

Introduction to International Repo & Securities Lending 全球债券回购与借贷

ASIFMA, CDC, UBS, RBS

February 19, 2007

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Legal Risk 法律风险 , Custodian Risk 托管风险 , Settlement Risk 结算风险)

SECTION 1 第一节

Basics of Repo & SellBuyBacks

证券回购，买断式回购，基本操作方法

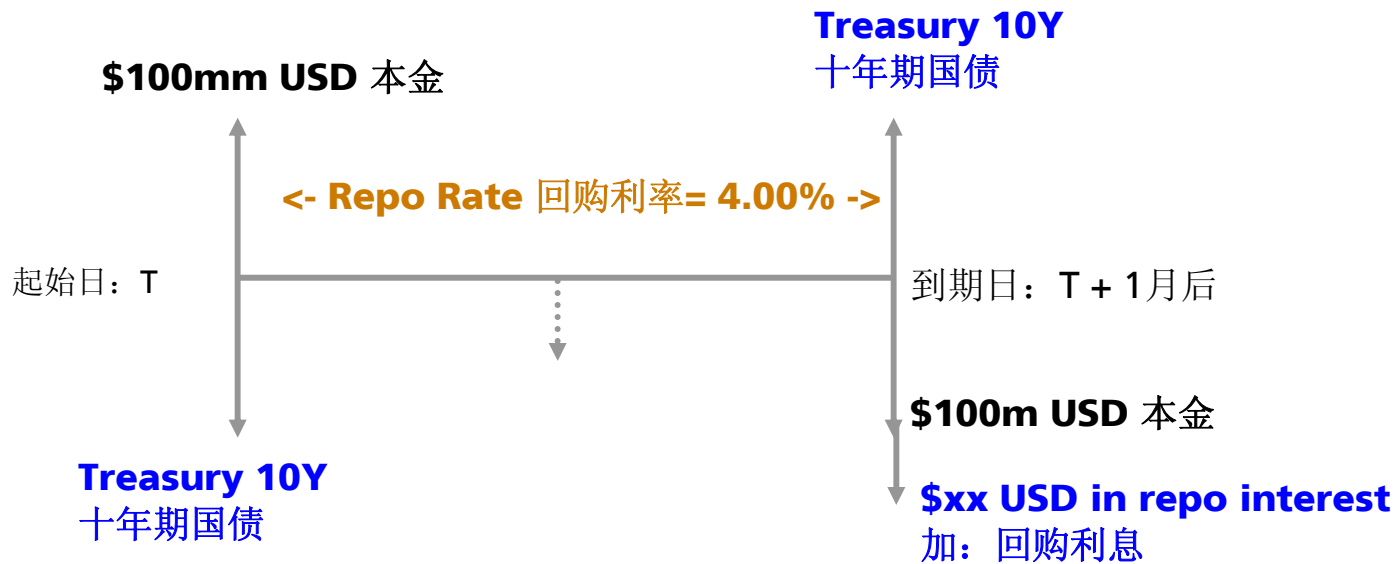
Classic Repo Basics & SellBuyBack Basics

证券回购，买断式回购，操作方法

- ◆ Internationally, there are many types of repo
国际上，回购种类繁多
- ◆ Most commonly used is the Classic Repo & ReverseRepo
最常用：“经典回购”与“经典逆回购”
- ◆ Next most commonly is the SellBuyBack & BuySellbacks
买断式回购与买断式逆回购
(卖出买入回购与买入卖出回购)
- ◆ Most Important 重要观念:
Repo as a Credit-Risk Mitigated Secured-Lending Product
证券回购：以抵押品减低借贷风险
- ◆ Other Types 其他种类
Gensaki 在日本交易的一种回购方式
Held-In-Custody 由融入资金方托管抵押品 (像国内的质押式回购)
etc 等。

Standard Repo Structure 标准回购结构

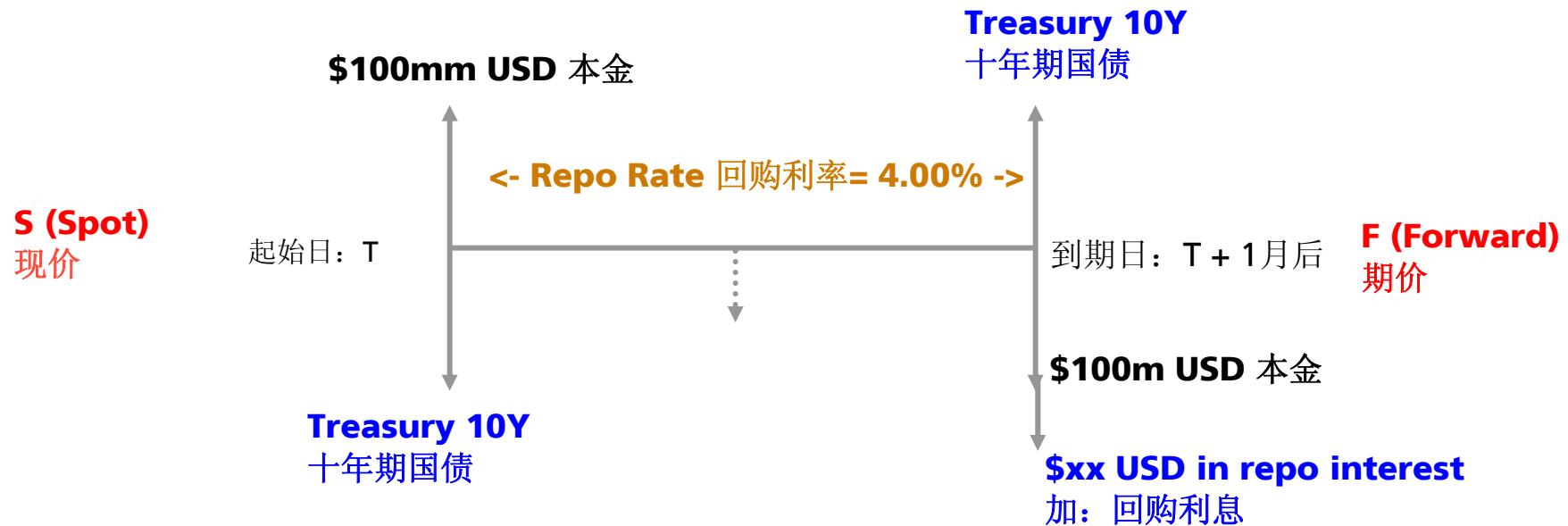
- ◆ Secured Loan : Cash Loan vs Securities as Collateral
有担保借贷：融出资金，借入证券



