

US Internet/Marketing & Advertising Technology

January Mobile AdTech Update: Upgrades should benefit game devs at some point

Industry Overview

Can AI & RTB resuscitate the mobile gaming market?

2024 growth expectations for consumer spending within the mobile gaming market are low (BofA/Street/Data.ai at +2%/+5%/+4% Y/Y), but we are on the lookout for an unexpected growth inflection driven by improvements in the user acquisition environment. Improvements in in-app advertising targeting, driven by AI upgrades, have demonstrated the ability to deploy larger ad budgets at acceptable ROAS; mobile game publisher revenue should benefit several quarters after adoption, as newly acquired cohorts begin spending. We think the completion of the shift to real time bidding, driven by Google, will also improve ROAS for marketers, as well as potentially improve ad load within mobile games. Should these developments re-accelerate industry growth to 8-12% Y/Y we think investors in both publishers and ad networks would be surprised.

3P Data: iOS CPIs flat, Android CPIs rebounded

We aggregate 3P CPI data across 7 networks in all app categories in the US to estimate pricing trends – rising price trends would likely imply a resurgence of growth in the mobile gaming industry. Average CPIs on Android devices have declined since November '23, which we suspect was due to the mobile ad ecosystem adapting to Google's real-time bidding changes; pricing recovered in January but remained below October levels. Average iOS CPIs were flat sequentially. Both Meta & Alphabet reported improving ad pricing trends in 4Q, with Meta's average ad pricing inflecting to positive Y/Y growth (+2% Y/Y) for the first time since 4Q22. AppLovin reported +20% Y/Y growth in revenue per install in 4Q23; install volumes were up +66% Y/Y, a stark contrast to the single-digit Y/Y decline in aggregate downloads of top US gaming apps (per 3P data).

APP: Investors finally take notice after big Q4 beat

AppLovin remains our top pick for 2024. We forecast 50% growth in APP's software business in CY24 at 70%+ EBITDA margins. We heard from more new investors after [APP delivered its fourth beat & raise](#). We see scope for continued share price appreciation driven by broadening investor participation, which would help bring APP's multiple (still only 11x EV/BofA CY24 EBITDA as of 21 Feb) closer to that of AdTech leaders TTD (not covered, 44x EV/Street CY24E EBITDA) and DoubleVerify (Buy, currently 33x EV/BofA CY24E EBITDA). APP's Software business could outgrow the mobile gaming market for several years by becoming its primary source of user growth. Management views its AI advertising engine, Axon 2.0, as a new technology in early innings, and has guided to sequential quarterly growth through CY24.

APPS: Stock remains under the radar until catalysts hit

Digital Turbine (APPS) is reorienting its business to capitalize on the opportunities that may arise from alternative app distributions, but various infrastructure upgrades & platform consolidations have led to revenue losses in the short term. With EU's DMA coming into effect in March, publishers, APPS could prove itself as a key tech enabler as publishers, carriers, and social platforms formulate their alternative app store strategies. Current valuation (7x FY25 EBITDA) is near the bottom of AdTech peers, but investor participation could remain muted before a growth inflection.

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Timestamp: 23 February 2024 02:41AM EST

23 February 2024

Equity
United States
US Internet/Marketing & Advertising Technology

Omar Dessouky, CFA
Research Analyst
BofAS
+1 646 855 0686
omar.dessouky@bofa.com

Michael J. Funk
Research Analyst
BofAS
michael.j.funk@bofa.com

Justin Post
Research Analyst
BofAS
justin.post@bofa.com

Arthur Chu, CFA
Research Analyst
BofAS
+1 646 855 1131
arthur.chu@bofa.com

Matt Bullock
Research Analyst
BofAS
matthew.bullock2@bofa.com

Acronyms:

CPI: Cost per Install

3P: Third Party

RTB: Real Time Bidding

TTD: The Trade Desk

DMA: Digital Market Act

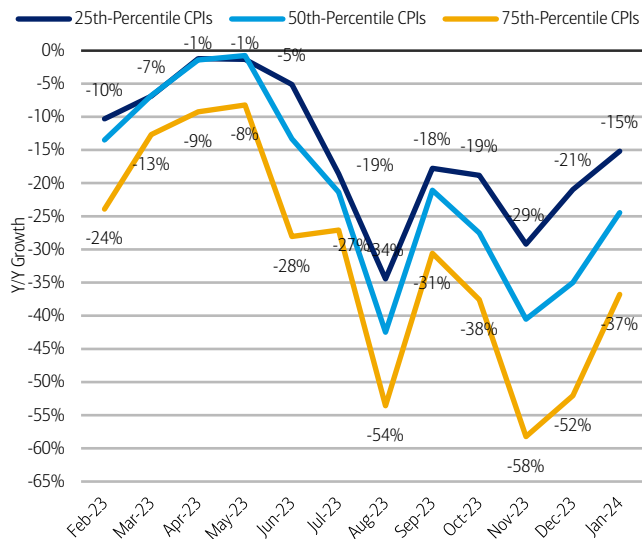
Pricing January: iOS flat, Android bounced back M/M

Cost per Install (CPI) and cost per 1000 impressions (CPM) are important indicators because they are related to the expected lifetime value of the gamers who install a game based on an ad served through an ad network.

- In November 2023, Google started to transition into real-time bidding on both AdMob as well as partner mediation platforms (AppLovin MAX, Unity LevelPlay, Chartboost, Digital Turbine Fairbid), a process that has completed in January 2024. We expect this change to result in ad pricing improvements over time as real-time bidding introduces more competition into ad auctions, though some near-term volatility is expected as the ecosystem adjusts to the transition.
- CPI (3P estimates) of US Android apps bounced back M/M in January, though still 15-35% lower Y/Y at different price points. We suspect the sequential rise in average pricing was due to 1) increased demand running through Google AdMob's real-time bidding engine, 2) bidders adapting to the new pricing mechanism better, though it's difficult to validate the hypothesis without data. We will look to further pricing improvements over the next few months for confirmation.
- CPI (3P estimates) of US iOS apps were flat sequentially in January. Overall in 2023, average pricing on iOS appears to have stabilized after two years of steep declines, particularly for less expensive installs. On a Y/Y basis, prices were still down double-digits but declines appeared to be moderating.

Exhibit 1: Cost per Install Y/Y Growth, US Android Apps (all categories)

Average Android CPIs (3P ests) saw strong sequential growth in January, with Y/Y comps improved by 5 - 15pts at different price points



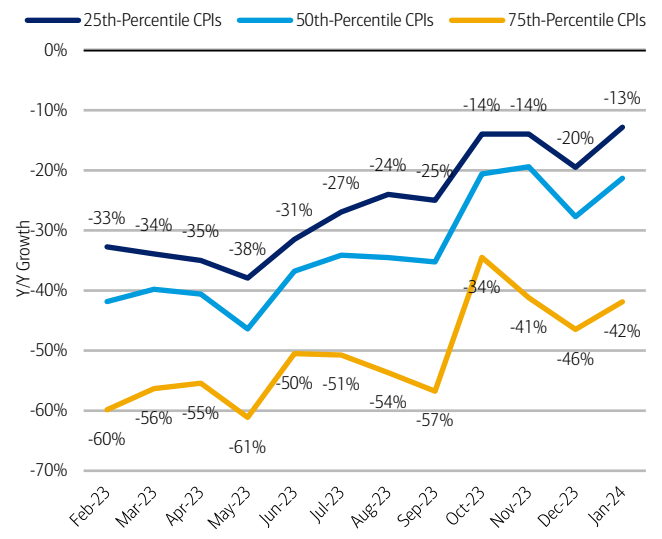
Source: Data.ai

Note: major networks included are AdMob, UnityAds, ironSource, Chartboost, Vungle, AdColony, InMobi

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Exhibit 2: Cost per Install Y/Y Growth, US iOS Apps (all categories)

