

J.P. Morgan ESG Global HY Corporate Custom Maturity Index

Methodology and Factsheet

Highlights

The J.P. Morgan ESG Global HY Corporate Custom Maturity Index tracks corporate fixed and floating-rate debt instruments across developed market and emerging market high yield issuers, including USD, EUR and GBP currencies. The index applies an ESG scoring and screening methodology to tilt toward issuers ranked higher on ESG criteria and green bond issues, and to underweight and exclude issuers that rank lower. Differing from the flagship JESG Global High Yield Corporate Index (JESG GHYCI), this custom index applies a higher amount outstanding threshold of \$300mm, €300mm, and £250mm with a minimum of 3 months till maturity to remain in the index. The returns and statistics are available since December 2012.

Baseline Index Criteria

Instrument Type:	Include: fixed rate, floating rate, hybrid, step-up, PIK, toggle, amortizers, perpetuals, Sukuk bonds, and all subordinated financial bonds except AT1 Exclude: structured bonds and credit enhanced bonds including credit linked, collateral trust and equipment trust bonds, dual currency bonds and bonds with non-transparent cash flows or atypical indices used to reset coupons		
Issuer Type:	Include: Corporate Exclude: sovereign and quasi-sovereign issuers ¹		
Collateral:	Exclude: covered, mortgage backed, asset backed, bank guaranteed, government guaranteed		
Maturity:	Entry: Minimum 24 months till maturity; Exit: minimum 3 months till maturity		
Amount Outstanding:	USD (\$) \$300mm	Euro (€) €300mm	Sterling (£) £250mm
Holiday:	SIFMA, EMTA		
Currency:	USD (\$) Euro (€) Sterling (£) denominated bonds are allowed.		
Country:	All countries across developed and emerging markets		
Credit Rating:	Only HY-rated securities included. Non-rated securities are included if issuer is HY-rated. For index purposes, S&P, Moody's, and Fitch will be considered. Credit rating will be determined based on the following rules: 1. The middle rating of the Moody's, S&P, and Fitch ratings 2. The lower rating when two ratings are available 3. The sole rating when only one rating is provided		
Defaulted Issues:	Upon default, the issue is removed from the index on the month-end after a grace period		
Fallen Angels / Rising Stars:	Bonds will transition between investment grade and high yield at the coming month-end rebalance up to and including T-1 business day of the month. Issuers transitioning between IG and HY with both rating changes that occur after the 15th of the month and bonds outstanding greater than or equal to 1% of the baseline index face value will be subject to a one month delay.		
Registration Type:	SEC-registered Global, Domestic, MTN, and 144A with or without registration rights, Eurobonds, and EMTNs that trade in accordance with ISMA principals. Reg-S bonds and Private Placements are eligible after 40-day seasoning period, provided liquidity requirements are met. Reg-S format for Euro-denominated, Sterling-denominated, and US Dollar-denominated EM bonds. 144A format for US Dollar-denominated DM bonds.		

Source: JPMorgan Chase & Co.

1 – Quasi-sovereign entities are defined as being 100% guaranteed or 100% owned by the national government.

