

19 May 2022 15:04:32 ET | **16 pages** 

## **US Equity Quant**

## 2022 Russell Index Rebalance Preview

#### **CITI'S TAKE**

FTSE Russell US indices are widely used by institutional investors as benchmarks. These indices are rebalanced at the end of June each year. For 2022, we expect to see significant changes in the Growth and Value indices as Healthcare (R1K) and Energy (R2K) are shifting more to growth, while Consumer Discretionary weights move more toward Value. Generally, turnover among the style indices is notable this year.

**What's New** — We use the fundamental information as of May 16<sup>th</sup> to project the upcoming Russell rebalance of their Growth and Value indices. The new indices will be implemented after the close of June 24<sup>th</sup>.

**R1000 Sector Changes** — Within the R1000, sector weight changes are minimal, but are led by a slight increase in Materials and decrease in Tech. Among styles, Healthcare moves more to growth, offset by Consumer Discretionary, Communication Services weight increases in value.

**R2000 Sector Changes** – In the R2000 core, the Energy weight is expected to fall, and is offset by a bump in Technology exposure, partly due to the migrations between Russell 1000 and 2000. Interestingly, Energy is projected to see its weight shift away from value and towards growth. Here, Consumer Discretionary, Healthcare, Financials and REITs all see their projected Value weights move higher.

**Turnover** — Russell 1000 turnover is projected at just under 2%. The R2000 turnover is higher, at 10%+, and they are slightly lower than last year. Similar to last year, style turnover is roughly 12% within the R1000 growth and value indexes, and 28% and 26% respectively for R2000 growth and value.

### Global Quantitative Research

### Hong Li AC

+1-212-816-5062 hong.li@citi.com

### Richard W Schlatter AC

+1-212-816-0591 richard.w.schlatter@citi.com

#### Jason Li

+1-212-816-6692 jason.li@citi.com

### **Equity Strategy & SMID Strategy**

#### Scott T Chronert AC

+1-415-951-1771 scott.t.chronert@citi.com

### **Drew Pettit**

+1-415-951-1621 drew.pettit@citi.com

## See Appendix A-1 for Analyst Certification, Important Disclosures and Research Analyst Affiliations.

Citi Research is a division of Citigroup Global Markets Inc. (the "Firm"), which does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. Certain products (not inconsistent with the author's published research) are available only on Citi's portals.

# **About This Report**

The Russell U.S. equity indices are reconstituted annually. For 2022, the new indexes are scheduled to take effect on June 24th. While the Russell 1000 and 2000 index membership ranking date is May 6th, the fundamental input data used for Growth and Value style indices are based on the data as of the end of May. Preliminary membership lists for new indices will be published after the close of Friday, June 3.

Figure 1. 2021 Russell US Index reconstitution schedule	
Rank day for Russell US Cap indexes	May 6
Preliminary Russell US index membership lists	June 3
Lock down date	June 13
Reconstitution final date	June 24
© 2022 Citigroup Inc. No redistribution without Citigroup's written permission.	
Source: Citi Research, FTSE Russell	

This report provides an overview of the properties for our projected 2022 Russell Indices using underlying data as of May 16, 2022. In addition, we highlight sector details for the projected Russell 1000, 2000, 3000, Midcap indices and their related Growth and Value indices.

## Russell Index Construction Methodology

## **Composite Indices**

The Russell Indices are reconstituted each year by ranking the stocks of firms incorporated in the U.S. and its territories based on their total equity capitalization.

About 3,000 companies with the largest total market capitalization then become members of the Russell 3000 Index. About 1,000 largest of these constitute the Russell 1000 Index, and the remaining smaller companies constitute the Russell 2000 Index. About 200 largest companies in the Russell 1000 become the members of the Russell Top 200 Index, and the remaining companies compose the Russell Midcap Index.

Beginning in 2007, a breakpoint by market capitalization was assigned to each index using the method stated above. If an existing member's market capitalization falls within 5% of the market capitalization breakpoint, it will remain in its current index rather than be moved to a different market capitalization based index. Thus, the actual number of constituents may vary slightly from the index descriptions.

After index membership is determined, a security's shares and weights are calculated with "free float" adjustment, i.e., only using those shares available to the public.

## **Style Indices**

Each of the Russell equity indices is divided into a growth index and a value index, and these are reconstituted at the same time as the composite indices. These style Index constituents are determined based on one value variable, price-to-book ratio, and two growth variables, I/B/E/S forecasted medium-term growth (FY2/FY0 growth) and 5-year historical sales per share growth. Approximately 30% of the constituents with intermediate values of these variables are considered mixed companies, and portions of their shares are assigned to both style indices. The overall share assignment is such that the market value of each style index is approximately 50% of the market value of the parent index. The process of assigning growth and value weights is applied separately to the Russell 1000 index and Russell 2000 index. These growth and value weight splits are also used for the other style indices (Russell 3000, Top 200 and Midcap).

There is no major methodology change this year. The exact methodology used by the FTSE Russell for constructing their indices is available from their website.

## **Profile of the Projected Indices**

## **Market Capitalization**

Figure 2 shows our estimates of the total capitalization of the smallest and largest companies in the reconstituted Russell Indices in billions of U.S. dollars, as well as the mean and median capitalizations. We also show the same statistics for the current indices.

	Sma	llest	Lar	gest	Me	an	Median Capitalization(B\$)		
	Compa	ny(B\$)	Compa	any(B\$)	Capitaliza	ation(B\$)			
Index	Current	New	Current	New	Current	New	Current	Nev	
Russell 1000	0.07	0.34	2545.61	2545.61	39.79	40.07	12.53	12.66	
Russell 2000	0.02	0.04	14.39	6.37	1.41	1.46	0.90	1.03	
Russell 3000	0.02	0.04	2545.61	2545.61	14.36	14.59	1.94	2.1	
Russell Top 200	1.71	28.92	2545.61	2545.61	150.02	156.53	77.09	79.64	
Russell MidCap	0.07	0.34	65.37	46.36	13.00	13.12	9.14	9.38	

<sup>© 2022</sup> Citigroup Inc. No redistribution without Citigroup's written permission.

Source: Citi Research, FTSE Russell

## **Turnover Statistics**

In Figure 3, we show the one-way percentage turnover for converting the current Russell Indices into their corresponding reconstituted indices. We measure the turnover by computing the difference between the weight of a stock in the new index and its weight in the old index, summing the absolute values of these differences, and dividing the result by two.

	Composite	Growth	Value
Russell 1000	1.9%	12.3%	12.6%
Russell 2000	10.3%	28.4%	26.1%
Russell 3000	1.9%	13.1%	12.9%
Russell Top 200	2.8%	10.9%	14.8%
Russell MidCap	7.6%	23.1%	16.5%

For the Composite indices, our study projects turnover rates of 1.9% for the Russell 1000 Composite Index and 10% for the Russell 2000 Composite Index, slightly lower than last year. The turnover rates for the Russell Growth and Value indices this year are similar to last year. The overall style index turnovers largely reflect the significant rotation from growth (Tech, for example) to value (Materials and Energy stocks) in last few months, and are helped by higher oil and commodities prices. (See VIEWPOINT | US Quantitative Insights: The equity market is not pricing in a 3% 10-year yield).

# Russell 1000 Index - Estimated Properties

Our study suggests that the Russell 1000 will include 1027 stocks. We expect 48 new members and 44 departures.

In Figure 4, we show the estimated number of stocks projected to enter and exit the Russell 1000 Composite Index. In addition, we show the total number of estimated migrations between the Russell 1000 Growth and Value Indices. Note that for our predicted migrations between a growth index and a value index, we include only those stocks that transfer 50% or more of their available capitalization from one style to the other.

Stocks Projected to Enter R1000	Number of Stocks
Outside To R1000	26
R2000 T0 R1000	22
Total Number Projected To Enter R1000	48
Stocks Projected to Exit R1000	Number of Stocks
R1000 To Outside	3
R1000 T0 R2000	41
Total Number Projected To Exit R1000	44
Projected Movement From Growth/Value Indices	Number of Stocks
R1000 Growth To R1000 Value	64
R1000 Value To R1000 Growth	41

Source: Citi Research, FTSE Russell

In Figure 5Error! Reference source not found., we show the GICS sector weights for the current and projected Russell 1000 Composite, Growth, and Value indices. For the composite index, higher weighs for Materials, Consumer Discretionary and Energy are notable. They are offset by modestly lower weights in Info Tech, Fins, HC and Communication Services.

The largest increase for the Russell 1000 Growth Index is projected to occur in Healthcare, and is offset by a decline in the Communication Services, Technology and Consumer Discretionary weights.

For the R1000 Value index, the Health Care weight falls as an offset to Growth, with Communication Services and Consumer Discretionary weights moving higher.

		Composite			Growth			Value	
GICS Sector	Current	Projected	Change	Current	Projected	Change	Current	Projected	Change
Energy	4.5%	4.6%	0.13%	0.6%	1.1%	0.5%	8.1%	8.0%	-0.1%
Materials	2.6%	3.0%	0.38%	1.1%	1.3%	0.3%	4.1%	4.6%	0.5%
Industrials	8.5%	8.5%	0.03%	6.4%	6.8%	0.4%	10.5%	10.2%	-0.3%
Consumer Discretionary	11.1%	11.2%	0.13%	17.5%	16.3%	-1.2%	5.0%	6.2%	1.2%
Consumer Staples	6.4%	6.5%	0.01%	4.8%	5.6%	0.8%	8.0%	7.2%	-0.7%
Healthcare	13.9%	13.8%	-0.12%	9.1%	11.6%	2.5%	18.4%	15.8%	-2.5%
Financials	11.4%	11.3%	-0.18%	2.5%	2.5%	0.0%	19.9%	19.9%	0.0%
Info. Technology	27.1%	26.8%	-0.31%	46.3%	45.0%	-1.3%	9.0%	9.0%	0.0%
Communication Services	8.3%	8.2%	-0.11%	10.0%	7.9%	-2.1%	6.7%	8.5%	1.7%
Utilities	2.9%	2.9%	-0.01%	0.0%	0.0%	0.0%	5.5%	5.7%	0.1%
Real Estate	3.4%	3.4%	0.04%	1.9%	1.9%	0.0%	4.8%	4.9%	0.1%

© 2022 Citigroup Inc. No redistribution without Citigroup's written permission.

Source: Citi Research, FTSE Russell

We expect the Russell 2000 Index to include 1993 stocks this year. 303 are projected as new entries, while 316 are estimated to leave the index.

## **Russell 2000 Index - Estimated Properties**

In Figure 6, we show the estimated number of stocks projected to enter and exit the Russell 2000 Composite Indices. In addition we show the total number of estimated migrations between the Growth and Value Indices. Note that for our predicted migrations between a growth index and a value index, we include only those stocks that transfer 50% or more of their available capitalization from one style to the other.

Stocks Projected to Enter R2000	Number of Stocks
Outside To R2000	262
R1000 T0 R2000	41
Total Number Projected To Enter R2000	303
Stocks Projected to Exit R2000	Number of Stocks
R2000 To Outside	294
R2000 T0 R1000	22
Total Number Projected To Exit R2000	316
Projected Movement From Growth/Value Indices	Number of Stocks
R2000 Growth To R2000 Value	197
R2000 Value To R2000 Growth	159
Source: Citi Research, FTSE Russell	

In Figure 7, we show the GICS sector weights for the current and projected Russell 2000 Composite, Growth, and Value indices.

In the R2000 composite index, the Tech weight increase is notable, as is the decline in the Energy weight.

However, the Energy sector provides a very interesting style picture. Note that the R2000 Growth index will see its Energy weight increase notably. This is offset by an abruptly lower weight in the Value index. In addition, the Consumer Discretionary weight shifts incrementally away from Growth and into Value. Value also picks up more Financials exposure. And, perhaps under the radar, Real Estate is projected to be the second largest sector weight in Value, as the Industrials weight falls.

Figure 7. GICS Sector Weights of Current and Projected Russell 2000 Indices

		Russell 2000									
		Composite			Growth			Value			
GICS Sector	Current	Projected	Change	Current	Projected	Change	Current	Projected	Change		
Energy	7.6%	6.0%	-1.6%	3.9%	6.8%	2.9%	10.8%	5.3%	-5.5%		
Materials	4.1%	4.3%	0.2%	3.6%	4.8%	1.2%	4.5%	3.8%	-0.7%		
Industrials	15.8%	15.1%	-0.6%	16.5%	17.8%	1.3%	15.1%	12.5%	-2.7%		
Consumer Discretionary	10.5%	10.7%	0.2%	14.4%	11.6%	-2.8%	7.1%	9.8%	2.6%		
Consumer Staples	3.8%	3.4%	-0.4%	4.5%	3.9%	-0.5%	3.2%	2.9%	-0.4%		
Healthcare	14.9%	15.4%	0.5%	23.0%	20.9%	-2.0%	8.0%	9.7%	1.7%		
Financials	16.3%	16.7%	0.4%	5.5%	5.5%	0.1%	25.4%	28.0%	2.5%		
Info. Technology	13.2%	14.4%	1.2%	22.4%	22.5%	0.1%	5.4%	6.2%	0.8%		
Communication Services	2.9%	2.9%	0.1%	2.5%	2.2%	-0.3%	3.1%	3.7%	0.5%		
Utilities	3.2%	3.2%	0.1%	0.4%	1.2%	0.8%	5.6%	5.4%	-0.2%		
Real Estate	7.9%	7.7%	-0.1%	3.3%	2.7%	-0.6%	11.7%	12.9%	1.1%		

# **Russell 3000 Index - Estimated Properties**

In Figure 8, we show the GICS sector weights for the projected and current Russell 3000 Composite, Growth, and Value indices.

We estimate the Russell 3000 Index to include a total of 3020 members.

The Technology and Materials sectors are estimated to experience the largest sector weight decrease and increase, respectively, for the Russell 3000 Composite Index.

For the Russell 3000 Growth and Value Index, the shift in Healthcare weight out of Value and into Growth stands out. Additionally, Communication Services and Consumer Discretionary move incrementally toward Value.

Figure 8. GICS Sector Weights of Current and Projected Russell 3000 Indices

					Russell 3000				
		Composite		Growth			Value		
GICS Sector	Current	Projected	Change	Current	Projected	Change	Current	Projected	Change
Energy	4.6%	4.7%	0.03%	0.8%	1.4%	0.7%	8.3%	7.8%	-0.4%
Materials	2.7%	3.1%	0.37%	1.2%	1.5%	0.3%	4.1%	4.5%	0.5%
Industrials	8.9%	8.9%	0.00%	6.9%	7.5%	0.5%	10.8%	10.4%	-0.4%
Consumer Discretionary	11.0%	11.2%	0.14%	17.3%	16.0%	-1.3%	5.2%	6.4%	1.3%
Consumer Staples	6.3%	6.3%	-0.01%	4.8%	5.5%	0.7%	7.7%	7.0%	-0.7%
Healthcare	13.9%	13.8%	-0.08%	9.9%	12.2%	2.3%	17.7%	15.5%	-2.3%
Financials	11.7%	11.6%	-0.14%	2.7%	2.7%	0.0%	20.2%	20.3%	0.1%
Info. Technology	26.3%	26.0%	-0.23%	44.9%	43.6%	-1.3%	8.8%	8.8%	0.0%
Communication Services	8.0%	7.9%	-0.10%	9.5%	7.6%	-2.0%	6.5%	8.2%	1.7%
Utilities	2.9%	2.9%	0.00%	0.0%	0.1%	0.0%	5.5%	5.6%	0.1%
Real Estate	3.6%	3.7%	0.04%	2.0%	1.9%	0.0%	5.2%	5.4%	0.2%
Source: Citi Research, FTSE Russell									

# **Russell Top 200 Index - Estimated Properties**

We estimate the Russell Top 200 Index to include a total of 193 stocks.

In Figure 9, we show our estimated GICS sector weights for the projected Russell Top 200 Composite, Growth, and Value indices.

The Technology and Financials sectors are estimated to experience the largest sector weight decrease while Energy is expected to have the largest sector weight increase, for the Russell Top 200 Composite Index.

As similar to the Russell 1000 style indices, we expect the biggest weight changes to occur in Consumer Discretionary and Healthcare sectors got the Top200 Growth and Value indices.

Figure 9. GICS Sector Weights of Current and Projected Russell Top 200 Indices

		Russell Top 200									
		Composite			Growth			Value			
GICS Sector	Current	Projected	Change	Current	Projected	Change	Current	Projected	Change		
Energy	3.6%	4.4%	0.7%	0.1%	0.5%	0.5%	8.0%	9.2%	1.2%		
Materials	1.3%	1.7%	0.4%	0.8%	0.8%	0.0%	1.8%	2.8%	1.0%		
Industrials	6.4%	6.4%	0.0%	4.5%	5.2%	0.7%	8.7%	8.0%	-0.8%		
Consumer Discretionary	11.0%	11.0%	0.0%	17.9%	16.6%	-1.3%	2.8%	4.1%	1.3%		
Consumer Staples	7.2%	7.4%	0.2%	5.3%	6.2%	0.9%	9.6%	8.9%	-0.6%		
Healthcare	15.1%	14.9%	-0.1%	7.6%	10.4%	2.8%	24.1%	20.6%	-3.5%		
Financials	11.0%	10.6%	-0.4%	1.9%	2.1%	0.2%	22.0%	21.2%	-0.8%		
Info. Technology	30.8%	30.4%	-0.4%	48.8%	47.7%	-1.1%	9.1%	9.0%	-0.1%		
Communication Services	10.0%	9.7%	-0.3%	11.3%	8.9%	-2.5%	8.3%	10.7%	2.4%		
Utilities	1.9%	1.8%	-0.1%	0.0%	0.0%	0.0%	4.2%	4.1%	-0.1%		
Real Estate	1.6%	1.6%	0.0%	1.8%	1.7%	0.0%	1.4%	1.4%	0.1%		
Source: Citi Research, FTSF Russell											

# **Russell Midcap Index - Estimated Properties**

We estimate the Russell Midcap Index to include a total of 834 members.

In Figure 10 we show the GICS sector weights for the current and projected Russell Midcap Composite, Growth, and Value indices.

The Consumer Discretionary and Energy sectors are estimated to experience the largest sector weight increase and decrease, respectively, for the Russell Midcap Composite index.

For the Midcap Value Index, the Financials (largest increase) and Energy (largest decrease) sectors are expected to experience the largest changes in sector weights.

However, for the Midcap Growth index, Materials is expected to have the largest increase while Technology to have the largest decrease in sector weights.

Figure 10. GICS Sector Weights of Current and Projected Russell Midcap Indices

	Russell Midcap								
		Composite		Growth			Value		
GICS Sector	Current	Projected	Change	Current	Projected	Change	Current	Projected	Change
Energy	6.8%	5.1%	-1.6%	3.2%	3.8%	0.6%	8.3%	5.8%	-2.5%
Materials	6.4%	6.6%	0.2%	2.3%	3.7%	1.5%	8.2%	8.0%	-0.2%
Industrials	14.4%	14.5%	0.1%	15.8%	14.5%	-1.3%	13.8%	14.5%	0.7%
Consumer Discretionary	11.2%	11.8%	0.6%	15.4%	14.9%	-0.5%	9.3%	10.3%	1.0%
Consumer Staples	4.2%	3.8%	-0.4%	2.4%	3.2%	0.8%	5.0%	4.0%	-0.9%
Healthcare	10.5%	10.4%	-0.1%	16.7%	17.5%	0.9%	7.7%	6.9%	-0.8%
Financials	12.7%	13.1%	0.4%	5.5%	4.6%	-0.9%	15.9%	17.3%	1.4%
Info. Technology	16.4%	16.4%	0.0%	33.2%	31.7%	-1.5%	8.9%	8.9%	0.0%
Communication Services	3.5%	3.9%	0.5%	2.9%	3.3%	0.5%	3.7%	4.2%	0.5%
Utilities	5.6%	5.7%	0.1%	0.2%	0.0%	-0.2%	8.0%	8.6%	0.5%
Real Estate	8.6%	8.6%	0.1%	2.6%	2.7%	0.1%	11.2%	11.6%	0.3%
Source: Citi Research, FTSF Russell									

If you are visually impaired and would like to speak to a Citi representative regarding the details of the graphics in this document, please call USA 1-888-800-5008 (TTY: 711), from outside the US +1-210-677-3788

## **Appendix A-1**

### **ANALYST CERTIFICATION**

The research analysts primarily responsible for the preparation and content of this research report are either (i) designated by "AC" in the author block or (ii) listed in bold alongside content which is attributable to that analyst. If multiple AC analysts are designated in the author block, each analyst is certifying with respect to the entire research report other than (a) content attributable to another AC certifying analyst listed in bold alongside the content and (b) views expressed solely with respect to a specific issuer which are attributable to another AC certifying analyst identified in the price charts or rating history tables for that issuer shown below. Each of these analysts certify, with respect to the sections of the report for which they are responsible: (1) that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc. and its affiliates; and (2) no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in this report.

## **IMPORTANT DISCLOSURES**

Disclosure for investors in the Republic of Turkey: Under Capital Markets Law of Turkey (Law No: 6362), the investment information, comments and recommendations stated here, are not within the scope of investment advisory activity. Investment advisory service is provided in accordance with a contract of engagement on investment advisory concluded between brokerage houses, portfolio management companies, non-deposit banks and clients. Comments and recommendations stated here rely on the individual opinions of the ones providing these comments and recommendations. These opinions may not fit to your financial status, risk and return preferences. For this reason, to make an investment decision by relying solely to this information stated here may not bring about outcomes that fit your expectations. Furthermore, Citi Research is a division of Citigroup Global Markets Inc. (the "Firm"), which does and seeks to do business with companies and/or trades on securities covered in this research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report, however investors should also note that the Firm has in place organisational and administrative arrangements to manage potential conflicts of interest of this nature.

Analysts' compensation is determined by Citi Research management and Citigroup's senior management and is based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates (the "Firm"). Compensation is not linked to specific transactions or recommendations. Like all Firm employees, analysts receive compensation that is impacted by overall Firm profitability which includes investment banking, sales and trading, and principal trading revenues. One factor in equity research analyst compensation is arranging corporate access events between institutional clients and the management teams of covered companies. Typically, company management is more likely to participate when the analyst has a positive view of the company.

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Unless stated otherwise neither the Research Analyst nor any member of their team has viewed the material operations of the Companies for which an investment view has been provided within the past 12 months.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Research product ("the Product"), please contact Citi Research, 388 Greenwich Street, 6th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at <a href="https://www.citivelocity.com/cvr/eppublic/citi">https://www.citivelocity.com/cvr/eppublic/citi</a> research disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Pursuant to the Market Abuse Regulation a history of all Citi Research recommendations published during the preceding 12-month period can be accessed via Citi Velocity (<a href="https://www.citivelocity.com/cv2">https://www.citivelocity.com/cv2</a>) or your standard distribution portal. Historical disclosures (for up to the past three years) will be provided upon request.

Citi Research Equity Ratings Distribution

	12 Mo	nth Rating		Catal	yst Watch	
Data current as of 31 Mar 2022	Buy	Hold	Sell	Buy	Hold	Sell
Citi Research Global Fundamental Coverage (Neutral=Hold)	61%	32%	8%	27%	63%	9%
% of companies in each rating category that are investment banking clients	62%	66%	54%	69%	60%	68%
Citi Research Quantitative World Radar Screen Model Coverage	30%	40%	30%			
% of companies in each rating category that are investment banking clients	43%	31%	26%			
Citi Research Quantitative Latam Radar Screen Model Coverage	21%	59%	21%			
% of companies in each rating category that are investment banking clients	77%	71%	57%			
Citi Research Quantitative Asia Radar Screen Model Coverage	20%	60%	20%			
% of companies in each rating category that are investment banking clients	42%	24%	18%			
Citi Research Quantitative Australia Radar Screen Model Coverage	54%	0%	46%			
% of companies in each rating category that are investment banking clients	48%	0%	35%			

### Guide to Citi Research Fundamental Research Investment Ratings:

Citi Research stock recommendations include an investment rating and an optional risk rating to highlight high risk stocks.

Risk rating takes into account both price volatility and fundamental criteria. Stocks will either have no risk rating or a High risk rating assigned. Investment Ratings: Citi Research investment ratings are Buy, Neutral and Sell. Our ratings are a function of analyst expectations of expected total return ("ETR") and risk. ETR is the sum of the forecast price appreciation (or depreciation) plus the dividend yield for a stock within the next 12 months. The target price is based on a 12 month time horizon. The Investment rating definitions are: Buy (1) ETR of 15% or more or 25% or more for High risk stocks; and Sell (3) for negative ETR. Any covered stock not assigned a Buy or a Sell is a Neutral (2). For stocks rated Neutral (2), if an analyst believes that there are insufficient valuation drivers and/or investment catalysts to derive a positive or negative investment view, they may elect with the approval of Citi Research management not to assign a target price and, thus, not derive an ETR. Citi Research may suspend its rating and target price and assign "Rating Suspended" status for regulatory and/or internal policy reasons. Citi Research may also suspend its rating and target price and assign "Under Review" status for other exceptional circumstances (e.g. lack of information critical to the analyst's thesis, trading suspension) affecting the company and/or trading in the company's securities. In both such situations, the rating and target price will show as "-" and "-" respectively in the rating history price chart. Prior to 11 April 2022 Citi Research assigned "Under Review" status to both situations and prior to 11 Nov 2020 only in exceptional circumstances. As soon as practically possible, the analyst will publish a note re-establishing a rating and investment thesis. Investment ratings are determined by the ranges described above at the time of initiation of coverage, a change in investment and/or risk rating, or a change in target price (subject to limited management discretion). At times, the expected total returns may fall outside of these ranges because of market price movements and/or other short-term volatility or trading patterns. Such interim deviations will be permitted but will become subject to review by Research Management. Your decision to buy or sell a security should be based upon your personal investment objectives and should be made only after evaluating the stock's expected performance and risk.

#### Catalyst Watch Upside/Downside calls:

Citi Research may also include a Catalyst Watch Upside or Downside call to highlight specific near-term catalysts or events impacting the company or the market that are expected to influence the share price over a specified period of 30 or 90 days. A Catalyst Watch Upside (Downside) call indicates that the analyst expects the share price to rise (fall) in absolute terms over the specified period. A Catalyst Watch Upside/Downside call will automatically expire at the end of the specified 30/90 day period; the analyst may also close a Catalyst Watch call prior to the end of the specified period in a published research note. A Catalyst Watch Upside or Downside call may be different from and does not affect a stock's fundamental equity rating, which reflects a longer-term total absolute return expectation. For purposes of FINRA ratings-distribution-disclosure rules, a Catalyst Watch Upside call corresponds to a buy recommendation and a Catalyst Watch Downside call corresponds to a sell recommendation. Any stock not assigned to a Catalyst Watch Upside or Catalyst Watch Downside call is considered Catalyst Watch Non-Rated (CWNR). For purposes of FINRA ratings-distribution-disclosure rules, we correspond CWNR to Hold in our ratings distribution table for our Catalyst Watch Upside/Downside rating system. However, we reiterate that we do not consider CWNR to be a recommendation. For all Catalyst Watch Upside/Downside calls, risk exists that the catalyst(s) and associated share-price movement will not materialize as expected.

### Guide to Citi Research Quantitative Research Investment Ratings:

Citi Research Quantitative Research World Radar Screen recommendations are based on a globally consistent framework to measure relative value and momentum for a large number of stocks across global developed and emerging markets. Relative value and momentum rankings are equally weighted to produce a global attractiveness score for each stock. The scores are then ranked and put into deciles. A stock with a decile rating of 1 denotes an attractiveness score in the top 10% of the universe (most attractive). A stock with a decile rating of 10 denotes an attractiveness score in the bottom 10% of the universe (least attractive).

Citi Research Asia Quantitative Radar Screen model recommendations are based on a regionally consistent framework to measure relative value and momentum for a large number of stocks across regional developed and emerging markets. Relative value and momentum rankings are equally weighted to produce a global attractiveness score for each stock. The scores are then ranked and put into quintiles. A stock with a quintile rating of 1 denotes an attractiveness score in the top 20% of the universe (most attractive). A stock with a quintile rating of 5 denotes an attractiveness score in the bottom 20% of the universe (least attractive).

Citi Research Quantitative Research Latam Radar Screen recommendations are based on a globally consistent framework to measure relative value and momentum for a large number of stocks across markets in Latin America. Relative value and momentum rankings are equally weighted to produce a global attractiveness score for each stock. The scores are then ranked and put into quintiles. A stock with a quintile rating of 1 denotes an attractiveness score in the top 20% of the universe (most attractive). A stock with a quintile rating of 5 denotes an attractiveness score in the bottom 20% of the universe (least attractive).

Citi Research Australia Quantitative Radar Screen model recommendations are based on a robust framework to measure relative value and momentum for a large number of stocks across the Australian market. Stocks with a ranking of 1 denotes a stock that is above average in terms of both value and momentum relative to the stocks in the Australian market. A ranking of 10 denotes a stock that is below average in terms of both value and momentum relative to the stocks in the Australian market.

For purposes of FINRA ratings-distribution-disclosure rules, a Citi Research Quantitative World Radar Screen recommendation of (1), (2) or (3) most closely corresponds to a buy recommendation; a recommendation from this product group of (4), (5), (6) or (7) most closely corresponds to a hold recommendation; and a recommendation of (8), (9) or (10) most closely corresponds to a sell recommendation. An (NR) recommendation indicates that the stock is no longer in the screen.

For purposes of FINRA ratings-distribution-disclosure rules, a Citi Research Latam Radar Screen recommendation of (1) most closely corresponds to a buy recommendation; a recommendation of (2),(3) or (4) most closely corresponds to a hold recommendation; and a recommendation of (5) most closely corresponds to a sell recommendation. An (NR) recommendation indicates that the stock is no longer in the screen.

For purposes of FINRA ratings distribution disclosure rules, a Citi Research Asia Quantitative Radar Screen recommendation of (1) most closely corresponds to a buy recommendation; a Citi Research Asia Quantitative Radar Screen recommendation of (2), (3), (4) most closely corresponds to a hold recommendation; and a recommendation of (5) most closely corresponds to a sell recommendation. An (NR) recommendation indicates that the stock is no longer in the screen.

For purposes of FINRA ratings-distribution-disclosure rules, a Citi Research Quantitative Research Australia Radar Screen recommendation of "attractive" (1) most closely corresponds to a buy recommendation. All other stocks in the sector are considered to be "unattractive" (10) which most closely corresponds to a sell recommendation. An (NR)/(0) recommendation indicates that the stock is no longer in the screen.

Recommendations are based on the relative attractiveness of a stock, thus can not be directly equated to buy, hold and sell categories. Accordingly, your decision to buy or sell a security should be based on your personal investment objectives and only after evaluating the stock's expected relative performance.

### RESEARCH ANALYST AFFILIATIONS / NON-US RESEARCH ANALYST DISCLOSURES

The legal entities employing the authors of this report are listed below (and their regulators are listed further herein). Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization (but are employed by an affiliate of the member organization) and therefore may not be subject to the FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Citigroup Global Markets Inc.

Hong Li; Richard W Schlatter; Scott T Chronert; Jason Li; Drew Pettit

### OTHER DISCLOSURES

Any price(s) of instruments mentioned in recommendations are as of the prior day's market close on the primary market for the instrument, unless otherwise stated

The completion and first dissemination of any recommendations made within this research report are as of the Eastern date-time displayed at the top of the Product. If the Product references views of other analysts then please refer to the price chart or rating history table for the date/time of completion and first dissemination with respect to that view.

Regulations in various jurisdictions require that where a recommendation differs from any of the author's previous recommendations concerning the same financial instrument or issuer that has been published during the preceding 12-month period that the change(s) and the date of that previous recommendation are indicated. For fundamental coverage please refer to the price chart or rating change history within this disclosure appendix or the issuer disclosure summary at https://www.citivelocity.com/cvr/eppublic/citi\_research\_disclosures.

Citi Research has implemented policies for identifying, considering and managing potential conflicts of interest arising as a result of publication or distribution of investment research. A description of these policies can be found at <a href="https://www.citivelocity.com/cvr/eppublic/citi">https://www.citivelocity.com/cvr/eppublic/citi</a> research disclosures.

The proportion of all Citi Research research recommendations that were the equivalent to "Buy", "Hold", "Sell" at the end of each quarter over the prior 12 months (with the % of these that had received investment firm services from Citi in the prior 12 months shown in brackets) is as follows: Q1 2022 Buy 34% (67%), Hold 43% (55%), Sell 23% (48%), RV 0.6% (84%); Q4 2021 Buy 33% (66%), Hold 43% (55%), Sell 23% (49%), RV 0.7% (81%); Q3 2021 Buy 34% (68%), Hold 43% (58%), Sell 23% (49%), RV 0.7% (76%); Q2 2021 Buy 33% (68%), Hold 43% (57%), Sell 23% (50%), RV 0.7% (79%). For the purposes of disclosing recommendations other than for equity (whose definitions can be found in the corresponding disclosure sections), "Buy" means a positive directional trade idea; "Sell" means a negative directional trade idea; and "Relative Value" means any trade idea which does not have a clear direction to the investment strategy.

European regulations require a 5 year price history when past performance of a security is referenced. CitiVelocity's Charting Tool (https://www.citivelocity.com/cv2/#go/CHARTING\_3\_Equities) provides the facility to create customisable price charts including a five year option. This tool can be found in the Data & Analytics section under any of the asset class menus in CitiVelocity (https://www.citivelocity.com/). For further information contact CitiVelocity support (https://www.citivelocity.com/cv2/go/CLIENT\_SUPPORT). The source for all referenced prices, unless otherwise stated, is DataCentral, which sources price information from Thomson Reuters. Past performance is not a guarantee or reliable indicator of future results. Forecasts are not a guarantee or reliable indicator of future performance.

Investors should always consider the investment objectives, risks, and charges and expenses of an ETF carefully before investing. The applicable prospectus and key investor information document (as applicable) for an ETF should contain this and other information about such ETF. It is important to read carefully any such prospectus before investing. Clients may obtain prospectuses and key investor information documents for ETFs from the applicable distributor or authorized participant, the exchange upon which an ETF is listed and/or from the applicable website of the applicable ETF issuer. The value of the investments and any accruing income may fall or rise. Any past performance, prediction or forecast is not indicative of future or likely performance. Any information on ETFs contained herein is provided strictly for illustrative purposes and should not be deemed an offer to sell or a solicitation of an offer to purchase units of any ETF either explicitly or implicitly. The opinions expressed are those of the authors and do not necessarily reflect the views of ETF issuers, any of their agents or their affiliates.

Citigroup Global Markets India Private Limited and/or its affiliates may have, from time to time, actual or beneficial ownership of 1% or more in the debt securities of the subject issuer.

Please be advised that pursuant to Executive Order 13959 as amended (the "Order"), U.S. persons are prohibited from investing in securities of any company determined by the United States Government to be the subject of the Order. This research is not intended to be used or relied upon in any way that could result in a violation of the Order. Investors are encouraged to rely upon their own legal counsel for advice on compliance with the Order and other economic sanctions programs administered and enforced by the Office of Foreign Assets Control of the U.S. Treasury Department.

This communication is directed at persons who are "Eligible Clients" as such term is defined in the Israeli Regulation of Investment Advice, Investment Marketing and Investment Portfolio Management law, 1995 (the "Advisory Law"). Within Israel, this communication is not intended for retail clients and Citi will not make such products or transactions available to retail clients. The presenter is not licensed as investment advisor or marketer by the Israeli Securities Authority ("ISA") and this communication does not constitute investment or marketing advice. The information contained herein may relate to matters that are not regulated by the ISA. Any securities which are the subject of this communication may not be offered or sold to any Israeli person except pursuant to an exemption from the Israeli public offering rules, including according to the Israeli Securities Law.

Citi Research generally disseminates its research to the Firm's global institutional and retail clients via both proprietary (e.g., Citi Velocity and Citi Personal Wealth Management) and non-proprietary electronic distribution platforms. Certain research may be disseminated only via the Firm's proprietary distribution platforms; however such research will not contain changes to earnings forecasts, target price, investment or risk rating or investment thesis or be otherwise inconsistent with the author's previously published research. Certain research is made available only to institutional investors to satisfy regulatory requirements. Individual Citi Research analysts may also opt to circulate published research to one or more clients by email; such email distribution is discretionary and is done only after the research has been disseminated. The level and types of services provided by Citi Research analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the

client's risk profile and investment focus and perspective (e.g. market-wide, sector specific, long term, short-term etc.), the size and scope of the overall client relationship with the Firm and legal and regulatory constraints.

Pursuant to Comissão de Valores Mobiliários Resolução 20 and ASIC Regulatory Guide 264, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Research does not set a predetermined frequency for publication, if the Product is a fundamental equity or credit research report, it is the intention of Citi Research to provide research coverage of the covered issuers, including in response to news affecting the issuer. For non-fundamental research reports, Citi Research may not provide regular updates to the views, recommendations and facts included in the reports. Notwithstanding that Citi Research maintains coverage on, makes recommendations concerning or discusses issuers, Citi Research may be periodically restricted from referencing certain issuers due to legal or policy reasons. Where a component of a published trade idea is subject to a restriction, the trade idea will be removed from any list of open trade ideas included in the Product. Upon the lifting of the restriction, the trade idea will either be re-instated in the open trade ideas list if the analyst continues to support it or it will be officially closed. Citi Research may provide different research products and services to different classes of customers (for example, based upon long-term or short-term investment horizons) that may lead to differing conclusions or recommendations that could impact the price of a security contrary to the recommendations in the alternative research product, provided that each is consistent with the rating system for each respective product.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

Important Disclosures for Bell Potter Customers: Bell Potter is making this Product available to its clients pursuant to an agreement with Citigroup Global Markets Australia Pty Limited. Neither Citigroup Global Markets Australia Pty Limited nor any of its affiliates has made any determination as to the suitability of the information provided herein and clients should consult with their Bell Potter financial advisor before making any investment decision.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by.

The Product is made available in **Australia** through Citigroup Global Markets Australia Pty Limited. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. Citigroup Global Markets Australia Pty Limited is not an Authorised Deposit-Taking Institution under the Banking Act 1959, nor is it regulated by the Australian Prudential Regulation Authority.

The Product is made available in **Brazil** by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários ("CVM"), BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBIMA – Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais. Av. Paulista, 1111 - 14° andar(parte) - CEP: 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of **Canada** by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3.

This product is available in **Chile** through Banchile Corredores de Bolsa S.A., an indirect subsidiary of Citigroup Inc., which is regulated by the Superintendencia de Valores y Seguros. Agustinas 975, piso 2, Santiago, Chile.

Disclosure for investors in the Republic of Colombia: This communication or message does not constitute a professional recommendation to make investment in the terms of article 2.40.1.1.2 of Decree 2555 de 2010 or the regulations that modify, substitute or complement it. Para la elaboración y distribución de informes de investigación y de comunicaciones generales de que trata este artículo no se requiere ser una entidad vigilada por la Superintendencia Financiera de Colombia.

The Product is made available in **Germany** by Citigroup Global Markets Europe AG ("CGME"), which is regulated by the German Federal Financial Supervisory Authority (Bundesanstalt fur Finanzdienstleistungsaufsicht BaFin). CGME, Reuterweg 16, 60323 Frankfurt am Main.

Research which relates to "securities" (as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)) is issued in **Hong Kong** by, or on behalf of, Citigroup Global Markets Asia Limited which takes full responsibility for its content. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Research is made available through Citibank, N.A., Hong Kong Branch, for its clients in Citi Private Bank, it is made available by Citibank N.A.(organized under the laws of U.S. A. with limited liability), Champion Tower, 3 Garden Road, Hong Kong. Citibank

N.A. is regulated by the Hong Kong Monetary Authority. Please contact your Private Banker in Citibank N.A., Hong Kong, Branch if you have any queries on or any matters arising from or in connection with this document.

The Product is made available in **India** by Citigroup Global Markets India Private Limited (CGM), which is regulated by the Securities and Exchange Board of India (SEBI), as a Research Analyst (SEBI Registration No. INH000000438). CGM is also actively involved in the business of merchant banking and stock brokerage in India, and is registered with SEBI in this regard. CGM's registered office is at 1202, 12th Floor, FIFC, G Block, Bandra Kurla Complex, Bandra East, Mumbai – 400098. CGM's Corporate Identity Number is U99999MH2000PTC126657, and its contact details are: Tel:+9102261759999 Fax:+9102261759961. The Investor Charter in respect of Research Analysts and Complaints information can be found at <a href="https://www.citivelocity.com/cvr/eppublic/citi\_research\_disclosures">https://www.citivelocity.com/cvr/eppublic/citi\_research\_disclosures</a>

The Product is made available in **Indonesia** through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations.

The Product is made available in **Israel** through Citibank NA, regulated by the Bank of Israel and the Israeli Securities Authority. Citibank, N.A, Platinum Building, 21 Ha'arba'ah St, Tel Aviv, Israel.

The Product is made available in **Japan** by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Otemachi Park Building, 1-1-1 Otemachi, Chiyoda-ku, Tokyo 100-8132 Japan. If the Product was distributed by SMBC Nikko Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Citi Velocity website. If you have questions regarding Citi Velocity, please call (81 3) 6270-3019 for help.

The product is made available in the **Kingdom of Saudi Arabia** in accordance with Saudi laws through Citigroup Saudi Arabia, which is regulated by the Capital Market Authority (CMA) under CMA license (17184-31). 2239 Al Urubah Rd – Al Olaya Dist. Unit No. 18, Riyadh 12214 – 9597, Kingdom Of Saudi Arabia.

The Product is made available in **Korea** by Citigroup Global Markets Korea Securities Ltd., which is regulated by the Financial Services Commission, the Financial Supervisory Service and the Korea Financial Investment Association (KOFIA). Citibank Center, 50 Saemunan-ro, Jongno-gu, Seoul 03184, Korea. KOFIA makes available registration information of research analysts on its website. Please visit the following website if you wish to find KOFIA registration information on research analysts of Citigroup Global Markets Korea Securities

Ltd. <a href="http://dis.kofia.or.kr/websquare/index.jsp?w2xPath=/wq/fundMgr/DISFundMgrAnalystList.xml&divisionId=MDIS030020020000000&serviceId=SDIS030020020000.">http://dis.kofia.or.kr/websquare/index.jsp?w2xPath=/wq/fundMgr/DISFundMgrAnalystList.xml&divisionId=MDIS030020020000000&serviceId=SDIS03002002000.</a>
 The Product is made available in Korea by Citibank Korea Inc., which is regulated by the Financial Services Commission and the Financial Supervisory Service. Address is Citibank Center, 50 Saemunan-ro, Jongno-gu, Seoul 03184, Korea. This research report is intended to be provided only to Professional Investors as defined in the Financial Investment Services and Capital Market Act and its Enforcement Decree in Korea.

The Product is made available in **Malaysia** by Citigroup Global Markets Malaysia Sdn Bhd (Company No. 460819-D) ("CGMM") to its clients and CGMM takes responsibility for its contents. CGMM is regulated by the Securities Commission of Malaysia. Please contact CGMM at Level 43 Menara Citibank, 165 Jalan Ampang, 50450 Kuala Lumpur, Malaysia in respect of any matters arising from, or in connection with, the Product.

The Product is made available in **Mexico** by Citibanamex Casa de Bolsa, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Citibanamex which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Actuario Roberto Medellín 800, Zedec Santa Fe, Álvaro Obregón, 01219 Ciudad de México, CDMX.

In **New Zealand** the Product is made available to 'wholesale clients' only as defined by s5C(1) of the Financial Advisers Act 2008 ('FAA') through Citigroup Global Markets Australia Pty Ltd (ABN 64 003 114 832 and AFSL No. 240992), an overseas financial adviser as defined by the FAA, participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000.

The Product is made available in **Pakistan** by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200.

The Product is made available in the **Philippines** through Citicorp Financial Services and Insurance Brokerage Philippines, Inc., which is regulated by the Philippines Securities and Exchange Commission. 20th Floor Citibank Square Bldg. The Product is made available in the Philippines through Citibank NA Philippines branch, Citibank Tower, 8741 Paseo De Roxas, Makati City, Manila. Citibank NA Philippines NA is regulated by The Bangko Sentral ng Pilipinas. The Product is made available in **Poland** by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul.Senatorska 16, 00-923 Warszawa.

The Product is made available in the **Russian Federation** through AO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gasheka Street, 125047 Moscow.

The Product is made available in **Singapore** through Citigroup Global Markets Singapore Pte. Ltd. ("CGMSPL"), a capital markets services license holder, and regulated by Monetary Authority of Singapore. Please contact CGMSPL at 8 Marina View, 21st Floor Asia Square Tower 1, Singapore 018960, in respect of any matters arising from, or in connection with, the analysis of this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore Branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Please contact your Private Banker in Citibank N.A., Singapore Branch if you have any queries on or any matters arising from or in connection with this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). This report is distributed in Singapore by Citibank Singapore Ltd ("CSL") to selected Citigold/Citigold Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigold/Citigold Private Client Relationship Manager in CSL if you have any queries on or

any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289).

Citigroup Global Markets (Pty) Ltd. is incorporated in the **Republic of South Africa** (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa.

The Product is made available in the **Republic of China** through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the license scope and the applicable laws and regulations in the Republic of China. CGMTS is regulated by the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced

the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS]. Pursuant to the applicable laws and regulations in the Republic of China, the recipient of the Product shall not take advantage of such Product to involve in any matters in which the recipient may have conflicts of interest. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus.

The Product is made available in **Thailand** through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 399 Interchange 21 Building, 18th Floor, Sukhumvit Road, Klongtoey Nua, Wattana, Bangkok 10110, Thailand.

The Product is made available in **Turkey** through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey.

In the **U.A.E**, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different Citi Research ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties.

The Product is made available in **United Kingdom** by Citigroup Global Markets Limited, which is authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA. This material may relate to investments or services of a person outside of the UK or to other matters which are not authorised by the PRA nor regulated by the FCA and the PRA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB.

The Product is made available in **United States** by Citigroup Global Markets Inc, which is a member of FINRA and registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013.

Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Europe AG ("CGME"), which is regulated by the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht-BaFin).

The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted. Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. The yield and average life of CMOs (collateralized mortgage obligations) referenced in this Product will fluctuate depending on the actual rate at which mortgage holders prepay the mortgages underlying the CMO and changes in current interest rates. Any government agency backing of the CMO applies only to the face value of the CMO and not to any premium paid. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product.

Citi Research product may source data from dataCentral. dataCentral is a Citi Research proprietary database, which includes the Firm's estimates, data from company reports and feeds from Thomson Reuters. The source for all referenced prices, unless otherwise stated, is DataCentral. Past performance is not a guarantee or reliable indicator of future results. Forecasts are not a guarantee or reliable indicator of future performance. The printed and printable version of the research report may not include all the information (e.g. certain financial summary information and comparable company data) that is linked to the online version available on the Firm's proprietary electronic distribution platforms.

Card Insights. Where this report references Card Insights data, Card Insights consists of selected data from a subset of Citi's proprietary credit card transactions. Such data has undergone rigorous security protocols to keep all customer information confidential and secure; the data is highly aggregated and anonymized so that all unique customer identifiable information is removed from the data prior to receipt by the report's author or distribution to external parties. This data should be considered in the context of other economic indicators and publicly available information. Further, the selected data represents only a subset of Citi's proprietary credit card transactions due to the selection methodology or other limitations and should not be considered as indicative or predictive of the past or future financial performance of Citi or its credit card business.

Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, redisseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. Part of this product may contain Sustainalytics proprietary information that may not be reproduced, used, disseminated, modified nor published in any manner without the express written consent of Sustainalytics. Sustainalytics, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly

disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Any information attributed to Sustainalytics is provided solely for informational purposes and on its own should not be considered an offer to buy or sell a security. Neither Sustainalytics nor all its third-party suppliers provide investment advice (as defined in the applicable jurisdiction) or any other form of (financial) advice. The information is provided "as is" and, therefore Sustainalytics assumes no responsibility for errors or omissions. Sustainalytics cannot be held liable for damage arising from the use of this product or information contained herein in any manner whatsoever. Where data is attributed to Morningstar that data is © 2022 Morningstar, Inc. All Rights Reserved. That information: (1) is proprietary to Morningstar and/or its content providers; (2) may not be copied or distributed; and (3) is not warranted to be accurate, complete or timely. Neither Morningstar nor its content providers are responsible for any damages or losses arising from any use of this information.

The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in any way form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

© 2022 Citigroup Global Markets Inc. Citi Research is a division of Citigroup Global Markets Inc. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc. and its affiliates and are used and registered throughout the world. All rights reserved. The research data in this report are not intended to be used for the purpose of (a) determining the price of or amounts due in respect of (or to value) one or more financial products or instruments and/or (b) measuring or comparing the performance of, or defining the asset allocation of a financial product, a portfolio of financial instruments, or a collective investment undertaking, and any such use is strictly prohibited without the prior written consent of Citi Research. Any unauthorized use, duplication, redistribution or disclosure of this report (the "Product"), including, but not limited to, redistribution of the Product by electronic mail, posting of the Product on a website or page, and/or providing to a third party a link to the Product, is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient to any third party.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST