Introducing "Interesting Bonds Today" in US HG Credit

Identifying potentially cheap and rich bonds using Big Data

- This new daily report identifies potentially cheap and rich bonds based on quantitative factors alone. It uses a multi-factor relative value framework.
- The factors used include a bond's G-spread, the discount/premium to its issuer curve, and the discount/premium to its sub-sector and rating curve.
- Each factor must be at the extreme of its one-month range, and the bond must be liquid in order to be highlighted. We consider a bond liquid if it has traded at least $5mn/day on average over the past week.
- A four-year back-test of the framework shows that buying potentially cheap and shorting potentially rich bonds as identified this way outperformed each respective bond's sub-sector over a one-week period.
- Trading the highlighted potentially cheap and rich bonds led to an annualized outperformance vs. their sub-sector of 15.6% (starting in 2015).
- The average success ratio was 74% since 2015, i.e., on average 74% of selected bonds outperformed their sub-sector in the five trading days following their identification.
- Our new daily "Interesting Bonds" report is available on J.P. Morgan Markets here.
- Note that bonds are selected with quantitative criteria only. There may be a fundamental justification for a bond's performance that has caused it to reach the thresholds of this report. Therefore, these are not trading recommendations but bonds that we find interesting to evaluate further.

US High Grade Strategy & Credit Derivatives Research

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See page 9 for analyst certification and important disclosures.

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Daily actionable interesting bonds

We introduce our new "Interesting Bonds Today" report for US High Grade Corporate Credit (link). Every day, the report produces a list of bonds which are liquid and identified as potentially cheap or rich based on a multi-factor relative value framework. The framework also tracks the performance of identified bonds historically as well as the success ratio.

The goal of this report is to identify potentially cheap and rich bonds on a daily basis that will outperform their respective sub-sectors consistently, based on an analytical Big Data framework. We leveraged the extensive datasets from our platform and built an algorithm that remains intuitive and tries to avoid the black-box syndrome. The result is a framework that identifies a set of bonds daily based on several easy-to-understand criteria.[1]

The bonds are highlighted in this report based on several factors: 1) each individual bond's spread, 2) each bond's premium or discount to its fitted issuer curve and its fitted sub-sector/rating curve, and 3) trading volumes as per TRACE.

Multi-year back-tests of the framework show that buying potentially cheap and shorting potentially rich bonds as identified by the framework outperformed each respective bond's sub-sector performance on average assuming a one-week holding period. Buying the highlighted potentially cheap bonds and shorting the rich bonds led to outperformance vs. their sub-sector by 15.6% on an annualized basis on average since the start of 2015 through November 2018. Furthermore, the average success ratio was 74% since 2015, i.e., on average 74% of selected bonds outperformed their sub-sector in the five days following their selection.

Note that the bonds that we identify using our framework are interesting and warrant further evaluation—these are not trade recommendations. Additionally the successful back-test does not guarantee the quality of identified potentially cheap/rich bond selection in the future. However, it does serve as an affirmation that the metrics used to identify the bonds are in fact sound.

Exhibit 1: The majority of highlighted bonds outperformed their sub-sector over the next 5 days by 0.2-0.4% (11-23% annualized)

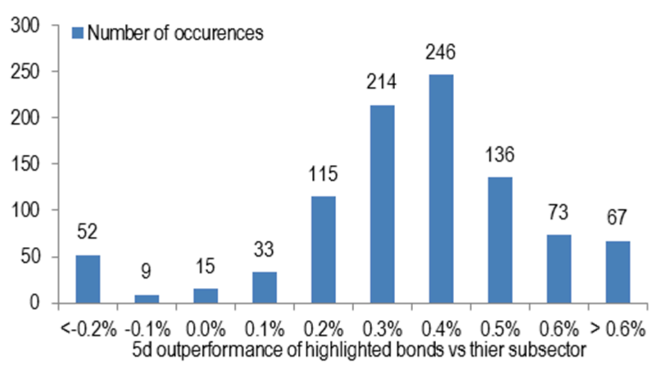
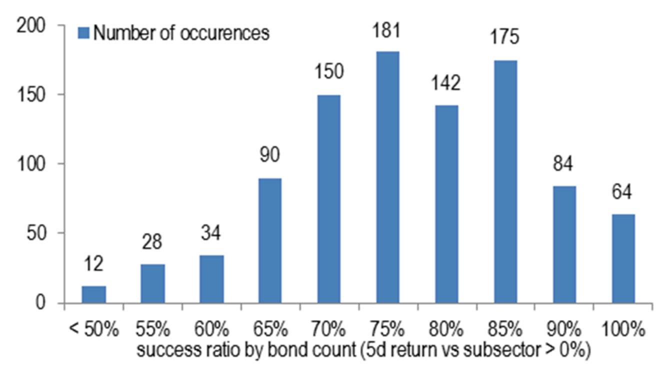


Exhibit 2: The success ratio was 74% by bond count during the back-test



Source for both: J.P. Morgan

Below we provide an introduction to the report and discuss the bond selection criteria we use. We also cover the results of the framework's back-test and the back-test

[1] Note that we use more than 600,000 data points every day to identify these bonds.

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methodology. Lastly, we provide additional details regarding our fitted curve frameworks and how investors can access this information for any HG bond via the DataQuery website.

Bond Selection Criteria

Potentially rich and cheap bonds are selected daily based on four criteria: liquidity, trading levels, and the bond's premium or discount to its respective issuer and sub-sector fitted curves. We discuss how we use these criteria below.

Liquidity: Selected bonds must be liquid in order to ensure that the identified cheap/rich bonds are actionable. Additionally, it is easier to be comfortable with the pricing of liquid bonds. We consider a bond liquid if it traded more than $5mn/day over the past week on average.

G-Spread: Selected rich bonds must be at the tight end of their one-month spread range. The current G-spread (spread to the maturity matched linearly interpolated Treasury curve) must be no more than 5% away from the extremity of this range. For instance, a bond identified as "cheap" must have its spread in the widest 5% of the one-month spread range. The one-month spread range is required to be at least 10bp from tightest to widest in order to ensure that spread moves and relative ranges are material.

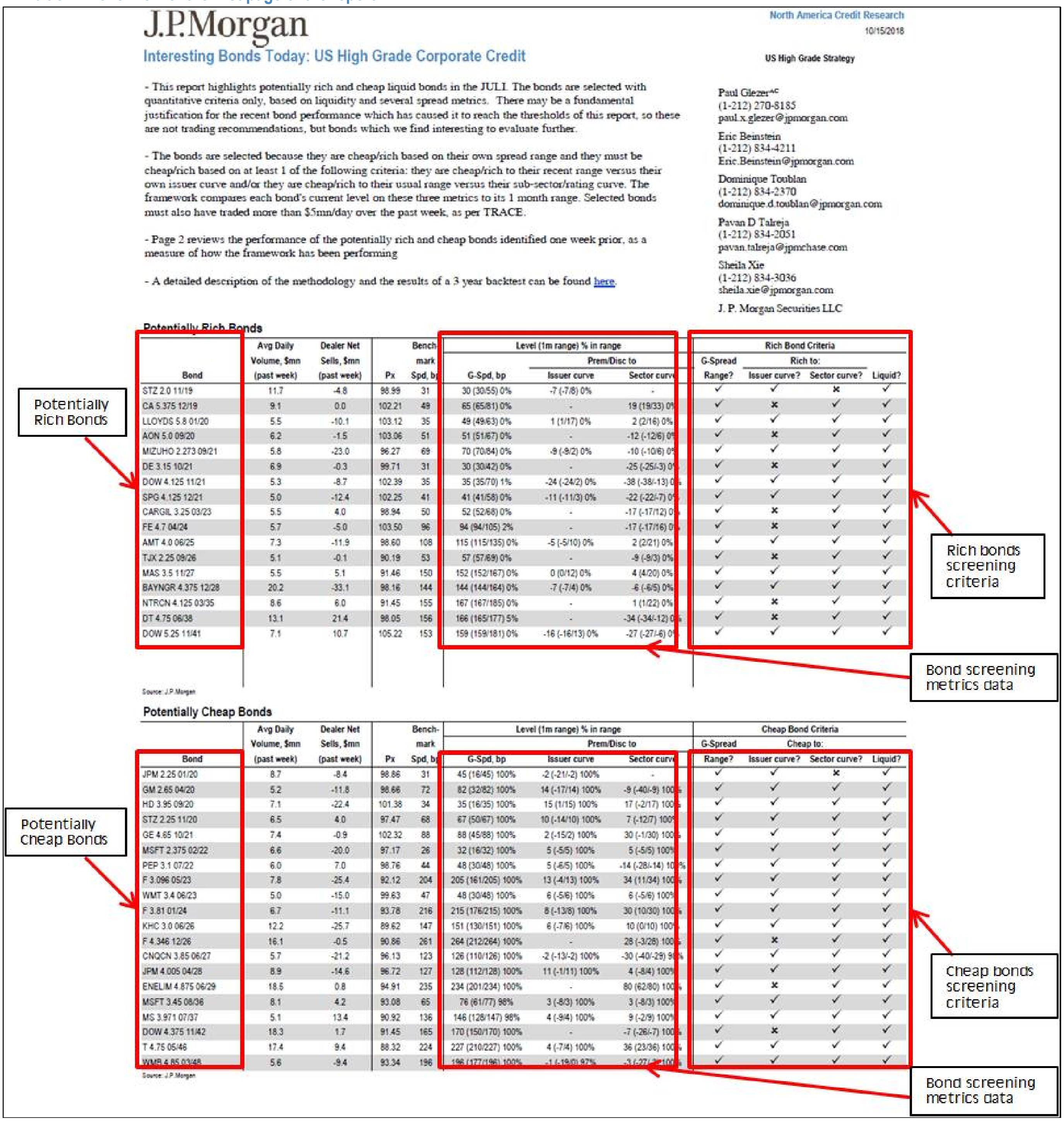
Premium/Discount to Issuer Curve: Our platform produces a best fit curve for over 300 US HG issuers daily (link). This curve is constructed for all JULI issuers with six or more senior unsecured bonds (see Appendix for details). Current premium/discount to issuer curve must be at the outer 5% bands of the one-month range, and the one-month range must be at least 10bp wide just as with the G-spread condition above. Additional information on our fitted curve methodology and how investors can access this data on the bond level historically are given in the Appendix below.

Premium/Discount to Sub-Sector Curve: Our platform also produces a daily fitted curve for each Sector and Sub-Sector within the JULI. Additionally, curves are also fitted for each sector and sub-sector by rating with and without EM bonds. For this analysis we track each bond's relative value to the Sub-Sector and Rating fitted curve. For example, a BBB-rated Medical Devices bond with 8.3 years remaining to maturity is compared to the BBB Medical Devices fitted curve at the 8.3 year point. The curve is built based on all BBB-rated Medical Devices senior unsecured bonds. See Appendix below for more details. The selection criterion is again based on the one-month range, with the bond in the top/bottom 5% for cheap/rich bonds, respectively, and the range itself to be at least 10bp wide.

All bonds that are selected each day must meet the Liquidity and G-spread criteria, and they must meet at least one of the Premium/Discount to curve criteria. Bonds that meet all four criteria are ranked at the top. Bonds that only meet Liquidity, G-spread, and one premium/discount to curve criteria are then ranked below. Within each of these categories the average percentage within the respective spread ranges serves as a tiebreaker. Each day, at most 20 richest and 20 cheapest bonds are selected.

The report at a glance

Exhibit 3: An overview of the first page of the report



J.P.Morgan

North America Credit Research
10/15/2018

US High Grade Strategy

Interesting Bonds Today: US High Grade Corporate Credit

- This report highlights potentially rich and cheap liquid bonds in the JULI. The bonds are selected with quantitative criteria only, based on liquidity and several spread metrics. There may be a fundamental justification for the recent bond performance which has caused it to reach the thresholds of this report, so these are not trading recommendations, but bonds which we find interesting to evaluate further.

- The bonds are selected because they are cheap/rich based on their own spread range and they must be cheap/rich based on at least 1 of the following criteria: they are cheap/rich to their recent range versus their own issuer curve and/or they are cheap/rich to their usual range versus their sub-sector/rating curve. The framework compares each bond's current level on these three metrics to its 1 month range. Selected bonds must also have traded more than $5mn/day over the past week, as per TRACE.

- Page 2 reviews the performance of the potentially rich and cheap bonds identified one week prior, as a measure of how the framework has been performing

- A detailed description of the methodology and the results of a 3 year backtest can be found here.

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Potentially Rich Bonds

Bond	Avg Daily Volume, $mn (past week)	Dealer Net Sells, $mn (past week)	Px	Benchmark Spd, bp	Level (1m range) % in range: G-Spd, bp	Prem/Disc to: Issuer curve	Prem/Disc to: Sector curve	Rich Bond Criteria: G-Spread Range?	Rich to: Issuer curve?	Rich to: Sector curve?	Liquid?
STZ 2.0 11/19	11.7	-4.8	98.99	31	30 (30/55) 0%	-7 (-7/8) 0%	-	✓	✓	✗	✓
CA 5.375 12/19	9.1	0.0	102.21	49	65 (65/81) 0%	-	19 (19/33) 0%	✓	✗	✓	✓
LLOYDS 5.8 01/20	5.5	-10.1	103.12	35	49 (49/63) 0%	1 (1/17) 0%	2 (2/16) 0%	✓	✓	✓	✓
AON 5.0 09/20	6.2	-1.5	103.06	51	51 (51/67) 0%	-	-12 (-12/6) 0%	✓	✗	✓	✓
MIZUHO 2.273 09/21	5.8	-23.0	96.27	69	70 (70/84) 0%	-9 (-9/2) 0%	-10 (-10/6) 0%	✓	✓	✓	✓
DE 3.15 10/21	6.9	-0.3	99.71	31	30 (30/42) 0%	-	-25 (-25/-3) 0%	✓	✗	✓	✓
DOW 4.125 11/21	5.3	-8.7	102.39	35	35 (35/70) 1%	-24 (-24/2) 0%	-38 (-38/-13) 0%	✓	✓	✓	✓
SPG 4.125 12/21	5.0	-12.4	102.25	41	41 (41/58) 0%	-11 (-11/3) 0%	-22 (-22/-7) 0%	✓	✓	✓	✓
CARGIL 3.25 03/23	5.5	4.0	98.94	50	52 (52/68) 0%	-	-17 (-17/12) 0%	✓	✗	✓	✓
FE 4.7 04/24	5.7	-5.0	103.50	96	94 (94/105) 2%	-	-17 (-17/16) 0%	✓	✗	✓	✓
AMT 4.0 06/25	7.3	-11.9	98.60	108	115 (115/135) 0%	-5 (-5/10) 0%	2 (2/21) 0%	✓	✓	✓	✓
TJX 2.25 09/26	5.1	-0.1	90.19	53	57 (57/69) 0%	-	-9 (-9/3) 0%	✓	✗	✓	✓
MAS 3.5 11/27	5.5	5.1	91.46	150	152 (152/167) 0%	0 (0/12) 0%	4 (4/20) 0%	✓	✓	✓	✓
BAYNGR 4.375 12/28	20.2	-33.1	98.16	144	144 (144/164) 0%	-7 (-7/4) 0%	-6 (-6/5) 0%	✓	✓	✓	✓
NTRCN 4.125 03/35	8.6	6.0	91.45	155	167 (167/185) 0%	-	1 (1/22) 0%	✓	✗	✓	✓
DT 4.75 06/38	13.1	21.4	98.05	156	166 (165/177) 5%	-	-34 (-34/-12) 0%	✓	✗	✓	✓
DOW 5.25 11/41	7.1	10.7	105.22	153	159 (159/181) 0%	-16 (-16/13) 0%	-27 (-27/-6) 0%	✓	✓	✓	✓

Source: J.P. Morgan

Potentially Cheap Bonds

Bond	Avg Daily Volume, $mn (past week)	Dealer Net Sells, $mn (past week)	Px	Bench-mark Spd, bp	Level (1m range) % in range: G-Spd, bp	Prem/Disc to: Issuer curve	Prem/Disc to: Sector curve	Cheap Bond Criteria: G-Spread Range?	Cheap to: Issuer curve?	Cheap to: Sector curve?	Liquid?
JPM 2.25 01/20	8.7	-8.4	98.86	31	45 (16/45) 100%	-2 (-21/-2) 100%	-	✓	✓	✗	✓
GM 2.65 04/20	5.2	-11.8	98.66	72	82 (32/82) 100%	14 (-17/14) 100%	-9 (-40/-9) 100%	✓	✓	✓	✓
HD 3.95 09/20	7.1	-22.4	101.38	34	35 (16/35) 100%	15 (1/15) 100%	17 (-2/17) 100%	✓	✓	✓	✓
STZ 2.25 11/20	6.5	4.0	97.47	68	67 (50/67) 100%	10 (-14/10) 100%	7 (-12/7) 100%	✓	✓	✓	✓
GE 4.65 10/21	7.4	-0.9	102.32	88	88 (45/88) 100%	2 (-15/2) 100%	30 (-1/30) 100%	✓	✓	✓	✓
MSFT 2.375 02/22	6.6	-20.0	97.17	26	32 (16/32) 100%	5 (-5/5) 100%	5 (-5/5) 100%	✓	✓	✓	✓
PEP 3.1 07/22	6.0	7.0	98.76	44	48 (30/48) 100%	5 (-6/5) 100%	-14 (-28/-14) 100%	✓	✓	✓	✓
F 3.096 05/23	7.8	-25.4	92.12	204	205 (161/205) 100%	13 (-4/13) 100%	34 (11/34) 100%	✓	✓	✓	✓
WMT 3.4 06/23	5.0	-15.0	99.63	47	48 (30/48) 100%	6 (-5/6) 100%	6 (-5/6) 100%	✓	✓	✓	✓
F 3.81 01/24	6.7	-11.1	93.78	216	215 (176/215) 100%	8 (-13/8) 100%	30 (10/30) 100%	✓	✓	✓	✓
KHC 3.0 06/26	12.2	-25.7	89.62	147	151 (130/151) 100%	6 (-7/6) 100%	10 (0/10) 100%	✓	✓	✓	✓
F 4.346 12/26	16.1	-0.5	90.86	261	264 (212/264) 100%	-	28 (-3/28) 100%	✓	✗	✓	✓
CNQCN 3.85 06/27	5.7	-21.2	96.13	123	126 (110/126) 100%	-2 (-13/-2) 100%	-30 (-40/-29) 96%	✓	✓	✓	✓
JPM 4.005 04/28	8.9	-14.6	96.72	127	128 (112/128) 100%	11 (-1/11) 100%	4 (-8/4) 100%	✓	✓	✓	✓
ENELIM 4.875 06/29	18.5	0.8	94.91	235	234 (201/234) 100%	-	80 (62/80) 100%	✓	✗	✓	✓
MSFT 3.45 08/36	8.1	4.2	93.08	65	76 (61/77) 98%	3 (-8/3) 100%	3 (-8/3) 100%	✓	✓	✓	✓
MS 3.971 07/37	5.1	13.4	90.92	136	146 (128/147) 98%	4 (-9/4) 100%	9 (-2/9) 100%	✓	✓	✓	✓
DOW 4.375 11/42	18.3	1.7	91.45	165	170 (150/170) 100%	-	-7 (-26/-7) 100%	✓	✗	✓	✓
T 4.75 05/46	17.4	9.4	88.32	224	227 (210/227) 100%	4 (-7/4) 100%	36 (23/36) 100%	✓	✓	✓	✓
WMB 4.85 03/48	5.6	-9.4	93.34	196	196 (177/196) 100%	-1 (-19/0) 97%	-3 (-27/[illegible]) 100%	✓	✓	✓	✓

Source: J.P. Morgan

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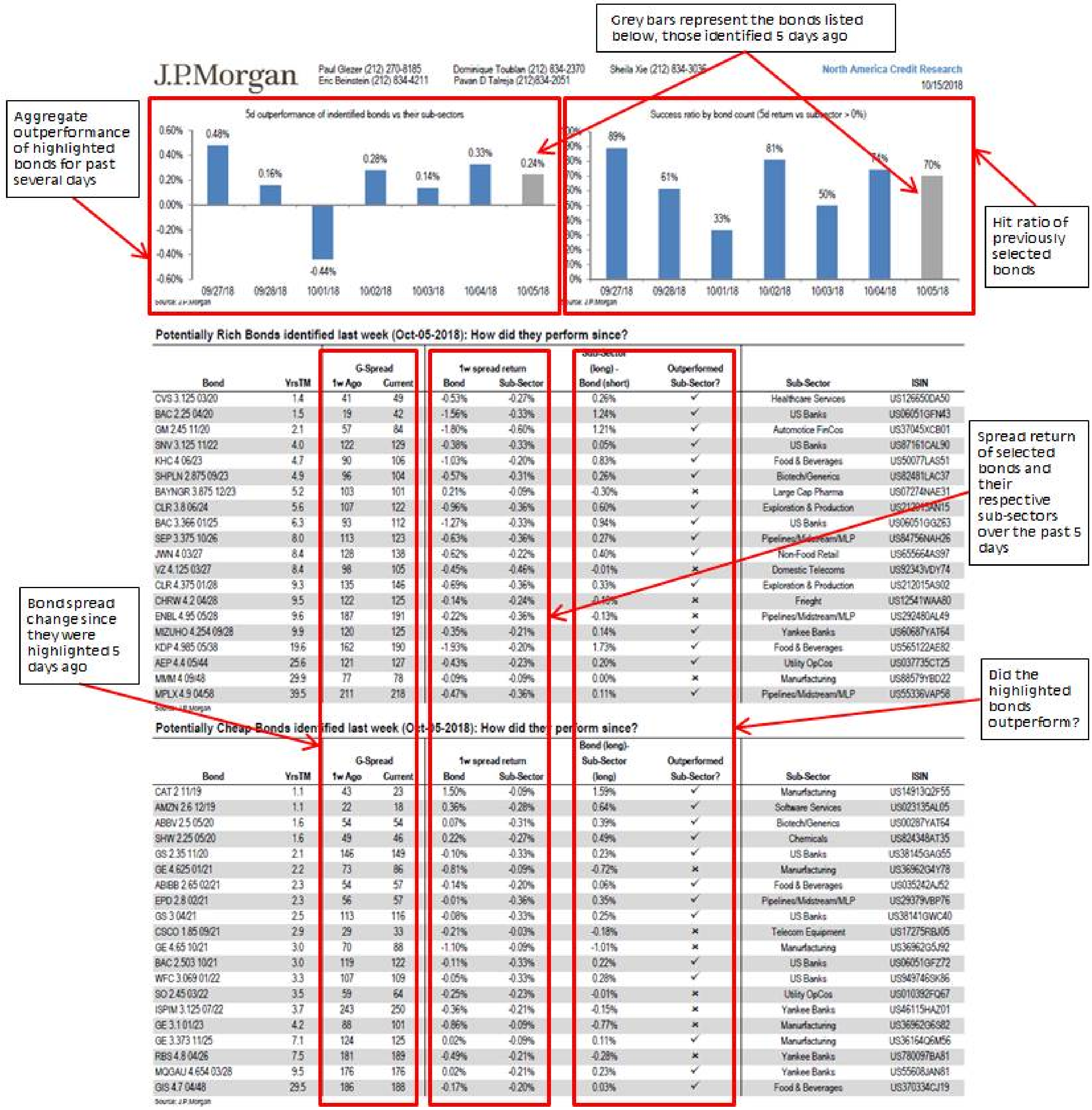
Exhibit 4: An overview of the second page of the report



Potentially Rich Bonds identified last week (Oct-05-2018): How did they perform since?

Bond	YrsTM	G-Spread 1w Ago	G-Spread Current	1w spread return Bond	1w spread return Sub-Sector	Sub-Sector (long) - Bond (short)	Outperformed Sub-Sector?	Sub-Sector	ISIN
CVS 3.125 03/20	1.4	41	49	-0.53%	-0.27%	0.26%	✓	Healthcare Services	US126650DA50
BAC 2.25 04/20	1.5	19	42	-1.56%	-0.33%	1.24%	✓	US Banks	US06051GFN43
GM 2.45 11/20	2.1	57	84	-1.80%	-0.60%	1.21%	✓	Automotice FinCos	US37045XCB01
SNV 3.125 11/22	4.0	122	129	-0.38%	-0.33%	0.05%	✓	US Banks	US87161CAL90
KHC 4 06/23	4.7	90	106	-1.03%	-0.20%	0.83%	✓	Food & Beverages	US50077LAS51
SHPLN 2.875 09/23	4.9	96	104	-0.57%	-0.31%	0.26%	✓	Biotech/Generics	US82481LAC37
BAYNGR 3.875 12/23	5.2	103	101	0.21%	-0.09%	-0.30%	×	Large Cap Pharma	US07274NAE31
CLR 3.8 06/24	5.6	107	122	-0.96%	-0.36%	0.60%	✓	Exploration & Production	US212015AN15
BAC 3.366 01/25	6.3	93	112	-1.27%	-0.33%	0.94%	✓	US Banks	US06051GGZ63
SEP 3.375 10/26	8.0	113	123	-0.63%	-0.36%	0.27%	✓	Pipelines/Midstream/MLP	US84756NAH26
JWN 4 03/27	8.4	128	138	-0.62%	-0.22%	0.40%	✓	Non-Food Retail	US655664AS97
VZ 4.125 03/27	8.4	98	105	-0.45%	-0.46%	-0.01%	×	Domestic Telecoms	US92343VDY74
CLR 4.375 01/28	9.3	135	146	-0.69%	-0.36%	0.33%	✓	Exploration & Production	US212015AS02
CHRW 4.2 04/28	9.5	122	125	-0.14%	-0.24%	[illegible]	×	Frieght	US12541WAA80
ENBL 4.95 05/28	9.6	187	191	-0.22%	-0.36%	-0.13%	×	Pipelines/Midstream/MLP	US292480AL49
MIZUHO 4.254 09/28	9.9	120	125	-0.35%	-0.21%	0.14%	✓	Yankee Banks	US60687YAT64
KDP 4.985 05/38	19.6	162	190	-1.93%	-0.20%	1.73%	✓	Food & Beverages	US565122AE82
AEP 4.4 05/44	25.6	121	127	-0.43%	-0.23%	0.20%	✓	Utility OpCos	US037735CT25
MMM 4 09/48	29.9	77	78	-0.09%	-0.09%	0.00%	×	Manufacturing	US88579YBD22
MPLX 4.9 04/58	39.5	211	218	-0.47%	-0.36%	0.11%	✓	Pipelines/Midstream/MLP	US55336VAP58

Source: J.P. Morgan

Potentially Cheap Bonds identified last week (Oct-05-2018): How did they perform since?

Bond	YrsTM	G-Spread 1w Ago	G-Spread Current	1w spread return Bond	1w spread return Sub-Sector	Bond (long)- Sub-Sector (long)	Outperformed Sub-Sector?	Sub-Sector	ISIN
CAT 2 11/19	1.1	43	23	1.50%	-0.09%	1.59%	✓	Manufacturing	US14913Q2F55
AMZN 2.6 12/19	1.1	22	18	0.36%	-0.28%	0.64%	✓	Software Services	US023135AL05
ABBV 2.5 05/20	1.6	54	54	0.07%	-0.31%	0.39%	✓	Biotech/Generics	US00287YAT64
SHW 2.25 05/20	1.6	49	46	0.22%	-0.27%	0.49%	✓	Chemicals	US824348AT35
GS 2.35 11/20	2.1	146	149	-0.10%	-0.33%	0.23%	✓	US Banks	US38145GAG55
GE 4.625 01/21	2.2	73	86	-0.81%	-0.09%	-0.72%	×	Manufacturing	US36962G4Y78
ABIBB 2.65 02/21	2.3	54	57	-0.14%	-0.20%	0.06%	✓	Food & Beverages	US035242AJ52
EPD 2.8 02/21	2.3	56	57	-0.01%	-0.36%	0.35%	✓	Pipelines/Midstream/MLP	US29379VBP76
GS 3 04/21	2.5	113	116	-0.08%	-0.33%	0.25%	✓	US Banks	US38141GWC40
CSCO 1.85 09/21	2.9	29	33	-0.21%	-0.03%	-0.18%	×	Telecom Equipment	US17275RBJ05
GE 4.65 10/21	3.0	70	88	-1.10%	-0.09%	-1.01%	×	Manufacturing	US36962G5J92
BAC 2.503 10/21	3.0	119	122	-0.11%	-0.33%	0.22%	✓	US Banks	US06051GFZ72
WFC 3.069 01/22	3.3	107	109	-0.05%	-0.33%	0.28%	✓	US Banks	US949746SK86
SO 2.45 03/22	3.5	59	64	-0.25%	-0.23%	-0.01%	×	Utility OpCos	US010392FQ67
ISPIM 3.125 07/22	3.7	243	250	-0.36%	-0.21%	-0.15%	×	Yankee Banks	US46115HAZ01
GE 3.1 01/23	4.2	88	101	-0.86%	-0.09%	-0.77%	×	Manufacturing	US36962G6S82
GE 3.373 11/25	7.1	124	125	0.02%	-0.09%	0.11%	✓	Manufacturing	US36164Q6M56
RBS 4.8 04/26	7.5	181	189	-0.49%	-0.21%	-0.28%	×	Yankee Banks	US780097BA81
MQGAU 4.654 03/28	9.5	176	176	0.02%	-0.21%	0.23%	✓	Yankee Banks	US55608JAN81
GIS 4.7 04/48	29.5	186	188	-0.17%	-0.20%	0.03%	✓	Food & Beverages	US370334CJ19

Source: J.P. Morgan

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Back-testing: the results and methodology

This framework was subjected to a four-year back-test by running on a daily basis from January 2015 through November 30, 2018. This time frame covers periods of both gradual and rapid HG credit spread widening and tightening. We believe this serves as a good sample period as it capture the gradual spread widening at the start of 2015, the energy-led sell-off of late 2015 to early 2016, the spread rally through February 2018, and the recent spread widening. This period also includes fluctuations in HG credit yields.

Exhibit 5: The back-test period covers period of spread widening and tightening . . .

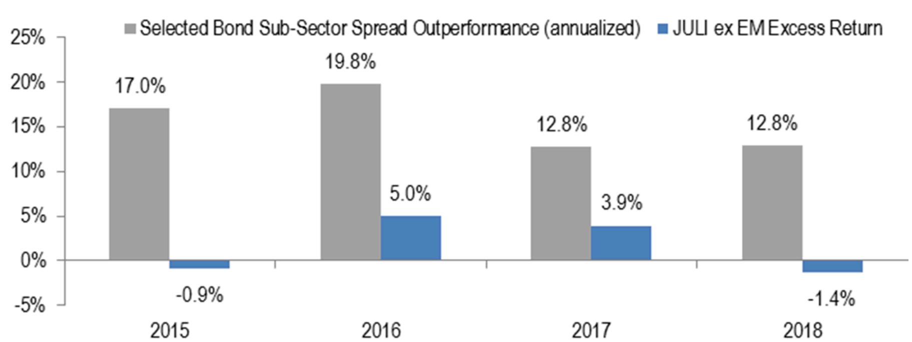
Exhibit 6: . . . and a varying range of yields

Source for both: J.P. Morgan.

For a given day the back-test revisits the rich and cheap bonds highlighted five days prior. We compare excess returns an investor would realize by being long a cheap bond for five days to being long that bond's sub-sector. Similarly we compare being short a rich bond to being long the sub-sector on an excess return basis. All returns at the selected bond and sub-sector level are duration adjusted to match the overall JULI.

Each bond's excess return over the sub-sector is aggregated each day. The average daily aggregate outperformance has been 0.28% per day based on a five-day holding period, i.e., 15.6% on an annualized basis.

Exhibit 7: The selected bonds have outperformed the JULI each year



Source: J.P. Morgan.

The framework is designed to highlight at most 20 potentially rich and 20 potentially cheap bonds each day, but there is no minimum. It is possible to have days where there are only some potentially rich bonds or only potentially cheap bonds, or no bonds at all on a given day. Similarly, the framework does not have any conditions to

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enforce distribution of selection across sectors or tenor categories across the credit curve.

The sector distribution across all recommendations for potentially rich bonds is relatively in line to the overall HG market as per the JULI. The framework does identify a large number of potentially rich Bank bonds and a lower number of potentially rich Utilities bonds. The framework also identifies a lower number of potentially rich long-end bonds.

Exhibit 8: Highlighted potentially rich bonds have a higher number of Banks and a lower number of Utilities relative to the HG bond market

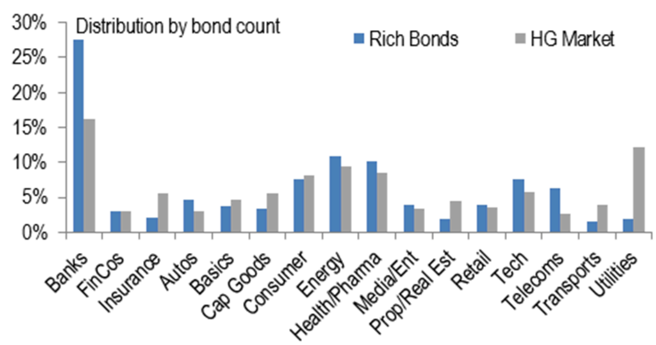
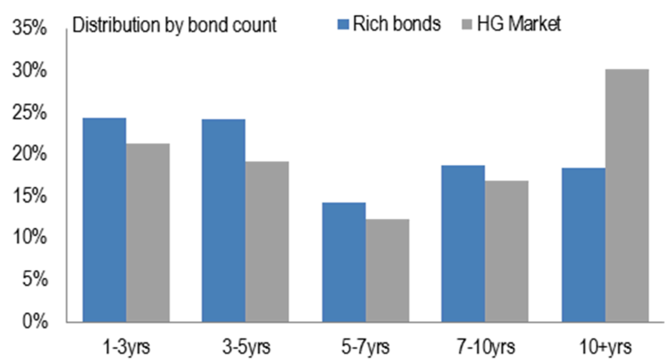


Exhibit 9: Potentially rich bonds had a lower number of long-end bonds than the broader HG market



Source for both: J.P. Morgan

The number of identified potentially cheap Utility bonds is lower than the number of Utilities in the market. The framework identifies more Bank bonds than they represent in the HG market, but this figure is more in line compared to rich bonds (see above). Additionally, the distribution across the curve for potentially cheap bonds is also more in line than rich bonds (see above).

Exhibit 10: Highlighted potentially cheap bonds a lower number of Utilities relative to the HG bond market

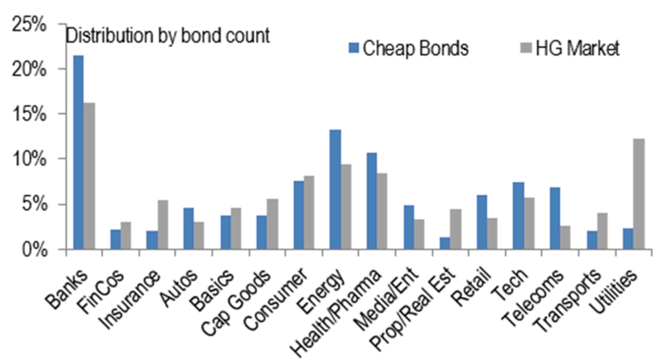
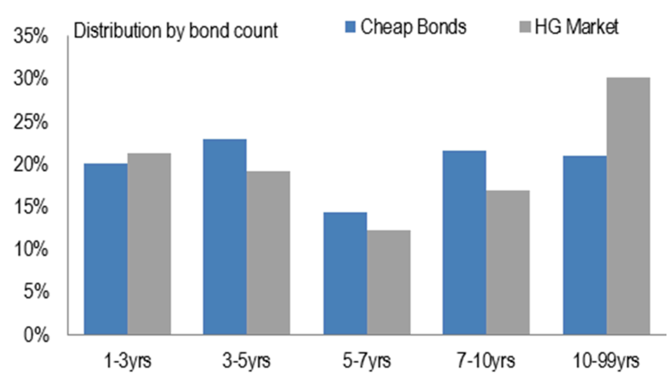


Exhibit 11: Potentially cheap bonds had a lower number of long-end bonds than the broader HG market



Source for both: J.P. Morgan

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Appendix: Fitted curves explained

Our fitted curve methodology fits a curve to a set of bonds based on a spread metric of choice. A bond's influence/pull on the shape of the curve is impacted primarily by its liquidity as per TRACE and less so by the par amount outstanding. We first introduced our fitted curve methodology in 2013, and you can find specifics here.

Individual bond's premium/discount to the issuer and sub-sector/rating curves are available historically on the DataQuery website (link). Using the left-hand navigation select Credit->US Corporates->JULI Bonds. After searching for a bond the attributes to select are "Prem/Disc to Issuer Curve" and "Prem/Disc to Sub-Sector/Rating Curve." A figure of -5 indicates that a bond is 5bp rich (tight) to the issuer curve at the bond's maturity on that day.

Fitted issuer curve information is available to investors in multiple ways. Investors can access fitted issuer curves via the DataQuery website. Using the left-hand navigation select Credit->US Corporates->JULI Issuer Curves. On the menu you can select an issuer, the preferred spread type, and the desired fixed maturity point on the curve. For example, selecting Verizon G-Spread (tsy) 10yr will return a historical data series of the level of the Verizon fitted curve based on the G-spread of underlying Verizon bonds. The data returned is the 10-year point on that curve historically. Investors can also access our daily High Grade Bond Curve Report on J.P. Morgan Markets (link) to see visual representations of individual issuer curves and each bond's premium/discount to the issuer curve today.

Fitted Sector and Sub-Sector curves at the top line as well as broken out by ratings are also available on DataQuery. They can be accessed via the left-hand navigation menu by selecting Credit->US Corporates->JULI Sector Curves.

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