

Transportation - Trucking

Survey Says: Demand holds 50 for 5th time after 19/21 issues below, but views softer

Industry Overview

Truck Shipper Survey #292, week of September 21st, 2023

This week, our proprietary bi-weekly BofA Truckload Demand Indicator for shippers' 0- to 3-month freight demand outlook **decreased to 50.0** from 52.4 last survey, down 5% sequentially. The Demand Indicator remains at or above 50 for the fifth consecutive issue (10 weeks) after 19 of 21 issues below that level (38 of 42 weeks). It is also flat year-year. The Indicator remains below its 60 all-time average for the 38th consecutive survey and below the 54.2 average level in the '12, '15, '19 Freight Recession periods. Rail carloads fell 1% yr-yr this week (week 37 2023), its 32nd consecutive downtick, but its thinnest decline since week 8. Dry van spot rates ex-fuel are \$1.23/mile, down 27% YTD, but up from last week's \$1.21 trough. Shippers' short-term Positive outlooks were 27% of respondents, up from 24% last survey; Neutral outlooks were 48%, down from 59% last issue, and Negative outlooks were 25%, from 17% last survey. In the week of Sep 21st, we surveyed 48 shippers for views on demand, supply, pricing, and inventory.

Inventory view ticks up; Rates view moderates

The Rate Indicator, or shipper view on truck rates, **fell to 45.8** from 46.3, down 1% sequentially, as expectations of future rate increases moderated a touch. **The Inventory Indicator increased to 53.1** from 52.4 last issue, as inventory views rose from its 52-week low last issue. **The Truck Capacity Indicator**, which measures shippers' views of available truckload capacity, **increased to 64.6** from 56.1 last survey, as shippers see tighter capacity. With respect to rates, 23% of shippers expect rates to fall, from 17% last issue, 63% expect flat pricing, from 73% last issue, and 15% expect rates to rise, down from 10% last issue. On capacity, 31% expect capacity to rise, down from 32% last issue, 67% expect capacity to remain flat, up from 49% last issue, and 2% expect capacity to be lower, down from 20% last issue. **SHIPPER COMMENTS:** An Industrial Shipper noted that in its 30 years of experience in the industry, it believes we are near or just coming out of the bottom. It noted that its linehaul rates are at pre-pandemic levels and are starting to follow the prior year's seasonality. A Consumer Shipper expects higher linehaul rates. It noted that fuel is already causing a slight increase in freight standards. (*Shipper comments cont'd on P.5*)

J.B. Hunt sees the end of Freight Recession in sight

Last week, multimodal carrier J.B. Hunt Transport Services (JBHT) President Shelley Simpson noted that the carrier is moving out of the Freight Recession. This is an inflection in its prior stance of uncertainty in when the freight cycle will recover (see our [JBHT Note](#)). While August for-hire volumes fell 10% year-year according to Cass Freight and spot dry-van rates ex-fuel are \$1.23, near 2020 COVID lows (\$1.15-\$1.20/mile) and well below average carrier per mile costs, J.B. Hunt noted that intermodal bid compliance is coming off historic troughs and volume declines are gradually moderating. Truck brokerage RXO also highlighted rising tender rejections (when a primary carrier rejects a shipper's offer) and a higher load-to-truck ratio on its load boards. Given the uptick in truck demand view, improving cycle leading indicators and carrier exits in the rising fuel backdrop, we stay focused on rates turning, a stabilized demand backdrop, and focus on truckload related carriers JBHT, KNX, SNDR. But watch for near term softening from select auto plant production and supplier impacts.

BofA Securities does and seeks to do business with issuers 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. Refer to important disclosures on page 8 to 12. Analyst Certification on page 7. Price Objective Basis/Risk on page 6.

12604655

Timestamp: 22 September 2023 05:00AM EDT

22 September 2023

Equity
Americas
Road Transport/Trucking

BofA
Data
Analytics



Ken Hoexter
Research Analyst
BofAS
+1 646 855 1498
ken.hoexter@bofa.com

Adam Roszkowski, CFA
Research Analyst
BofAS
+1 646 855 5498
adam.roszkowski@bofa.com

Nathan Ho, CFA
Research Analyst
BofAS
+1 646 855 3599
nathan.m.ho@bofa.com

Chart 1: DEMAND INDICATOR

Shipper's view of demand next 0-3 months; Demand Indicator at 50.0



Source: BofA Global Research.

BofA GLOBAL RESEARCH

Chart 2: RATE INDICATOR

Shipper's view of rates; Rate Indicator at 45.8



Source: BofA Global Research.

BofA GLOBAL RESEARCH

SHIPPERS VIEW OF DEMAND

Table 1: BofA Truckload Demand Diffusion Indicator

Demand Indicator: at 50.0, down 5% sequentially

	2019	2020	2021	2022	2023
Jan	1/4 67.3	1/3 55.1	1/14 63.8	1/13 75.0	1/12 47.5
	1/18 76.7	1/17 58.1	1/28 63.8	1/27 70.0	1/26 51.3
Feb	2/1 69.8	1/31 56.7	2/11 67.5	2/10 69.5	2/9 45.1
	2/14 53.7	2/13 53.1	2/25 68.8	2/24 71.9	2/23 47.6
Mar	2/28 59.2	2/27 51.3	3/11 72.9	3/10 70.3	3/9 46.9
	3/14 60.1	3/12 46.1	3/25 68.8	3/24 69.2	3/23 48.3
Apr	3/28 59.2	3/26 43.5	4/8 73.0	4/7 64.1	4/6 49.5
	4/11 61.2	4/9 37.2	4/22 75.7	4/21 58.0	4/20 44.4
	4/25 58.3	4/23 33.3	5/6 77.6	5/5 57.5	5/4 49.5
May	5/9 56.6	5/7 37.8	5/20 78.3	5/19 55.0	5/18 44.3
	5/23 52.5	5/21 46.2	6/3 78.3	6/2 58.5	6/1 42.6
Jun	6/6 61.1	6/4 54.6	6/17 78.1	6/16 54.0	6/15 47.9
	6/20 52.5	6/18 56.4	7/1 75.7	6/30 55.5	6/29 49.4
Jul	7/4 52.3	7/2 59.3	7/15 70.9	7/14 50.9	7/13 47.1
	7/18 50.6	7/16 62.5	7/29 74.3	7/28 53.9	7/27 50.0
Aug	8/1 52.6	7/30 59.1	8/12 73.0	8/11 50.0	8/10 55.2
	8/15 51.9	8/13 63.5	8/26 73.0	8/25 54.5	8/24 51.0
Sep	8/29 55.0	8/27 71.1	9/9 73.6	9/8 51.6	9/7 52.4
	9/12 51.9	9/10 75.8	9/23 75.0	9/22 50.0	9/21 50.0
Oct	9/26 55.6	9/24 78.1	10/8 69.4	10/6 47.6	10/5
	10/10 48.7	10/8 73.3	10/21 68.3	10/20 45.6	10/19
	10/24 53.8	10/22 70.0	11/4 76.6	11/3 42.4	11/2
Nov	11/7 55.7	11/5 72.5	11/18 67.7	11/17 50.4	11/16
	11/21 51.3	11/19 69.9	12/2 69.7	12/1 47.8	11/30
Dec	12/5 52.3	12/3 63.8	12/16 68.6	12/15 47.2	12/14
	12/19 51.9	12/17 66.3	12/30 66.7	12/29 49.4	12/28
		12/31 67.7			

Source: BofA Global Research

BofA GLOBAL RESEARCH

Disclaimer: The indicator identified as BofA Truckload Diffusion Indicator in this report is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark.

SHIPPERS' VIEW OF RATES

Chart 5: Shippers' view of rates over next three months

Rate Indicator at 45.8, -1pt sequentially



Source: BofA Global Research.

BofA GLOBAL RESEARCH

Chart 3: BofA Truckload Demand Diffusion Indicator

0-3 months demand time series; Demand Indicator at 50.0

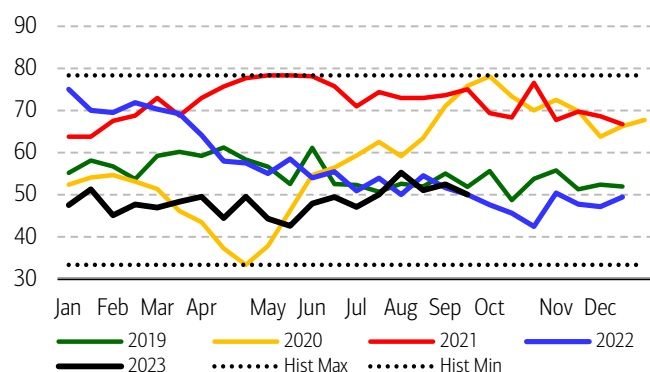


Source: BofA Global Research

BofA GLOBAL RESEARCH

Chart 4: BofA Truckload Demand Diffusion Indicator

0-3 months demand outlook – stack basis y-y; Demand Indicator at 50.0



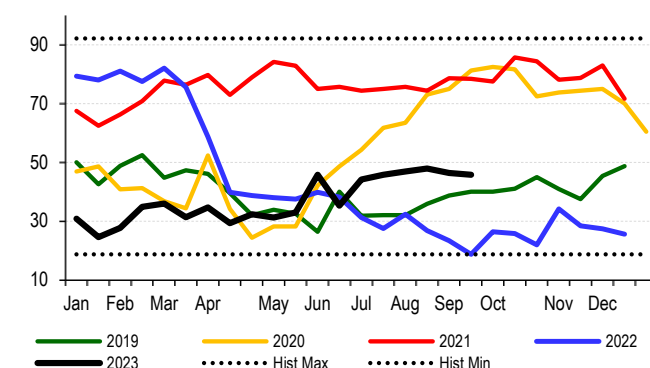
Source: BofA Global Research

Historical Max 04/03/14 (and 5/20-6/3/21). Historical Min 4/23/20. Survey began in mid-2012

BofA GLOBAL RESEARCH

Chart 6: Shippers' view of rates

Stack basis year-over-year; Rate Indicator at 45.8



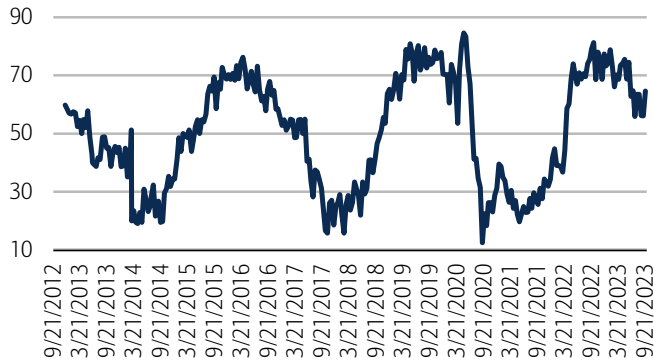
Source: BofA Global Research.

BofA GLOBAL RESEARCH

CAPACITY AVAILABILITY

Chart 7: Shippers' view of available capacity

Capacity Indicator flat at 64.6, above its historic 50 avg

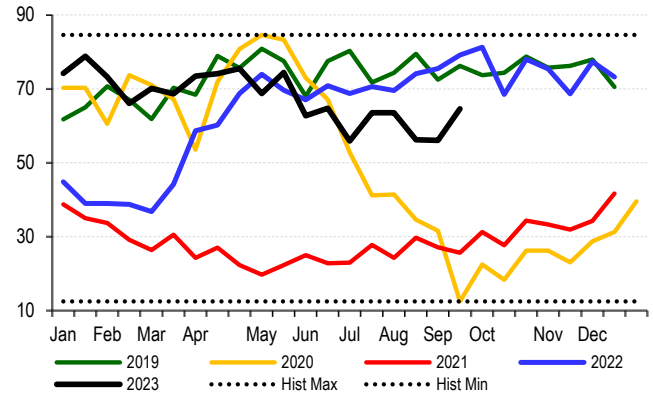


Source: BofA Global Research.

BofA GLOBAL RESEARCH

Chart 8: Shippers' view of available capacity

Stack basis year-year; Capacity Indicator at 64.6



Source: BofA Global Research.

BofA GLOBAL RESEARCH

6-12-MONTH FREIGHT DEMAND

Chart 9: Shippers' 6-12 month outlook for freight demand

L-T Demand Indicator at 57.3, down 1 pt sequentially

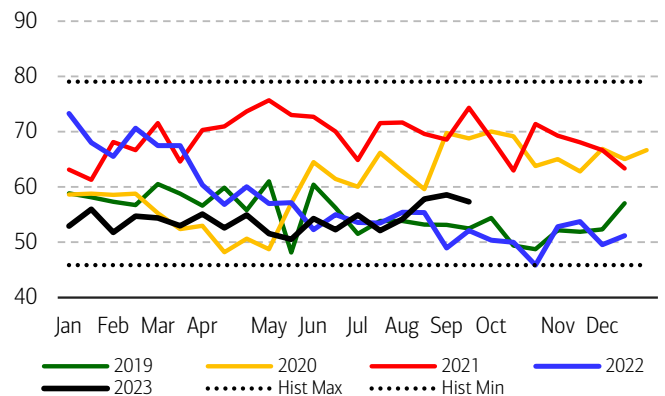


Source: BofA Global Research.

BofA GLOBAL RESEARCH

Chart 10: Shippers' 6-12 mo. outlook for freight demand

Stack basis year-year; Long-Term Demand Indicator at 57.3



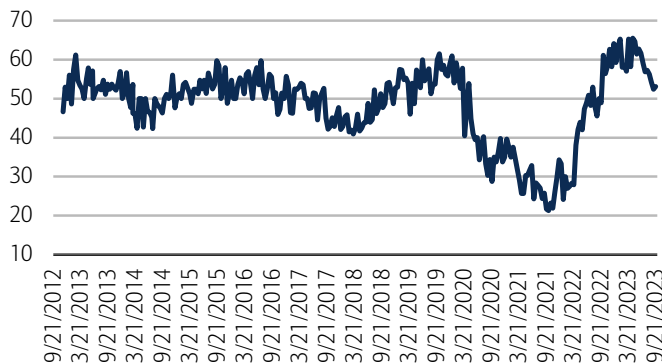
Source: BofA Global Research.

BofA GLOBAL RESEARCH

INVENTORY

Chart 11: Shippers' view of inventory levels

Inventory Indicator at 53.1, up 1% sequentially from last issue.

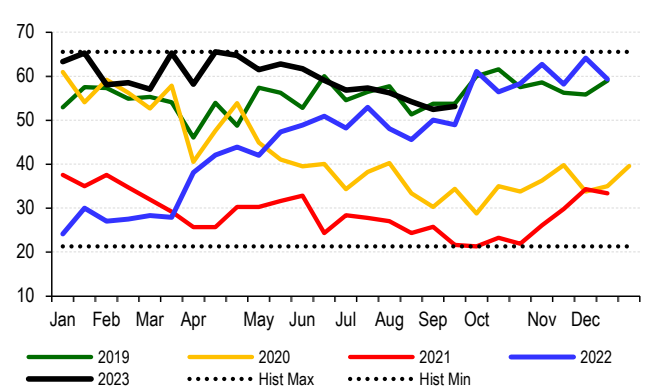


Source: BofA Global Research.

BofA GLOBAL RESEARCH

Chart 12: Shippers' view of inventory levels

Stack basis year-year; Inventory Indicator at 53.1



Source: BofA Global Research.

BofA GLOBAL RESEARCH

The survey, which is distributed to approximately 1,300 shipping managers, received responses from a varied mix of all major end markets (retail, consumer goods, industrial, manufacturing, basic materials, healthcare, tech).

Figure 1: Shippers' core end-market

Retail and Manufacturing oriented end-markets



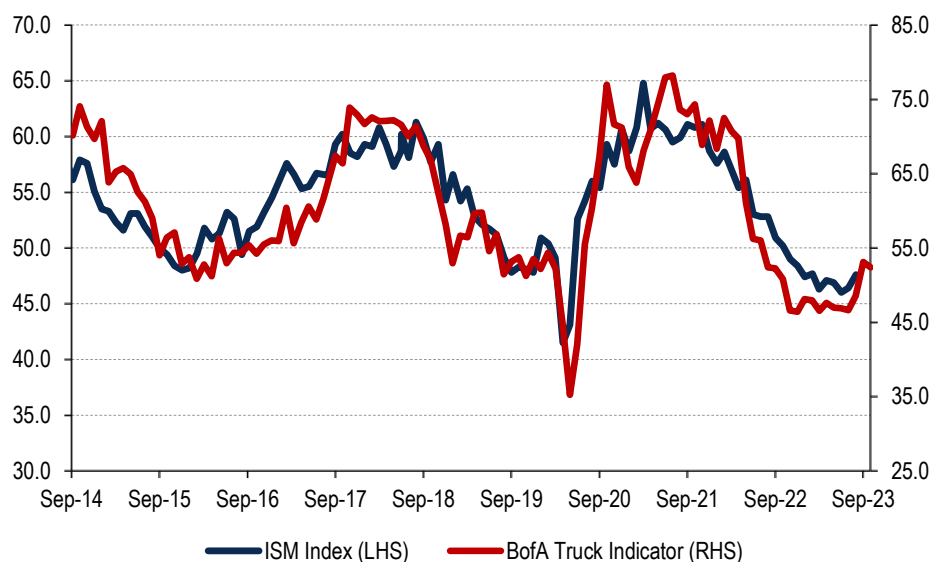
Source: BofA Global Research estimates.

BofA GLOBAL RESEARCH

Correlation between BofA Truck indicator and ISM Index

Chart 13: BofA Truck Indicator and ISM Index

Two data sets have shown correlation since survey inception (0.81 on a one-month leading basis)



Source: BofA Global Research estimates, ISM Index

BofA GLOBAL RESEARCH

Shipper Comments Cont'd

- An Industrial Shipper noted the industry looks to be flat.
- A Consumer Shipper noted tender acceptance remains strong with primary carriers.

- A Forest Product Shipper noted the last three months of year are historically its slowest months of the year.
- A Retail Shipper is keeping its eye on fuel prices.
- An Industrial Shipper noted that truckload carriers will be looking for freight to keep drivers employed if the auto worker strike goes longer than 2-3 weeks and inter-plant transfers slow or stop all together.
- A Consumer Shipper noted that fuel is driving a huge unknown which could push inflation leading to a recession.

Exhibit 1: Stocks mentioned

Prices and ratings for stocks mentioned in this report

BofA Ticker	Bloomberg ticker	Company name	Price	Rating
JBHT	JBHTUS	J.B. Hunt Trans	US\$ 189.96	B-1-7
KNX	KNXUS	Knight-Swift	US\$ 51.01	B-1-7
SNDR	SNDR US	Schneider National	US\$ 27.9	B-1-7

Source: BofA Global Research

BofA GLOBAL RESEARCH

Price objective basis & risk**J.B. Hunt Transport Services (JBHT)**

Our \$216 price objective is based on a 23x target multiple of our 2024e EPS. Our target multiple is at the top of its 16x-23x one standard deviation trading band as earnings are expected to trough in late '23 and begin to recover in '24. We expect pricing pressure to be somewhat countered with improved operational performance as supply chains improve fluidity. We forecast solid double-digit EPS gains over time, robust Intermodal performance, and potential for improved box turns as rail service improves. It also plans to grow its container fleet to 150k over 2-4 years as it scales growth on BNSF's network, post competitors shift to UNP.

Risks to our PO are a slowing economic environment, an inability for the company to raise rates to offset rising costs (driver pay, insurance, depreciation, and fuel), a severe accident impacting costs or the company's image, or significant impacts (strikes, network outages) to BNSF or Norfolk Southern's rail network or J.B. Hunt's relationship with either of those carriers impacting intermodal operations. Additional risks are regulatory changes impacting the flow of freight from the highway to rail, or rapidly falling fuel prices that could encourage freight to stay on the highway, its occasional arbitration with BNSF over rail rates, a sustained loose capacity truckload market that may overhang Intermodal pricing, and inability to obtain labor.

Knight-Swift Transportation Holdings Inc (KNX)

Our \$63 price objective is based on a 18.5x target multiple on our 2024 EPS estimate. Our target multiple is above the bottom of its one-standard-deviation 22-year historical trading range of 14x-25x on year ahead estimates, as it nears trough earnings (led by pressure on economic growth and truck spot rate declines). We view downside as somewhat limited given its diversified model and strong operational performance, and a truckload market that is beginning to work out excess capacity (though recognize the pendulum can overswing on rate declines and cost pressures). Nevertheless, given its diversification moves (LTL, Intermodal, Brokerage/Logistics, and Trucking/Dedicated) it looks to prove earnings will be more sustainable than in prior cycles.

Risks to our price objective are volatility at its truckload segment (particularly its historical SWFT segment, which is more exposed to large retail and project pricing), slower earnings growth from its LTL acquisitions of AAA Cooper and MME, weaker-than-expected economic conditions, an inability for the company to have trucking rates offset rising costs (driver pay, insurance, depreciation, and fuel), a severe accident impacting the company's image and finances, over-expanding (or acquiring assets) without maintaining its focus on cost controls, and a lack of growth opportunities, and the failure to complete its acquisition of US Xpress, which may affect its growth outlook.

Schneider National (SNDR)

Our \$36 PO is based on a 16.5x target multiple on our 2024 EPS estimate. Our target multiple is above the mid-point of its 10x-19x historical range. It is at a discount to average of best-in-class peer targets, which include a blend of peer historical averages

(50% of SNDR's revs are Truck, which peers trade low double digits, currently, 20% is Intermodal and its peer trade at 20x, 20% is Logistics which peers trade at upper-teens multiples, and 10% is other, or low double-digits), yielding a mid-teen fair value multiple target. SNDR's diverse base is countered by increasing concerns of decelerating economic and freight flows.

Risks to our price objective are a cyclical downturn impacting freight flows, higher-than-expected costs from weather, driver pay, accident claims, fuel costs, and equipment prices. Given Schneider operates in a fragmented market, it may not have pricing power to adjust as costs rise in an improving market to offset an increased cost base. Additionally, the company is a 'controlled company' given A shares have 10:1 votes and are completely controlled by the Schneider family and trusts.

Analyst Certification

I, Ken Hoexter, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

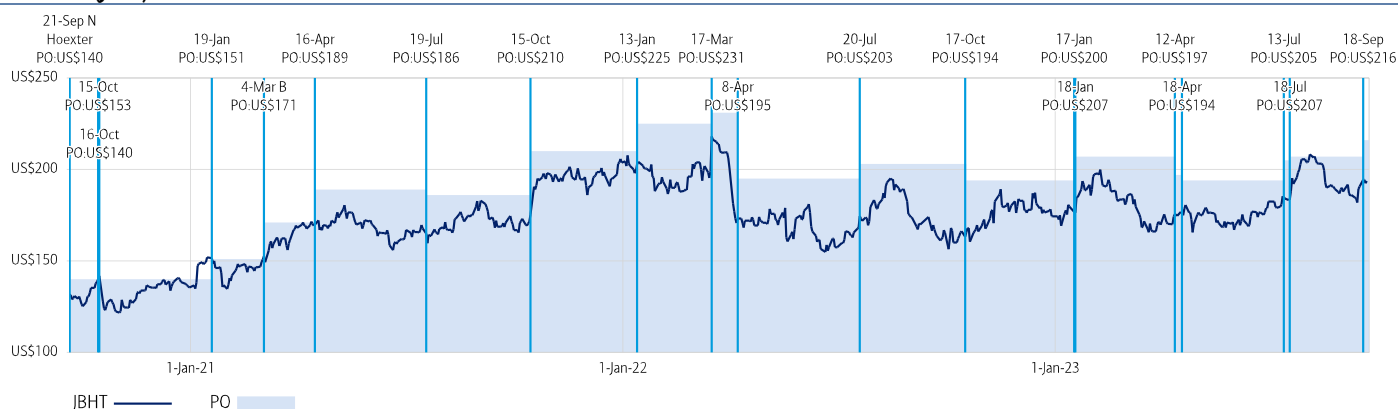
US - Transportation Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Canadian National	CNI	CNI US	Ken Hoexter
	Canadian Pacific Kansas City Ltd	CP	CP US	Ken Hoexter
	CSX Corporation	CSX	CSX US	Ken Hoexter
	FedEx Corp.	FDX	FDX US	Ken Hoexter
	J.B. Hunt Transport Services	JBHT	JBHT US	Ken Hoexter
	Kirby Corp	KEX	KEX US	Ken Hoexter
	Knight-Swift Transportation Holdings Inc	KNX	KNX US	Ken Hoexter
	Norfolk Southern	NSC	NSC US	Ken Hoexter
	Old Dominion Freight Line	ODFL	ODFL US	Ken Hoexter
	RXO, Inc.	RXO	RXO US	Ken Hoexter
	Saia Inc.	SAIA	SAIA US	Ken Hoexter
	Schneider National	SNDR	SNDR US	Ken Hoexter
	Union Pacific	UNP	UNP US	Ken Hoexter
	Werner Enterprises	WERN	WERN US	Ken Hoexter
	XPO, Inc.	XPO	XPO US	Ken Hoexter
NEUTRAL				
	Scorpio Tankers Inc.	STNG	STNG US	Ken Hoexter
	Teekay Tankers Limited	TNK	TNK US	Ken Hoexter
	TFI International	TFII	TFII US	Ken Hoexter
	TFI International	YTFII	TFII CN	Ken Hoexter
	UPS	UPS	UPS US	Ken Hoexter
	Wabtec Corp.	WAB	WAB US	Ken Hoexter
UNDERPERFORM				
	ArcBest Corporation	ARCB	ARCB US	Ken Hoexter
	C.H. Robinson	CHRW	CHRW US	Ken Hoexter
	The Greenbrier Companies	GBX	GBX US	Ken Hoexter
	World Kinect	WKC	WKC US	Ken Hoexter
RSTR				
	Triton International, Ltd	TRTN	TRTN US	Ken Hoexter

Disclosures

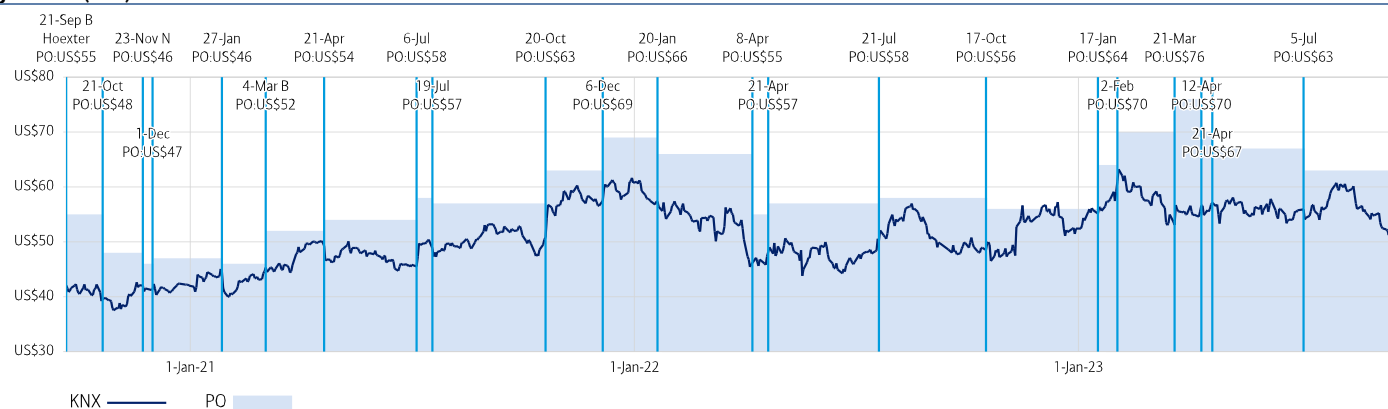
Important Disclosures

J.B. Hunt Trans (JBHT) Price Chart



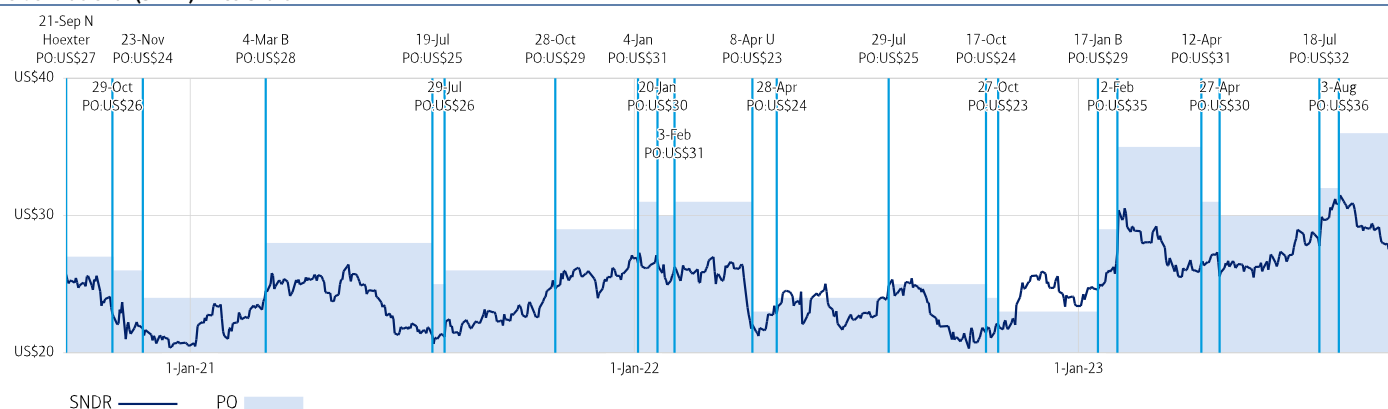
B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Knight-Swift (KNX) Price Chart

B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Schneider National (SNDR) Price Chart

B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Equity Investment Rating Distribution: Transport/Infrastructure Group (as of 30 Jun 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	72	52.94%	Buy	42	58.33%
Hold	29	21.32%	Hold	13	44.83%
Sell	35	25.74%	Sell	17	48.57%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1877	53.28%	Buy	1040	55.41%
Hold	815	23.13%	Hold	464	56.93%
Sell	831	23.59%	Sell	385	46.33%

^{R1} Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. **VOLATILITY RISK RATINGS**, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. **INVESTMENT RATINGS** reflect the analyst's assessment of both a stock's absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). Our investment ratings are: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. An investment rating of 6 (No Rating) indicates that a stock is no longer trading on the basis of fundamentals. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R2}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R2} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

INCOME RATINGS, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. **Coverage Cluster** is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

Price Charts for the securities referenced in this research report are available on the [Price Charts website](#), or call 1-800-MERRILL to have them mailed.

BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: J.B. Hunt Trans, Knight-Swift, Schneider National.

The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: J.B. Hunt Trans, Knight-Swift, Schneider National.

BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: J.B. Hunt Trans, Knight-Swift, Schneider National.

The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: J.B. Hunt Trans, Knight-Swift, Schneider National.

BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: J.B. Hunt Trans, Knight-Swift, Schneider National.

BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: J.B. Hunt Trans, Knight-Swift, Schneider National.

BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: J.B. Hunt Trans, Knight-Swift, Schneider National.

The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: J.B. Hunt Trans, Knight-Swift, Schneider National.

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.

Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no. 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofam.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Investment Industry Regulatory Organization of Canada; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.

This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has

been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

BofA ESGMeter Methodology:

ESGMeter is a proprietary metric based on quantitative analysis and fundamental analyst inputs that reflects our assessment of a company's Environmental, Social and Governance-related attributes. The ESGMeter is intended to indicate a company's likelihood of experiencing stronger financial stability (higher return on equity and lower earnings and price volatility) over the next three years relative to peer group. There are three ESGMeter levels - Low, Medium, and High - which indicate whether a company has attributes most likely to translate into superior financial stability (in the case of a High level) or weaker financial stability (in the case of a Low level) over the next three years relative to its peer group. A Medium level suggests that a company exhibits ESG characteristics that are likely associated with financial stability results in line with its peer group over the next three years. Full details of our methodology, financial stability definition and disclaimers are available at [BofA ESGMeter methodology](#). ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating. ESGMeter is independent of the BofA Global Research fundamental equity analyst's investment rating, volatility risk rating, income rating or price objective for that company.

Copyright and General Information:

Copyright 2023 Bank of America Corporation. All rights reserved. iQDatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this

material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BofA Securities policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.