Standard SellBuyBack Structure 标准买断式回购

◆ Similar Structure

相似结构。开始：卖出证券。到期：买回证券。



Spot Price 现价 = 99.50 (clean净价) + 0.063881 (accrued interest 应计利息) = 99.563881

Forward Price 期价 = Spot Price 现价 + Carry 回购收益 = 99.563881 + 0.309754 = 99.873635

Carry 回购收益 = Spot现价 * RepoRate回购利率 * 日数 d / 360天
= 99.563881 * 4.00% * 28/360 = 0.309754

Repo Math 回购计算

$$F \text{ 起价} = S \text{ 现价} * (1 + \text{RepoRate 回购利率} * d/360)$$

$$(1 + \text{RepoRate 回购利率} * d/360) = \frac{(1 + r_{\text{USD}} * d/360)}{(1 + r_{\text{BOND}} * d/360)}$$

Rule of Thumb 简单地说:

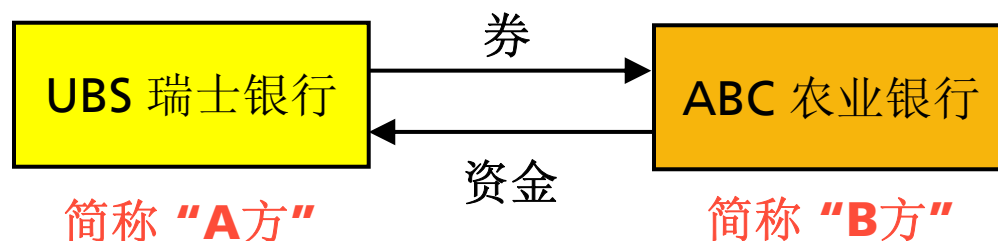
$$\text{RepoRate} \sim \text{USD Rate} - \text{Bond Fee}$$

$$\text{回购利率} \sim \text{现金贷款利率} - \text{借券的使用费}$$

$$4.00\% \sim 5.25\% - 125\text{bps}$$

$$\text{十年期国债回购利率} \sim \text{联邦基金利率} - \text{十年期国债借券使用费}$$

Repo Terminology 回购专用名词



Repo "Seller"
Repo "Lender"
 融资方

Repo "Buyer"
Repo "Borrower"
 融券方

Securities
 证券

Security Lender
 借出证券

Security Borrower
 借入证券

Cash
 现金

Cash Borrower
 融入资金

Cash Lender
 融出资金

Classic Repo 经典回购 (“RRRA” Bloomberg Ticket)

GRAB Govt **RRRA**
 屏幕已通过 <MESSAGE> 功能发送。

回购/逆回购分析

US TREASURY N/B T 4 ½ 02/15/17 100-14 /100-15 (4.57 /57) BGN @18:31
 CUSIP: 912828GH7

结算日	2/20/07	利率 (360)	4.0000%
价格	99.500000	抵押:	100.0000% 现金
收益	4.6881842	Y/N, HOLD COLLATERAL PERCENT CONSTANT?	Y
应计	0.0638812	Y/N, BUMP ALL DATES FOR WEEKENDS/HOLIDAYS?	Y
FOR 5 DAYS.		近似	1 1 = 没有近似 2 = 保留至最接近值 1/ 8
总计	99.5638812		

面额	M	100000	<或>	结算金额	99563881.22
<或> 查寻价格请输入债券数量、结算金额以及抵押金额					
终止日期		3/20/07	<或>	期限 (天数)	28
ACCRUED	0.421616	FOR	33	DAYS.	

