Previously published in the U.S. Credit Alpha
13 October 2017

Fuller Cushions in Low-Quality Short Duration

Bradley Rogoff, CFA
+1 212 412 7921
bradley.rogoff@barclays.com
BCI, US

Rizwan Hussain
+1 212 412 7997
riz.hussain@barclays.com
BCI, US

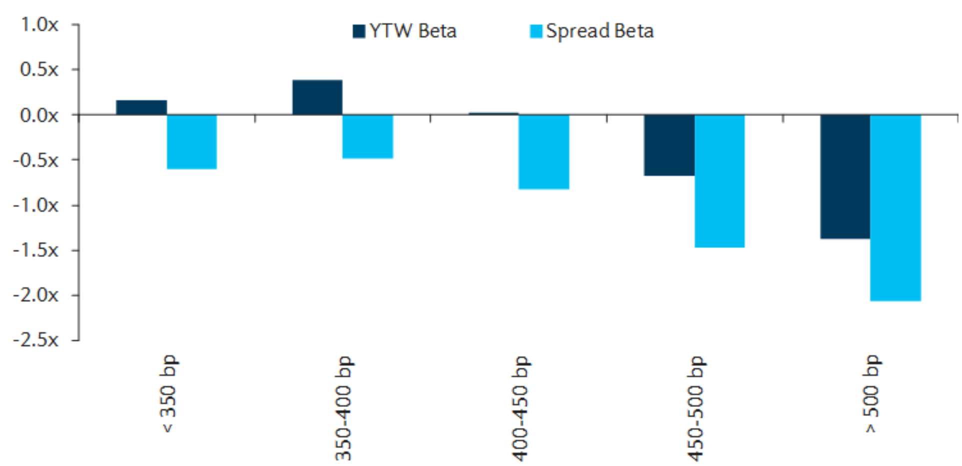
Arvind Kumar
+ 1 646 333 1184
arvind.kumar4@barclays.com
BCI, US

The impending start of Fed balance sheet normalization, a pickup in certain inflation measures, uncertainty about the next Fed chief nomination, and the potential for growing budget deficits as a result of the administration's current tax reform proposal have all conspired to propel both Treasury yields and swaption volatility off their recent lows. More recent, stability has been positive for high yield credit, however, with approximately $2.9bn of inflows to high yield funds (per Lipper data) over the four weeks ending October 11. Those flows have helped drive the US High Yield Index to near year-to-date tights. However, the relationship between changes in risk-free spreads and the shape of the Treasury curve and the implications for credit spreads across duration and quality over the medium term can be complex and invites further study.

To start, history shows that spread reactions to moves in risk-free yields are themselves a function of spread levels. Figure 1 displays the betas of simple regressions using five years of data over various levels of prevailing index spreads. The yield to worst beta captures the betas of regression of the yield changes in the Ba/B US high yield index and 5y US Treasuries.[1] The spread beta similarly tracks weekly spread changes versus Treasuries. Simply put, spread betas of -1.0x or greater indicate spread moves that fully offset the underlying changes in risk-free yields. That threshold is observed for the 450-500bp and >500bp index spread regimes. At tighter spreads, moves wider or tighter have not consistently offset the underlying move in Treasuries.

So while the data confirm intuition that spread tightening has helped absorb moves higher in Treasury yields, particularly when index spreads have been wider, where along the duration spectrum should investors focus? In a previous report (*Lift the Barbell, Trim the Belly*), we concluded that a duration barbell strategy was the most effective way to position for the bear flattening that our interest rate strategy team expects (*Stormy Weather Ahead*). Currently, it forecasts that 2y UST yields will increase by approximately 40bp, to 1.90%, by 3Q18, with 10y USTs largely pegged at current levels around 2.40%.

FIGURE 1
Ability of Spreads to Counterbalance UST Yield Changes Depends on the Starting Level of Spreads

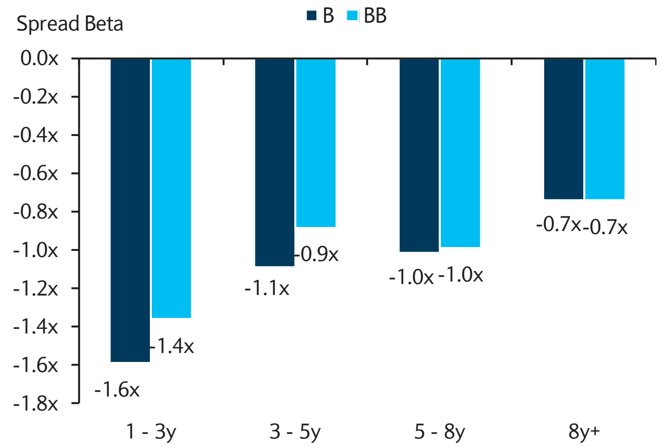


Source: Bloomberg Barclays Indices

[1] We have not considered CCC risk generally, as we consider idiosyncratic credit developments for this rating cohort to be more relevant than risk-free yield changes and associated spread moves in driving dollar prices and returns.

FIGURE 2

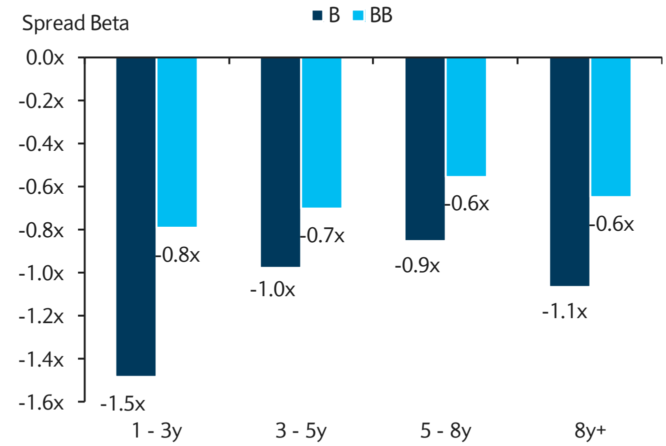
Historically, Short-Dated Spreads Have Shown Significant Cushion against Rates…



Note: Spread beta measured by regressing weekly spread changes of each duration bucket to yield changes of a representative Treasury bond.
Source: Bloomberg Barclays Indices

FIGURE 3

Restricting the Data to Periods with Spread Levels Similar to Today's, BBs Are Much Less Able to Absorb Yield Changes in Treasuries across Duration Buckets, Particularly for1-3y



Note: We consider periods when BB spreads were 175-225bp to calculate the BB spread betas (current level of 203bp). To calculate B spread betas, we consider periods when Bs traded between 300 and 350bp (current level of 332bp).
Source: Bloomberg Barclays Indices

With that barbell preference in mind, Figure 2 shows how spread betas vary along the maturity spectrum. Should investors reach for spread through duration or credit quality? Over the past five years, short-duration spread changes (in the 1-3y bucket) have more than offset rate moves, as indicated by spread betas of -1.6x and -1.4x for Bs and BBs, respectively. Betas in the 3-5y duration bucket show a modest preference for Bs (ie, spread betas larger than -1.0x), while spread betas of less than -1.0x for the 8y+ duration bucket suggest avoiding it, all else equal, if investors are simply looking to offset risk-free yield increases with spread tightening.

What if we restrict the observation to periods when B and BB spreads were similar to today's levels? Figure 3 shows that the spread betas of BBs across duration buckets are uniformly below -1.0x, and underlying risk-free yield moves are not fully offset by equal or greater opposing spread moves. Again, focusing on the shortest duration bucket, BBs have shown a relative poor ability to absorb moves in short-dated rates in spread regimes similar to today's (spread beta of -0.8x); considering heightened extension risk in BBs relative to Bs, we remain more cautious on this part of the market (please see *Upside-Down BBs*). Meanwhile, single-B short-dated spreads still offset more than 1.5x of underlying rate moves.

Rolling up our conclusions from above, we reiterate our preference for short-duration (1-3y) single-B risk for investors who are looking to offset anticipated increases in UST yields with credit spread tightening. Figure 4 presents securities rated Overweight by our fundamental analysts that fit these duration and rating criteria. Some of these credits could also benefit from positive event risk or other drivers, such as potential liability management exercises or sufficient debt service runways, but we believe that they are all attractive short-duration candidates to add to credit portfolios.

