

Project  
Portfolio theory

International finance and globalization

## Letter from your CEO

Dear financial analysts,

As you know we got 9 new clients this week and all of them are waiting for their portfolio proposal from our Investment fund by Monday (**15/10/2018**). Please note that our clients are very busy, so you will have no more than **12 minutes** for your presentation and 4 minutes for Q&A session. Also note that all clients want to hear all of the team members during presentation in order to get acquainted with their future investment consultants.

All our clients want a portfolio (that contains **at least 3 securities**) that is well-diversified in terms of different financial instruments, countries and industries and that perfectly satisfy their needs. Clients profiles with detailed information can be seen below. If you cannot satisfy the requirements perfectly, provide the closest estimate and explain why it was impossible to fulfill clients needs. If you can find better return under the risk profile of your client – show it!

Our research team prepared some current materials on bonds and stocks that will help you to construct a proper portfolio. However, you are free to use any other sources to find out more information on these financial instruments or even suggest investment in some other securities. Any current news about the companies that you have decided to include in your portfolio is welcomed.

Good luck!

CEO of IR-INVEST Corp

Ella Khromova

## Hints from your CEO

**1) Portfolio calculation**

**Expected return of a portfolio** = Expected return of security A \* weigh of security A in portfolio +  
Expected return of security B \* weigh of security B in portfolio...

**Portfolio risk**=Portfolio volatility=

$$= \sqrt{\text{Volatility of security A}^2 * \text{weigh of security A}^2 + \text{Volatility of security B}^2 * \text{weigh of security B}^2 + 2\text{Covariance between returns of security A and B} * \text{weigh of A} * \text{weigh of B} + \dots}$$

You can assume *during your calculations* that Covariance between any securities is zero . However you need separately to comment whether your securities are correlated or not and whether it is good or bad in terms of your portfolio risk

**2) Bond evaluation**

**Expected return of a bond** can be approximated by YTM of Current Yield + You need separately discuss whether do you expect to have capital gains or losses if you sell bond before maturity

**Bond risk** can be approximated as Bond Duration (Mod DUR is calculated in %) + You need separately to discuss Volatility of bonds prices (in case you are going to sell a bond before maturity) and Risk of default of a bond(Rating)

**3) Stock evaluation**

**First of all you need to compare Multipliers of a company with Industry Multipliers (Google them or calculate from similar companies median) and find out those stocks that are UNDERVALUED.**




**Expected return of a stock** can be approximated by Dividend Yield + You need separately discuss whether do you expect to have capital gains or losses if you sell a company( depends on price volatility)

**Stock risk** can be approximated as Volatility of stock prices and Risk of default of a company(Rating)

**4)Hedging (not obligatory)**

You can separately advise your client how to hedge his currency or interest rate risk of the portfolio.

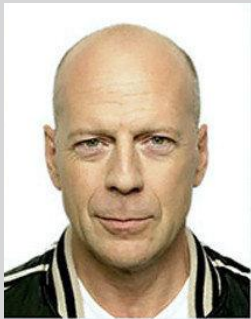


## Client profile

| Client № | Client photo  | Overall info  | Amount of investment and investment horizon | Expected annual return in USD                                       | Attitude to risk (maximum loss for 60 days) |
|----------|---|---|---|---|---|
| 1        |    | <p><b>Yuriy Vitalevich Kantemirov</b></p> <ul style="list-style-type: none"> <li>•Russian</li> <li>•Manager at Sberbank</li> <li>•Married</li> </ul>        | 25 mln RUB for 3 years                      | 6%  | 2%  |
| 2        |   | <p><b>Anzhela</b></p> <ul style="list-style-type: none"> <li>•Russian</li> <li>•Source of funds is unknown</li> <li>•Single, but has a boyfriend</li> </ul> | 30 mln RUB for 2 years                      | She doesn't know what % is, so she wants to earn 5 mln RUB per year | No risk!                                    |
| 3        |  | <p><b>Ahmed al Raptun</b></p> <ul style="list-style-type: none"> <li>•Arab</li> <li>•Sheikh</li> <li>•3 wives and 20 children</li> </ul>                    | 3 mln USD for 10 years                      | 16%   | 12%   |

## Client profile

| Client № | Client photo  | Overall info  | Amount of investment and investment horizon | Expected annual return in USD | Attitude to risk (maximum loss for 60 days) |
|----------|---|---|---|-------------------------------|---|
| 4        |    | <b>Dzhevahal Kapura</b> <ul style="list-style-type: none"> <li>•Hindu</li> <li>•Film studio director</li> <li>•Married</li> </ul>         | 0.5 mln USD for 1 year                      | 4%                            | 1%  |
| 5        |   | <b>Anna Zhdanova</b> <ul style="list-style-type: none"> <li>•Russian</li> <li>•CEO of Russian cosmetics brand</li> <li>•Single</li> </ul> | 60 mln RUB for 5 years                      | 10%                           | 7%  |
| 6        |  | <b>Walter Fischer</b> <ul style="list-style-type: none"> <li>•German</li> <li>•IBD analyst at Goldman Sachs</li> <li>•Single</li> </ul>   | 1 mln EUR for 4 years                       | 7%                            | 3%  |

## Client profile

| Client № | Client photo  | Overall info   | Amount of investment and investment horizon | Expected annual return in USD | Attitude to risk(max loss for 60 days) |
|----------|---|--|---|-------------------------------|--|
| 7        |    | <b>Bruce Willis</b> <ul style="list-style-type: none"> <li>•USA</li> <li>•Actor</li> <li>•Married</li> </ul>                                 | 100 mln USD for 4 years                     | 100%                          | 85%                                    |
| 8        |    | <b>Akiko Tanaka</b> <ul style="list-style-type: none"> <li>•Japanese</li> <li>•Product manager at Honda Motor Co</li> <li>•Single</li> </ul> | 100 mln JPY for 5 years                     | 12%                           | 10%                                    |
| 10       |  | <b>Bahir Azar</b> <ul style="list-style-type: none"> <li>•Arab</li> <li>•Oil rig owner</li> <li>•Single (yet)</li> </ul>                     | 10 mln USD for 10 years                     | 11%                           | 8%                                     |

Italy government bond

BTPS 5 08/01/34 ↓114.783 -1.9/1 114.717 / 114.852 3.792 / 3.781

AL 18:59 -- X -- SOURCE

**BTPS 5 08/01/34 Corp** Settings Page 1/12 Security Description: Bond

94 Notes 95 Buy 96 Sell

25 Bond Description 26 Issuer Description

| Pages                | Issuer Information                    | Identifiers             |
|----------------------|---------------------------------------|-------------------------|
| 1) Bond Info         | Name BUONI POLIENNALI DEL TES         | ID Number ED1544706     |
| 2) Adrtl Info        | Industry Sovereigns                   | ISIN IT0003535157       |
| 3) Reg/Tax           | Security Information                  | FIGI BBG00002VSW3       |
| 4) Covenants         | Mkt Iss Euro-Zone                     | Bond Ratings            |
| 5) Guarantors        | Country IT Currency EUR               | Moody's Baa2u *-        |
| 6) Bond Ratings      | Rank Unsecured Series                 | S&P NR                  |
| 7) Identifiers       | Coupon 5.000000 Type Fixed            | Fitch BBB               |
| 8) Exchanges         | Cpn Freq S/A                          | DBRS BBBHu              |
| 9) Inv Parties       | Day Cnt ACT/ACT Iss Price 98.10600    | Issuance & Trading      |
| 20) Fees, Restrict   | Maturity 08/01/2034 Reoffer 98.106    | Amt Issued/Outstanding  |
| 21) Schedules        | BULLET                                | EUR 25,111.00 (MM) /    |
| 22) Coupons          | Iss Sprd +3.00bp vs BTPS 5 ¾ 02/01/33 | EUR 25,111.00 (MM)      |
| Quick Links          | Calc Type (523)ITALY:TRSY BONDS       | Min Piece/Increment     |
| 32) ALLQ Pricing     | Pricing Date 09/17/2003               | 1,000.00 / 1,000.00     |
| 33) QRD Qt Recap     | Interest Accrual Date 08/01/2003      | Par Amount 1,000.00     |
| 34) TDH Trade Hist   | 1st Settle Date 09/24/2003            | Book Runner JOINT LEADS |
| 35) CACS Corp Action | 1st Coupon Date 02/01/2004            | Exchange Multiple       |
| 36) CF Prospectus    |                                       |                         |
| 37) CN Sec News      |                                       |                         |
| 38) HDS Holders      |                                       |                         |
| 66) Send Bond        |                                       |                         |

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
 SN 529493 MSK GMT+3:00 H823-1582-2 08-Oct-2018 19:49:12

BTPS 5 08/01/34 Corp Settings Yield and Spread Analysis

114.717/114.852 3.792/3.781 BGN @ 18:59 95 Buy 96 Sell

1) Yield & Spread 2) Graphs 3) Pricing 4) Description 5) Custom

BTPS 5 08/01/34 ( IT0003535157 ) Risk

| Spread                     | Price                      | Yield                     | Wkout                                 | Settle   | Risk           | Workout | OAS     |
|----------------------------|----------------------------|---------------------------|---------------------------------------|----------|----------------|---------|---------|
| -1.90 bp vs BTPS 5 ¾ 02/33 | 114.852 ↕ 121.802 19:51:13 | 3.780962 wst 3.799972 Ann | 08/01/2034 @ 100.00 Consensus Yld 6.6 | 10/10/18 | M.Dur • Dur    | 10.959  | 11.347  |
|                            |                            |                           |                                       |          | Risk Convexity | 12.691  | 13.141  |
|                            |                            |                           |                                       |          | DV 01 on 1MM   | 1.577   | 1.628   |
|                            |                            |                           |                                       |          | Benchmark Risk | 1,269   | 1,314   |
|                            |                            |                           |                                       |          | Risk Hedge     | 12.208  | 12.625  |
|                            |                            |                           |                                       |          | Proceeds Hedge | 1,040 M | 1,041 M |

| Spreads         | Yield Calculations              | Invoice                        |
|-----------------|---------------------------------|--------------------------------|
| 1) G-Sprd 299.5 | True Yield Gross • Net 3.780962 | Face 1,000 M                   |
| 2) I-Sprd 235.1 | Yield 3.781196                  | Principal 1,148,520.00         |
| 3) Basis 54.6   | Equiv 2/Yr Yield 3.745883       | Net Accrued (70 Days) 9,510.90 |
| 4) Z-Sprd 243.2 | MMkt Equiv Yield                | Total (EUR) 1,158,030.90       |
| 5) ASW 251.8    |                                 |                                |
| 6) OAS 292.0    |                                 |                                |

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UBS bond

UBS 5 PERP \$↑ 87.422 - .370 87.058 / 87.786 8.720 / 8.492  
 At 19:52 -- X -- Source CBBT

UBS 5 PERP Corp Settings Page 1/12 Security Description: Bond

94 Notes 95 Buy 96 Sell

25 Bond Description 26 Issuer Description

| Pages                | Issuer Information                      | Identifiers            |
|----------------------|---|------------------------|
| 1) Bond Info         | Name UBS GROUP FUNDING SWITZE           | ID Number AQ9022791    |
| 2) Adrtl Info        | Industry Financial Services             | ISIN CH0400441280      |
| 3) Reg/Tax           | Security Information                    | FIGI BBG00JVQF232      |
| 4) Covenants         | Mkt Iss Euro-Dollar Capital Type CoCo   | Bond Ratings           |
| 5) Guarantors        | Country CH Currency USD                 | Moody's Ba1u           |
| 6) Bond Ratings      | Rank Jr Subordinated Series             | S&P BB                 |
| 7) Identifiers       | Coupon 5.000000 Type Variable           | Fitch BBB-             |
| 8) Exchanges         | Cpn Freq Annual                         | Composite BB+          |
| 9) Inv Parties       | Day Cnt ISMA-30/360 Iss Price 100.00000 | Issuance & Trading     |
| 10) Fees, Restrict   | Maturity PERPETUAL Reoffer 100          | Amt Issued/Outstanding |
| 11) Schedules        | PERPETUAL CALL 01/31/23@100.00          | USD 2,000,000.00 (M) / |
| 12) Coupons          | Iss Sprd                                | USD 2,000,000.00 (M)   |
| Quick Links          | Calc Type (1469)FIX-TO-VARIABLE BD      | Min Piece/Increment    |
| 32) ALLQ Pricing     | Pricing Date 01/24/2018                 | 200,000.00 / 1,000.00  |
| 33) QRD Qt Recap     | Interest Accrual Date 01/31/2018        | Par Amount 1,000.00    |
| 34) TDH Trade Hist   | 1st Settle Date 01/31/2018              | Book Runner UBS-sole   |
| 35) CACS Corp Action | 1st Coupon Date 01/31/2019              | Reporting TRACE        |
| 36) CF Prospectus    |   |                        |
| 37) CN Sec News      |   |                        |
| 38) HDS Holders      |   |                        |
| 66) Send Bond        |   |                        |

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 SN 529493 MSK GMT+3:00 H823-1562-2 08-Oct-2018 19:52:49

Bond Matures on a SUNDAY

UBS 5 PERP Corp Settings Yield and Spread Analysis

87.058/87.786 8.720/8.492 CBBT @ 19:52 95 Buy 96 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom 6 Calls

UBS 5 PERP ( CH0400441280 )

|        |                      |                   |                                     |
|--------|----------------------|-------------------|-------------------------------------|
| Spread | 524.97 bp vs         | 5y T 2 % 09/30/23 | Coupon Schedule                     |
| Price  | 87.786 G.P. 91.25822 | 99-03+ 19:53:00   | Fix Coupon Pay Date Frequency       |
| Yield  | 8.319008 Call        | 3.069280 S/A      | 5.0000 01/31/2019 1.0000            |
| Wkout  | 01/31/2023 @ 100.00  | Consensus Yld 6.6 | 5.0000 01/31/2023 1.0000            |
| Settle | 10/10/18             | 10/09/18          | Coupon Method F S23 - USD (30/36... |

Default Swap curve is used for projecting...

|            |        |                   |          |          |
|------------|--------|-------------------|----------|----------|
| 11) G-Sprd | 527.8  | Street Convention | 8.492023 | 6.287584 |
| 12) I-Sprd | 513.8  | Equiv 2 /Yr       | 8.319008 | 6.191740 |
| 13) Basis  | -448.9 |                   |          |          |

Z-Sprd N.A.  
 ASW N.A. \*Risk calculations done to the end of the  
 Calculate OAS fix coupon period - 01/31/2023

|                 |     |         |        |
|-----------------|-----|---------|--------|
| Risk            | OAS | Workout | Reset  |
| M.Dur Dur       |     | 3.811*  | 3.811* |
| Risk Convexity  |     | 0.163*  | 0.163* |
| DV 1 on 1,000 M |     | 334*    | 334*   |
| Benchmark Risk  |     | 4.558*  | 4.558* |
| Risk Hedge      |     | 733 M   | 733 M  |

Invoice

|                    |            |
|--------------------|------------|
| Face               | 1,000 M    |
| Principal          | 877,860.00 |
| Accrued (250 Days) | 34,722.22  |
| Total (USD)        | 912,582.22 |

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 SN 529493 MSK GMT+3:00 H823-1562-3 08-Oct-2018 19:53:03



USA Treasury bond

T 1 3/4 10/31/18 ↑99-31+ -- 99-30 7/8 /99-31+ 2.321 / 1.996  
 At 19:01 Source BGN

T 1 3/4 10/31/18 Govt Settings Page 1/11 Security Description: Bond  
 99 Buy 90 Sell

29 Bond Description 20 Issuer Description

| Pages                | Issuer Information             | Identifiers                   |
|----------------------|--------------------------------|-------------------------------|
| 11) Bond Info        | Name US TREASURY N/B           | ID Number 912828RP7           |
| 12) Addtl Info       | Industry US GOVT NATIONAL      | CUSIP 912828RP7               |
| 13) Covenants        | Security Information           | ISIN US912828RP73             |
| 14) Guarantors       | Issue Date 10/31/2011          | SEDOL 1 B55HZR2               |
| 15) Bond Ratings     | Interest Accrues 10/31/2011    | FIGI BBG002620KJ9             |
| 16) Identifiers      | 1st Coupon Date 04/30/2012     | Issuance & Trading            |
| 17) Exchanges        | Maturity Date 10/31/2018       | Issue Price 99.731389         |
| 18) Inv Parties      | Floater Formula N.A.           | Risk Factor .060              |
| 19) Fees, Restrict   | Workout Date 10/31/2018        | Amount Issued 30103 (MM)      |
| 20) Schedules        | Coupon 1.750 Security Type USN | Amount Outstanding 30103 (MM) |
| 21) Coupons          | Cpn Frequency S/A Type FIXED   | Minimum Piece 100             |
| Quick Links          | Mty/Refund Type NORMAL Series  | Minimum Increment 100         |
| 32) ALLQ Pricing     | Calc Type STREET CONVENTION    | SOMA Holdings 59.17           |
| 33) QRD Quote Reca   | Day Count ACT/ACT              | Market Sector US GOVT         |
| 34) CACS Corp Action | Country US Currency USD        | TENDERS ACCEPTED: \$29000MM.  |
| 35) CN Sec News      |                                |                               |
| 36) HDS Holders      |                                |                               |
| 66) Send Bond        |                                |                               |

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
 SN 529493 MSK GMT+3:00 H823-1582-2 08-Oct-2018 19:52:17

T 1 3/4 10/31/18 Govt Settings Yield and Spread Analysis  
 99-30 7/8 /99-31+ 2.321/1.996 BGN @ 19:01 99 Buy 90 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom 6 Yields

T 1 3/4 10/31/18 ( 912828RP7 ) Risk

|        |                                      |                |             |
|--------|--------------------------------------|----------------|-------------|
| Spread | -15.10 bp vs 1m B 0 11/01/18         | Workout        | OAS         |
| Price  | 99-31+ 2.115 19:52:30                | M.Dur          | Dur         |
| Yield  | 1.996296 Wst 2.147277 Conv           | Risk           | 0.060 0.060 |
| Wkout  | 10/31/2018 @ 100.00 Duration Yld 6.6 | Convexity      | 0.000 0.000 |
| Settle | 10/09/18 10/09/18                    | DV 01 on 1MM   | 6.02 6.01   |
|        |                                      | Benchmark Risk | 0.063 0.062 |
|        |                                      | Risk Hedge     | 957 M 966 M |
|        |                                      | Proceeds Hedge | 1,009 M     |

| Spreads          | Yield Calculations         | Invoice                     |
|------------------|----------------------------|-----------------------------|
| 11) G-Sprd -15.1 | Street Convention 1.996296 | Face 1,000 M                |
| 12) I-Sprd -41.2 | Equip 1 /Yr 2.015141       | Principal 999,843.75        |
| 13) Basis 63.6   | Mmkt (Act/ 360) 1.952899   | Accrued (162 Days) 7,703.80 |
| 14) Z-Sprd -46.6 | True Yield 1.996296        | Total (USD) 1,007,547.55    |
| 15) ASW -38.4    | Current Yield 1.750        |                             |
| 16) OAS -19.5    |                            |                             |

After Tax (Inc 40.800 % CG 23.800 %) 1.185506  
 Issue Price = 99.731. OID Bond with Acquisition Pre...

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Barclays bond

BACR Float 08/10/21 \$↑103.841 +.059 -226.7 bp vs T 2.750 09/15/2021  
 As of 05 Oct DM .000 Source BMRK

BACR Float 08/10/21 Corp Settings Page 1/12 Security Description: Bond

94 Notes 95 Buy 96 Sell

25 Bond Description 26 Issuer Description

|                      |                                     |                               |
|----------------------|-------------------------------------|-------------------------------|
| <b>Pages</b>         | <b>Issuer Information</b>           | <b>Identifiers</b>            |
| 1) Bond Info         | Name BARCLAYS PLC                   | ID Number QZ1326615           |
| 2) Adm Info          | Industry Diversified Banks          | CUSIP 06738EAR6               |
| 3) Reg/Tax           | Security Information                | ISIN US06738EAR62             |
| 4) Covenants         | Mkt Iss Global                      | <b>Bond Ratings</b>           |
| 5) Guarantors        | Country GB Currency USD             | Moody's Baa3                  |
| 6) Bond Ratings      | Rank Sr Unsecured Series            | S&P BBB                       |
| 7) Identifiers       | Coupon 4.450500 Type Floating       | Fitch A                       |
| 8) Exchanges         | Formula QUARTLY US LIBOR +211.0000  | Composite BBB                 |
| 9) Inv Parties       | Day Cnt ACT/360 Iss Price 100.00000 | <b>Issuance &amp; Trading</b> |
| 20) Fees, Restrict   | Maturity 08/10/2021                 | Amt Issued/Outstanding        |
| 21) Schedules        | BULLET                              | USD 1,000,000.00 (M) /        |
| 22) Coupons          | Iss Sprd                            | USD 1,000,000.00 (M)          |
| <b>Quick Links</b>   | Calc Type (21)FLOAT RATE NOTE       | Min Piece/Increment           |
| 32) ALLQ Pricing     | Pricing Date 08/03/2016             | 200,000.00 / 1,000.00         |
| 33) QRD Qt Recap     | Interest Accrual Date 08/10/2016    | Par Amount 1,000.00           |
| 34) TDH Trade Hist   | 1st Settle Date 08/10/2016          | Book Runner BCLY-sole         |
| 35) CACS Corp Action | 1st Coupon Date 11/10/2016          | Reporting TRACE               |
| 36) CF Prospectus    |                                     |                               |
| 37) CN Sec News      |                                     |                               |
| 38) HDS Holders      |                                     |                               |
| 66) Send Bond        |                                     |                               |

Australia 61 2 9777 6000 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 6900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
 SN 529493 MSK GMT+3:00 H825-1582-2 08-OCT-2018 19:54:58

BACR 0 08/10/21 Corp Settings Yield and Spread Analysis

103.749/103.937 74.658/67.963 BMRK @ 10/ 6 95 Buy 96 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom 6 Yields

BACR Float 08/10/21 ( 06738EAR6 )

|                             |                 |                           |                     |
|-----------------------------|-----------------|---------------------------|---------------------|
| Price 103.937               | Settle 10/10/18 | M/M Equiv to Next Fix     | Floater Cpn History |
| DM (bp) 67.963187           | to Wst          | ACT/360 ACT/365           | Date Rate           |
| Yield 3.087692              |                 | Price at Refix 103.809536 | 08/10/18 4.45050    |
| Workout 08/10/2021 @ 100.00 |                 | on 11/13/2018 34 Days     | 11/13/18 0.00000    |
| SFL 77.418                  |                 | Mmkt 3.003068             |                     |

**Floater Information**

|   |                    |          |
|---|--------------------|----------|
| Benchmark US0003M Assumed Rt d 2.40806    | To 11/13/18        | OAS      |
| Quoted Margin 211.00 Coupon 4.4505        | Mod Duration 0.098 | 2.594    |
| Next Pay 11/13/2018 Coupon Freq Quarterly | Risk 0.102         | 2.715    |
| Refix Freq Quarterly                      | Convexity 0.000191 | 0.083145 |
| Index to 11/13/2018 2.282298 d            | DV 01 on 1MM       | 10 272   |

**Risk**

OAS Floater Analysis | YASN »

|   |                            |              |
|---|----------------------------|--------------|
| OAS 67.5                                      | Option Premium 0           | Face 1,000 M |
| Discount Curve S23 USD (30/360, S/A vs. 3M... | Principal 1,039,370.00     |              |
| Forward Curve S23 USD (30/360, S/A vs. 3M...  | Accrued (61 Days) 7,541.13 |              |
| Curve Shift (bp) 0 Z-Spread 66                | Total (USD) 1,046,911.13   |              |
| Vol Cube VCUB                                 |                            |              |
| Fixed Equivalent Yield 08/10/21 3.7826        |                            |              |

Australia 61 2 9777 6000 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 6900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
 SN 529493 MSK GMT+3:00 H825-1582-3 08-OCT-2018 19:55:12

Turkey government bond

TURKEY 6 1/4 09/26/22 \$↑96.064 - .132 95.736 / 96.391 7.513 / 7.315  
 As of 05 Oct

TURKEY 6 1/4 09/26/22 Cor Settings Page 1/12 Security Description: Bond  
 90 Notes 95 Buy 90 Sell

25 Bond Description 20 Issuer Description

| Pages                | Issuer Information                     | Identifiers                 |
|----------------------|--|-----------------------------|
| 1) Bond Info         | Name REPUBLIC OF TURKEY                | ID Number EI9661808         |
| 2) Addtl Info        | Industry Sovereigns                    | CUSIP 900123BZ2             |
| 3) Reg/Tax           |  | ISIN US900123BZ27           |
| 4) Covenants         | Security Information                   | Bond Ratings                |
| 5) Guarantors        | Mkt Iss Global                         | Moody's Ba3                 |
| 6) Bond Ratings      | Country TR Currency USD                | S&P NR                      |
| 7) Identifiers       | Rank Sr Unsecured Series               | Fitch BB                    |
| 8) Exchanges         | Coupon 6.250000 Type Fixed             | DBRS NR                     |
| 9) Inv Parties       | Cpn Freq S/A                           | Issuance & Trading          |
| 10) Fees, Restrict   | Day Cnt ISMA-30/360 Iss Price 99.24400 | Amt Issued/Outstanding      |
| 11) Schedules        | Maturity 09/26/2022                    | USD 2,500,000.00 (M) /      |
| 12) Coupons          | BULLET                                 | USD 2,500,000.00 (M)        |
| 13) Quick Links      | Iss Sprd +377.50bp vs T 2 11/15/21     | Min Piece/Increment         |
| 32) ALLQ Pricing     | Calc Type (1)STREET CONVENTION         | 200,000.00 / 1,000.00       |
| 33) QRD Qt Recap     | Pricing Date 01/18/2012                | Par Amount 1,000.00         |
| 34) TDH Trade Hist   | Interest Accrual Date 01/26/2012       | Book Runner BARCBK,CITI,JPM |
| 35) CACS Corp Action | 1st Settle Date 01/26/2012             | Exchange Multiple           |
| 36) CF Prospectus    | 1st Coupon Date 03/26/2012             |                             |
| 37) CN Sec News      |  |                             |
| 38) HDS Holders      |  |                             |
| 66) Send Bond        |  |                             |