终止现金

贷款金额	99,563,881.22
回购利息	309,754.30
终止现金	99,873,635.51

附注: **UBS LENDS BONDS TO ABC 瑞士银行 借出债券给 农业银行**

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
 G966-174-3 19-Mar-07 18:33:05

SellBuyBack 买断式回购 (“BSR” Bloomberg Ticket)

GRAB Govt **BSR**
 输入 1 <GO> 通过彭博电子邮件系统传递此屏幕。
 买回/卖回回购分析
 CUSIP: 912828GH7 Page 1 of 2
 US TREASURY N/B T 4 02/15/17 99-15 / 99-16 (4.69 /69) BGN @13:00

结算	2/20/07		
价格	99.50000000	<ACCRD: 0.06388122>	收益率 4.68818%
回购 % (实 / 360)	4.0000	<ACCRD # DAYS: 5>	推算 日期 / 价格
面额 M	100000		W 最差 2/15/17 100
Minimum Piece: 1000 / Minimum Increment: 1000			
终止	3/20/07		
远期价格	99.45201949	<ACCRD: 0.42161602>	期限 (实际天数): 28
远期点	0.047981	<ACCRD # DAYS: 33>	收益率 4.69428%
			推算 日期 / 价格
			W 最差 2/15/17 100

WTC COUPONS | FORWARD PRICE | WTC N

息票再投资		
日期	数额	利率
/ /		%
/ /		%
/ /		%

复利方法: BX
 P = 款项 或 B = 子弹债

抵押 100.0000 % OF MNY
 % 现金
 终止现金

* 结算额	99,563,881.22	*
回购利息	309,754.30	
终止现金	99,873,635.52	

持有债券 PRICE/FACE AMOUNT PX

NOTES: UBS LENDS BONDS TO ABC 瑞士银行 借出债券给 农业银行

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 6966-174-2 19-Feb-07 13:52:43

Discussion 讨论

- ◆ International market hardly uses “pledged repo”.
All securities are delivered. Securities are rehypothecable.

国际市场质押式回购比较少。

证券（债券）一般要过户。券从借出证券方的账户转到融出资金方的账户。

- ◆ Because international repo have rehypothecation rights,
bond borrowers can re-use the bonds. Consequently,
bonds become “special” and repo rates can go lower.
This is equivalent to “Bond Fee” increasing.
国际间的回购有“再借”的权力，所以借入证券方可以再借出证券给其他的借券方。
- ◆ Repo & Sellbuyback numbers are the same!
(only if there are no interim coupons)
当回购期间无利息支付时,经典回购和买断式回购是相同的。

Classic Repo (with interim coupon) 经典回购（回购期间有支付票息）

GRAB Govt **RRRA**

输入 1 <GO> 通过彭博电子邮件系统传递此屏幕。
回购/逆回购分析

US TREASURY N/B T 4 ½ 02/15/17 99-15 / 99-16 (4.69 /69) BGN @13:00
CUSIP: 912828GH7

结算日	2/20/07	利率 (360)	4.0000%
价格	99.5000000	抵押:	100.0000% 现金
收益	4.6881842	Y/N, HOLD COLLATERAL PERCENT CONSTANT?	Y
应计	0.0638812	Y/N, BUMP ALL DATES FOR WEEKENDS/HOLIDAYS?	Y
总计	99.5638812	近似	1 1 = 没有近似 2 = 保留至最接近值 1/ 8

FOR 5 DAYS.

面额	M	100000	<或>	结算金额	99563881.22
<或>	查寻价格请输入债券数量、结算金额以及抵押金额				
终止日期		8/20/07	<或>	期限 (天数)	181
ACCRUED	0.062840	FOR	5 DAYS.		

* WARNING: Term extends past coupon date
终止现金

贷款金额	99,563,881.22
回购利息	2,002,340.28
终止现金	101,566,221.49

附注: UBS LENDS BONDS TO ABC 瑞士银行 借出债券给 农业银行

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SellBuyBack (with interim coupon)

买断式回购（回购期间有支付票息）

GRAB Govt BSR
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买回/卖回回购分析

CUSIP: 912828GH7 Page 1 of 2
 US TREASURY N/B T 4 5/8 02/15/17 99-15 / 99-16 (4.69 /69) BGN @13:00

结算	2/20/07		
价格	99.50000000	(ACCRD: 0.06388122)	收益率 4.68818%
回购 % (实 /360)	4.0000	(ACCRD # DAYS: 5)	推算 日期 / 价格
面额 M	100000		W 最差 2/15/17 100
Minimum Piece: 1000 / Minimum Increment: 1000			
终止	8/20/07		
远期价格	99.18959710	(ACCRD: 0.06283967)	期限 (实际天数): 181
远期点	0.310403	(ACCRD # DAYS: 5)	收益率 4.73193%
			推算 日期 / 价格
			W 最差 2/15/17 100

ADD COUPONS to FORWARD PRICE (Y/N): **N**

息票再投资		
日期	数额	利率
8/15/07	2312500	4.000%
/ /		%
/ /		%

抵押 100.0000 % OF MNY
 % 现金 终止现金

结算额	99,563,881.22
回购利息	2,002,340.28
未调整终止现金	101,566,221.50
利息调整	99,252,436.77

复利方法: **BX**
 P = 款项 或 B = 子弹债

持有债券 PRICE/FACE AMOUNT **FX**

NOTES: UBS LENDS BONDS TO ABC 瑞士银行 借出债券给 农业银行

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 G966-174-2 19-Feb-07 13:48:00

Coupon Handling 如何处理回购期间所得票息

- ◆ Classic Repo: Repo Seller gets the coupon (Repo Buyer manufactures coupon)
- SellBuyBack: Repo Buyer keeps the coupon.

经典回购：借出证券方取回票息（借入证券方“制造票息”，才付给借出证券方）
买断式回购：借入证券方存用

- ◆ In international market, both the “Classic Repo” and “SellBuyback” allows the Repo Buyer practically the same rights. Only difference when there are interim coupons or tax.

国际间, 经典回购和买断式回购几乎相同。最主要分别在于票息和税额。

- ◆ In China, “pledged repo” seller freezes bond in his account. Therefore “pledged repo” buyer cannot reuse the bond.
- ◆ We can summarize:

国际经典回购 ~ = 中国质押式回购 + 券得过户
国际买断式回购 ~ = 中国买断式回购（银行间）

所以，中国的质押式回购，抵押证券冻结在帐户内。因此，借入证券方不能用该证券。

Main Uses of Repo 证券回购的主要用途

- ◆ **Financing Long Positions 融资用途, 为资产提供资金**
使用者 Who: Securities Companies 证券公司, Financial Institutions 金融机构
原因 Why: Need Cash; 需要资金; Limited Access to Unsecured Funds 无担保借贷额不足;
To Maintain Inventory 保持存货. Secured financing rates may be lower 使融资利率更低一些
- ◆ **Financing Leveraged Long Positions 以杠杆作用提升资产额**
使用者 Who: Hedge Funds 对冲基金, Banks 银行
原因 Why: Little capital 资本有限; Efficient Use of Capital 提升资本使用效率
- ◆ **Covering Short Positions 弥补空头头寸**
使用者 Who: Securities Companies 证券公司, Hedge Funds 对冲基金
原因 Why: Settlement 必须结算, Hedge Interest Rate Risk 对冲利息风险
- ◆ **Covering Leveraged Short Positions 以杠杆作用弥补空头头寸**
使用者 Who: Securities Companies 证券公司, Hedge Funds 对冲基金
原因 Why: Trading Strategies 交易投资策略
- ◆ **Investment of Cash 逆回购代表一种短期投资产品**
使用者 Who: Money Market 货币市场基金 & Mutual Funds / Unit Trust 共同基金/单位信托,
Central Banks 中央银行
原因 Why: Safe product 提供安全产品; Liquidity 流动性较高; Flexible Enddates 期限有弹性

Profit! Yield-Enhancement Combinations

商机！提升投资组合的收益率

Where there is market demand for borrowing securities, lend it out!
应市场借券的要求，把证券借出去！

Typical strategies 典型策略:

- Collateral Swap (Special vs GC) “抵押品掉换” (特别证券对一般证券)

$$\begin{array}{r}
 \text{正回购 repo(SBB) UST CT10 bond 十年期国债 1mth @ 4.15\%} \\
 + \text{逆回购 reverserepo(BSB) GC bond 一般证券 1mth @ 5.15\%} \\
 \hline
 = \text{net pickup 提升收益率 (CT10 vs GC) for } \mathbf{100 \text{ bps 基点}}
 \end{array}$$

- Credit Risk Creation 承担信贷风险

$$\begin{array}{r}
 \text{正回购 repo UST 10 bond 十年期国债 1mth @ 4.15\%} \\
 \text{银行定期存款 depo USD 1mth @ 5.25\%} \rightarrow \text{net pickup 提升收益率 } \mathbf{110 \text{ bps 基点}}
 \end{array}$$

- Gap Risk 期限差距风险

$$\begin{array}{r}
 \text{正回购 repo UST10 bond 十年期国债 1mth @ 4.15\%} \\
 \text{银行定期存款 depo USD 3mth @ 5.27\%} \rightarrow \text{net pickup 提升收益率 } \mathbf{112 \text{ bps 基点}}
 \end{array}$$

- Issuer Risk 发行者风险

$$\begin{array}{r}
 \text{正回购 repo UST10 bond 十年期国债 1mth @ 4.15\%} \\
 \text{买3月期的商业票据 buy ABCP 3mth @ 5.35\%} \rightarrow \text{net pickup 提升收益率 } \mathbf{120 \text{ bps 基点}}
 \end{array}$$

Collateral Types 抵押品种类

◆ “General Collateral” Repo (GC Repo) “一般”抵押品回购 (简称一般回购, GC)

Basket of Securities 一篮子公认的证券抵押品.

Securities can be substituted and replaced. 抵押品可以替换

Mainly used for funding. 融出资金方不指明某特定债券。主要是让借出证券方融资之用。

GC repo is an alternative to the lending of cash 一般回购是拆出资金的另一种方法

GC repo rate correlated w/ money market rates 一般回购利率与货币市场利率相关

◆ “Specials Repo” or “Specific Repo” “特殊”或“特定”抵押品回购

Security is explicitly identified (i.e. CGB 2.92% 9/26/16 国债060016)

No substitution. Will likely be used against a short position.

Specials repo rates are lower than GC repo rates.

特定证券:融出资金方指明借入某证券 (例: CGB 2.92% 9/26/16 国债060016)

不可替换。通常用于弥补空头头寸。特别抵押品回购利率要比一般抵押品回购利率低。

◆ Demand drives a bond from being “general collateral” to “very special”.

Factors determining a bond’s specialness include issue size, floating supply, and value in the cash market.