JESG Overlay Criteria

ESG providers & Green Bond certification authorities:	Sustainalytics (Corporates) RepRisk (Corporates) Climate Bonds Initiative (Green bonds)																																												
JESG Scoring methodology:	The absolute index scores are a blend of Sustainalytics & RepRisk on an equal weight basis. The scores range from 0 - 100, with 100 classified as the best possible score.																																												
JESG Integration methodology:	Issuers with better overall ESG scores are assigned larger weights compared to the non-ESG baseline index.																																												
Green bond treatment:	Increased weight allocation compared to a conventional bond from same issuer.																																												
JESG Ethical exclusions & Negative Screening:	<p>Issuers are excluded based on the below criteria.</p> <ul style="list-style-type: none"> • Issuers with revenue from the following sectors: <ul style="list-style-type: none"> ○ Thermal Coal ○ Tobacco ○ Weapons ○ Oil Sands (Effective Dec 31, 2020 onwards) • Issuers not in compliance with UN Global Compact principles as identified by both RepRisk and Sustainalytics • Issuers with JESG scores less than 20 are not eligible for index re-inclusion for 12 months 																																												
JESG Categories of Involvement & Exclusion Thresholds	<table border="1"> <thead> <tr> <th>Category</th> <th>Category of Involvement</th> <th>Description</th> <th>Revenue Threshold</th> </tr> </thead> <tbody> <tr> <td>Oil Sands</td> <td>Extraction</td> <td>The company extracts oil sands.</td> <td>0%</td> </tr> <tr> <td>Thermal Coal</td> <td>Extraction</td> <td>The company extracts thermal coal.</td> <td>0%</td> </tr> <tr> <td></td> <td>Power Generation</td> <td>The company generates electricity from thermal coal.</td> <td>0%</td> </tr> <tr> <td>Tobacco</td> <td>Production</td> <td>The company manufactures tobacco products.</td> <td>0%</td> </tr> <tr> <td>Military Contracting</td> <td>Weapons</td> <td>The company manufactures military weapon systems and/or integral, tailor-made components or these weapons.</td> <td>0%</td> </tr> <tr> <td>Small Arms</td> <td>Civilian customers (Assault weapons)</td> <td>The company manufactures and sells assault weapons to civilian customers.</td> <td>0%</td> </tr> <tr> <td></td> <td>Military/law enforcement customers</td> <td>The company manufactures and sells small arms to military/law enforcement.</td> <td>0%</td> </tr> <tr> <td></td> <td>Key components</td> <td>The company manufactures and sells key components of small arms.</td> <td>0%</td> </tr> <tr> <td></td> <td>Civilian customers (Non-assault weapons)</td> <td>The company manufactures and sells small arms (Non-assault weapons) to civilian customers.</td> <td>0%</td> </tr> <tr> <td>Controversial Weapons</td> <td>Tailor-made and essential</td> <td>The company is involved in the core weapon system, or components/services of the core weapon system that are considered tailor-made and essential for the lethal use of the weapon.</td> <td>0%</td> </tr> </tbody> </table>	Category	Category of Involvement	Description	Revenue Threshold	Oil Sands	Extraction	The company extracts oil sands.	0%	Thermal Coal	Extraction	The company extracts thermal coal.	0%		Power Generation	The company generates electricity from thermal coal.	0%	Tobacco	Production	The company manufactures tobacco products.	0%	Military Contracting	Weapons	The company manufactures military weapon systems and/or integral, tailor-made components or these weapons.	0%	Small Arms	Civilian customers (Assault weapons)	The company manufactures and sells assault weapons to civilian customers.	0%		Military/law enforcement customers	The company manufactures and sells small arms to military/law enforcement.	0%		Key components	The company manufactures and sells key components of small arms.	0%		Civilian customers (Non-assault weapons)	The company manufactures and sells small arms (Non-assault weapons) to civilian customers.	0%	Controversial Weapons	Tailor-made and essential	The company is involved in the core weapon system, or components/services of the core weapon system that are considered tailor-made and essential for the lethal use of the weapon.	0%
Category	Category of Involvement	Description	Revenue Threshold																																										
Oil Sands	Extraction	The company extracts oil sands.	0%																																										
Thermal Coal	Extraction	The company extracts thermal coal.	0%																																										
	Power Generation	The company generates electricity from thermal coal.	0%																																										
Tobacco	Production	The company manufactures tobacco products.	0%																																										
Military Contracting	Weapons	The company manufactures military weapon systems and/or integral, tailor-made components or these weapons.	0%																																										
Small Arms	Civilian customers (Assault weapons)	The company manufactures and sells assault weapons to civilian customers.	0%																																										
	Military/law enforcement customers	The company manufactures and sells small arms to military/law enforcement.	0%																																										
	Key components	The company manufactures and sells key components of small arms.	0%																																										
	Civilian customers (Non-assault weapons)	The company manufactures and sells small arms (Non-assault weapons) to civilian customers.	0%																																										
Controversial Weapons	Tailor-made and essential	The company is involved in the core weapon system, or components/services of the core weapon system that are considered tailor-made and essential for the lethal use of the weapon.	0%																																										

Source: JPMorgan Chase & Co.

Effective January 31st, 2023, Issuers deriving less than 10% of their revenue from military contracting and small arms sales will become eligible for JESG indices.

Index Characteristics and Methodology

Pricing:	Mid prices are taken from a third party pricing source, PricingDirect.
Aggregate Return:	Index level total return is calculated as a market-weighted average of bond returns using mid prices.
Rebalancing:	Rebalances on the last US business day of the month.
Coupon Treatment:	All coupons received are immediately reinvested into the index.
FX Rates:	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters.
Hedging Strategy:	Assume a 1-month currency forward position that begins on rebalance day and ends on next rebalance day.
Weighting:	Market capitalization based weighting, renormalized based on JESG Band scalar
Bloomberg Ticker:	JPEIGHYC Index

Source: JPMorgan Chase & Co.

Appendix

Defining the Index Universe

Eligibility for the index will be determined on a continuous basis by monitoring the index criteria. Any changes to the composition or eligibility will be announced prior to rebalance with an estimated schedule to provide full transparency to the investor base.

Countries of risk for the instruments in the index will be determined based upon the below considerations:

1. The country with the largest source of revenue. Guarantees by other entities including subsidiaries or holding companies in other countries will also be considered.
2. The headquarters or the location of the issuer's majority assets will also be considered.

New Issue Timing

A new issue that meets the index admission requirements is added to the index on the month-end business date after its issuance, provided its settle date falls five business days before month-end. A new issue whose settlement date falls on or after month-end minus five is not eligible for inclusion until the following month-end rebalancing.

The exception to the timing of new issuance is for Reg-S securities. Instruments issued purely in reliance on Regulation S or "Reg-S" (without an accompanying 144A or registered tranche) or private placements (not registered instruments) are eligible for inclusion only after a 40 calendar day seasoning period provided they meet all other index criteria. The date at which the seasoning restriction is lifted will effectively be the new "settlement" date.

Fallen angels and rising stars

Fallen angels (issuers with an index rating transitioning from IG to HY) which meet all other index eligibility rules are added to the index on the last business day of the month-end following the credit rating bucket change from investment grade to high yield. Fallen angel issuers downgraded after the 15th of the month and with aggregate index eligible bonds outstanding equivalent to 1% or more of the total face value of the baseline index, will be subject to a one month delay for index inclusion.

All rising stars (issuers transitioning from HY to IG) will exit the index at the coming month-end rebalance following the credit rating bucket change up to and including T-1 business day of the month. Rising star issuers upgraded after the 15th of the month and with aggregate index eligible bonds outstanding equivalent to 1% or more of the total face value of the baseline index, will be subject to a one month delay for index exclusion.

ESG Methodology

The index applies J.P. Morgan ESG (JESG) issuer scores to adjust the market value of index constituents from the global high yield corporate baseline index. JESG issuer scores are a 0-100 percentile rank calculated based on normalized raw ESG scores from third-party research providers Sustainalytics and RepRisk. An issuer's finalized JESG score incorporates a 3-month rolling average. Corporate issuers with no coverage by either third-party research provider default to their region-sector JESG score. The JESG scores are divided into five bands that are used to scale each issue's baseline index market value, with the band rebalance occurring with a one-month lag.

JESG Score Bands	Scalar
Band 1: Score > 80	1.00
Band 2: 60 < Score <= 80	0.80
Band 2: 40 < Score <= 60	0.60
Band 2: 20 < Score <= 40	0.40
Band 2: Score <= 20	0.00

Issuers in Band 5 will be excluded from the index and will not be eligible for twelve months. If an instrument is categorized as

a “green bond” by the Climate Bonds Initiative, the security will receive a one-band upgrade. Green bonds by issuers already in Band 1 will not receive any further upgrades.

Weighting Methodology

While the weight of the instruments in the baseline global high yield corporate index are market-weighted, the weight of each instrument in the JESG Global HY Corporate Custom Maturity Index is determined by taking the issue’s market value in USD, weighting by the ESG scalar, and then dividing by the total JESG market value of all JESG-eligible instruments in the index (US\$). The result represents the weight of the issue expressed as a percentage of the JESG Global HY Corporate Custom Maturity Index. The market value of each issue is calculated by multiplying its face amount outstanding by the dirty price. Face amount outstanding for each issue is updated at each month-end in order to reflect market events (such as re-openings or buybacks) that have increased or decreased the issue’s available supply.