Average iOS CPIs (3P ests) were flat sequentially in Jan and down double digits Y/Y



Source: Data.ai

Note: major networks included are AdMob, UnityAds, ironSource, Chartboost, Vungle, AdColony, InMobi

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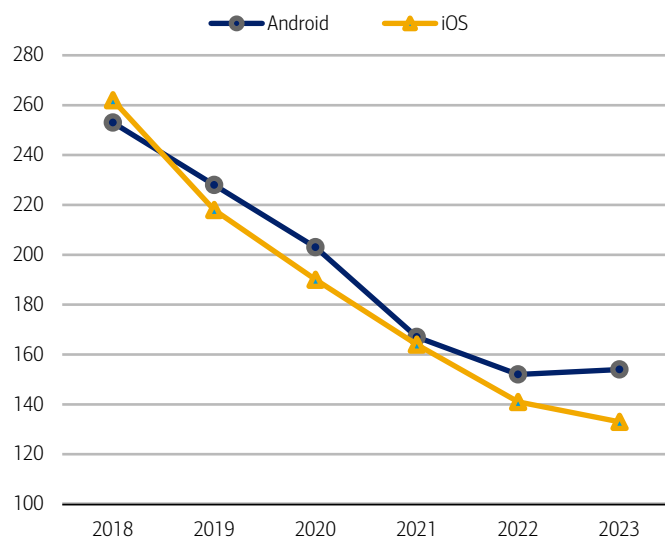
New launch: early signs of rebound, but no inflection yet

New game launches are important growth drivers of ad network revenues because publishers tend to spend the most on advertising at launch in an effort to reach a scale at which the game can be profitable. Moreover, most mobile games see their revenue flatten or decline after a few years in operation, making new game launches critical to the financial success (and ongoing advertising spend) of any publisher with a portfolio.

We track the number of newly launched games among the top 1500 grossing gaming apps on iOS and Android respectively to gauge the pace and success of new game launches. An acceleration in the pace of new launches could suggest 1) an increase in risk appetite by publishers, 2) an increase in VC/private market funding in mobile gaming, and 3) user targeting may be improving, lowering the bar for scaling new games, both of which could indicate higher industry growth going forward, a positive for Mobile AdTech platforms such as AppLovin, Unity, Vungle, and Digital Turbine. Our analysis suggests that new launches within top games have declined consistently since 2018, reaching a new low in 2023. However, there are early signs that new launches have been picking up since 3Q23. Overall, our data does not indicate an inflection in mobile gaming industry growth driven by new launches. We look for more clues if the rebound since 3Q23 marks a turning point.

Exhibit 3: Number of New Launches Among Top 1500 Game Apps by Revenue, US iOS & Android, YTD (thru December)

The number of new launches among top gaming apps have consistently declined since 2018; new launches continued to fall in 2023 on iOS, but appeared flat on Android



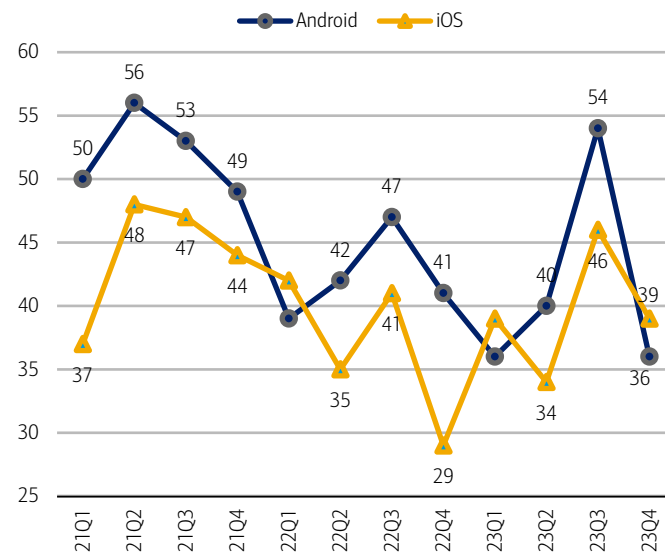
Source: SensorTower, BofA Global Research

Note: New launch defined as a game that was released in the year

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Exhibit 4: Number of New Launches Among Top 1500 Game Apps by Revenue, by Quarter, US iOS & Android

The number of new launches per quarter has showed early signs of rebound since 3Q23, particularly on iOS



Source: SensorTower, BofA Global Research

Note: New launch defined as a game that was released in the quarter

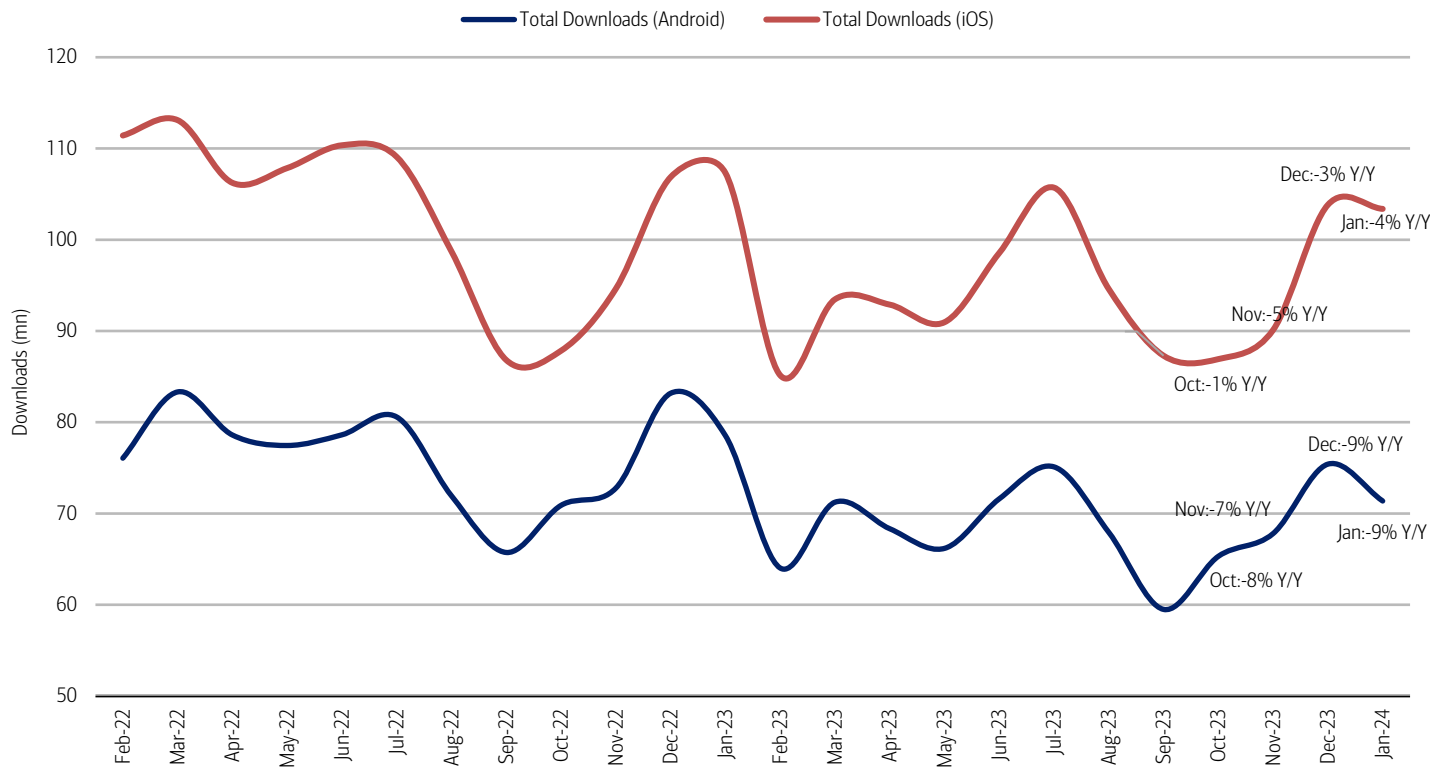
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Volumes: Y/Y comps stable despite seasonal fluctuations

The volume of downloads of mobile game apps is an indicator of volume of paid installs through mobile ad networks, although the metric includes organic installs as well. Mobile game install volumes appeared to have trended sideways since August '22, and Y/Y declines have slowly moderated since early 2023 as comps eased. In January, game downloads fell slightly following a seasonal peak in December, while Y/Y comps remained stable.

Exhibit 5: Monthly Total Downloads of Top US Mobile Games

Total downloads of US top mobile games fell slightly M/M in January following a seasonally strong December, with Y/Y comps stable



Source: Sensor Tower, BofA analysis of 500 top gaming apps on Android & iOS respectively

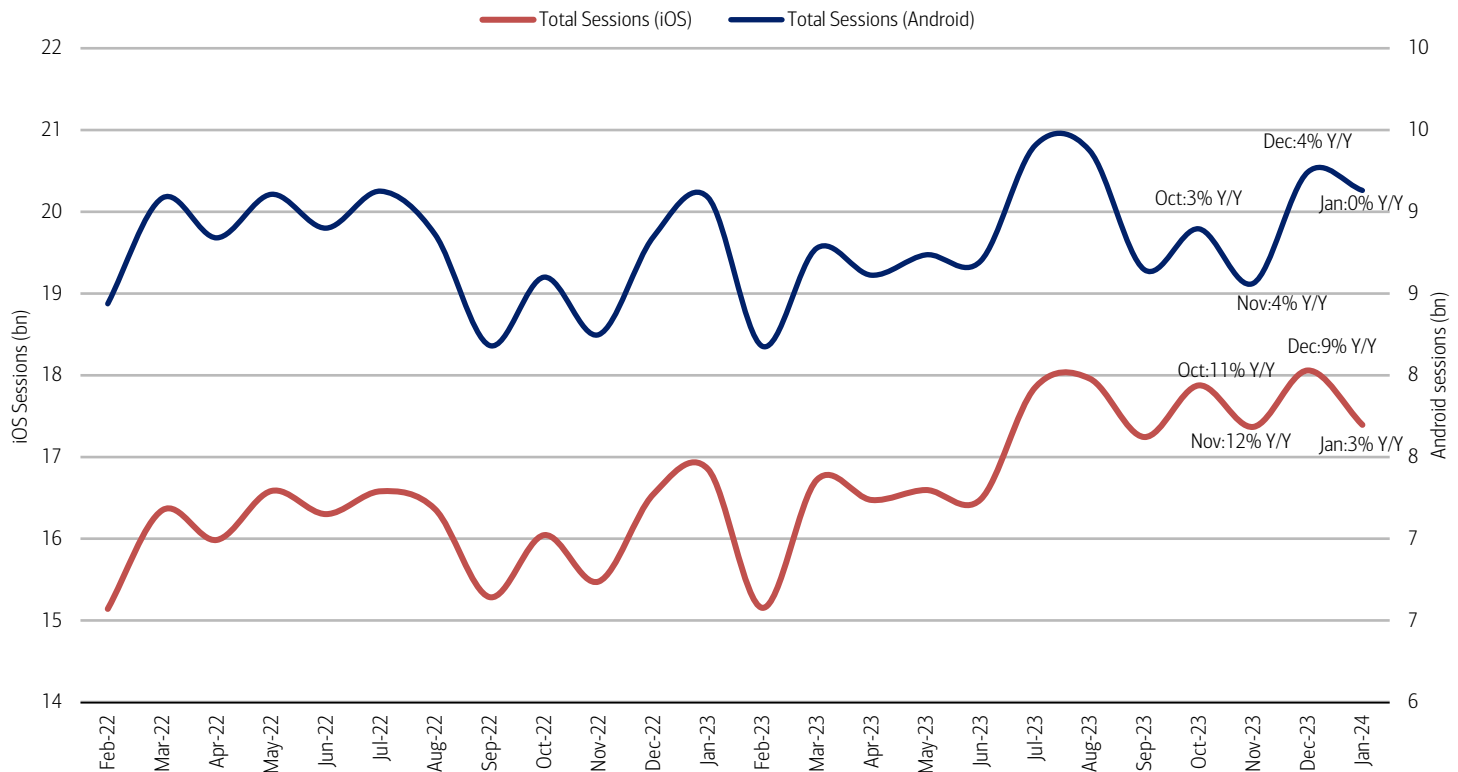
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Engagement: sequentially stable and positive Y/Y since July

