How GSE Affordability Targets Address Income and Racial Imbalances in Homeownership

15 Oct 2020

This document 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. Barclays trades the securities covered in this report for its own account and on a discretionary basis on behalf of certain clients. Such trading interests may be contrary to the recommendations offered in this report.

PLEASE SEE ANALYST CERTIFICATIONS AND IMPORTANT DISCLOSURES STARTING AFTER PAGE 13.
An initial read of data suggests that the subsidies and support for US housing could lead to serious distortions without generating better outcomes.

**US Mortgage Debt and Homeownership**

**International Homeownership Levels**

**Residential Square Feet per Capita**

*Source for all charts: Federal Reserve, Mortgage Debt Outstanding, Data 1980-2018, ABS (Australia), CHMC (Canada), Census Bureau (USA), EMF (Europe), Statistics Bureau Japan, CommSec, RBA, UN, US Census, Barclays Research*
But this may too naïve a take – the structure of the US economy is different, with higher and (generally) increasing income inequality.

*Note: The chart shows the share of all income received by the top 10%, divided by the share of income received by the bottom 10% for each country (S90/S10). Source for all charts: World Inequality Database (WID), OECD Income Distribution Database, Data 2013-2015, Barclays Research.
With a panel of data across states and time, we examine the relationship between homeownership, inequality, and the GSE affordability targets.

### Data Description

<table>
<thead>
<tr>
<th>Data</th>
<th>Description and Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeownership Rate</td>
<td>Available at the state-year level, defined as owner occupied homes divided by total occupied homes. Source: Census Bureau, Department of Housing and Urban Development.</td>
</tr>
<tr>
<td>Income inequality</td>
<td>Available at state-year level. Defined as the Gini coefficient based on pre-tax gross income, excluding capital and entrepreneurial income. Source: Frank-Sommeiller Price Series, <a href="https://www.shsu.edu/eco_mwf/inequality.html">https://www.shsu.edu/eco_mwf/inequality.html</a>.</td>
</tr>
<tr>
<td>Controls</td>
<td>State and time fixed effects. Country (macro) variables: gross domestic product (GDP), unemployment rate, industrial production, average household size, federal funds target rate, average mortgage rate and total mortgage debt outstanding. Our state-level controls are median income, population count and new housing permits.</td>
</tr>
</tbody>
</table>

Source for all charts: Frank-Sommeiller-Price Series (1984-2015), Barclays Research
Result 1: Higher income inequality is strongly associated with lower homeownership, but the advent of GSE affordability targets reduced this sensitivity by 40-60%

Panel Regression Before/After Targets

Regression Results

$$Y_{s,t} = \alpha_s + \delta_t + \beta \text{Gini}_{s,t} + \varepsilon_{s,t},$$

where $s$ denotes US states and $t$ time period.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini coefficient, $\beta$</td>
<td>-0.39***</td>
<td>-0.13***</td>
</tr>
<tr>
<td></td>
<td>[-0.49, -0.28]</td>
<td>[-0.18, -0.07]</td>
</tr>
<tr>
<td>Controls</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>State Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>612</td>
<td>1020</td>
</tr>
</tbody>
</table>

Key Takeaways

Gini Rose Over 4pts from 1996 to 2015

- Based on “before” – rise in inequality would have driven c. 160bp decline in homeownership
- But actually c. 50bp – decline of roughly 2/3
- Robust to other specifications, with slightly lower effect

Note: The regression table gives the result of estimating the model: $Y_{s,t} = \alpha_s + \delta_t + \beta \text{Gini}_{s,t} + \varepsilon_{s,t}$, where $s$ denotes US states and $t$ time period. Significance at the 95 % confidence level is denoted by ***. Standard errors are adjusted for heteroscedasticity.

Result 2: The effect of income inequality on homeownership varied with the level of the target

Interact Gini Coefficient with Target

\[ Y_{s,t} = \alpha_s + \beta Gini_{s,t} + \theta Gini_{s,t} \times Target_t + \varphi Z_t + \gamma X_{s,t} + \epsilon_{s,t} \]

where \( s \) denotes US states and \( t \) time period.

Affordability Targets Introduced in 1993

<table>
<thead>
<tr>
<th>Years</th>
<th>Goals</th>
<th>Years</th>
<th>Goals</th>
<th>Years</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993-1995</td>
<td>30%</td>
<td>1996</td>
<td>40%</td>
<td>2009</td>
<td>43%</td>
</tr>
<tr>
<td>1997-2000</td>
<td>42%</td>
<td>2010</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001-2004</td>
<td>50%</td>
<td>2011</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>52%</td>
<td>2012</td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>53%</td>
<td>2013</td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>55%</td>
<td>2014</td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>56%</td>
<td>2015</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The coefficient of the interaction term suggests that higher affordability targets mitigate more the negative impact of income inequality on homeownership.

When Target = 20% a 1 pp increase in Gini reduces homeownership by 
\[-0.14 + 0.089 \times 0.20 = -0.12pp\]

When Target = 0% a 1 pp increase in Gini reduces homeownership by 
0.14pp

When Target reaches the maximum of 100%, the effect is still negative, but considerably lower 
\[-0.14 + 0.089 \times 1 = -0.051pp\]

Note: The table gives the result of estimating the model: 
\[ Y_{s,t} = \alpha_s + \beta Gini_{s,t} + \theta Gini_{s,t} \times Target_t + \varphi Z_t + \gamma X_{s,t} + \epsilon_{s,t} \]
where \( s \) denotes US states and \( t \) time period. Significance at the 95% confidence level is denoted by **. Standard errors are adjusted for heteroscedasticity.

Result 3: This benefit was highly concentrated in states with the largest black populations.

Homeownership Varies by Race...

States with Large Black Populations Benefited from the Affordability Targets

\[ Y_{s,t} = \alpha_s + \beta Gini_{s,t} + \theta Gini_{s,t} \times Target_t + \lambda Gini_{s,t} \times Black_{s,t} + \mu Gini_{s,t} \times Black_{s,t} \times Target_t + \phi Z_t + \gamma X_{s,t} + \epsilon_{s,t} \]

where \( s \) denotes US states and \( t \) time period

<table>
<thead>
<tr>
<th>Homeownership 1996-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini coefficient</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gini × Target</td>
</tr>
<tr>
<td>Gini x % Black Population</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gini × Target x % Black Population</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Controls</td>
</tr>
<tr>
<td>State Fixed Effects</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
</tr>
<tr>
<td>Observations</td>
</tr>
</tbody>
</table>

Summary

• Link between higher income inequality and lower home ownership is strong, particularly before the introduction of affordability targets.

• Targets are surprisingly effective at mitigating the downwards drag on homeownership from inequality. Given the sharp rise in the Gini coefficient in the US after the targets, the impact on homeownership is material (over 100bp). Suggests that other forms of support (eg FHA) not sufficient

• Most of the benefit goes to states with the highest black populations. True at the county level too, although without individual data we cannot confirm the beneficiaries of the targets

• Constraint associated with higher inequality is unclear, but the link to race may be informative: less inter-generational support, less stable wages are possibilities

• Measurement of inequality – after tax/transfer should include efforts like the affordability targets
Analyst Certifications and Important Disclosures

Analyst Certification(s)
We, Jigar Patel, Steve Wang, and Duoduo Chen, 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 necessarily 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.

All pricing information is indicative only. Unless otherwise indicated, prices are sourced from Refinitiv and reflect the closing price in the relevant trading market, which may not be the last available price at the time of publication.

If the following page with material mentions is included in this publication, please delete the Pricing text above, it should appear after material mentions.
Important Disclosures

Materially Mentioned Issuers/Bonds

COMSTOCK RESOURCES INC, A/CD/CE/D/J/K/L/M
CRK 7 1/2 05/15/25, Overweight (USD 95.00, 02-Oct-2020)
CRK 9 3/4 08/15/26, Overweight (USD 102.50, 02-Oct-2020)

DEVON ENERGY CORP, Overweight, CD/CE/FA/J/K/M
Representative Bond: DVN 5 06/15/45 (USD 95.13, 02-Oct-2020)
Representative Bond: DVN 7 7/8 09/30/31 (USD 128.88, 02-Oct-2020)

ENLINK MIDSTREAM LLC, CD/CE/J/K/M
ENLC 5 3/8 06/01/29, Overweight (USD 80.50, 02-Oct-2020)

ENLINK MIDSTREAM PARTNERS LP, CD/J
ENLK 4.15 06/01/25, Overweight (USD 85.38, 02-Oct-2020)
ENLK 4.4 04/01/24, Overweight (USD 89.88, 02-Oct-2020)
ENLK 4.85 07/15/26, Overweight (USD 86.25, 02-Oct-2020)

MDC HOLDINGS INC, CD/J
MDC 3.85 01/15/30, Overweight (USD 106.00, 02-Oct-2020)

RANGE RESOURCES CORP, A/CD/CE/D/J/K/L/M
RRC 4 7/8 05/15/25, Overweight (USD 89.25, 02-Oct-2020)
RRC 5 03/15/23, Overweight (USD 95.00, 02-Oct-2020)

WPX ENERGY INC, A/CD/CE/D/J/K/L/M/N
WPX 4 1/2 01/15/30, Market Weight (USD 97.50, 02-Oct-2020)
WPX 5 1/4 09/15/24, Market Weight (USD 104.00, 02-Oct-2020)
WPX 5 1/4 10/15/27, Market Weight (USD 100.75, 02-Oct-2020)
WPX 5 3/4 06/01/26, Market Weight (USD 102.00, 02-Oct-2020)
WPX 5 7/8 06/15/28, Market Weight (USD 103.00, 02-Oct-2020)
WPX 6 01/15/22, Market Weight (USD 102.50, 02-Oct-2020)
WPX 8 1/4 08/01/23, Market Weight (USD 112.25, 02-Oct-2020)

All pricing information is indicative only. Unless otherwise indicated, prices are sourced from Refinitiv and reflect the closing price in the relevant trading market, which may not be the last available price at the time of publication.
Important Disclosures (continued)

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 PLC 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 (and/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 (and/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/research/EMSectorReturns on Barclays Live.
Important Disclosures (continued)

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, 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.
Important Disclosures (continued)

Distribution of ratings assigned by Barclays Corporate Credit Research at the issuer level:
25% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 54% of issuers with this rating category are investment banking clients of the Firm; 75% of the issuers with this rating have received financial services from the Firm.
50% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 61% of issuers with this rating category are investment banking clients of the Firm; 82% of the issuers with this rating have received financial services from the Firm.
25% 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; 78% of the issuers with this rating have received financial services from the Firm.

Distribution of ratings assigned by Barclays Corporate Credit Research at the bond level:
25% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 52% of bonds with this rating category are investment banking clients of the Firm; 68% of the issuers with this rating have received financial services from the Firm.
52% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 63% of bonds with this rating category are investment banking clients of the Firm; 81% of the issuers with this rating have received financial services from the Firm.
23% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 57% of bonds with this rating category are investment banking clients of the Firm; 73% of the issuers with this rating have received financial services from the Firm.

Types of investment recommendations produced by Barclays FICC Research:
In addition to any ratings assigned under Barclays’ formal rating systems, this publication may contain investment recommendations in the form of trade ideas, thematic screens, scorecards or portfolio recommendations that have been produced by analysts in FICC Research. Any such investment recommendations produced by non-Credit Research teams shall remain open until they are subsequently amended, rebalanced or closed in a future research report. Any such investment recommendations produced by the Credit Research teams are valid at current market conditions and may not be otherwise relied upon.

Disclosure of other 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 all investment recommendations published by Barclays FICC Research in the preceding 12 months please refer to https://live.barcap.com/go/research/Recommendations.

Legal entities involved in producing Barclays Research:
Barclays Bank PLC (Barclays, UK)
Barclays Capital Inc. (BCI, US)
Barclays Bank Ireland PLC, Frankfurt Branch (BBI, Frankfurt)
Barclays Bank Ireland PLC, Paris Branch (BBI, Paris)
Barclays Bank Ireland PLC, Milan Branch (BBI, Milan)
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)
Barclays Bank PLC, DIFC Branch (Barclays Bank, DIFC)
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 prepared for institutional investors and not for retail investors. It has been distributed by one or more Barclays affiliated legal entities listed below. It is provided to our clients for informational 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 distributes such institutional debt research reports to various issuers, media, regulatory and academic organisations for their own internal informational news gathering, regulatory or academic purposes and not for the purpose of making investment decisions regarding any debt securities. Media organisations are prohibited from re-publishing any opinion or recommendation concerning a debt issuer or debt security contained in any Barclays institutional debt research report. Any such recipients that do not want to continue receiving Barclays institutional debt research reports should contact debtresearch@barclays.com. Clients that are subscribed to receive equity research reports, will not receive certain cross asset research reports co-authored by equity and FICC research analysts that are distributed as “institutional debt research reports” unless they have agreed to accept such reports. Eligible clients may get access to such cross asset reports by contacting debtresearch@barclays.com. Barclays will not treat unauthorized recipients of this report as its clients and accepts no liability for use by them of the contents which may not be suitable for their personal use. Prices shown are indicative and Barclays is not offering to buy or sell or soliciting offers to buy or sell any financial instrument.

Without limiting any of the foregoing and to the extent permitted by law, in no event shall Barclays, nor any affiliate, nor any of their respective officers, directors, partners, or employees have any liability for (a) any special, punitive, indirect, or consequential damages; or (b) any lost profits, lost revenue, loss of anticipated savings or loss of opportunity or other financial loss, even if notified of the possibility of such damages, arising from any use of this publication or its contents.

Other than disclosures relating to Barclays, the information contained in this publication has been obtained from sources that Barclays Research believes to be reliable, but Barclays does not represent or warrant that it is accurate or complete. Barclays is not responsible for, and makes no warranties whatsoever as to, the information or opinions contained in any written, electronic, audio or video presentations of third parties that are accessible via a direct hyperlink in this publication or via a hyperlink to a third-party web site ('Third-Party Content'). Any such Third-Party Content has not been adopted or endorsed by Barclays, does not represent the views or opinions of Barclays, and is not incorporated by reference into this publication. Third-Party Content is provided for information purposes only and Barclays has not independently verified its accuracy or completeness.

The views in this publication are solely and exclusively those of the authoring analyst(s) and are subject to change, and Barclays Research has no obligation to update its opinions or the information in this publication. Unless otherwise disclosed herein, the analysts who authored this report have not received any compensation from the subject companies in the past 12 months. If this publication contains recommendations, they are general recommendations that were prepared independently of any other interests, including those of Barclays and/or its affiliates, and/or the subject companies. This publication does not contain personal investment recommendations or investment advice or take into account the individual financial circumstances or investment objectives of the clients who receive it. The securities and other investments discussed herein may not be suitable for all investors. Barclays is not a fiduciary to any recipient of this publication. Investors must independently evaluate the merits and risks of the investments discussed herein, consult any independent advisors they believe necessary, and exercise independent judgment with regard to any investment decision. The value of and income from any investment may fluctuate from day to day as a result of changes in relevant economic markets (including changes in market liquidity). The information herein is not intended to predict actual results, which may differ substantially from those reflected. Past performance is not necessarily indicative of future results. The information provided does not constitute a financial benchmark and should not be used as a submission or contribution of input data for the purposes of determining a financial benchmark.

United Kingdom: This document is being distributed (1) only by and with the approval of an authorised person (Barclays Bank PLC) or (2) to, and is directed at (a) persons in the United Kingdom having professional experience in matters relating to investments and who fall within the definition of "investment professionals" in Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the "Order"); or (b) high net worth companies, unincorporated associations and partnerships and trustees of high value trusts as described in Article 49(2) of the Order; or (c) other persons to whom it may otherwise lawfully be communicated (all such persons being "Relevant Persons"). Any investment or investment activity to which this communication relates is only available to and will only be engaged in with Relevant Persons. Any other persons who receive this communication should not rely on or act upon it. Barclays Bank PLC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority and is a member of the London Stock Exchange.

European Economic Area (“EEA”): This material is being distributed in the EEA by Barclays Bank PLC. Barclays Bank PLC is not registered in France with the Autorité des marchés financiers or the Autorité de contrôle prudentiel.

Americas: The Investment Bank of Barclays Bank PLC undertakes U.S. securities business in the name of its wholly owned subsidiary Barclays Capital Inc., a FINRA and SIPC member. Barclays Capital Inc., a U.S. registered broker/dealer, is distributing this material in the United States and, in connection therewith accepts responsibility for its contents. Any U.S. person wishing to effect a transaction in any security discussed herein should do so only by contacting a representative of Barclays Capital Inc. in the U.S. at 745 Seventh Avenue, New York, New York 10019.

Non-U.S. persons should contact and execute transactions through a Barclays Bank PLC branch or affiliate in their home jurisdiction unless local regulations permit otherwise.

This material is distributed in Canada by Barclays Capital Canada Inc., a registered investment dealer, a Dealer Member of IIROC (www.iiroc.ca), and a Member of the Canadian Investor Protection Fund (CIPF).

This material is distributed in Mexico by Barclays Bank Mexico, S.A. This material is distributed in the Cayman Islands and in the Bahamas by Barclays Capital Inc., which it is not licensed or registered to conduct and does not conduct business in, from or within those jurisdictions and has not filed this material with any regulatory body in those jurisdictions.