For any questions or for additional information, please contact index.research@jpmorgan.com.

Global Index Research

www.jpmorganmarkets.com

Disclosures

Analyst Certification: The research analyst(s) denoted by an “AC” on the cover of this report certifies (or, where multiple research analysts are primarily responsible for this report, the research analyst denoted by an “AC” on the cover or within the document individually certifies, with respect to each security or issuer that the research analyst covers in this research) that: (1) all of the views expressed in this report accurately reflect the research analyst’s personal views about any and all of the subject securities or issuers; and (2) no part of any of the research analyst’s compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the research analyst(s) in this report. For all Korea-based research analysts listed on the front cover, if applicable, they also certify, as per KOFIA requirements, that their analysis was made in good faith and that the views reflect their own opinion, without undue influence or intervention.

All authors named within this report are research analysts unless otherwise specified. In Europe, Sector Specialists may be shown on this report as contacts but are not authors of the report or part of the Research Department.

Company-Specific Disclosures: Important disclosures, including price charts and credit opinion history tables, are available for compendium reports and all J.P. Morgan-covered companies by visiting <https://www.jpmm.com/research/disclosures>, calling 1-800-477-0406, or e-mailing research.disclosure.inquiries@jpmorgan.com with your request. J.P. Morgan’s Strategy, Technical, and Quantitative Research teams may screen companies not covered by J.P. Morgan. For important disclosures for these companies, please call 1-800-477-0406 or e-mail research.disclosure.inquiries@jpmorgan.com.

Analysts' Compensation: The research analysts responsible for the preparation of this report receive compensation based upon various factors, including the quality and accuracy of research, client feedback, competitive factors, and overall firm revenues.

Other Disclosures

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide.

Any data discrepancies in this report could be the result of different calculations and/or adjustments.

Any long form nomenclature for references to China; Hong Kong; Taiwan; and Macau within this research report are Mainland China; Hong Kong SAR, China; Taiwan, China; Macau SAR, China.

Options and Futures related research: If the information contained herein regards options or futures related research, such information is available only to persons who have received the proper options or futures risk disclosure documents. Please contact your J.P. Morgan Representative or visit <https://www.theocc.com/components/docs/riskstoc.pdf> for a copy of the Option Clearing Corporation’s Characteristics and Risks of Standardized Options or http://www.finra.org/sites/default/files/Security_Futures_Risk_Disclosure_Statement_2018.pdf for a copy of the Security Futures Risk Disclosure Statement.

Private Bank Clients: Where you are receiving research as a client of the private banking businesses offered by JPMorgan Chase & Co. and its subsidiaries (“J.P. Morgan Private Bank”), research is provided to you by J.P. Morgan Private Bank and not by any other division of J.P. Morgan, including but not limited to the J.P. Morgan corporate and investment bank and its research division.

Legal entity responsible for the production of research: The legal entity identified below the name of the Reg AC research analyst who authored this report is the legal entity responsible for the production of this research. Where multiple Reg AC research analysts authored this report with different legal entities identified below their names, these legal entities are jointly responsible for the production of this research.