任何一张债券可由“一般”转为“特定”抵押品。在资金市场中,债券的发行量,增发量,价格等决定了特定抵押品的性质。

Collateral Types 抵押品种类

◆ More on “Specials Repo” or “Specific Repo” 特殊回购.....

strong demand **specific** piece of collateral 对特定抵押品有强烈需求
buyer offers cheap cash to seller 买方向卖方提供低成本资金
driver of special transactions is **security** 证券是特殊回购交易的驱动器
special repo is an alternative to securities lending
特殊回购是实现证券借贷的另一种方法

special rates match **securities lending fees** 特殊回购利率和证券借贷费率匹配
special repo is a **capital market instrument** 特殊回购是 资本市场工具

Example of Repo Rates 回购利率例子

GRAB Govt MSG
 1<GO>DEL, 2<GO>REPLY, 3<GO>FWD, 11<GO>NEXT, 12<GO>PREV, 99<GO>MENU OF OPTIONS
 From: ANNE ROEKLIKHITRAT, UBS AG 1/24 8:23:34
 Subject: UST ON-THE-RUNS REPO BID
 Attachment(s): None Page 1/ 2

UST ON-THE-RUNS REPO BID +65 6836 5660 (0) +65 9368 9791 (M)

BIDS		O/N	1wk	2wk	1mth
T4 ⁵ ₈	9/08	5.10	5.11	5.11	5.17
T4 ⁷ ₈	10/08	5.10	5.11	5.11	5.12
T4 ⁵ ₈	11/08	5.10	5.11	5.11	5.12
T4 ³ ₄	12/08	5.10	5.11	5.08	5.09
T4 ¹ ₂	2/09	5.15	5.16	5.16	5.17
T4 ⁷ ₈	5/09	5.15	5.16	5.16	5.17
T4 ⁷ ₈	8/09	5.15	5.16	5.16	5.17
T4 ⁵ ₈	11/09	5.15	5.16	5.16	5.17
T4 ¹ ₂	9/11	5.17	5.18	5.18	5.19
T4 ⁵ ₈	10/11	5.17	5.18	5.18	5.19
T4 ¹ ₂	11/11	5.15	5.16	5.16	5.17
T4 ⁵ ₈	12/11	4.80	4.80	4.90	5.05
T4 ¹ ₂	2/16	5.10	5.11	5.11	5.12

特定回购买率

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 G966-174-2 24-Jan-07 15:10:51

Example of Repo Rates 回购利率例子

```

GRAB
1<GO>DEL, 2<GO>REPLY, 3<GO>FWD, 11<GO>NEXT, 12<GO>PREV, 99<GO>MENU OF OPTIONS
Curncy MSG
From: ANNE ROEKLIKHITRAT, UBS AG 1/24 8:23:34
Subject: UST ON-THE-RUNS REPO BID
Attachment(s): None Page 2/ 2
UBS REPO ASIA +65 6836 5660 (0) +65 9368 9791 (M)
T51/8 5/16 5.17 5.18 5.18 5.19
T47/8 8/16 5.05 5.06 5.06 5.07
T45/8 11/16 4.25 4.30 4.30 4.30
T53/8 2/31 5.05 5.06 5.06 5.07
T41/2 2/36 4.90 4.90 4.80 4.55

GC OFFER: 一般回购卖率
<10 yr UST 5.15 5.14 5.14 5.15 OFFER
<30 yr UST 5.16 5.15 5.15 5.16 OFFER

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Market Risk 市场风险

- ◆ Just as unsecured loans 如同银行间的拆借贷款, repos also have interest rate risks 回购并有利息风险

- ◆ Example 举例:

repo trade notional 回购数额	100,000,000 USD (一亿美元)
repo term 回购期限	1month (一个月)

delta $\approx 100,000,000 * 0.01\% * 12 = \text{USD}\$833/\text{bp}$
利率增减一个基点, 收益波动USD\$833

- ◆ Size

Position in one bond 一张券的持有数额:	2,000,000,000 USD \rightarrow deltas = \$16,000/bp
Positions in whole repo book 回购组合的持有数额:	100,000,000,000 USD \rightarrow deltas = \$833,000 / bp

- ◆ GC repo rates less volatile 一般抵押品的回购利率较为稳定
Specials repo rates can be volatile 特定抵押品利率波动幅度较大
- ◆ Rate movement risks (Eurodollar futures trading, Fed hike, etc)
利率波动风险的主要原因: 随着欧元期货交易, 联储局调整利率等

Market Risk 市场风险

Repo & MM Curves 回购曲线 & 货币市场曲线

◆ Money Market Curves 货币市场利率曲线

Not just one curve. 不只一种曲线

Deposits, Fed Funds, LIBOR, Treasury Bill Rates
(银行存款, 联邦基金, 欧洲美元, 短期国库券)

◆ Repo Curves 回购利率曲线

US Treasury GC Curve

US Agency GC Curve

US MBS GC Curve

US Specials Repo Curves

Corporate Repo Curves

国债一般回购率曲线

机构证券一般回购率曲线

抵押证券一般回购率曲线

国债特定回购率曲线

企业债(一般/特定) 回购曲线

◆ Divergence of rates in post "9-11" period

9-11事件后一个月左右, 各种利息波动因信贷风险的不同, 造成利率曲线间的关系脱钩

Credit Risk 信用风险

- ◆ Repo offers double indemnity 回购提供双重保障

If the Seller fails, Buyer sells the Bond

If the Bond fails, Buyer calls on Seller for new collateral

如果卖方违约, 买方可以出售抵押品

如果抵押品违约, 买方可以要求卖方提供新的抵押品

- ◆ (Risk of collateral AND counterparty failure) < (Risk of collateral OR collateral failure)

(抵押品和对手方同时违约的风险) 比 (抵押品或对手方违约的风险) 小得多

Credit Risk 信用风险

◆ Cumulative Default Probabilities 累计违约概率

Credit Rating 信贷评级	6 mths (个月)	12 mths (个月)
AAA	0	0
AA	0.0075	0.015
A	0.0177	0.035
BBB	0.10837	0.205
BB	0.6748	1.345
B	3.3874	6.66

all figures are percentages
数据单位为%

Credit Risk 信用风险

- ◆ Cumulative Default Probability of 6mth Repo
6个月回购的累计概率

Counterparty (对手方评级)	Collateral (抵押品评级)	
	AA	BBB
AA	0.000000563%	0.000007695%
A	0.000001313%	0.000017955%

eg AA collateral from uncorrelated AA counterparty gives
default risk = $0.0075\% \times 0.0075\% = 0.000000563\%$

例如，AA级抵押品由非关联的AA级对手方提供，则
违约风险 = $0.0075\% \times 0.0075\% = 0.000000563\%$

Credit Risk 信用风险

◆ Reasons

- collateral has legal & operational risks
- collateral may generate unexpected losses
- collateral should be secondary defence
- primary defence is counterparty creditworthiness
- repo is no substitute for credit risk management
- repo is not an excuse for accepting lower credits

◆ Warning! 注意!

Credit Risk + Collateral = Operational Risk + Legal Risk
信用风险 + 抵押品 = 操作风险 + 法律风险

- 抵押品有法律及操作风险
- 抵押品可能会有意想不到的损失
- 抵押品应该充当第二道防线
- 第一道防线应该是对手方的信用程度
- 回购不能替代信用风险管理
- 回购不是接受较低信用交易的借口
(只和那些您愿意和他作无担保交易的对手方作回购)

Credit Risk 信用风险

- ◆ Repo allows:
回购能实现:

More business with same counterparty and same capital
在相同对手方、相同资本条件下, 做成更多的业务

→ higher return on capital 更高资本回报

Same business, same counterparties, and less capital
在相同业务量, 相同对手方条件下, 引用更少的资本

→ higher return on capital 更高资本回报

Credit Risk Mitigation 减低信用风险

- ◆ Credit risks in repo transactions can be mitigated / subdued via initial haircuts and mark-to-market margining
回购交易的信用风险可由保证金来减低

Initial Margin/Haircuts (One-time)

The start proceeds of a repo are usually equal or less than the market value of the collateral by an amount called the **initial margin or haircut**.

回购的初期金额通常等于或小于抵押品的市场价值，其差额部分即称为**初始保证金或折扣**。

Initial margin/haircut usually protect buyer against illiquidity of collateral and counterparty risk

初始保证金/折扣通常保护买方，降低以下风险：
抵押品的流动性低， **对手方风险**

Initial Haircuts 初始折扣率

- Haircut Matrix (Sample Only) 折扣率表（举例）

Rating 证券信用评级	1mth	3mth
A	5%	5%
BBB	10%	15%
BB+/BB	15%	20%
B+/B	30%	35%
B-	35%	40%

Will also depend on maturity, bullet/callable, liquidity
折扣率根据期限，种额，流动性而定

- Example 举例

KOREA08 (rated A)
Dirty Price 现价/全价 = \$93.00
Haircut 折扣率 = 5%
Face amount 面值 = 10,000,000 USD
Money amount 现金 = 8,835,000 USD

- What are appropriate haircuts? 折扣率以何为准？

Often firm-specific, but probably consider 95%/99% VAR and consideration of counterparty quality
通常保持在“VALUE-AT-RISK”的95%至99%之间，同时也考虑到交易对方的信贷风险

Credit Risk Mitigation via Margin Maintenance

信用风险减低: 保证金维护

- ◆ The market value of the collateral should be maintained by margin maintenance:
透过保证金维护, 以确保足够的抵押品。
抵押品的市值应该进行保证金维护管理。

if market value of collateral falls → buyer calls for extra collateral or cash refund
如果抵押品市值下降 → 买方追加保证金 (买方要求额外抵押品或部分资金返还)

if market value of collateral rises → seller calls for extra cash or collateral back
如果抵押品市值上升 → 卖方追加抵押品 (卖方要求额外资金或者部分抵押品返还)

Margin Maintenance Frequency

保证金维护调整次数

- ◆ Margin maintenance is a major operational challenge. To mitigate this burden: 保证金维护对具体操作是一个主要挑战。为降低操作负担有下列方法:

Margin maintenance on repo documented under the same master agreement are made **net**.

在主协议下的所有回购，保证金维护采用净额支付。

Margin calls can be limited by mutual agreement to material changes in **net exposure** --- excess of an agreed amount called a **margin maintenance limit** --- which is also the **minimum transfer amount**.

双方同意，追加保证金一定要等到不足的差额（或证**净额头寸**额）超过了**最低交付额净额头寸**才发出通知书。

Credit Risk Mitigation 减低信用风险

- ◆ Most importantly, your rights to make margin calls and liquidate collateral are stated in the legal agreement (GMRA)!

最重要点：

回购主协议 (GMRA “全球回购主协议”) 列明交易双方调整保证金额以及清盘出售抵押品的权力！

- ◆ Have we encountered liquidation?

公司是否曾经清盘？

Collateral Management

保证金的维护与管理

- ◆ Collateral management is the team whose activities are 抵押品管理/保证金管理部门负责
 - monitors collateral eligibility 确保抵押品符合接受条件
 - values the collateral 抵押品的估值
 - calculate exposure (value of collateral $<, =, >$ value of cash) 计算抵押品不足的数量
 - makes margin calls, recalls/substitutes collateral 发出保证金调整通知, 收回或掉换抵押品。

In general, what collateral is eligible? 可接受的抵押品是什么?

Cash is best 现金最好

"Like or Better Quality Securities" 同样或者更好信用评级的证券

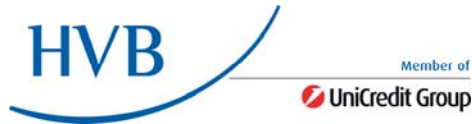
How do you value collateral? See pricing/valuation session

How to satisfy margin calls? 调整抵押品的方法?

- 1) Post cash (earn interest?) 现金保证金 (有没有加利息?)
- 2) Post eligible securities 提交可接受的证券
- 3) Reprice trade 重新定价

Collateral Management (Exposure Example)

- ◆ Example provided by Eduard Cia (HVB) 例子



Risk evaluation list 风险评估表

Overview 概览

THE OVERVIEW SHOWS THE CALLABLE MARGIN AMOUNTS (IN RELATION TO THE MINIMUM TRANSFER AMOUNT (MTA))

概览中显示了可调整保证金数量（超过MTA 部分相关）

Margin evaluation overview as of 10/14/2004

in EUR, customer with risk > -500.000,00

- we have to receive -

Sec. account	Customer	Total risk	Master agreement	Margin percent
