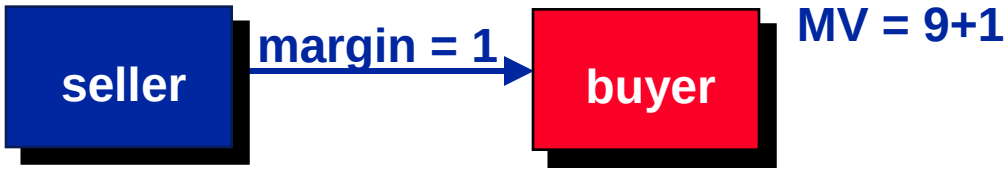
margin maintenance

buyer makes margin call of 1



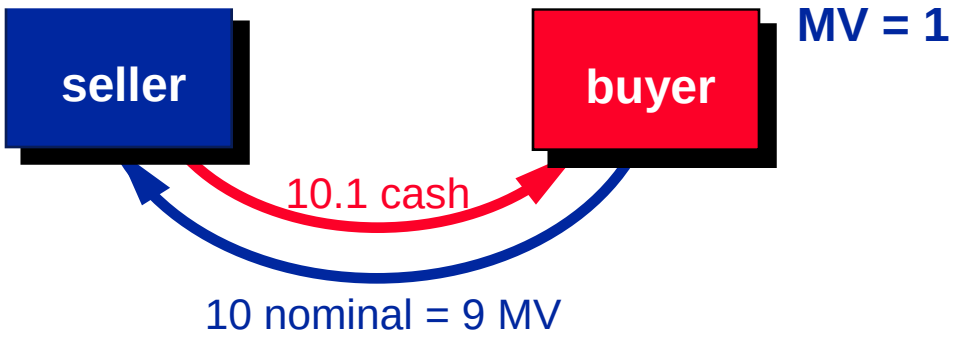
margin maintenance

seller pays margin call of 1



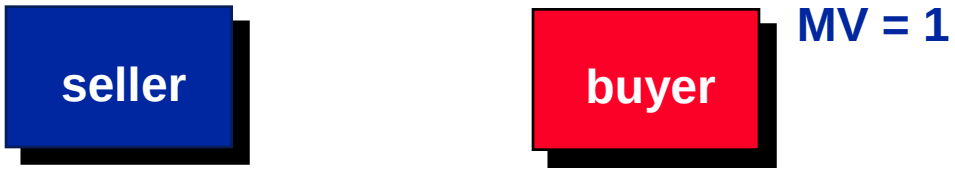
margin maintenance

seller pays back repurchase price of 10.1
buyer returns original collateral of 10



margin maintenance

buyer retains margin of 1 until seller makes margin call



margin maintenance

Net Exposure

	A	Z
TX_1	0.772	nil
TX_2	nil	0.359
TX_3	0.053	nil
aggregate TX	0.825	0.359
Income due	+nil	+0.475
Net Margin	-nil	-0.150
aggregate exposure	0.825	0.684
Net Exposure	0.141	nil

margin maintenance

- only current exposure is margined
- potential future exposure has to be covered by initial margin/haircut

margin maintenance

- margin can be paid in cash or securities or both
- decision usually at discretion of margin transferor
- call margin by 14:00 CET
- if margining with securities, allocate by 16:00 CET
- if margining in cash, agree interest rate

margin maintenance

give margin in cash or collateral?

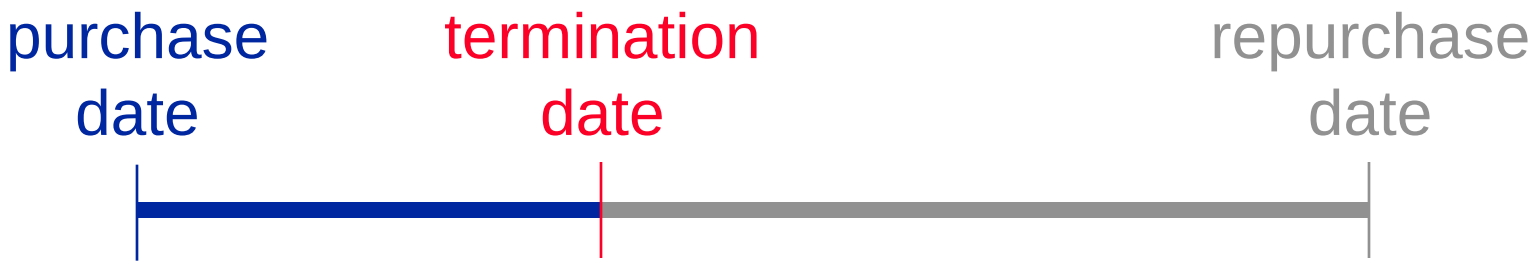
- cash rare in US & not widely used in Europe
- collateral usually favoured because:
  - economically neutral
  - less liquidity impact than cash
  - potential for re-use to meet other collateral requirements
  - cash has reinvestment & balance sheet issues
- but cash sometimes favoured because:
  - easy to value, no market risk
  - easy to transfer, little operational risk
  - no corporate events
  - no correlation with collateral or counterparty
  - later settlement cut-off times than securities