Legal Entities Disclosures

U.S.: JPMS is a member of NYSE, FINRA, SIPC and the NFA. JPMorgan Chase Bank, N.A. is a member of FDIC. **Canada:** J.P. Morgan Securities Canada Inc. is a registered investment dealer, regulated by the Investment Industry Regulatory Organization of Canada and the Ontario Securities Commission and is the participating member on Canadian exchanges. **U.K.:** JPMorgan Chase N.A., London Branch, is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and to limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from J.P. Morgan on request. J.P. Morgan Securities plc (JPMS plc) is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. Registered in England & Wales No. 2711006. Registered Office 25 Bank Street, London, E14 5JP. **Germany:** This material is distributed in Germany by J.P. Morgan Securities plc, Frankfurt Branch which is regulated by the Bundesanstalt für Finanzdienstleistungsaufschaff and also by J.P. Morgan AG (JPM AG) which is a member of the Frankfurt stock exchange and is regulated by the Federal Financial Supervisory Authority (BaFin), JPM AG is a company incorporated in the Federal Republic of Germany with registered office at Taunustor 1, 60310 Frankfurt am Main, the Federal Republic of Germany. **South Africa:** J.P. Morgan Equities South Africa Proprietary Limited is a member of the Johannesburg Securities Exchange and is regulated by the Financial Services Board. **Hong Kong:** J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong and/or J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. JP Morgan Chase Bank, N.A., Hong Kong is organized under the laws of U.S.A. with limited liability. **Korea:** This material is issued and distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch, which is a member of the Korea Exchange(KRX) and is regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). **Australia:** J.P. Morgan Securities Australia Limited (JPMSAL) (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by ASIC and is a Market, Clearing and Settlement Participant of ASX Limited and CHI-X. **Taiwan:** J.P. Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. **India:** J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai - 400098, is registered with Securities and Exchange Board of India (SEBI) as a ‘Research Analyst’ having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited and the Bombay Stock Exchange Limited (SEBI Registration Number – INZ000239730) and as a Merchant Banker (SEBI Registration Number - MB/INM000002970). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: www.jpmipl.com. For non local research reports, this material is not distributed in India by J.P. Morgan India Private Limited. **Thailand:** This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500. **Indonesia:** PT J.P. Morgan Sekuritas Indonesia is a member of the Indonesia Stock Exchange and is regulated by the OJK a.k.a. BAPEPAM LK. **Philippines:** J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund.

It is regulated by the Securities and Exchange Commission. **Brazil:** Banco J.P. Morgan S.A. is regulated by the Comissão de Valores Mobiliários (CVM) and by the Central Bank of Brazil. **Mexico:** J.P. Morgan Casa de Bolsa, S.A. de C.V., J.P. Morgan Grupo Financiero is a member of the Mexican Stock Exchange and authorized to act as a broker dealer by the National Banking and Securities Exchange Commission. **Singapore:** This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JPMSS) [MCI (P) 058/04/2019 and Co. Reg. No.: 199405335R], which is a member of the Singapore Exchange Securities Trading Limited and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore) [MCI (P) 070/09/2019], both of which are regulated by the Monetary Authority of Singapore. This material is issued and distributed in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289 (SFA). This material is not intended to be issued or distributed to any retail investors or any other investors that do not fall into the classes of "accredited investors," "expert investors" or "institutional investors," as defined under Section 4A of the SFA. Recipients of this document are to contact JPMSS or JPMCB Singapore in respect of any matters arising from, or in connection with, the document. **Japan:** JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan. **Malaysia:** This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X) which is a Participating Organization of Bursa Malaysia Berhad and a holder of Capital Markets Services License issued by the Securities Commission in Malaysia. **Pakistan:** J. P. Morgan Pakistan Broking (Pvt.) Ltd is a member of the Karachi Stock Exchange and regulated by the Securities and Exchange Commission of Pakistan. **Dubai:** JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - Building 3, Level 7, PO Box 506551, Dubai, UAE. **Russia:** CB J.P. Morgan Bank International LLC is regulated by the Central Bank of Russia. **Argentina:** JPMorgan Chase Bank Sucursal Buenos Aires is regulated by Banco Central de la República Argentina ("BCRA"- Central Bank of Argentina) and Comisión Nacional de Valores ("CNV"- Argentinian Securities Commission")

Country and Region Specific Disclosures

U.K. and European Economic Area (EEA): Unless specified to the contrary, issued and approved for distribution in the U.K. and the EEA by JPMS plc. Investment research issued by JPMS plc has been prepared in accordance with JPMS plc's policies for managing conflicts of interest arising as a result of publication and distribution of investment research. Many European regulators require a firm to establish, implement and maintain such a policy. Further information about J.P. Morgan's conflict of interest policy and a description of the effective internal organisations and administrative arrangements set up for the prevention and avoidance of conflicts of interest is set out at the following link <https://www.jpmorgan.com/jmpdf/1320742677360.pdf>. This report has been issued in the U.K. only to persons of a kind described in Article 19 (5), 38, 47 and 49 of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (all such persons being referred to as "relevant persons"). This document must not be acted on or relied on by persons who are not relevant persons. Any investment or investment activity to which this document relates is only available to relevant persons and will be engaged in only with relevant persons. In other EEA countries, the report has been issued to persons regarded as professional investors (or equivalent) in their home jurisdiction. **Australia:** This material is issued and distributed by JPMSAL in Australia to "wholesale clients" only. This material does not take into account the specific investment objectives, financial situation or particular needs of the recipient. The recipient of this material must not distribute it to any third party or outside Australia without the prior written consent of JPMSAL. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Corporations Act 2001. J.P. Morgan's research coverage universe spans listed securities across the ASX All Ordinaries index, securities listed on offshore markets, unlisted issuers and investment products which Research management deem to be relevant to the investor base from time to time. J.P. Morgan seeks to cover companies of relevance to the domestic and international investor base across all GIC sectors, as well as across a range of market capitalisation sizes. **Germany:** This material is distributed in Germany by J.P. Morgan Securities plc, Frankfurt Branch which is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht. **Korea:** This report may have been edited or contributed to from time to time by affiliates of J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Singapore:** As at the date of this report, JPMSS is a designated market maker for certain structured warrants listed on the Singapore Exchange where the underlying securities may be the securities discussed in this report. Arising from its role as designated market maker for such structured warrants, JPMSS may conduct hedging activities in respect of such underlying securities and hold or have an interest in such underlying securities as a result. The updated list of structured warrants for which JPMSS acts as designated market maker may be found on the website of the Singapore Exchange Limited: <http://www.sgx.com>. In addition, JPMSS and/or its affiliates may also have an interest or holding in any of the securities discussed in this report – please see the Important Disclosures section above. For securities where the holding is 1% or greater, the holding may be found in the Important Disclosures section above. For all other securities mentioned in this report, JPMSS and/or its affiliates may have a holding of less than 1% in such securities and may trade them in ways different from those discussed in this report. Employees of JPMSS and/or its affiliates not involved in the preparation of this report may have investments in the securities (or derivatives of such securities) mentioned in this report and may trade them in ways different from those discussed in this report. **Taiwan:** Research relating to equity securities is issued and distributed in Taiwan by J.P. Morgan Securities (Taiwan) Limited, subject to the license scope and the applicable laws and the regulations in Taiwan. According to Paragraph 2, Article 7-1 of Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers (as amended or supplemented) and/or other applicable laws or regulations, please note that the recipient of this material is not permitted to engage in any activities in connection with the material which may give rise to conflicts of interests, unless otherwise disclosed in the "Important Disclosures" in this material. **India:** For private circulation only, not for sale. **Pakistan:** For private circulation only, not for sale. **New Zealand:** This material is issued and distributed by JPMSAL in New Zealand only to "wholesale clients" (as defined in the Financial Advisers Act 2008). The recipient of this material must not distribute it to any third party or outside New Zealand without the prior written consent of JPMSAL. **Canada:** This report is distributed in Canada by or on behalf of J.P. Morgan Securities Canada Inc. The information contained herein is not, and under no circumstances is to be construed as an offer to sell securities described herein, or solicitation of an offer to buy securities described herein, in Canada or any province or territory thereof. The information contained herein is under no circumstances to be construed as investment advice in any province or territory of Canada and is not tailored to the needs of the recipient. **Dubai:** This report has been distributed to persons regarded as professional clients or market counterparties as defined under the DFSA rules. **Brazil:** Ombudsman J.P. Morgan: 0800-7700847 / ouvidoria.jp.morgan@jpmorgan.com.

General: Additional information is available upon request. Information has been obtained from sources believed to be reliable but JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) do not warrant its completeness or accuracy except with respect to any disclosures relative to JPMS and/or its affiliates and the analyst's involvement with the issuer that is the subject of the research. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Opinions and estimates constitute our judgment as of the date of this material and are subject to change without notice. Past performance is not indicative of future results. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. The recipient of this report must make its own independent decisions regarding any securities or financial instruments mentioned herein. JPMS distributes in the U.S. research published by non-U.S. affiliates and accepts responsibility for its contents. Periodic updates may be provided on companies/industries based on company specific developments or announcements, market conditions or any other publicly available information. Clients should contact analysts and execute transactions through a J.P. Morgan subsidiary or affiliate in their home jurisdiction unless governing law permits otherwise.

"Other Disclosures" last revised January 01, 2020.

Copyright 2020 JPMorgan Chase & Co. All rights reserved. This report or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan.