

## Internet/e-Commerce

# BofA Internet Advertising Indicator shows marginal improvement in Jan

Industry Overview

## BofA Internet Advertising Indicator improves to 0.14

The BofA Internet Advertising Indicator is a proprietary macro tool (using macroeconomic, consumer, and corporate factors) designed to identify inflection points and momentum in digital advertising revenue growth. In Jan'24., the indicator showed marginal improvement and increased to 0.14 (vs 0.13 in Dec and 0.09 in Nov). The uptick was driven by improvement in macro factors, offset by declines in consumer and corporate.

## Macro improved while consumer and corporate declined

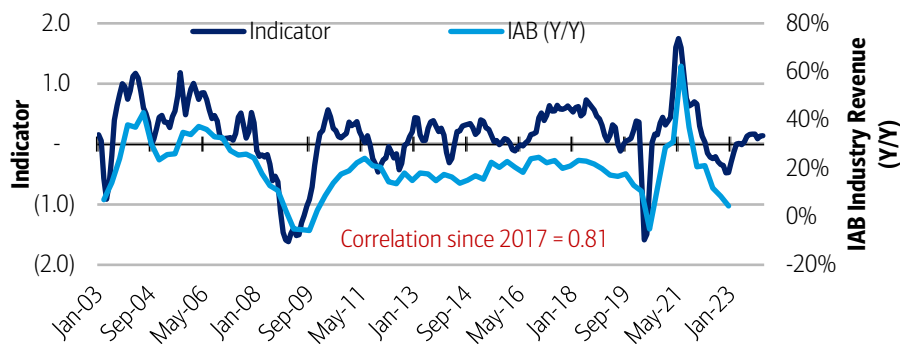
For macro, the Fed's Weekly Economic Index reading increased 0.37pts m/m to 2.28 (positive) and PMI increased 0.7pts m/m (positive), but avg. cash balance increased 0.3pts m/m to 4.8% (negative), overall net positive. For corporate, the number of US Business formation applications declined 7K m/m to 450K, net negative. For consumer, BAC card data, total indexed retail card spending per household was down 2% y/y (negative) and number of jobless claims was up 3% m/m to 1,895K (negative), overall net negative.

## Jan IAI suggests a stable to improving digital ad market

The Jan IAI reading suggests stable y/y growth for the basket. For 1Q'24, we project Meta's ad revenue growth will accelerate 1pt to 25% y/y driven by ramping Reels and messaging monetization and I integrations, improving advertiser ROI. We estimate Google Properties will grow 12% y/y (1pt q/q deceleration in y/y growth), which could be conservative given acceleration in competitor's outlooks. For smaller platforms, we project stronger acceleration in y/y growth in 1Q, 4pts for Pinterest (comps and 3P deals benefit) and 9pts for Snap, driven by easier comps and Snapchat+ ramp. Meta and Pinterest remain our top stock picks for sector strength.

### Exhibit 1: BofA Internet Advertising Indicator vs. IAB industry revenue growth (y/y)

The BofA Internet Advertising Indicator improved to 0.14 in January.



**Source:** Interactive Advertising Bureau, BofA Predictive Analytics, BofA Global Research

The BofA Internet Advertising Indicator 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.

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### Abbreviations:

IAI: BofA Internet Advertising Indicator

IAB: Interactive Advertising Bureau

BAC: Bank of America

AI: Artificial Intelligence

ML: Machine Learning

FMS: Fund Manager Survey



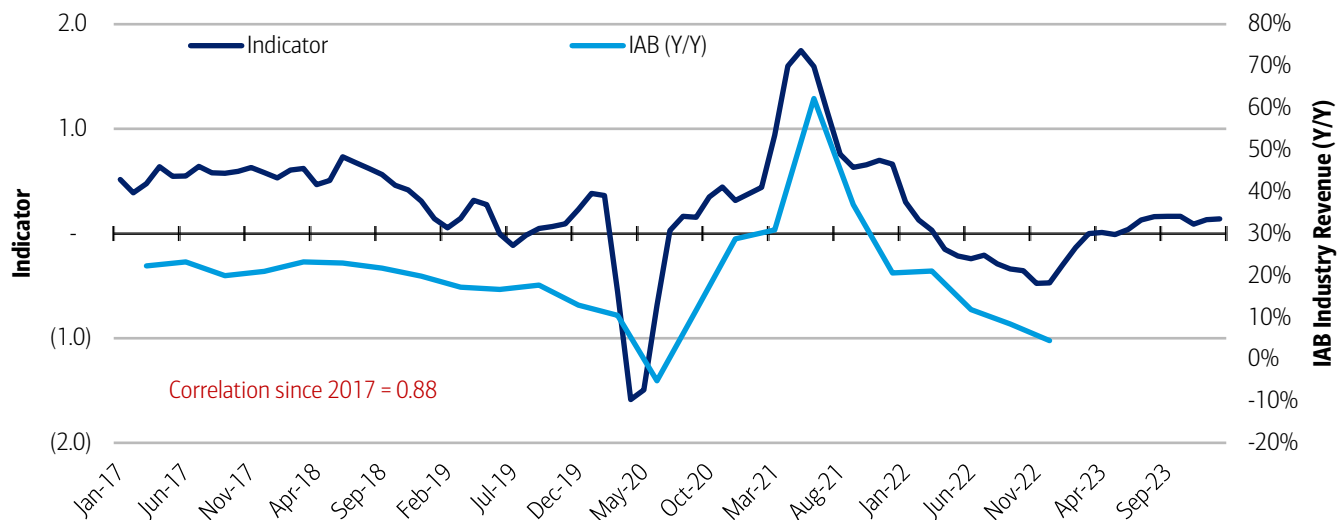
## BofA's Internet Advertising Indicator

### IAI remains in positive territory, shows marginal m/m improvement in January

The BofA Internet Advertising Indicator (IAI) is a two-month rolling average of six, equally weighted inputs that we found to have a high correlation with Internet advertising revenues in aggregate (0.81 correlation with Interactive Advertising Bureau revenues since 2003 and 0.88 since 2017). In Jan'24, the indicator showed marginal improvement and increased to 0.14 (vs 0.13 in Dec and 0.09 in Nov). The uptick in January was driven by improvement in macro factors, offset by a decline in consumer and corporate factors.

#### Exhibit 2: BofA Internet Advertising Indicator vs. IAB industry revenue growth (y/y), from 1Q'17

In Jan, the indicator increased to 0.14 driven by improvement in the macro category but offset by decline in corporate and consumer.



Source: Interactive Advertising Bureau, BofA Predictive Analytics, BofA Global Research

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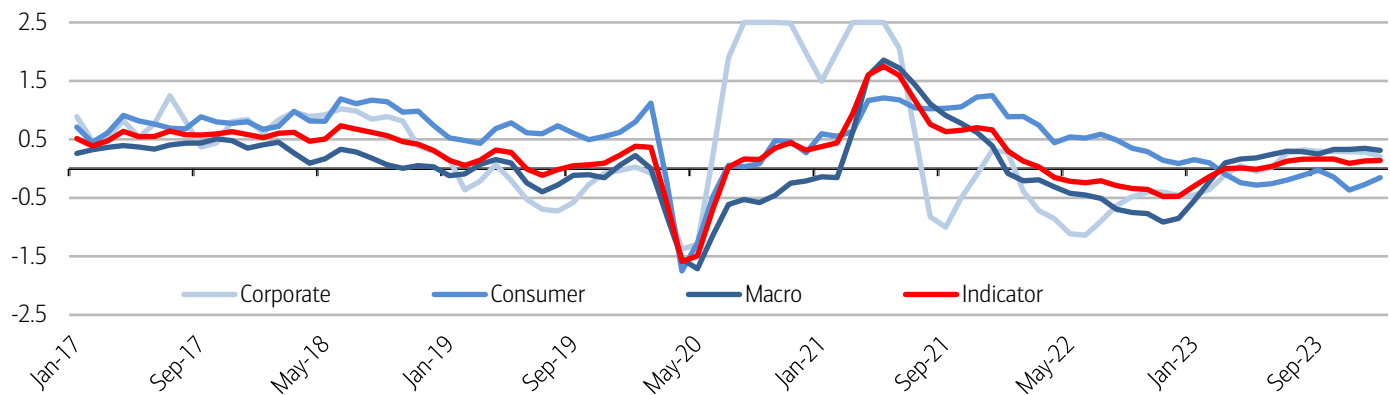
### Macro improved while consumer & corporate declined

In Jan, the Internet Advertising Indicator increased to 0.14 (vs 0.13 in Dec), driven by improvement in macro factors offset by decline in consumer and corporate factors.

- **Macro (3 factors):** In Jan, Fed's Weekly Economic Index reading increased 0.37pts m/m to 2.28 vs 1.91 in Dec (positive), PMI increased 0.7pts to 52.3 from 51.6 (positive) but avg. cash balance increased to 4.8% from 4.5% in Dec (negative). Overall, the impact from macro factors was **net positive**.
- **Consumer (2 factors):** According to BAC aggregated credit & debit card data, total indexed retail card spending per household declined 2% y/y in January (negative) and number of jobless claims increased 3% m/m (up 61K m/m) to 1,895K (also negative). Overall, the impact from consumer factors was **net negative**.
- **Corporate (1 factor):** In January, the number of US Business Formation Applications declined 7K m/m to 450K. Overall, the impact from the corporate factor was **net negative**.

**Exhibit 3: Indicator values, by category**

In January, macro factors improved, while consumer and corporate declined.



Source: Bloomberg, BofA Predictive Analytics, BofA Global Research

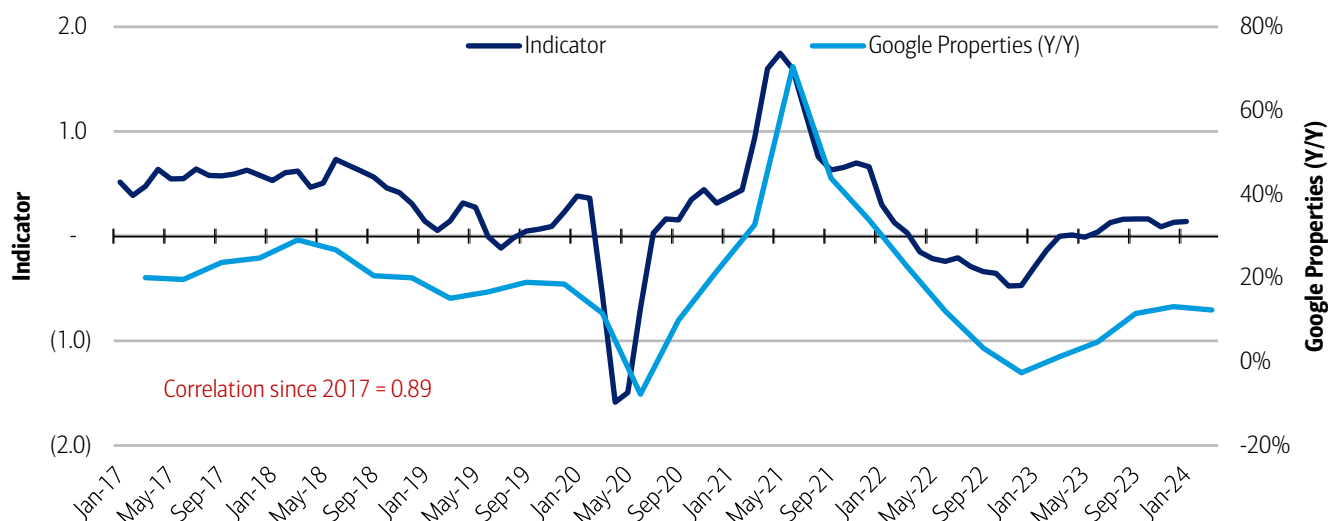
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**Google Properties (Search & YouTube)**

According to our back-tested analysis, the BofA Internet Advertising Indicator has had a 0.89 correlation since 2017 with global Google Properties Revenues, which includes Search and YouTube. Using data prior to 2017 had a lower 0.48 correlation, reflecting outsized growth of search, acquisitions, and bigger impact of Google's own product changes. January IAI data suggests stable growth for the sector. In 1Q'24, we project Google Properties' revenue will grow 12% y/y (1pt deceleration vs 4Q'23), driven by continued ad market recovery and potential AI tailwinds (increasing Performance Max adoption), offset by slightly tougher comps. For 1Q'24, we project Search growth to decelerate 1pt to 12% y/y and YouTube growth to accelerate 1pts to 17% y/y, which could be conservative given our IAI data and acceleration in competitor outlooks.

**Exhibit 4: Internet Advertising Indicator vs. Google Properties revenue growth (y/y)**

We project 1Q'24 Google properties revenue growth to decelerate 1pts to 12% y/y.



Source: Company reports, BofA Predictive Analytics, BofA Global Research

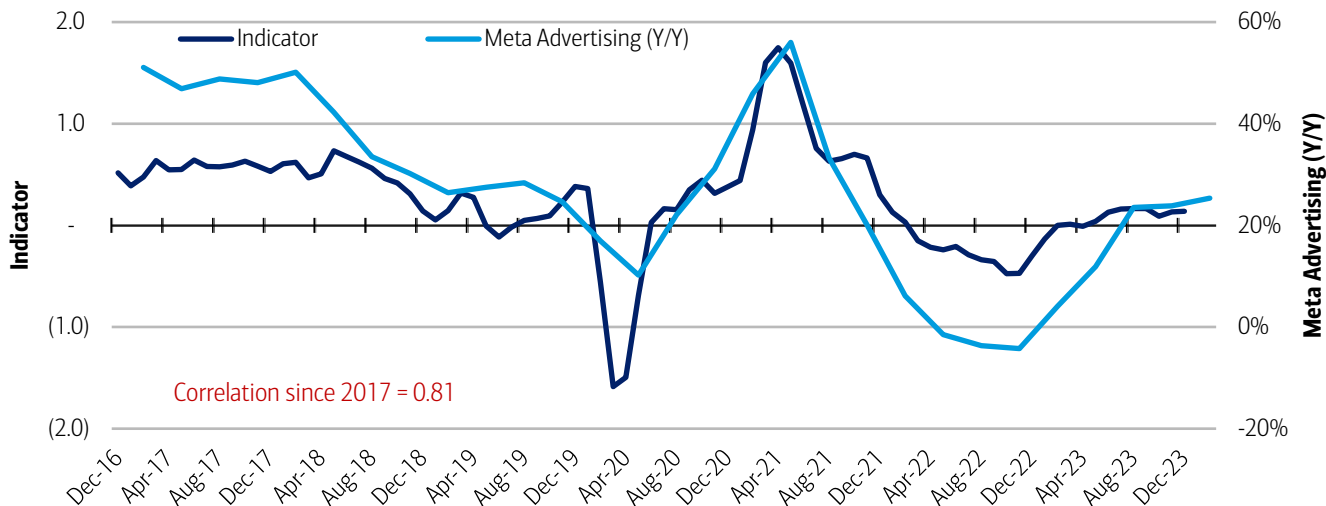
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## Meta Advertising

The IAI has had an 0.81 correlation to Meta Advertising revenue since 2017. Using data prior to 2017 had a lower 0.29 correlation (since 2011) with rapid mobile advertiser adoption on Facebook likely skewing early correlations. We project Meta's ad revenue growth will accelerate 1pt to 25% y/y in 1Q, driven by ramping Reels and messaging monetization and AI integrations improving advertiser ROI and driving incremental ad spending on the platform. We view our Indicator rating as consistent with our Meta estimates.

### Exhibit 5: BofA's Internet Advertising Indicator vs. Meta advertising revenue growth (y/y)

We project 1Q Meta advertising revenue to grow 25% y/y (1pt acceleration vs 4Q'23).



Source: Company reports, BofA Predictive Analytics, BofA Global Research

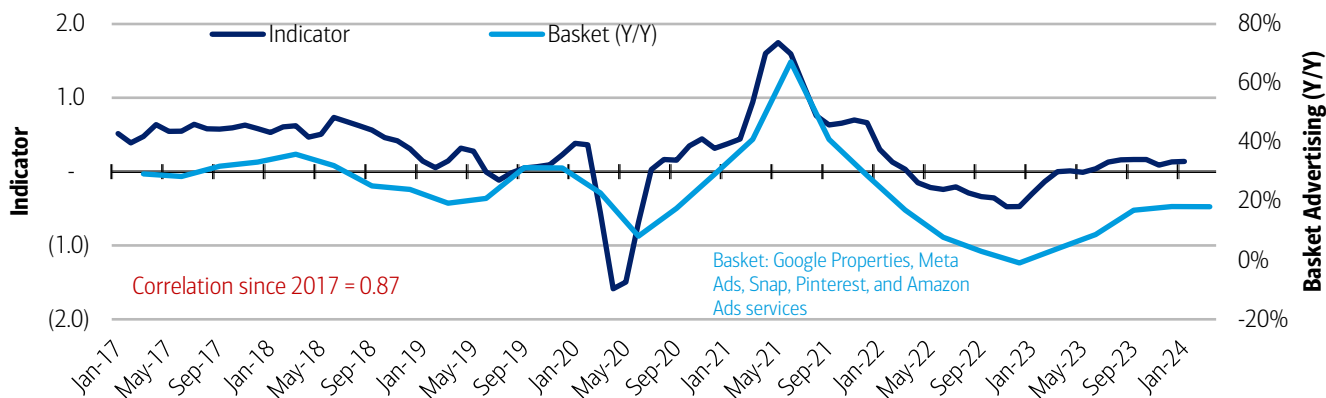
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## Basket of Online Media (Revenue weighted)

The IAI has had a correlation of 0.87 since 2017 with global ad revenue from a basket of Online media companies under coverage (**Google Properties, Meta Advertising, Snap, Pinterest, and Amazon advertising services**). We estimate US ad revenue from these companies represents approx. 85% of the total US Online advertising market. The January IAI reading suggests a stable growth trend for the basket. For 1Q'24, we project 4pts acceleration for Pinterest (3P deals benefit), and 9pts acceleration for Snap (driven by 7pts easier comp and Snapchat+ subscription service aiding growth).

### Exhibit 6: BofA's Internet Advertising Indicator vs Basket of major advertisers' revenue growth (y/y)

Jan IAI reading suggests stable growth trend for the basket.



Source: Company reports, BofA Predictive Analytics, BofA Global Research

We measure respective segment revenues from time of earliest disclosure; Google Properties (1Q'03), Meta Ads (1Q'10), Snap (1Q'15), Pinterest (1Q'17), and Amazon advertising (3Q'19).

**Exhibit 6: BofA's Internet Advertising Indicator vs Basket of major advertisers' revenue growth (y/y)**

Jan IAI reading suggests stable growth trend for the basket.

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**Components of the Indicator Advertising Indicator**

We worked with our Predictive Analytics team to analyze over 50 data series to create a proprietary indicator for the digital advertising revenue growth of major US Online media. We tested each variable with different lag periods to determine the best fit and identified six variables that are not only intuitive drivers of advertising activity, but also have high correlation with industry revenue growth reported by IAB over the past 20 years. The selected variables are published weekly or monthly and can be broadly classified into three categories: **US consumer health and activity** (BAC total retail card spending per household, US Continuing Jobless Claims), **US corporate sentiment** (US Business Applications), and **US/global economic outlook** (Global Services PMI, Weekly Economic Index, and FMS average cash balance as % of AUM (assets under management)).

The BofA Internet Advertising Indicator is constructed by taking an equal-weighted average of the two-month moving average z-scores of the six input variables. Our back-test analysis indicates that these six variables in aggregate have a strong correlation with IAB revenue growth, and we believe the IAI readings can be an effective proxy to gauge concurrent industry growth. As a best practice, we believe the IAI should be viewed in context of several quarters and general directionality, rather than focusing solely on monthly readings that can fluctuate.

**Exhibit 7: Components of the BofA Digital Advertising Indicator**

The Digital Advertising Indicator is comprised of six components

| Component   | Source                       | Measure of:                      | Inclusion date |
|---|------------------------------|----------------------------------|----------------|
| BAC Total Retail Card Spend per Household (y/y %) | BAC Internal Data            | US retail spend                  | Jan-06         |
| US Continuing Jobless Claims*                     | US Dept. of Labor, Bloomberg | US labor market health           | Jan-03         |
| US Business Applications                          | US Census Bureau, Bloomberg  | US corporate sentiment           | Jul-05         |
| New York Fed Weekly Economic Index (WEI)          | FRB New York, Bloomberg      | US real economic activity        | Jul-08         |
| Global Services Purchasing Managers' Index        | S&P Global, Bloomberg        | Global business services outlook | Jan-03         |
| BofA Global FMS average cash balance (% of AUM)*  | BofA Global Research         | Global investor risk appetite    | Jan-03         |

Source: BofA Global Research

\*Inversely correlated with IAB industry revenue growth

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**US consumer health and activity**

**BAC aggregated credit and debit card retail spending** is based on aggregated and anonymized transaction data that is used to track US Retail Sales. Readers should be aware that although the BAC datasets utilized in our analysis represent a significant number of data points, they nevertheless present a degree of selection bias, including but not limited to income levels and geographies. In addition, the data are limited to debit and credit cards and does not include other payment methods such as cash or checks. BAC data used in this report include spending from active US households (HHs) only. Spending from corporate cards is excluded. For more information on the methodology, disclaimers and limitations regarding BAC US aggregated credit and debit card data please see latest [BofA on USA](#).

**US Continuing Jobless Claims** tracks the total number of US residents who have filed jobless claims with the appropriate government labor office in a given week, typically to receive unemployment benefits. It reflects a good approximation of the current number of insured unemployed workers filing for unemployment insurance benefits, thereby providing confirming evidence of the direction of the U.S. economy.

## US corporate sentiment

**US Business Formation Applications (BFS)** provide high frequency information on new business applications and formations in the US. BFS data cover Employer Identification Number (EIN) applications made in the US, including those associated with starting a new employer business. Business Application contains 4 filtered series of EIN applications, viz. Business Applications (BA), High-Propensity Business Applications (HBA), Business Applications with Planned Wages (WBA), and Business Applications from Corporations (CBA), measuring selected groupings based on a variety of factors.

The BofA Internet Advertising Indicator takes an additional two-month moving average from BFS, which, according to our back-test, increases Indicator correlation with IAB revenue growth and smooths volatility.

## US/global economic outlook

**New York Fed Weekly Economic Index (WEI)** is an index of ten indicators of real economic activity, scaled to align with the four-quarter GDP growth rate. It represents the common component of series covering consumer behavior, the labor market, and production.

**Global Services Purchasing Managers' Index (PMI)** is a survey-based diffusion index covering financial services, consumer services, and all other business services, providing a timely insight into business conditions. It is widely used to anticipate changing economic trends in official data such as GDP, or sometimes as an alternative gauge of economic performance and business conditions to official data. It is calculated by weighting together individual country indices using national services GDP weights (annual value added) for over 40 countries, accounting for 89% of global gross domestic product (GDP).

**BofA Global Fund Manager Survey (FMS) average cash balance** gauges investor risk appetite by capturing the average cash holdings of the participants in the survey. Higher cash balances reflect low risk appetite, and by extension, lower propensity to spend, and vice-versa. See latest [Global Fund Manager Survey](#).

## Disclaimers, Risks, and Limitations

### Risks and limitations of the Internet Advertising Indicator

The composition of our indicator is subject to review and may change in the future. We may monitor the continued relevance, availability, and timing of each variable and evaluate the inclusion of additional data series and reserve the right to modify the Indicator, though do not intend to make frequent changes. Equal weighting of variables could overlook potential disproportionate impact from certain variables. Changes in these inputs may significantly impact the Indicator.

The Indicator may inform our ratings and views on the Internet advertising industry, though should not be solely relied on for investment decisions. It is not intended to be indicative of actual or future performance.

### Limitations and disclosures of the revenue Basket

Our Basket of industry revenues is comprised of a sum of ad revenue from five companies under coverage, including Google Properties, Meta Advertising, Snap, Pinterest, and Amazon advertising segment. We estimate the combined ad revenues currently represent approximately 85% of the Online ad market in the United States.

The Basket is a sum of the advertising revenues from BofA Global Research's internal models for each company, and incorporates segment revenue starting when disclosures are available, up to 2003. Data used in the Indicator is available from Google Properties starting 1Q'03, Meta Advertising in 1Q'10, Snap in 1Q'15, Pinterest in 1Q'17, and Amazon advertising in 3Q'19. As such, the Basket may not be an accurate

representation of aggregate revenues from all companies since 2003, or before a respective company began reporting segment revenues.

**BAC credit and debit card data disclaimer and methodology**

Bank of America (“BAC”) transaction data is used to inform views expressed in this report and should be considered in the context of other economic indicators and publicly available information. In certain instances, the data may provide directional and/or predictive value. The data used are not comprehensive; they are based on aggregated and anonymized selections of BAC data and may reflect a degree of selection bias and limitations on the data available.

Readers should be aware that although the BAC datasets utilized in our analysis represent a significant number of data points, they nevertheless present a degree of selection bias, including but not limited to income levels and geographies. In addition, the data is limited to debit and credit cards and does not include other payment methods such as cash or checks. BAC data used in this report include spending from active US households (HHs) only. Spending from corporate cards is excluded.

Additional information about the methodology used to aggregate the data is available upon request.



**Exhibit 8: Stocks mentioned**

Prices and ratings for stocks mentioned in this report

| <b>BofA Ticker</b> | <b>Bloomberg ticker</b> | <b>Company name</b> | <b>Price</b> | <b>Rating</b> |
|--------------------|-------------------------|---------------------|--------------|---------------|
| GOOGL              | GOOGL US                | Alphabet A          | US\$ 142.55  | B-1-9         |
| GOOG               | GOOG US                 | Alphabet C          | US\$ 143.84  | B-1-9         |
| AMZN               | AMZN US                 | Amazon.com          | US\$ 168.59  | B-1-9         |
| META               | META US                 | Meta Platforms      | US\$ 468.03  | C-1-7         |
| PINS               | PINS US                 | Pinterest           | US\$ 35.44   | C-1-9         |
| SNAP               | SNAP US                 | Snap Inc            | US\$ 10.74   | C-2-9         |

Source: BofA Global Research

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**Price objective basis & risk****Alphabet (GOOGL / GOOG)**

Our price objective of \$173/\$173 is based on 21x 2025E core Google GAAP EPS plus cash. Alphabet has traded at an average multiple of 22x GAAP P/E over the last ten years and we think our multiple is reasonable vs history given expectations for double-digit revenue growth, Cloud margin expansion, and opportunity to capitalize on strong AI assets.

Risks for the stock are 1) loss of search traffic to AI tools from competitors, 2) LLM integration in search may take longer than expected or negatively impact search revenues, 3) revenue pressure from compliance with the EU Digital Markets Act (DMA), 4) adverse judge ruling on the ongoing Department of Justice (DOJ) search distribution trial, 5) potential for increasing Capex and lower FCF-given AI focus.

**Amazon.com (AMZN)**

Our PO of \$204 is based on our SOTP analysis that values the 1P retail business at 1.1x 2025E Revenue (including subscription/Prime membership fees), 3P retail business at 2.6x 2025E Revenue, AWS at 8.0x 2025 Sales, and the advertising business at 5.0x 2025 Sales. For 2025E, our 8.0x AWS multiple is relatively below our SaaS comps at 8.9x, our 1.1x GMV multiple is a slight discount to our retail comps at 1.2x, and our 5.0x advertising multiple is a slight discount to our digital advertising comps at 5.2x. We think some conglomerate discount is warranted with elevated regulatory/antitrust risk, but long-term we believe that in-line to discount multiples are warranted given growth rates in-excess of peers.

Our PO of \$204 for Amazon implies 3.0x P/Sales, a multiple toward the high end of Amazon's historical range of 1.0-3.5x. With improving margins long-term, we expect the revenue multiple should trend upward over time.

Downside risks to our price objective are increasing competition from offline and local retailers, AWS client cost optimization impact on revenues and margins, and regulatory pressure on the 3P marketplace. The stock has been subject to heavy volatility in the past, based on margin trends, and this volatility could increase due to economic uncertainty.

**Meta Platforms Inc (META)**

Our \$510 price objective is based on 21x 2025E GAAP EPS, plus net cash. On a total company basis, including Metaverse investments, our valuation is largely in line with S&P 500 (over the past five years Meta has had a 2pt average premium to S&P). We think accelerating revenue growth and conservative expense management can lead to 3-year EPS growth above the S&P 500.

Downside risks are decline in user activity from competition, privacy or data issues



impact revenue generation, potential for Street to assign a negative value to Metaverse (Reality Labs) given significant investments, and new regulations that impact monetization.

### **Pinterest (PINS)**

Our \$42 price objective is based on 6.0x 2024E EV/Revenue, within Pinterest's historical EV/Revenue valuation range and below its 8x 10-year average. Our valuation reflects a premium to peer group multiples given early stage of monetization and 30%+ margin opportunity.

Risks to our PO are: 1) US user growth below peers, 2) seemingly high ad loads, could limit 3rd party partner benefits, 3) heavy competition for both general usage and shopping activity, 4) high cost of AI infrastructure, and 5) multiple compression given high SBC expense.

### **Snap (SNAP)**

Our \$16 price objective is based on 4.5x 2025E EV/Revenue, within Snap's historical EV/Revenue valuation range. Our valuation reflects a modest discount to mid-cap Online media peer group multiples given lower relative growth, high revenue volatility and lower FCF including SBC expense.

Risks to our PO are 1) deceleration in user growth that would raise concerns on long-term revenue opportunity, 2) pressure on usage due to competing services, 3) valuation that has less earnings based support than peers and 4) high SBC expense that could lower valuation multiples.

## **Analyst Certification**

I, Justin Post, 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 - Internet Coverage Cluster