0000 0069128041,	Counterpart A 顾客A	-695.446,56	17.08.1998	
0000 0069004377,	Counterpart B 顾客B	-803.611,32	18.12.2002	
0000 0068410452,	Counterpart C 顾客C	-751.500,00	13.01.1998	

* - risk defined by customer

Risk evaluation list 风险评估表

Detailed report by counterparty 对手方详尽报告

Margin evaluation as of 14.10.2004
in EUR, Counterpart A

Sec.ID	ISIN No.	Units/nominal	Start	End	New price	Haircut	现在价值	交易现金	Risk margin amount
							Receivable/liability New valuation amount	Principal	
Buy - ReverseRepo 逆回购交易头寸									
RR 131323	IT0000367497	85.000.000,00	14.10.04	15.11.04	109,070000	100,0000	94.333.280,50	-94.299.000,00	34.280,50
RR 648386	ES0414970139	10.000.000,00	13.10.04	20.10.04	109,175000	100,0000	11.193.664,38	-11.175.596,00	18.068,38
Total Buy - Reverse Repo:							105.526.944,88	-105.474.596,00	52.348,88
Sell - Repo 正回购交易头寸									
R 353474	AT0000384938	100.000.000,00	16.08.04	16.11.04	110,450000	100,0000	-114.552.459,02	113.337.662,93	-1.214.796,08
R 353474	AT0000384938	100.000.000,00	16.08.04	16.11.04	110,450000	100,0000	-114.552.459,02	113.337.662,93	-1.214.796,08
Total Sell - Repos:							-229.104.918,03	226.675.325,87	-2.429.592,17
Margin (Cash, Security) Deposit 抵押品									
SD 138157	DE0001381572	600.000,00	21.09.04-	(open)	108,240000	100,0000	672.718,69	0,00	672.718,69
SD 138157	DE0001381572	900.000,00	27.09.04-	(open)	108,240000	100,0000	1.009.078,03	0,00	1.009.078,03
Total Margin Deposit:							1.681.796,72	0,00	1.681.796,72

总共风险

Risk: -695.466,56 !!! MARGIN CALL !!!

Margining (One Simple Example)

调整保证金的例子

- During the life of trade, mark-to-market and margining will manage exposures
在回购期间，用市场价计价，调整保证金，以减低信贷风险
- Example 例子

KOREA08 (rated A) 证券
 Dirty Price 全价= \$93.00
 Haircut 折扣率 = 5%
 Face amount 面额 = 10,000,000 USD
 Money amount 现金 = 8,835,000 USD
 UBS lends cash

	市计价 * 折扣率 HaircuttedValue	风险额 Exposure
If DirtyPrice若全价= \$92	8,740,000	-95,000
If DirtyPrice若全价= \$93	8,835,000	0
If DirtyPrice若全价= \$94	8,930,000	95,000

- Make a margin call when Exposure > MTA
若风险额超过最低交付额 (“MTA”) 即须发出调整保证金的通知

MTA (Margin Threshold Amount) depends on rating of counterparty and operational risks. I.e. MTA for a small hedge fund may be 50,000 USD.

MTA (保证金最低的交付额) 是根据交易对手及操作风险程度而定。若对手方是一家小型的对冲基金，可能只是 5 万美元。

Collateral Management (Which Trades?)

抵押品管理 (哪些交易 ?)

- ◆ Note, did not restrict Collateral Management activities for just “repo”
抵押品管理业非只限与回购交易之用。
 - ◆ Collateral Managers cover different trade exposures
包括以下的例子
 - repo trades 回购
 - interest-rate swaps 利息掉期
 - securities-lending transactions 证券借贷业务
- ... generally, any trade that has post-transaction credit exposure
where credit-risk management is required

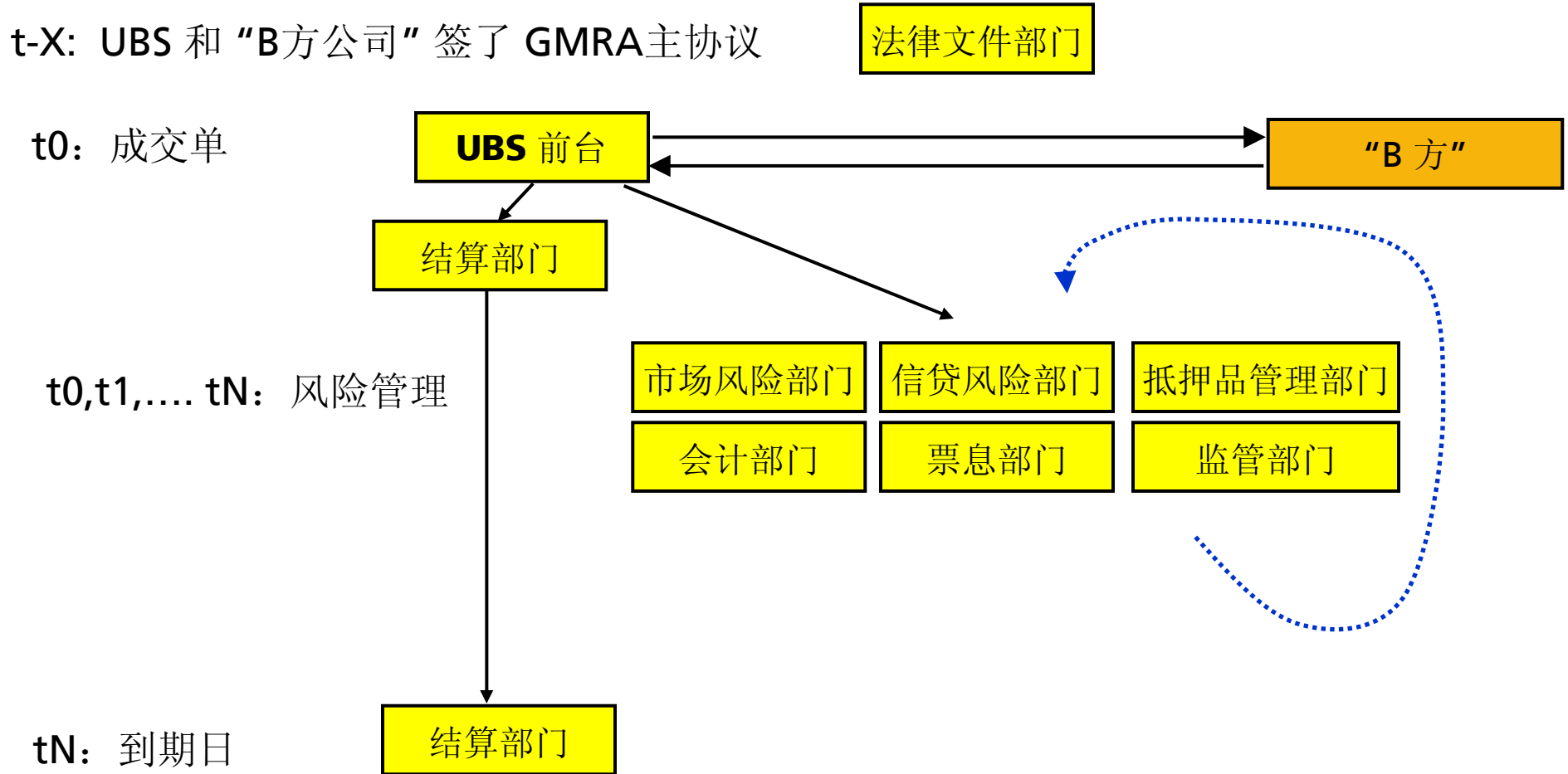
任何交易，只要交易后有信贷风险， 都必用抵押品管理部门管理风险。

Prices for Securities/Collateral

证券或抵押品的市价

- ◆ Repo transactions are generally Security vs Cash
回购交易一般指证券 现金掉换。
- ◆ Securities Lending transaction are Security vs Collateral
证券借贷指证券对抵押品的调换
(collateral can be cash or other securities)
抵押品可以是现金或其他证券
- ◆ Pricing issues apply in general to both Security and Collateral
证券或抵押品都须注意市价的准确性。
- ◆ Price concerns include 市价的相关题:
 - Sources (do they exist?) 价钱的来源 (是否有市有价?)
 - Availability & Robustness 准确性
(end of day, start of day, intraday; prices updated or just re-fed)
(开市价, 毕市价 ?)
 - Price disagreements during margin calls (illiquid securities, whose price is right)?
若调整保证金时, 双方无法达成市价的同意, 如何处理? 。 (若流动性偏低, 该用谁的价格?)

Time Line 时间程序



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