margin maintenance

- alternative method to eliminate Net Exposure for sell/buy-backs
- repo terminated/accelerated and replaced
- two alternative methods

margin maintenance

margin maintenance



margin maintenance

margin maintenance

- alternative method to eliminate Net Exposure for sell/buy-backs
- repo terminated/accelerated and replaced
- two alternative methods
  - Repricing method --- cash realigned to new market value of collateral
  - Adjustment method --- collateral realigned to latest repurchase price

margin maintenance

	buyer	seller
purchase date	+10 collateral	-10 collateral
	-10 cash	+10 cash

margin maintenance

	buyer	seller
purchase date	+10 collateral -10 cash	-10 collateral +10 cash
termination	-9 collateral +10 cash	+9 collateral -10 cash

margin maintenance

	buyer	seller
purchase date	+10 collateral -10 cash	-10 collateral +10 cash
termination	-9 collateral +10 cash	+9 collateral -10 cash
new repo	+10 collateral -10 cash	-10 collateral +10 cash

margin maintenance

	buyer	seller
purchase date	+10 collateral -10 cash	-10 collateral +10 cash
termination	-9 collateral +10 cash	+9 collateral -10 cash
new repo	+10 collateral -10 cash	-10 collateral +10 cash
net	+1 collateral	-1 collateral

margin maintenance

Major operational challenge. To mitigate burden:

- margin maintenance on repo documented under the same master agreement are made net.
- margin calls can be limited to material changes in net exposure --- excess of an agreed amount called minimum transfer amount.

margin maintenance

minimum transfer amount

- trade off between credit exposure & operational cost
- risk of abuse
- reciprocal agreement

default procedure

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default procedures

defaults trigger:

- close-out --- Repurchase Dates accelerated
- margin to be returned immediately
- non-defaulting party establishes Default Market Value of collateral --- conversion to monetary obligations --- and cash sums outstanding at new Repurchase Date
- everything converted to Base Currency
- set-off --- netting to single residual sum
- balance due next business day

default procedures

Events of Default

- standard list in GMRA
- two automatic events of default (acts of insolvency)
- otherwise default is triggered by Default Notice

default procedures

- Default Market Value has to be established by Default Valuation Time
- close of business on five business days after default
- if no valuation by deadline, but non-defaulting party reasonably determines that a *commercially reasonable* value cannot be determined, value will be fixed *as soon as reasonably practicable*

default procedures

calculation of Default Market Value:

- 3 options

default procedures

calculation of Default Market Value

- 3 options:
  - option 1 --- actual dealing prices
    - applied to amount of collateral dealt or all holdings

default procedures

calculation of Default Market Value

- 3 options:
  - option 2 --- market quotes
    - offers for collateral due from defaulter
    - bids for collateral due to defaulter
    - from 2 or more market-makers/regular dealers
    - in commercially reasonable size

default procedures

calculation of Default Market Value

- 3 options
  - option 1 and 2 --- combination of actual dealing prices and market quotes

default procedures

calculation of Default Market Value

- 3 options:
  - option 3 --- fair market value
    - if, *acting in good faith*, non-defaulting party has failed to:
      - buy/sell collateral
      - obtain quotations
      - or not *commercially reasonable* to obtain market quotes
      - or not *commercially reasonable* to use market quotes
    - estimate Net Value

default procedures

what is Net Value?

- fair market value
- based on appropriate pricing sources & methods
- in the *reasonable* opinion of non-defaulting party

default procedures

calculation of Default Market Value

- *reasonable legal and other professional expenses* arising from Event of Default
- plus on late payments
- but no consequential loss or damages
- recover loss or expense of replacement transactions or of unwinding/replacing hedging transactions
- loss or expense to be determined *in good faith* by non-defaulting party

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