Engagement with mobile games (total times an app is opened) is an important indicator of the supply of impressions available for ad networks to serve ads to. According to 3P estimates, player engagement on top iOS games seems to have slowly trended upwards since July 2023. On Android, aggregate player engagement appears stable since 2022. In January, player engagement slightly fell M/M following a strong December, which is typically the seasonale high. Y/Y comps have inflected to positive since July. Overall, player engagement appeared mostly stable.

Exhibit 6: Monthly Aggregate Engagement with Top US Mobile Games

Overall player engagement fell slightly M/M after a seasonally strong December, Y/Y growth also decelerated



Source: Sensor Tower, BofA analysis of 500 top gaming apps on Android and iOS

Note: Aggregate engagement based on total player sessions on top 500 iOS & Android gaming apps

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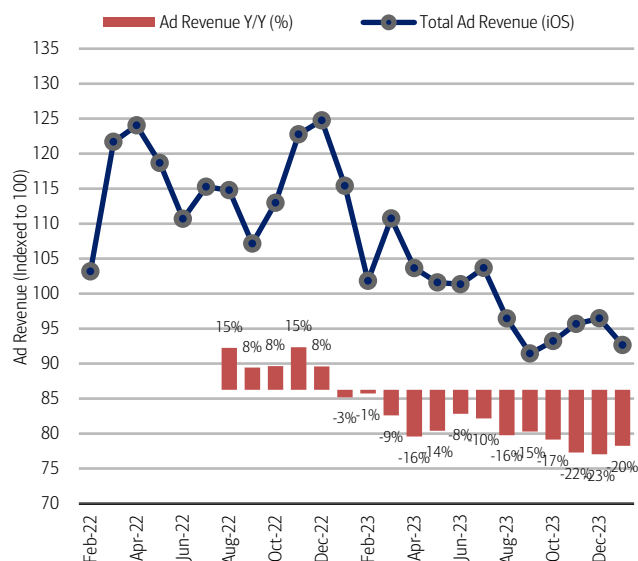
In-game ads: Not showing secular growth

In-game advertising is still very small (BofA est. of \$15-\$20bn) as compared to the ~\$100bn in-app spending within mobile games. But some AdTech firms have pointed to in-game mobile advertising as a secular growth opportunity; with IAP under pressure, publishers should attempt to monetize the > 95% of mobile gamers that do not spend in game.

3P data does not suggest that in-game mobile ad revenue is experiencing secular growth (see Exhibits 5 and 6). Moreover, Hypercasual games, which make up the most significant part of the in-game advertising have been hurt by the downward trend in CPMs since 1Q22.

Exhibit 7: Total Ad Revenue (Indexed) of Top 1000 Ad Monetizing Games (iOS, US Only)

Total ad revenue across top iOS games fell M/M after a seasonally strong December, but Y/Y comps slightly improved



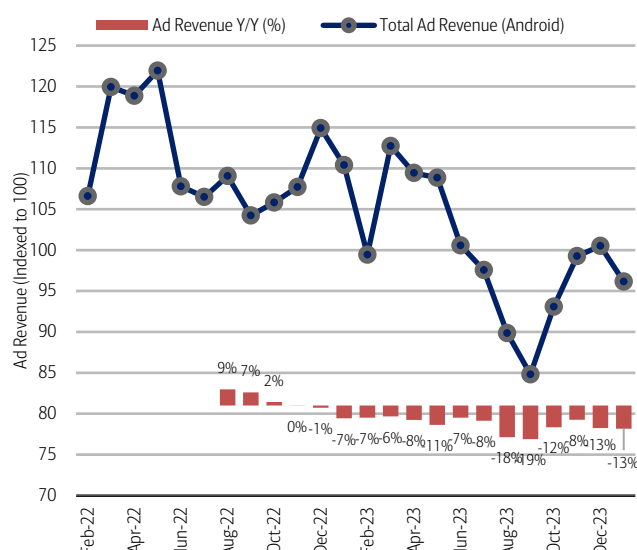
Source: data.ai

Note: Ad revenue includes a subset of ad networks and excludes social media and OTT. Included networks are: AdColony, AdMob, AppLovin, ironSource, UnityAds, Vungle

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Exhibit 8: Total Ad Revenue (Indexed) of Top 1000 Ad Monetizing Games (Android, US Only)

Total ad revenue across top Android games fell slightly M/M after a strong December, Y/Y comps remained stable



Source: data.ai

Note: Ad revenue includes a subset of ad networks and excludes social media and OTT. Included networks are: AdColony, AdMob, AppLovin, ironSource, UnityAds, Vungle

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Price objective basis & risk

AppLovin (APP; C-1-9; \$57.80)

Our \$68 PO is based on our SOTP framework valuing APP's Software segment at \$66 and the Gaming Segment, including both in-game advertising and in-game consumer spend, at \$2/share. Our Software valuation is 13x FY24 EBITDA, inline with META, which we view as the key barometer of the overall health of the mobile ad ecosystem and an important valuation anchor. Our Gaming segment valuation is based on an enterprise value that is 5x FY24 Gaming Segment EBITDA, inline with Casual Mobile Game Publisher peers.

Upside risks to our PO are new dovish monetary policy and regulation that would reduce Apple's or Google's control over their own mobile ecosystems. Downside risks to our PO include a recession, and a tightening of financial conditions brought about by the Fed. Policies by Google and Apple, pertaining to their mobile platforms, that would debase broker ad networks' value proposition are also downside risks, and a major resurgence of Facebook on iOS would also negatively affect APP stock.

Digital Turbine, Inc (APPS; C-2-9; \$3.16)

Our \$6 PO is based on 9.5x valuation multiple on FY25E EBITDA, below that of AppLovin, but roughly inline with other smaller adtech players (not mobile focused). Upside risks to our PO include faster-than-expected ramp in SingleTap and Hubs business, as well as a re-acceleration in the AGP business. Downside risks to our PO include: 1) adverse macroeconomic conditions that could lead to a decline in ad dollars, 2) consolidation of ad channels, which could disproportionately hurt tier 2 ad platforms, 3) longer-than-expected enterprise sales cycle (due to adverse macro) that could lead to delayed product uptake and monetization, and 4) significant churn of business as related to platform integrations (Fyber and AdColony)

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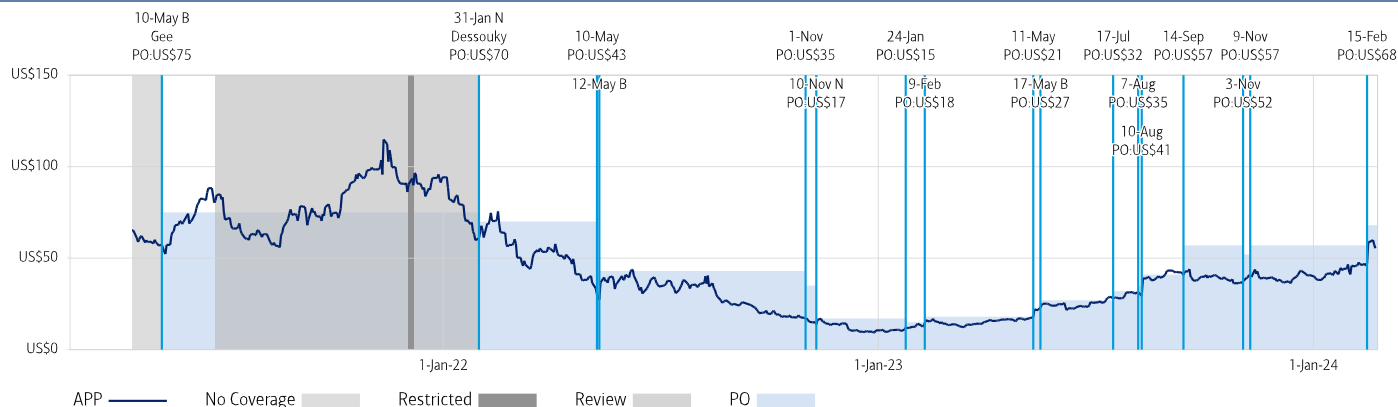


US - Internet Coverage Cluster

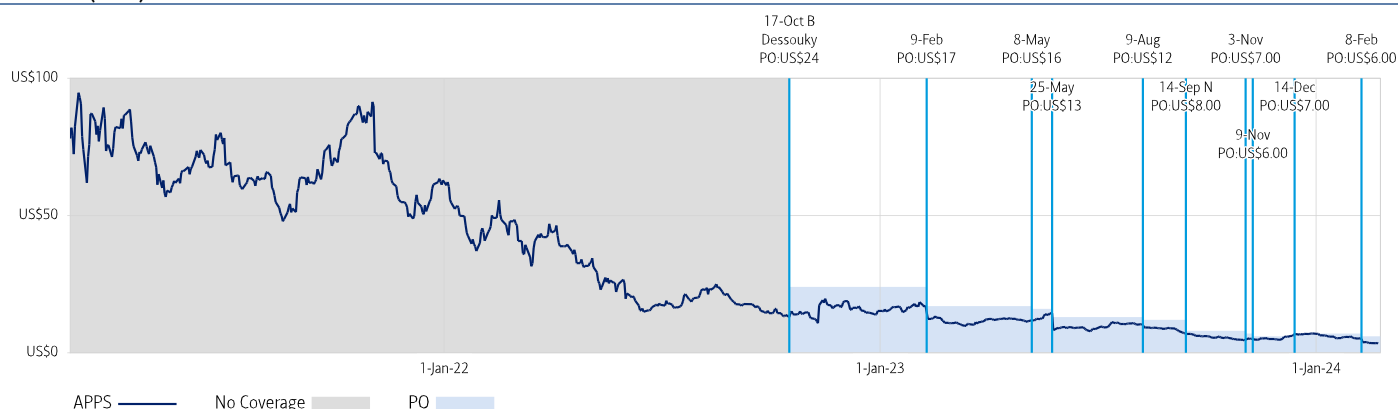
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	Alphabet	GOOG	GOOG US	Justin Post
	Amazon.com	AMZN	AMZN US	Justin Post
	AppLovin	APP	APP US	Omar Dessouky, CFA
	DoorDash	DASH	DASH US	Michael McGovern
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	Uber	UBER	UBER US	Justin Post
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	Vivid Seats	SEAT	SEAT US	Curtis Nagle, CFA
	Wayfair	W	W US	Curtis Nagle, CFA
	Wix.com	WIX	WIX US	Michael McGovern
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	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
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	Take-Two Interactive	TTWO	TTWO US	Omar Dessouky, CFA
	Zillow	ZG	ZG US	Curtis Nagle, CFA
	Zillow	Z	Z US	Curtis Nagle, CFA
UNDERPERFORM				
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	Opendoor Technologies	OPEN	OPEN US	Curtis Nagle, CFA
	Peloton	PTON	PTON US	Curtis Nagle, CFA
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	Redfin Corp	RDFN	RDFN US	Curtis Nagle, CFA
	Shutterstock	SSTK	SSTK US	Curtis Nagle, CFA
RSTR				
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AppLovin (APP) Price Chart

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Digital Turbine (APPS) Price Chart

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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 ^{R1}	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)

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Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

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Neutral	≥ 0%	≤ 30%
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