Australia 61 2 9777 0600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
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TURKEY 6 1/4 09/26/22 Corp Settings Yield and Spread Analysis  
 95.736/96.391 7.513/7.315 BGN @ 10/ 5 95 Buy 90 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom

| TURKEY 6 1/4 09/26/22 ( 900123BZ2 )           |                                       | Risk              |            |
|---|---------------------------------------|-------------------|------------|
| Spread  | 424.55 bp vs 5y T 2 7/8 09/30/23      | M.Dur             | 3.427      |
| Price   | 96.391                                | Dur               | 3.434      |
| Yield   | 7.314733 Wst                          | Risk              | 3.312      |
| Wkout   | 09/26/2022 @ 100.00 Consensus Yld 6.6 | Convexity         | 0.142      |
| Settle  | 10/10/18                              | DV 01 on 1MM      | 331        |
|   |                                       | Benchmark Risk    | 4.558      |
|   |                                       | Risk Hedge        | 727M       |
|   |                                       | Proceeds Hedge    | 974M       |
| Spreads                                       |                                       | Invoice           |            |
| 11) G-Sprd                                    | 428.9                                 | Face              | 1,000 M    |
| 12) I-Sprd                                    | 414.1                                 | Principal         | 963,910.00 |
| 13) Basis                                     | -3.2                                  | Accrued (14 Days) | 2,430.56   |
| 14) Z-Sprd                                    | 415.0                                 | Total (USD)       | 966,340.56 |
| 15) ASW                                       | 398.1                                 |                   |            |
| 16) OAS                                       | 429.5                                 |                   |            |
|   | Street Convention 7.314733            |                   |            |
|   | Equiv 1 /Yr 7.448496                  |                   |            |
|   | Mmkt (Act/ 360) 7.313960              |                   |            |
|   | True Yield 6.484                      |                   |            |
|   | Current Yield 6.484                   |                   |            |
| After Tax (Inc 40.800 % CG 23.800 %) 4.504083 |                                       |                   |            |

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JPMorgan bond

JPM Float 10/24/23 \$↑ 101.989 - .104 -235.7 bp vs T 2.875 09/30/2023  
 As of 05 Oct DM .000 Source BMRK

JPM Float 10/24/23 Corp Settings Page 1/12 Security Description: Bond

94 Notes 95 Buy 96 Sell

25 Bond Description 20 Issuer Description

| Pages                | Issuer Information                                     | Identifiers            |
|----------------------|--|------------------------|
| 1) Bond Info         | Name JPMORGAN CHASE & CO                               | ID Number QZ9145314    |
| 2) Addtl Info        | Industry Diversified Banks                             | CUSIP 46625HRW2        |
| 3) Reg/Tax           | Security Information                                   | ISIN US46625HRW24      |
| 4) Covenants         | Mkt Iss Global   | Bond Ratings           |
| 5) Guarantors        | Country US Currency USD                                | Moody's A3 **          |
| 6) Bond Ratings      | Rank Sr Unsecured Series                               | S&P A-                 |
| 7) Identifiers       | Coupon 3.571560 Type Floating                          | Fitch AA-              |
| 8) Exchanges         | Formula QUARTLY US LIBOR +123.0000                     | Composite A            |
| 9) Inv Parties       | Day Cnt ACT/360 Iss Price 100.00000                    | Issuance & Trading     |
| 10) Fees, Restrict   | Maturity 10/24/2023                                    | Amt Issued/Outstanding |
| 11) Schedules        | CALL 10/24/22@100.00                                   | USD 2,000,000.00 (M) / |
| 12) Coupons          | Iss Sprd   | USD 2,000,000.00 (M)   |
| 13) Quick Links      | Calc Type (21) FLOAT RATE NOTE                         | Min Piece/Increment    |
| 14) ALLQ Pricing     | Pricing Date 10/17/2016                                | 2,000.00 / 1,000.00    |
| 15) QRD Qt Recap     | Interest Accrual Date 10/24/2016                       | Par Amount 1,000.00    |
| 16) TDH Trade Hist   | 1st Settle Date 10/24/2016                             | Book Runner JPM-sole   |
| 17) CACS Corp Action | 1st Coupon Date 01/24/2017                             | Reporting TRACE        |
| 18) CF Prospectus    | ONE TIME CALL ON 10/24/22. PAR CALL BEGINNING 8/24/23. |                        |
| 19) CN Sec News      |  |                        |
| 20) HDS Holders      |  |                        |
| 21) Send Bond        |  |                        |

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 Japan 81 3 3201 6900 Singapore 65 6212 1000 U.S. 1 212 310 2000 Copyright 2018 Bloomberg Finance L.P.  
 SN 529493 MSK GMT+3:00 H823-1562-2 08-Oct-2018 19:55:33

JPM 0 10/24/23 Corp Settings Yield and Spread Analysis

101.918/102.028 73.024/70.184 BMRK @ 10/ 6 95 Buy 96 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom 6 Yields

JPM Float 10/24/23 ( 46625HRW2 ) M/M Equiv to Next Fix Floater Cpn History

|         |                     |        |          |                     |          |          |
|---------|---------------------|--------|----------|---------------------|----------|----------|
| Price   | 102.028             | Settle | 10/10/18 | • ACT/360 • ACT/365 | Date     | Rate     |
| DM (bp) | 70.184474           | to Wst |          | Price at Refix      | 07/24/18 | 3.57156  |
| Yield   | 3.109905            |        |          | on 10/24/2018       | 14 Days  | 10/24/18 |
| Workout | 10/24/2022 @ 100.00 |        |          | Mmkt                | 2.971371 | 0.00000  |
| SFL     | 73.813              |        |          |                     |          |          |

Floater Information Risk

|               |                                  |              |                   |
|---------------|----------------------------------|--------------|-------------------|
| Benchmark     | US0003M Assumed Rt d 2.40806     | To 10/24/18  | OAS               |
| Quoted Margin | 123.00 Coupon 3.57156            | Mod Duration | 0.040 3.636       |
| Next Pay      | 10/24/2018 Coupon Freq Quarterly | Risk         | 0.041 3.738       |
|               | Refix Freq Quarterly             | Convexity    | 0.000031 0.157718 |
| Index to      | 10/24/2018 2.228822174 d         | DV 01 on 1MM | 4 374             |

OAS Floater Analysis | YASN » Invoice

|                        |                                |                      |              |         |
|------------------------|--------------------------------|----------------------|--------------|---------|
| OAS                    | 70.9                           | Option Premium -0.45 | Face         | 1,000 M |
| Discount Curve         | S23 USD (30/360, S/A vs. 3M... | Principal            | 1,020,280.00 |         |
| Forward Curve          | S23 USD (30/360, S/A vs. 3M... | Accrued (78 Days)    | 7,738.38     |         |
| Curve Shift (bp)       | 0 Z-Spread 69.3                | Total (USD)          | 1,028,018.38 |         |
| Vol Cube               | VCUB                           |                      |              |         |
| Fixed Equivalent Yield | 10/24/22 3.8595                |                      |              |         |

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Transocean bond

RIG 9 07/15/23 \$↑108.362 - .254 Yld 6.354  
 As of 05 Oct Source BMRK

RIG 9 07/15/23 Corp Settings Page 1/12 Security Description: Bond  
 94 Notes 95 Buy 96 Sell

25 Bond Description 26 Issuer Description

| Pages                | Issuer Information                            | Identifiers                  |
|----------------------|---|------------------------------|
| 11) Bond Info        | Name TRANSOCEAN INC                           | ID Number LW8150358          |
| 12) Addtl Info       | Industry Oil & Gas Services & Equipment       | ISIN USG90073AA86            |
| 13) Reg/Tax          | Security Information                          | FIGI BBG00D9THRK8            |
| 14) Covenants        | Mkt Iss Euro-Dollar                           | Bond Ratings                 |
| 15) Guarantors       | Country KY Currency USD                       | Moody's B3                   |
| 16) Bond Ratings     | Rank Sr Unsecured Series REGS                 | S&P B                        |
| 17) Identifiers      | Coupon 9.000000 Type Fixed                    | Fitch WD                     |
| 18) Exchanges        | Cpn Freq S/A                                  | Composite B-                 |
| 19) Inv Parties      | Day Cnt ISMA-30/360 Iss Price 97.50000        | Issuance & Trading           |
| 20) Fees, Restrict   | Maturity 07/15/2023                           | Aggregated Amount Issued/Out |
| 21) Schedules        | MAKE WHOLE @50.000000 until 07/15/20/ CALL... | USD 1,250,000.00 (M) /       |
| 22) Coupons          | Iss Sprd +829.00bp vs T 1 3/8 06/30/23        | USD 1,250,000.00 (M)         |
| Quick Links          | Calc Type (1)STREET CONVENTION                | Min Piece/Increment          |
| 32) ALLQ Pricing     | Pricing Date 07/07/2016                       | 2,000.00 / 1,000.00          |
| 33) QRD Qt Recap     | Interest Accrual Date 07/21/2016              | Par Amount 1,000.00          |
| 34) TDH Trade Hist   | 1st Settle Date 07/21/2016                    | Book Runner GS,MS            |
| 35) CACS Corp Action | 1st Coupon Date 01/15/2017                    | Reporting TRACE              |
| 36) CF Prospectus    |   |                              |
| 37) CN Sec News      |   |                              |
| 38) HDS Holders      |   |                              |
| 66) Send Bond        |   |                              |

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 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
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Bond Matures on a SATURDAY

RIG 9 07/15/23 Corp Settings Yield and Spread Analysis  
 108.090/108.621 6.504/6.208 BMRK @ 10/ 6 95 Buy 96 Sell

1 Yield & Spread 2 Graphs 3 Pricing 4 Description 5 Custom 6 Calls

RIG 9 07/15/23 ( USG90073AA86 )

|        |                                  |                   |                |         |
|--------|----------------------------------|-------------------|----------------|---------|
| Spread | 332.27 bp vs 2y T 2 3/4 09/30/20 | Risk              | Workout        | OAS     |
| Price  | 108.621                          | 99-23 19:56:38    | M.Dur          | 1.597   |
| Yield  | 6.207655 Wst                     | 2.884969 S/A      | Dur            | 2.408   |
| Wkout  | 07/15/2020 @ 104.50              | Consensus Yld 6.6 | Risk           | 1.768   |
| Settle | 10/10/18                         | 10/09/18          | Convexity      | 0.034   |
|        |                                  |                   | DV 01 on 1MM   | 177     |
|        |                                  |                   | Benchmark Risk | 1.904   |
|        |                                  |                   | Risk Hedge     | 929M    |
|        |                                  |                   | Proceeds Hedge | 1,110 M |

| Spreads          | Yield Calculations         | Invoice                     |
|------------------|----------------------------|-----------------------------|
| 11) G-Sprd 337.9 | Street Convention 6.207655 | Face 1,000 M                |
| 12) I-Sprd 317.6 | Equip 1 /Yr 6.303992       | Principal 1,086,210.00      |
| 13) Basis -214.0 | Mmkt (Act/ 360) 6.383633   | Accrued (85 Days) 21,250.00 |
| 14) Z-Sprd 318.6 | True Yield 6.207655        | Total (USD) 1,107,460.00    |
| 15) ASW 335.7    | Current Yield 8.286        |                             |
| 16) OAS 307.3    |                            |                             |

After Tax (Inc 40.800 % CG 23.800 %) 3.296940

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## Bond volatility estimation

| <b>Ticker</b>             | <b>Issuer</b> | <b>Volatility<br/>10D</b> | <b>Volatility<br/>30D</b> | <b>Volatility<br/>60D</b> | <b>Volatility<br/>90D</b> |
|---------------------------|---------------|---------------------------|---------------------------|---------------------------|---------------------------|
| BTPS 5 08/01/34 Corp      | Italy         | 16,534                    | 15,065                    | 12,147                    | 12,343                    |
| TURKEY 6.25 09/26/22 Corp | Turkey        | 7,094                     | 13,689                    | 21,193                    | 17,692                    |
| T 1.75 10/31/18 Govt      | USA           | 0,025                     | 0,045                     | 0,047                     | 0,050                     |
| UBS 5 PERP Corp           | UBS           | 8,207                     | 7,386                     | 7,734                     | 7,834                     |
| QZ132661 CORP             | Barclays      | 1,165                     | 0,949                     | 0,998                     | 1,027                     |
| JPM Float 10/24/23 Corp   | JPM           | 1,120                     | 1,022                     | 1,157                     | 1,157                     |
| RIG 9 07/15/2023 REGS COR | TransOcean    | 2,186                     | 2,338                     | 2,520                     | 2,612                     |

## Equity estimation

| Company                      | Country | Currency | MC<br>\$ M | EV<br>\$ M | EBITDA<br>CAGR<br>17- '21 | EBITDA<br>margin | EV /<br>EBITDA | EV / Sales | P / E  |
|------------------------------|---------|----------|------------|------------|---------------------------|------------------|----------------|------------|--------|
| APPLE INC                    | USA     | USD      | 1 077 653  | 948 510    | 7%                        | 30,6%            | 11,7x          | 3,6x       | 18,2x  |
| AMAZON.COM INC               | USA     | USD      | 900 521    | 919 260    | 41%                       | 13,6%            | 28,8x          | 3,9x       | 68,1x  |
| BERKSHIRE HATHAWAY INC-CL A  | USA     | USD      | 545 056    | 324 307    | n/a                       | 16,3%            | 8,1x           | 1,3x       | 23,4x  |
| TESLA INC                    | USA     | USD      | 42 585     | 53 243     | 570%                      | 7,9%             | 32,8x          | 2,6x       | -38,9x |
| TWITTER INC                  | USA     | USD      | 21 364     | 18 399     | 40%                       | 36,6%            | 17,3x          | 6,3x       | 40,2x  |
| SNAP INC - A                 | USA     | USD      | 9 433      | 7 863      | n/a                       | -58,7%           | -11,6x         | 6,8x       | -13,2x |
| SBERBANK OF RUSSIA PJSC      | Russia  | RUB      | 62 052     | 42 367     | n/a                       | n/a              | n/a            | 1,4x       | 5,0x   |
| GAZPROM PJSC                 | Russia  | RUB      | 60 942     | 92 461     | 9%                        | 27,7%            | 2,7x           | 0,7x       | 3,3x   |
| NOVATEK PJSC-SPONS GDR REG S | Russia  | USD      | 54 593     | 56 507     | 5%                        | 35,4%            | 13,9x          | 4,9x       | 15,8x  |
| MAGNIT PJSC-SPON GDR REGS    | Russia  | USD      | 6 785      | 8 453      | 9%                        | 7,1%             | 5,9x           | 0,4x       | 10,5x  |
| SISTEMA PJSC-REG S SPONS GDR | Russia  | USD      | 1 184      | 13 313     | 1%                        | 28,0%            | 4,4x           | 1,2x       | n/a    |

| Company                      | Dividend<br>Yield, % | Closing<br>Price | Share Price Performance |        |        |        | Volatility 60D |       |
|------------------------------|----------------------|------------------|-------------------------|--------|--------|--------|----------------|-------|
|                              |                      |                  | YTD                     | -12 M  | -6 M   | -3 M   |                | -1 M  |
| APPLE INC                    | 1,22                 | 223              | 31,8%                   | 43,7%  | 32,5%  | 18,7%  | 0,8%           | 21,58 |
| AMAZON.COM INC               | 0,00                 | 1 846            | 57,9%                   | 86,6%  | 31,4%  | 7,9%   | -5,4%          | 22,20 |
| BERKSHIRE HATHAWAY INC-CL A  | 0,00                 | 331 460          | 11,4%                   | 18,0%  | 12,7%  | 16,8%  | 3,0%           | 15,27 |
| TESLA INC                    | 0,00                 | 250              | -19,8%                  | -30,1% | -16,6% | -19,2% | -5,2%          | 78,07 |
| TWITTER INC                  | 0,00                 | 28               | 17,4%                   | 57,9%  | 0,3%   | -39,6% | -7,5%          | 62,71 |
| SNAP INC - A                 | 0,00                 | 7                | -49,5%                  | -50,1% | -48,2% | -45,4% | -25,6%         | 36,84 |
| SBERBANK OF RUSSIA PJSC      | 9,17                 | 192              | -14,8%                  | -1,2%  | -25,3% | -15,4% | 9,7%           | 36,34 |
| GAZPROM PJSC                 | 5,33                 | 172              | 31,7%                   | 39,2%  | 21,4%  | 18,5%  | 15,5%          | 26,27 |
| NOVATEK PJSC-SPONS GDR REG S | 1,53                 | 180              | 49,6%                   | 51,5%  | 26,9%  | 16,9%  | 4,2%           | 38,13 |
| MAGNIT PJSC-SPON GDR REGS    | 3,53                 | 13               | -51,3%                  | -66,8% | -29,4% | -24,2% | -5,2%          | 39,39 |
| SISTEMA PJSC-REG S SPONS GDR | 0,00                 | 2                | -41,2%                  | -47,6% | -37,4% | -14,1% | 8,1%           | 32,70 |