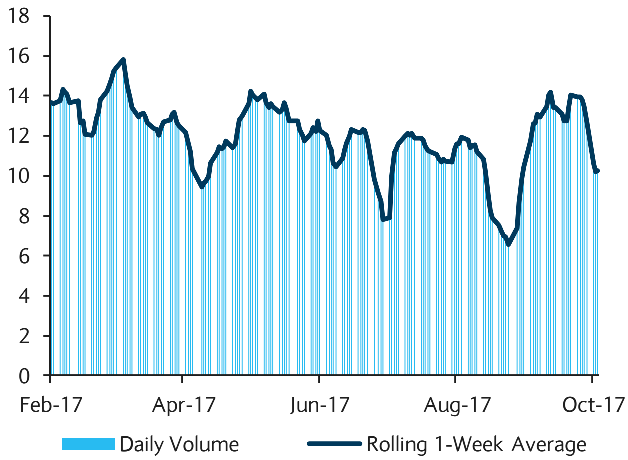
FIGURE 4

Short-Duration Single-Bs Rated Overweight

Ticker	Security	Amount Outs. ($mn)	Index Rating	Price ($)	Yield to Worst (%)	OAS (bp)
OAS	6.875s of 2022	937	B3	101.1	6.24	431
OAS	6.5s of 2021	396	B3	100.7	6.13	419
NE	4.9s of 2020	168	B2	97.0	6.08	437
DYN	7.375s of 2022	1750	B3	105.2	5.5	353
HBMCN	7.25s of 2023	400	B3	106.5	5.3	326
TLN	4.625s of 2019	208	B3	99.1	5.19	363
AKS	7.5s of 2023	380	B1	108.7	4.38	267
ARGID	7.25s of 2024	1650	B3	109.9	4.1	233
S	7s of 2020	1500	B2	109.5	3.47	183

Note: We consider bonds with durations of 1-3 years. Source: Bloomberg Barclays Indices

High Yield Average Institutional Trade Volume ($bn)

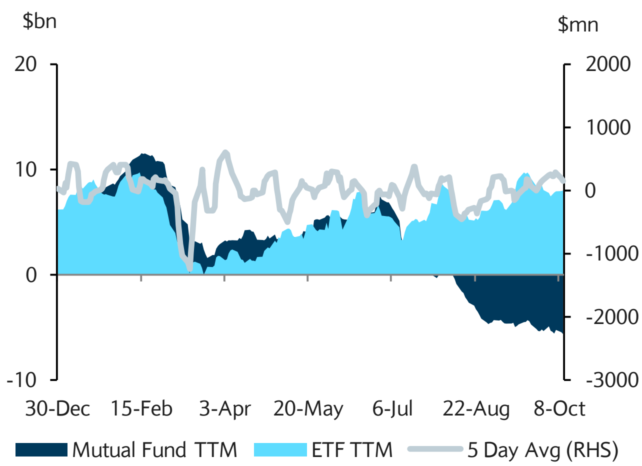


Note: Includes both registered and 144A volumes. Source: FINRA TRACE

On-the-Run HYCDX versus US High Yield Index (bp)

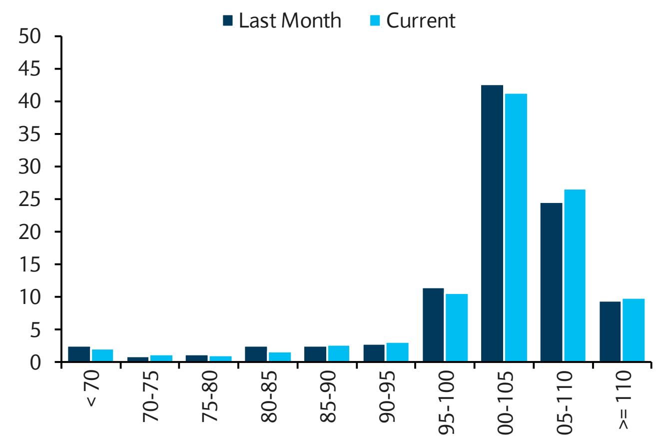
Source: Barclays Research

Flows to High Yield Mutual Funds and ETFs (YTD)



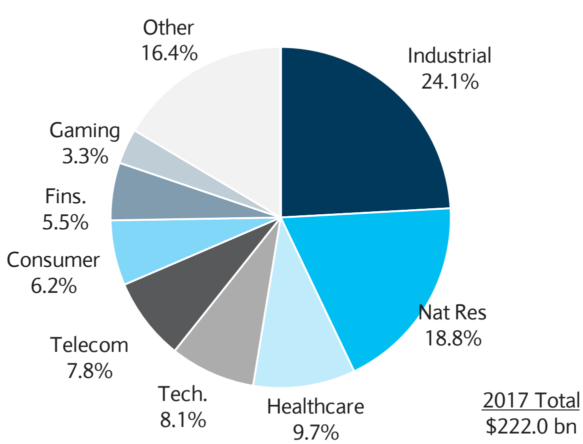
Note: Daily reporters only. Source: EPFR

High Yield Index Price Distribution by Par (%)



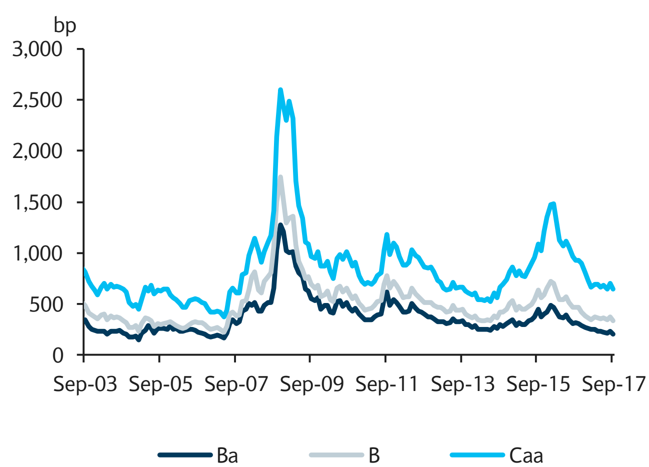
Source: Barclays Research

High Yield Supply by Sector (YTD)



Source: Barclays Research

High Yield Spreads by Credit Quality



Source: Bloomberg Barclays Indices

Analyst Certification
We, Rizwan Hussain, Arvind Kumar and Bradley Rogoff, CFA, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

Important Disclosures:
Barclays Research is produced by the Investment Bank of Barclays Bank PLC and its affiliates (collectively and each individually, "Barclays")
All authors contributing to this research report are Research Analysts unless otherwise indicated. The publication date at the top of the report reflects the local time where the report was produced and may differ from the release date provided in GMT.

Availability of Disclosures:
For current important disclosures regarding any issuers which are the subject of this research report please refer to https://publicresearch.barclays.com or alternatively send a written request to: Barclays Research Compliance, 745 Seventh Avenue, 13th Floor, New York, NY 10019 or call +1-212-526-1072.

Barclays Capital Inc. and/or one of its affiliates does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that Barclays may have a conflict of interest that could affect the objectivity of this report. Barclays Capital Inc. and/or one of its affiliates regularly trades, generally deals as principal and generally provides liquidity (as market maker or otherwise) in the debt securities that are the subject of this research report (and related derivatives thereof). Barclays trading desks may have either a long and / or short position in such securities, other financial instruments and / or derivatives, which may pose a conflict with the interests of investing customers. Where permitted and subject to appropriate information barrier restrictions, Barclays fixed income research analysts regularly interact with its trading desk personnel regarding current market conditions and prices. Barclays fixed income research analysts receive compensation based on various factors including, but not limited to, the quality of their work, the overall performance of the firm (including the profitability of the Investment Banking Department), the profitability and revenues of the Markets business and the potential interest of the firm's investing clients in research with respect to the asset class covered by the analyst. To the extent that any historical pricing information was obtained from Barclays trading desks, the firm makes no representation that it is accurate or complete. All levels, prices and spreads are historical and do not represent current market levels, prices or spreads, some or all of which may have changed since the publication of this document. Barclays Research Department produces various types of research including, but not limited to, fundamental analysis, equity-linked analysis, quantitative analysis, and trade ideas. Recommendations and trade ideas contained in one type of Barclays Research may differ from those contained in other types of Barclays Research, whether as a result of differing time horizons, methodologies, or otherwise.
The Barclays Research Department operates independently from the Absa Research Department. Absa Research is produced by Absa Bank Limited acting through its Corporate and Investment Bank division, which is a part of Barclays Africa Group Limited and affiliated with the Investment Bank of Barclays Bank PLC. Eligible clients may receive research reports from both research departments, which may reach different conclusions and may contain different and conflicting forecasts, recommendations, or trade ideas. In order to access Barclays Statement regarding Research Dissemination Policies and Procedures, please refer to *https://publicresearch.barcap.com/static/S_ResearchDissemination.html*. In order to access Barclays Research Conflict Management Policy Statement, please refer to: *https://publicresearch.barcap.com/static/S_ConflictManagement.html*.

Materially Mentioned Issuers/Bonds

AK STEEL CORP, A/CD/D/E/J/K/L/M
AKS 7 1/2 07/15/23, Overweight (USD 108.38, 11-Oct-2017)

ARDAGH PACKAGING FINANCE PLC / ARDAGH HOLDINGS USA INC, A/CD/D/J/K/L/M
ARGID 7 1/4 05/15/24, Overweight (USD 109.50, 11-Oct-2017)

DYNEGY INC, A/CD/CE/D/E/J/K/L/M/N
Other Material Conflicts: Barclays Bank PLC and/or its affiliate is serving as lead financial advisor to Dynegy Inc. (NYSE: DYN) in relation to its announced sale of its Dighton and Milford Energy Facilities to Starwood Energy Group Global.
DYN 7 3/8 11/01/22, Overweight (USD 105.38, 11-Oct-2017)

HUDBAY MINERALS INC, A/CD/D/J/L/R
HBMCN 7 1/4 01/15/23, Overweight (USD 106.25, 11-Oct-2017)

NOBLE HOLDING INTERNATIONAL LTD, A/CD/D/J/K/L/M
NE 4.9 08/01/20, Overweight (USD 96.88, 11-Oct-2017)

OASIS PETROLEUM INC, CD/CE/J
OAS 6.5 11/01/2021, Overweight (USD 101.13, 11-Oct-2017)
OAS 6 7/8 03/15/22, Overweight (USD 101.50, 11-Oct-2017)

SPRINT COMMUNICATIONS INC, CD/D/J/K/L/M/N
S 7 08/15/20, Overweight (USD 109.50, 11-Oct-2017)

TALEN ENERGY SUPPLY LLC, CD/D/J/K/L/M
TLN 5 1/8 07/15/19, Overweight (USD 100.00, 11-Oct-2017)

All pricing information is indicative only. Prices are sourced from Thomson Reuters as of the last available closing price at the time of production of the research report, unless another time and source is indicated.

Disclosure Legend:
A: Barclays Bank PLC and/or an affiliate has been lead manager or co-lead manager of a publicly disclosed offer of securities of the issuer in the previous 12 months.
B: An employee or non-executive director of Barclays Bank PLC and/or an affiliate is a director of this issuer.
CD: Barclays Bank PLC and/or an affiliate is a market-maker in debt securities issued by this issuer.
CE: Barclays Bank PLC and/or an affiliate is a market-maker in equity securities issued by this issuer.
D: Barclays Bank PLC and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.
E: Barclays Bank PLC and/or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer within the next 3 months.
FA: Barclays Bank PLC and/or an affiliate beneficially owns 1% or more of a class of equity securities of this issuer, as calculated in accordance with US regulations.
FB: Barclays Bank PLC and/or an affiliate beneficially owns a long position of more than 0.5% of a class of equity securities of this issuer, as calculated in accordance with EU regulations.
FC: Barclays Bank PLC and/or an affiliate beneficially owns a short position of more than 0.5% of a class of equity securities of this issuer, as calculated in accordance with EU regulations.
GD: One of the analysts on the fundamental credit coverage team (or a member of his or her household) has a financial interest in the debt or equity securities of this issuer.
GE: One of the analysts on the fundamental equity coverage team (or a member of his or her household) has a financial interest in the debt or equity securities of this issuer.
H: This issuer beneficially owns more than 5% of any class of common equity securities of Barclays PLC.
I: Barclays Bank PLC and/or an affiliate is party to an agreement with this issuer for the provision of financial services to Barclays Bank PLC and/or an affiliate.
J: Barclays Bank PLC and/or an affiliate is a liquidity provider and/or trades regularly in the securities of this issuer and/or in any related derivatives.
K: Barclays Bank PLC and/or an affiliate has received non-investment banking related compensation (including compensation for brokerage services, if applicable) from this issuer within the past 12 months.
L: This issuer is, or during the past 12 months has been, an investment banking client of Barclays Bank PLC and/or an affiliate.
M: This issuer is, or during the past 12 months has been, a non-investment banking client (securities related services) of Barclays Bank PLC and/or an affiliate.
N: This issuer is, or during the past 12 months has been, a non-investment banking client (non-securities related services) of Barclays Bank PLC and/or an affiliate.
O: Not in use.
P: A partner, director or officer of Barclays Capital Canada Inc. has, during the preceding 12 months, provided services to the subject company for remuneration, other than normal course investment advisory or trade execution services.
Q: Barclays Bank PLC and/or an affiliate is a Corporate Broker to this issuer.
R: Barclays Capital Canada Inc. and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.
S: This issuer is a Corporate Broker to Barclays PLC.
T: Barclays Bank PLC and/or an affiliate is providing equity advisory services to this issuer.
U: The equity securities of this Canadian issuer include subordinate voting restricted shares.
V: The equity securities of this Canadian issuer include non-voting restricted shares.

Explanation of the Barclays Research Corporate Credit Sector Rating System

Overweight (OW):
For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to exceed the six-month excess return of the relevant index.
For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to exceed the six-month total return of the relevant index.

Market Weight (MW):
For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to be in line with the six-month excess return of the relevant index.
For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to be in line with the six-month total return of the relevant index.

Underweight (UW):
For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to be less than the six-month excess return of the relevant index.
For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to be less than the six-month total return of the relevant index.

Sector definitions:

Sectors in U.S. High Grade Research are defined using the sector definitions of the Bloomberg Barclays U.S. Credit Index and are rated against the Bloomberg Barclays U.S. Credit Index.

Sectors in U.S. High Yield Research are defined using the sector definitions of the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index and are rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index.

Sectors in European High Grade Research are defined using the sector definitions of the Bloomberg Barclays Pan-European Credit Index and are rated against the Bloomberg Barclays Pan-European Credit Index.

Sectors in Industrials and Utilities in European High Yield Research are defined using the sector definitions of the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials and are rated against the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials.

Sectors in Financials in European High Yield Research are defined using the sector definitions of the Bloomberg Barclays Pan-European High Yield Finance Index and are rated against the Bloomberg Barclays Pan-European High Yield Finance Index.

Sectors in Asia High Grade Research are defined on Barclays Live and are rated against the Bloomberg Barclays EM Asia USD High Grade Credit Index.

Sectors in Asia High Yield Research are defined on Barclays Live and are rated against the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index.

Sectors in EEMEA and Latin America Research are defined on Barclays Live and are rated against the Bloomberg Barclays EM USD Corporate and Quasi Sovereign Index. These sectors may contain both High Grade and High Yield issuers.

To view sector definitions and monthly sector returns for Asia, EEMEA and Latin America Research, go to https://live.barcap.com/go/RSL/servlets/dv.search?pubType=4511&contentType=latest on Barclays Live.

Explanation of the Barclays Research Corporate Credit Rating System

For all High Grade issuers covered in the US, Europe or Asia, and for all issuers in Latin America and EEMEA (excluding South Africa), the credit rating system is based on the analyst's view of the expected excess return over a six-month period of the issuer's index-eligible corporate debt securities* relative to the expected excess return of the relevant sector, as specified on the report.

Overweight (OW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to exceed the six-month expected excess return of the relevant sector.

Market Weight (MW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to be in line with the six-month expected excess return of the relevant sector.

Underweight (UW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to be less than the six-month expected excess return of the relevant sector.

Rating Suspended (RS): The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity in a merger or strategic transaction involving the company.

Coverage Suspended (CS): Coverage of this issuer has been temporarily suspended.

Not Covered (NC): Barclays' fundamental credit research team does not provide formal, continuous coverage of this issuer and has not assigned a rating to the issuer or its debt securities. Any analysis, opinion or trade recommendation provided on a Not Covered issuer or its debt securities is valid only as of the publication date of this report and there should be no expectation that additional reports relating to the Not Covered issuer or its debt securities will be published thereafter.

For all High Yield issuers (excluding those covered in EEMEA or Latin America), the credit rating system is based on the analyst's view of the expected total returns over a six-month period of the rated debt security relative to the expected total return of the relevant sector, as specified on the report.

Overweight (OW): The analyst expects the six-month total return of the debt security subject to this rating to exceed the six-month expected total return of the relevant sector.

Market Weight (MW): The analyst expects the six-month total return of the debt security subject to this rating to be in line with the six-month expected total return of the relevant sector.

Underweight (UW): The analyst expects the six-month total return of the rated debt security subject to this rating to be less than the six-month expected total return of the relevant sector.