| Investment rating   | Company                           | BofA Ticker | Bloomberg symbol | Analyst            |
|---------------------|-----------------------------------|-------------|------------------|--------------------|
| <b>BUY</b>          |                                   |             |                  |                    |
|                     | Alphabet                          | GOOGL       | GOOGL US         | Justin Post        |
|                     | Alphabet                          | GOOG        | GOOG US          | Justin Post        |
|                     | Amazon.com                        | AMZN        | AMZN US          | Justin Post        |
|                     | AppLovin                          | APP         | APP US           | Omar Dessouky, CFA |
|                     | DoorDash                          | DASH        | DASH US          | Michael McGovern   |
|                     | DoubleVerify Holdings, Inc.       | DV          | DV US            | Omar Dessouky, CFA |
|                     | Electronic Arts                   | EA          | EA US            | Omar Dessouky, CFA |
|                     | Integral Ad Science Holding Corp. | IAS         | IAS US           | Omar Dessouky, CFA |
|                     | LegalZoom                         | LZ          | LZ US            | Michael McGovern   |
|                     | Match Group                       | MTCH        | MTCH US          | Curtis Nagle, CFA  |
|                     | Meta Platforms Inc                | META        | META US          | Justin Post        |
|                     | Pinterest                         | PINS        | PINS US          | Justin Post        |
|                     | RH                                | RH          | RH US            | Curtis Nagle, CFA  |
|                     | Roblox Corp. Class A              | RBLX        | RBLX US          | Omar Dessouky, CFA |
|                     | Squarespace, Inc.                 | SQSP        | SQSP US          | Michael McGovern   |
|                     | Uber                              | UBER        | UBER US          | Justin Post        |
|                     | Udemy Inc                         | UDMY        | UDMY US          | Curtis Nagle, CFA  |
|                     | Vivid Seats                       | SEAT        | SEAT US          | Curtis Nagle, CFA  |
|                     | Wayfair                           | W           | W US             | Curtis Nagle, CFA  |
|                     | Wix.com                           | WIX         | WIX US           | Michael McGovern   |
| <b>NEUTRAL</b>      |                                   |             |                  |                    |
|                     | ACV Auctions                      | ACVA        | ACVA US          | Curtis Nagle, CFA  |
|                     | Airbnb                            | ABNB        | ABNB US          | Justin Post        |
|                     | Beyond Inc                        | BYON        | BYON US          | Curtis Nagle, CFA  |
|                     | Booking Holdings Inc              | BKNG        | BKNG US          | Justin Post        |
|                     | Bumble                            | BMBL        | BMBL US          | Curtis Nagle, CFA  |
|                     | Digital Turbine, Inc              | APPS        | APPS US          | Omar Dessouky, CFA |
|                     | Duolingo                          | DUOL        | DUOL US          | Curtis Nagle, CFA  |
|                     | eBay                              | EBAY        | EBAY US          | Justin Post        |
|                     | Etsy, Inc.                        | ETSY        | ETSY US          | Curtis Nagle, CFA  |
|                     | Expedia                           | EXPE        | EXPE US          | Justin Post        |
|                     | Instacart                         | CART        | CART US          | Justin Post        |
|                     | Magnite, Inc.                     | MGNI        | MGNI US          | Omar Dessouky, CFA |
|                     | Snap                              | SNAP        | SNAP US          | Justin Post        |
|                     | Take-Two Interactive              | TTWO        | TTWO US          | Omar Dessouky, CFA |
|                     | Zillow                            | ZG          | ZG US            | Curtis Nagle, CFA  |
|                     | Zillow                            | Z           | Z US             | Curtis Nagle, CFA  |
| <b>UNDERPERFORM</b> |                                   |             |                  |                    |
|                     | Chewy Inc                         | CHWY        | CHWY US          | Curtis Nagle, CFA  |
|                     | Lyft, Inc.                        | LYFT        | LYFT US          | Michael McGovern   |
|                     | Opendoor Technologies             | OPEN        | OPEN US          | Curtis Nagle, CFA  |
|                     | Peloton                           | PTON        | PTON US          | Curtis Nagle, CFA  |
|                     | Playtika                          | PLTK        | PLTK US          | Omar Dessouky, CFA |
|                     | Redfin Corp                       | RDFN        | RDFN US          | Curtis Nagle, CFA  |
|                     | Shutterstock                      | SSTK        | SSTK US          | Curtis Nagle, CFA  |

## Disclosures

## Important Disclosures

## Equity Investment Rating Distribution: Media &amp; Entertainment Group (as of 31 Dec 2023)

| Coverage Universe | Count | Percent | Inv. Banking Relationships <sup>R1</sup> | Count | Percent |
|-------------------|-------|---------|--|-------|---------|
| Buy               | 35    | 53.85%  | Buy                                      | 15    | 42.86%  |
| Hold              | 15    | 23.08%  | Hold                                     | 8     | 53.33%  |
| Sell              | 15    | 23.08%  | Sell                                     | 7     | 46.67%  |



**Equity Investment Rating Distribution: Technology Group (as of 31 Dec 2023)**

| Coverage Universe | Count | Percent | Inv. Banking Relationships <sup>R1</sup> | Count | Percent |
|-------------------|-------|---------|--|-------|---------|
| Buy               | 215   | 53.09%  | Buy                                      | 111   | 51.63%  |
| Hold              | 97    | 23.95%  | Hold                                     | 45    | 46.39%  |
| Sell              | 93    | 22.96%  | Sell                                     | 24    | 25.81%  |

**Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)**

| Coverage Universe | Count | Percent | Inv. Banking Relationships <sup>R1</sup> | Count | Percent |
|-------------------|-------|---------|--|-------|---------|
| Buy               | 1895  | 53.62%  | Buy                                      | 1083  | 57.15%  |
| Hold              | 832   | 23.54%  | Hold                                     | 454   | 54.57%  |
| Sell              | 807   | 22.84%  | Sell                                     | 383   | 47.46%  |

<sup>R1</sup> 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 <sup>R2</sup> |
|-------------------|---|--|
| Buy               | ≥ 10%   | ≤ 70%  |
| Neutral           | ≥ 0%  | ≤ 30%  |
| Underperform      | N/A   | ≥ 20%  |

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