Rating Suspended (RS): The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity in a merger or strategic transaction involving the company.

Coverage Suspended (CS): Coverage of this issuer has been temporarily suspended.

Not Covered (NC): Barclays' fundamental credit research team does not provide formal, continuous coverage of this issuer and has not assigned a rating to the issuer or its debt securities. Any analysis, opinion or trade recommendation provided on a Not Covered issuer or its debt securities is valid only as of the publication date of this report and there should be no expectation that additional reports relating to the Not Covered issuer or its debt securities will be published thereafter.

Where a recommendation is made at the issuer level, it does not apply to any sanctioned securities, where trading in such securities would be prohibited under applicable law, including sanctions laws and regulations.

*In EEMEA and Latin America (and in certain other limited instances in other regions), analysts may occasionally rate issuers that are not part of the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or Bloomberg Barclays EM USD Corporate and Quasi Sovereign Index. In such cases the rating will reflect the analyst's view of the expected excess return over a six-month period of the issuer's corporate debt securities relative to the expected excess return of the relevant sector, as specified on the report.

Distribution of ratings assigned by Barclays Corporate Credit Research at the bond level:
22% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 67% of bonds with this rating category are investment banking clients of the Firm; 79% of the issuers with this rating have received financial services from the Firm.
54% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 57% of bonds with this rating category are investment banking clients of the Firm; 77% of the issuers with this rating have received financial services from the Firm.
24% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 55% of bonds with this rating category are investment banking clients of the Firm; 79% of the issuers with this rating have received financial services from the Firm.

Explanation of the Barclays EM Sovereign Credit Issuer Rating System
Overweight (OW):
The analyst expects the three-month excess return of the country's index eligible bonds to exceed the three-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Market Weight (MW):
The analyst expects the three-month excess return of the country's index eligible bonds to be in line with the three-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Underweight (UW):
The analyst expects the three-month excess return of the country's index eligible bonds to be less than the three-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Rating Suspended (RS):
The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity.

Distribution of ratings assigned by Barclays Emerging Markets Sovereign Research at the issuer level:
33% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 33% of issuers with this rating category are investment banking clients of the Firm; 92% of the issuers with this rating have received financial services from the Firm.
25% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 22% of issuers with this rating category are investment banking clients of the Firm; 78% of the issuers with this rating have received financial services from the Firm.
42% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 60% of issuers with this rating category are investment banking clients of the Firm; 87% of the issuers with this rating have received financial services from the Firm.

Explanation of other types of investment recommendations produced by Barclays FICC Research:
Trade ideas contained herein that have been produced by the Credit teams within Barclays Research are valid at current market conditions and may not be otherwise relied upon.
Trade ideas contained herein that have been produced by other research teams within Barclays FICC Research shall remain open until they are subsequently amended or closed in a future research report.

Disclosure of previous investment recommendations produced by Barclays FICC Research:
Barclays FICC Research may have published other investment recommendations in respect of the same securities/instruments recommended in this research report during the preceding 12 months. To view previous investment recommendations published by Barclays FICC Research in the preceding 12 months please refer to *https://live.barcap.com/go/research/ResearchInvestmentRecommendations*.

Legal entities involved in producing Barclays Research:
Barclays Bank PLC (Barclays, UK)
Barclays Capital Inc. (BCI, US)
Barclays Securities Japan Limited (BSJL, Japan)
Barclays Bank PLC, Hong Kong branch (Barclays Bank, Hong Kong)
Barclays Capital Canada Inc. (BCCI, Canada)
Barclays Bank Mexico, S.A. (BBMX, Mexico)
Barclays Securities (India) Private Limited (BSIPL, India)
Barclays Bank PLC, India branch (Barclays Bank, India)
Barclays Bank PLC, Singapore branch (Barclays Bank, Singapore)

Disclaimer
This publication has been produced by Barclays Research Department in the Investment Bank of Barclays Bank PLC and/or one or more of its affiliates (collectively and each individually, "Barclays"). It has been distributed by one or more Barclays affiliated legal entities listed below. It is provided to our clients for information purposes only, and Barclays makes no express or implied warranties, and expressly disclaims all warranties of merchantability or fitness for a particular purpose or use with respect to any data included in this publication. To the extent that this publication states on the front page that it is intended for institutional investors and is not subject to all of the independence and disclosure standards applicable to debt research reports prepared for retail investors under U.S. FINRA Rule 2242, it is an "institutional debt research report" and distribution to retail investors is strictly prohibited. Barclays also

Trustees (India) Private Limited, registered with Registrar of Companies (CIN U93000MH2008PTC188438), are associates of BSIPL in India that are not authorised to distribute any reports produced by Barclays' Investment Bank.
Barclays Bank PLC Frankfurt Branch distributes this material in Germany under the supervision of Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin).
This material is distributed in Mexico by Barclays Bank Mexico, S.A.
Nothing herein should be considered investment advice as defined in the Israeli Regulation of Investment Advisory, Investment Marketing and Portfolio Management Law, 1995 ("Advisory Law"). This document is being made to eligible clients (as defined under the Advisory Law) only. Barclays Israeli branch previously held an investment marketing license with the Israel Securities Authority but it cancelled such license on 30/11/2014 as it solely provides its services to eligible clients pursuant to available exemptions under the Advisory Law, therefore a license with the Israel Securities Authority is not required. Accordingly, Barclays does not maintain an insurance coverage pursuant to the Advisory Law.
Barclays Bank PLC in the Dubai International Financial Centre (Registered No. 0060) is regulated by the Dubai Financial Services Authority (DFSA). Principal place of business in the Dubai International Financial Centre: The Gate Village, Building 4, Level 4, PO Box 506504, Dubai, United Arab Emirates. Barclays Bank PLC-DIFC Branch, may only undertake the financial services activities that fall within the scope of its existing DFSA licence. Related financial products or services are only available to Professional Clients, as defined by the Dubai Financial Services Authority.
Barclays Bank PLC in the UAE is regulated by the Central Bank of the UAE and is licensed to conduct business activities as a branch of a commercial bank incorporated outside the UAE in Dubai (Licence No.: 13/1844/2008, Registered Office: Building No. 6, Burj Dubai Business Hub, Sheikh Zayed Road, Dubai City) and Abu Dhabi (Licence No.: 13/952/2008, Registered Office: Al Jazira Towers, Hamdan Street, PO Box 2734, Abu Dhabi).
Barclays Bank PLC in the Qatar Financial Centre (Registered No. 00018) is authorised by the Qatar Financial Centre Regulatory Authority (QFCRA). Barclays Bank PLC-QFC Branch may only undertake the regulated activities that fall within the scope of its existing QFCRA licence. Principal place of business in Qatar: Qatar Financial Centre, Office 1002, 10th Floor, QFC Tower, Diplomatic Area, West Bay, PO Box 15891, Doha, Qatar. Related financial products or services are only available to Business Customers as defined by the Qatar Financial Centre Regulatory Authority.
This material is distributed in the UAE (including the Dubai International Financial Centre) and Qatar by Barclays Bank PLC.
This material is not intended for investors who are not Qualified Investors according to the laws of the Russian Federation as it might contain information about or description of the features of financial instruments not admitted for public offering and/or circulation in the Russian Federation and thus not eligible for non-Qualified Investors. If you are not a Qualified Investor according to the laws of the Russian Federation, please dispose of any copy of this material in your possession.
This material is distributed in Singapore by the Singapore branch of Barclays Bank PLC, a bank licensed in Singapore by the Monetary Authority of Singapore. For matters in connection with this report, recipients in Singapore may contact the Singapore branch of Barclays Bank PLC, whose registered address is 10 Marina Boulevard, #23-01 Marina Bay Financial Centre Tower 2, Singapore 018983.
This material is distributed to persons in Australia by either Barclays Bank plc, Barclays Capital Inc., Barclays Capital Securities Limited or Barclays Capital Asia Limited. None of Barclays Bank plc, nor any of the other referenced Barclays group entities, hold an Australian financial services licence and instead they each rely on an exemption from the requirement to hold such a licence. This material is intended to only be distributed to "wholesale clients" as defined by the Australian Corporations Act 2001.
IRS Circular 230 Prepared Materials Disclaimer: Barclays does not provide tax advice and nothing contained herein should be construed to be tax advice. Please be advised that any discussion of U.S. tax matters contained herein (including any attachments) (i) is not intended or written to be used, and cannot be used, by you for the purpose of avoiding U.S. tax-related penalties; and (ii) was written to support the promotion or marketing of the transactions or other matters addressed herein. Accordingly, you should seek advice based on your particular circumstances from an independent tax advisor.

BRCF2242