



Internet 2023 Outlook Series: December 23 US Consumer Survey Results

As part of our franchise's 2023 outlook, we are publishing a month-long series that will highlight the key fundamental debate points across multiple subsectors within US internet.

For the first installment, we highlight the results from our December, as well as June 2022 US consumer dbDIG surveys. In short, while a US recession is likely a base-case heading into 2023, our survey is indicating that US consumers remain stubbornly resilient, supporting the view that a US recession in 2023 could end up more benign than some fear. Across our multiple subsectors, the survey results, in our view, highlight the following:

Online Advertising: Engagement on social media platforms continues to grow (**SNAP** and **META** stand out as relative winners at the expense of TikTok, with both notching strong improvement between June and December). Looking ahead, purchase-intent remains steady (for items discovered via social) and has improved relative to trends in June.

e-commerce: Most consumers surveyed expect to grow their spend over the next 6 months across all e-commerce platforms in question, with spend intention metrics improving meaningfully in December relative to June results, **CHWY** and **ETSY** are clear callouts in this regard.

Online Travel: Looking out to next year, despite the inflationary environment, US consumers still look to grow total travel nights by double digits in 2023, with most expecting hotel stays to grow next year and AA stays to decline. **EXPE** remains the favored US platform, particularly as a one-stop shop for all travel needs, but has lost some share to **BKNG** in terms of its position as the first step in the travel booking journey versus the June survey result.

US Rideshare: The strong reopening trends appear to be continuing for both **UBER** and **LYFT** through December. Here, we broadly observe growth in users, frequency, spending levels, and expected consumption of rideshare over the next 6 months. While the increase in users was meaningfully higher for **UBER**, **LYFT** appears to be growing rider frequency at a faster clip. Overall, the data points us to continued strong near-term reopening trends for both **UBER** and **LYFT**.

Benjamin Black
Research Analyst
+1-212-250-9218

Lee Horowitz
Research Analyst
+1-212-250-4403

Ishant Goel
Research Associate
+1-212-250-1942

Xiaorui Song
Research Associate
+1-212-250-6301

Jeff Seiner
Research Associate
+1-212-250-8153

We would like to thank Ben Novak of dbDIG Primary Research for his contribution to this report. For more dbDIG Primary Research, click [here](#)



Deutsche Bank Securities Inc.

Deutsche Bank does and seeks to do business with companies covered in its research reports. Thus, 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. DISCLOSURES AND ANALYST CERTIFICATIONS ARE LOCATED IN APPENDIX 1. MCI (P) 097/10/2022.



Food Delivery: As a more discretionary category, it was not surprising to see user trends moderate in the US over the last 6 months. Frequency, however, has seen marked improvement as have memberships to Uber One and DashPass. Beyond core food, we see growing utilization of new verticals (groceries, alcohol, quick commerce, etc.), which screen less discretionary and should support gross bookings trends for both **DASH** and **UBER** into 2023.

Music: Despite ongoing macro concerns, we continue to monitor growing music streaming subscription trends in the US. Looking forward, with considerable pricing power and only a small portion of revenue associated with advertising, **we contend that music broadly (and the music labels in particular) screen relatively recession resilient - a defensible characteristic that will be increasingly in focus (and valuable) as we cycle into FY23.**

Online Dating: Encouragingly, we note that the number of people citing a preference for "traditional" offline channels for dating has decreased by 8 points to 15%, indicating a continuation of the secular growth tailwinds in the industry. To that end, we observe that all apps appear to be growing users across our survey respondents, with the exception of **Match.com** and **Tinder (MTCH)**. Similarly, we see waning propensity to renew Tinder subscriptions, which stands in contrast to **BMBL**, Hinge, OkCupid and The League. For Tinder, we think these issues point to lack of product innovation, perhaps a marketplace imbalance coming out of pandemic restrictions and also general macro softness which are weighing on propensity to spend in the current environment.



[Table of Contents](#)

Survey details.....	4
Online advertising.....	4
E-commerce.....	8
Online travel.....	16
Rideshare.....	21
Food delivery.....	26
Music.....	32
Dating.....	36



Survey Details

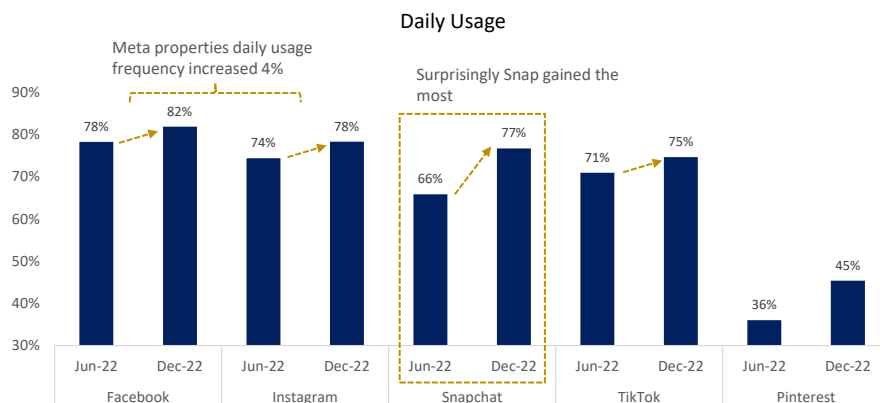
Below we highlight the results from December 2022 US consumer survey and in some instances compare key takeaways with our June 22 survey. In short, while a US recession is likely a base-case heading into 2023, US consumers seem to have ended 2022 in a fairly resilient fashion, likely supporting the view that a 2023 US recession could end up being milder than some fear.

For reference our December survey covered 1,440 people (with a 50/50 male/female split) across states in the Northeast, South, Midwest, and West. All the respondents we surveyed are over 18 years of age with a median household income of \$50,000 to \$99,000. Additionally, 37% of respondents live in urban/cities and 44% are employed full-time.

Online advertising: Engagement on social media platforms continues to grow

Despite the emergence of TikTok, we have yet to see negative daily usage trends across US social media platforms. In fact, between our two survey periods, we actually observe daily usage increasing across all properties, weakening the thesis that TikTok's growth will suppress trends at the larger social platforms such as Facebook and Instagram. Surprisingly, we see US daily engagement trends meaningfully improve at SNAP in December (vs June levels), perhaps indicating a reversal of the softness the company alluded to on the 3Q earnings call (where time spent on content surfaces contracted by 5% y/y in the US). Across Facebook Blue, Instagram, and TikTok, we see very comparable improvements in daily activity, which could signal that the rollout of Reels is supporting engagement at META's properties and limiting engagement shifts towards TikTok. PINS, on the other hand, also garnered a meaningful uplift in engagement trends in our sample period (though off a lower base), with daily engagement up 9 points to 45% of our survey respondents in December vs. 36% in June.

Figure 1: Approximately how often do you use each of the following



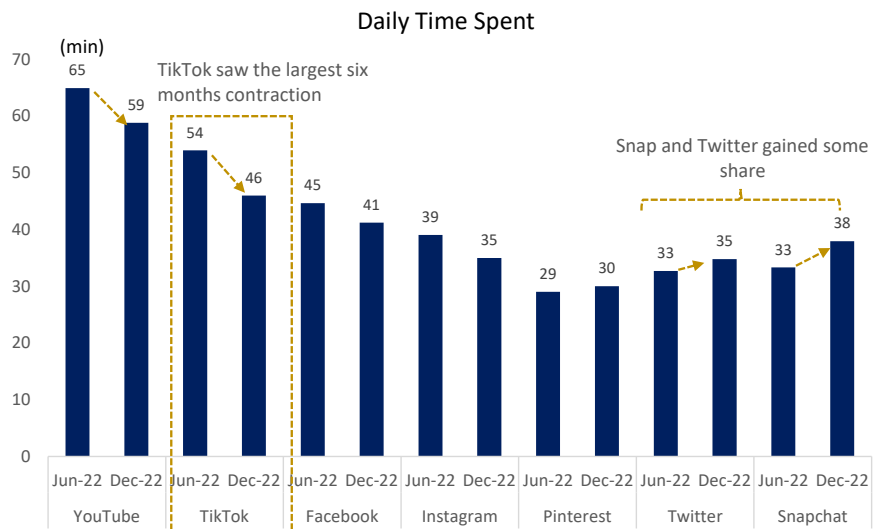
Source : dbDIG Survey, DB Research



Modest gains in daily time spent for Snap/Pins/Twitter

We see similar trends in regards to daily time spent, with Facebook Blue and Instagram maintaining share, modest share gains at Snap/Pins/Twitter, but **noticeable engagement share losses for TikTok over the last six months**. Perhaps this could be a function of growing competition across short-form video, with Reels now broadly distributed across Instagram and Facebook Blue, or it could simply be a plateauing of the strong share gains we've seen over the last 18 months. In either case, we note this represents yet another datapoint that stands in contrast to the narrative suggesting that TikTok continues to siphon user engagement from other social media platforms. On Snap specifically, while improving engagement may well be tied to greater utilization of the messaging platform, we think some of the uplift may be attributable to time spent on the content surfaces. This could be a positive if it leads to the company reporting a reversal in the y/y contracting content engagement trends highlighted in the 3Q.

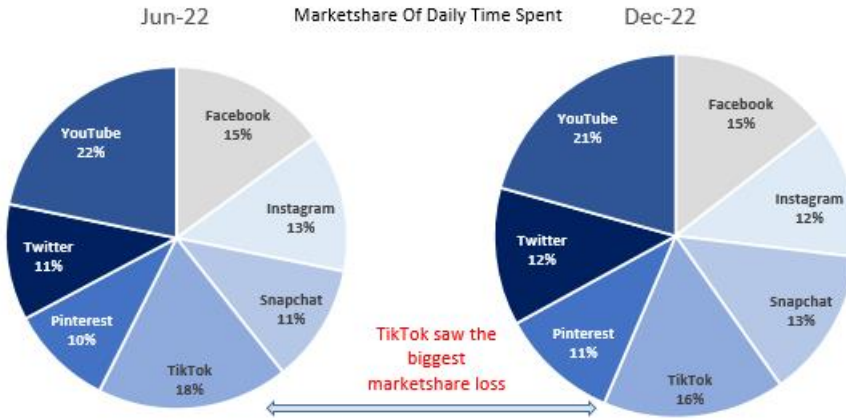
Figure 2: On average, how much time do you spend per day using the following social media platforms?



Source : dbDIG Survey, DB Research



Figure 3: TikTok lost market share of daily time spent

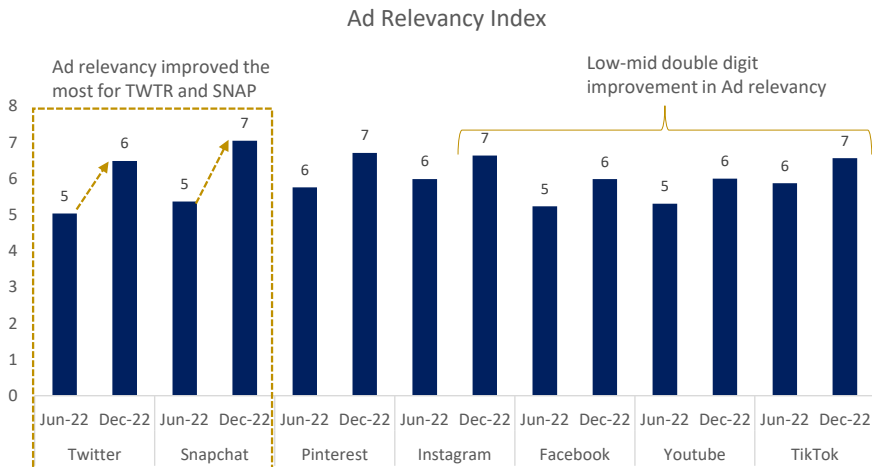


Source : dbDIG Survey, DB Research

Improving ad relevance trends

While there are concerns that ad relevance (targeting) would be heavily impacted across the social platforms, our survey work in fact indicates improving trends across all services, perhaps indicating the positive gradual impact that CAPI/CAPI Gateway products and AI investments are having on recapturing lost signal via the removal of IDFA.

Figure 4: How relevant are the products that you see promoted or advertised on the following social media platforms



Source : dbDIG Survey, DB Research

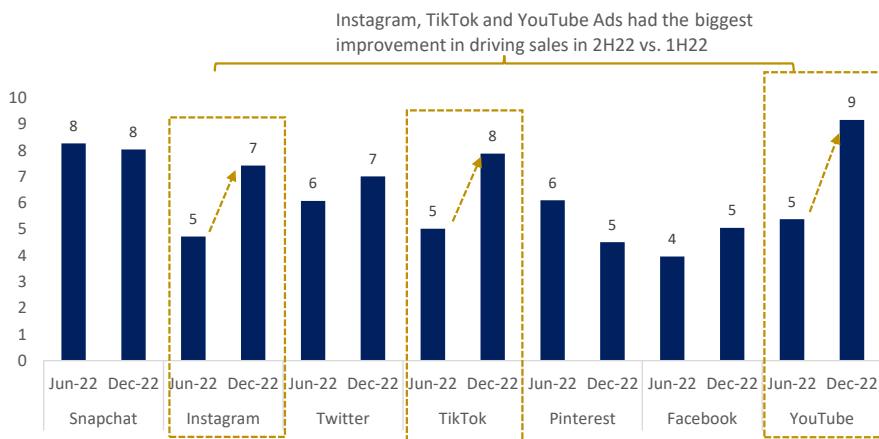


Purchase-intent on social media increased over the last six months

Notwithstanding the strong engagement trends, we see that commercial activity on Snap has remained steady over the last six months, while the average number of items purchased on competing social platforms has increased. The two larger callouts here are TikTok and YouTube, which both scaled their commerce activity north of 60% over our sample period. Instagram and Facebook Blue also had increased activity, but at a modestly lower magnitude, while PINS was the only platform to see meaningfully lower commercial activity between June and December across our survey respondents.

Figure 5: In the past six months, approximately how many times have you purchased something by clicking on brand/product posts, links or ads when using the following social media platforms

Average Items Purchased By Clicking On Ads In The Past Six Months



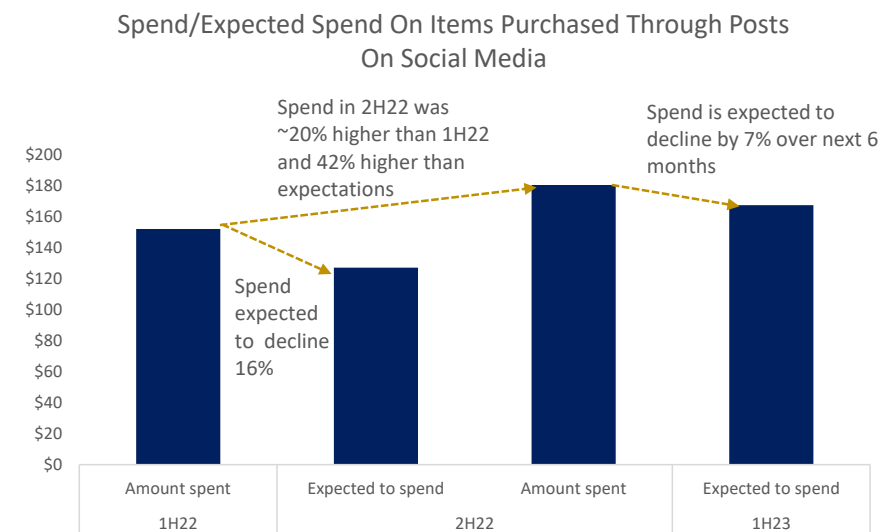
Source : dbDIG Survey, DB Research

Spending intentions using social media ads are down 7% over next six months

Looking ahead, our survey indicates that social users are poised to spend less on items they discover on social media platforms over the next 6 months. That said, in our June 2022 survey, the panel outlined intentions to lower spend by 16% over the next six months, but actual reported spend was up ~20%, a near 40 point swing. In our more recent December survey, the survey respondents highlighted an intention to lower spending levels by 7%, which is less than half the rate indicated in the June survey.



Figure 6: In the next six months, approximately how much do you expect to spend on items purchased through brand/product posts, links or ads found on social media?



Source : dbDIG Survey, DB Research

e-commerce: US e-commerce seeing a holiday bump with healthy spend intention into next year

Heading into the holiday shopping season, inflationary pressures were certainly on everyone's mind. That said, data points from the Turkey 5 have in many cases proved more resilient than many investors may have thought. **All in, we believe that the preponderance of holiday data points have been decidedly mixed, which was likely better than feared and included:**

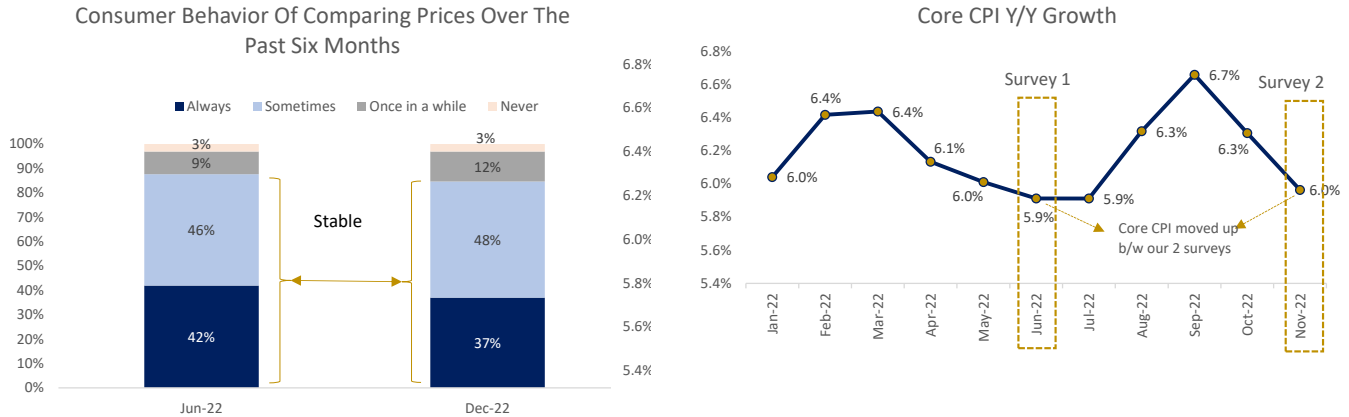
- Our app data checks that are showing lower than typical seasonal engagement trends: **Negative**
- Adobe holiday e-commerce growth of 2.5% y/y, towards the high end of the company's expectations but still fairly tepid, particularly given inflation that is running hotter than these levels, suggesting unit declines: **Neutral to Negative**
- US monthly adjusted non-store retail sales growth y/y that decelerated meaningfully in November to 7.7% from 10.5% in October: **Negative**
- Shopify holiday data points that proved to be fairly resilient at 19% y/y growth on Black Friday to Cyber Monday weekend: **Positive**
- BigCommerce holiday data pointing towards 32% y/y growth for Cyber Week: **Positive**

Looking at our survey results, the behavior changes associated with rising prices in the US seem to be generally stable since June, with price comparison behavior holding steady to modestly less aggressive. Specifically, in the June survey, 88% of the respondents indicated that they compared prices online versus ~85% as of the December survey respondents. This, despite the fact that y/y core CPI growth was at 5.91% in June and has accelerated to 5.96% as of December 2022, with



meaningful growth acceleration to 6.7% over the sample period.

Figure 7: When you are shopping online, how often do you compare prices across different sites and platforms?



Source : Fred, dbDIG Survey, DB Research

Rising cost of essentials is putting pressure on discretionary spend

That said, with CPI growth peaking, at least in the near term, consumers have perhaps already adjusted down their purchasing behavior at this point, which could positively impact e-commerce growth rates throughout 2023, particularly with easy reopening compares on the horizon.

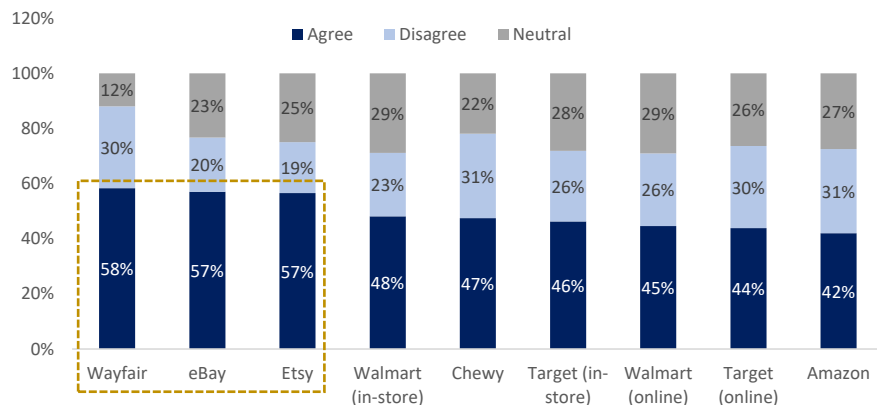
At a platform level, the rising cost of essentials seem to be weighing on spending behavior more relative to six months ago across the more discretionary platforms, including **Wayfair, eBay, and Etsy. Specifically, >55% of respondents indicated that rising prices across essential categories have caused consumers to spend less across these three platforms than they previously had.** This compares with more essential focused/non-discretionary platforms like Chewy and Amazon, where only 47% and 42% of respondents, respectively, agreed with the statement "Over the past six months, the rising cost of gas, food and other essential items has caused me to spend less at each of the following than before."

We believe that these dynamics should provide a degree of certainty to top-line estimates into 2023 and underpin our bullish views on both AMZN and CHWY.



Figure 8: Over the past six months, the rising cost of gas, food and other essential items has caused me to spend less at each of the following than before - agree or disagree?

Percentage of Respondents Agree vs. Disagree (Dec Survey)



Source : dbDIG Survey, DB Research

Shopping frequency on e-commerce platforms has increased

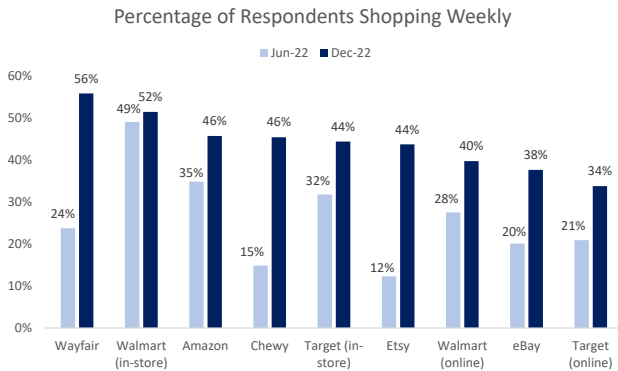
Inflation aside, with reopening headwinds now fully baked, shopping behavior improved in the holiday season relative to when we ran the survey back in June.

Specifically, we see the percentage of respondents who are shopping on e-commerce platforms every week rising dramatically in the December survey vs. the June version. **Additionally, we also see an increase (average 43%) in dollars spent across each platform.** Without the benefit of having these results back in 2019 it is challenging to say whether the improvement in both shopping days and dollars spent are better or worse than typical seasonality, at the very least we are seeing some strong seasonal improvement across all the e-commerce platforms in question.

Most notable to us, however, is the improvements at Chewy, where we see the percentage of respondents who are shopping on a weekly basis improving from 15% in June to 48% in December and those that are spending >\$100 on the platform improving from 24% in June to 45% in the December survey. **Overall, the average spend/customer on Chewy increased by 56% to \$207 in December from \$133 in June 2022.** While many of the other names in the survey should likely benefit from a fair degree of seasonal uplift from June to December, Chewy is a much less seasonal business and we suspect that these improvements are an output of waning reopening headwinds, as well as ongoing improvements to the Chewy user experience/gains made in cross-category shopping behavior.

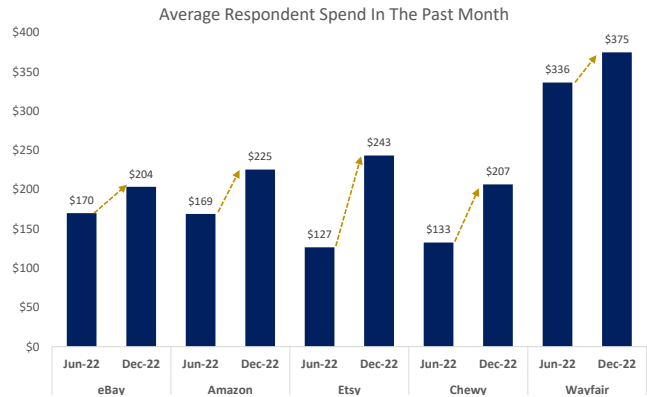


Figure 9: About how often do you shop from the following (weekly, monthly, every two-six months)



Source : dbDIG Survey, DB Research

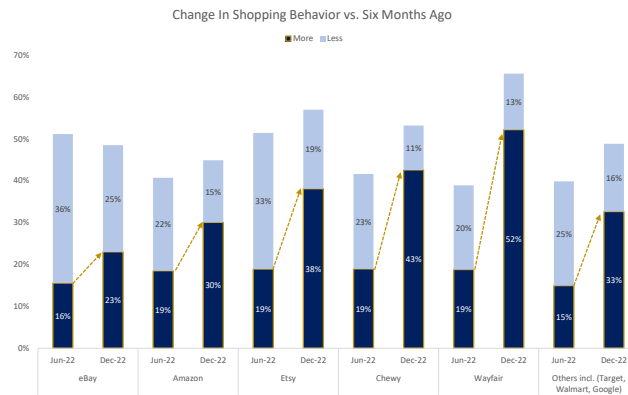
Figure 10: About how much did you spend at the following in the past month



Source : dbDIG Survey, DB Research

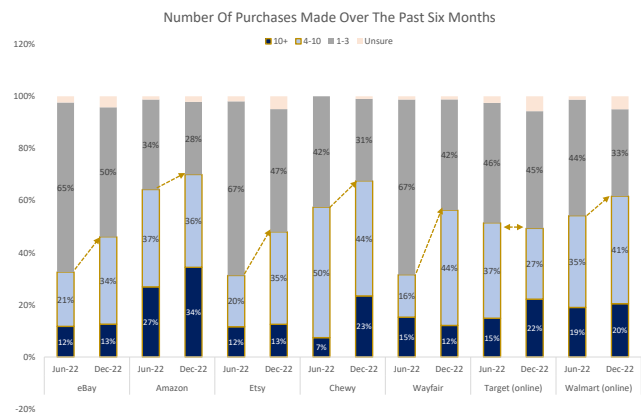
Similarly, we see robust improvement across the board in terms of survey respondents who are shopping more frequently across all e-commerce platforms in question, as well as the number of items purchased.

Figure 11: Would you say that you are currently shopping more or less at the following compared with six months ago



Source : dbDIG Survey, DB Research

Figure 12: About how many purchases did you make from each of the following over the past six months?



Source : dbDIG Survey, DB Research

Spend intention for next six months looks strong

More important than the seasonal uplift that the survey is indicating in December, is the US consumer outlook for 1H23. **Here, we believe it's an extremely bullish, and likely non-consensus indicator that spend intention for the next six months has improved meaningfully across most e-commerce platforms since June.** That is to say, that the number of respondents who indicated that they plan to spend more over the next six months improved dramatically in the December survey versus the June survey.

Most notable, in our view, was Etsy, where future spend growth intention improved from 9% in June to 33% in December and again Chewy which went from

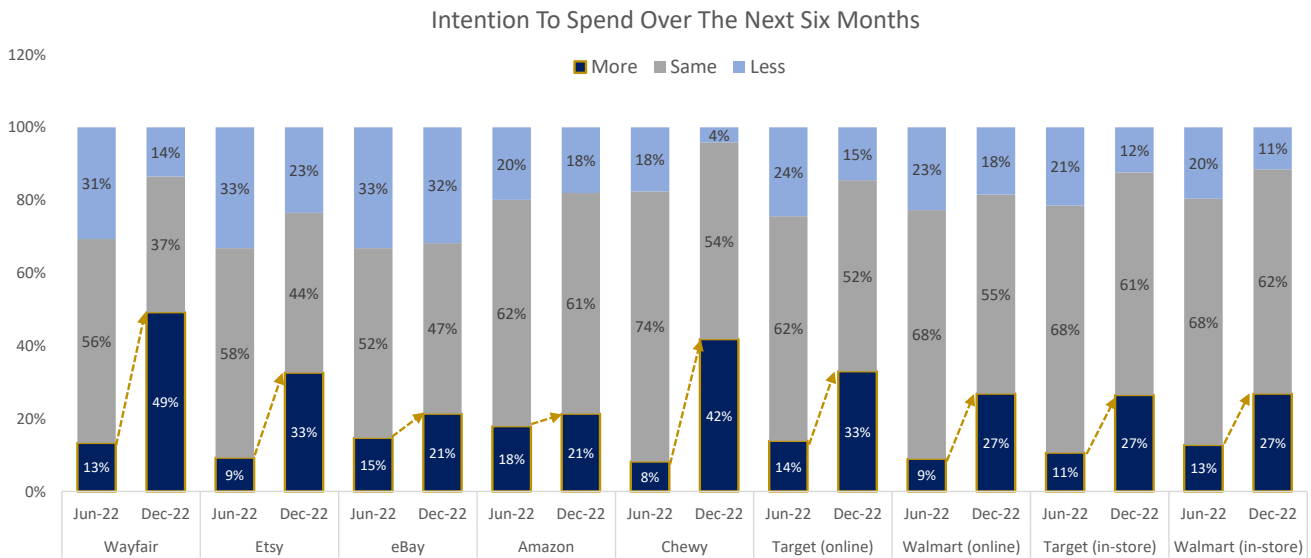


8% to 42%. For both names, we believe that with reopening headwinds in the rearview mirror, continued improvements being made to the user experience, and perhaps a healthier US consumer than many investors thought should set up well for accelerative revenue growth outperformance in 2023. Particularly, given the fact that 2023 revenue expectations have already been cut by 20% and 18% for CHWY and ETSY, respectively, since January of 2022.

For ETSY, selection and value are the biggest drivers of spend growth in the next six months, suggesting strong ROI on product initiatives aimed at unearthing the best selection for ETSY consumers, as well as, its recent marketing messaging aimed at driving home the idea that ETSY is a place for affordable luxury.

For CHWY, we believe it's notable that "I will need to buy more" was such a big driver of spend growth intention over the next six months. Here, **(1)** we believe that the underlying secular industry growth, **(2)** improved intent for pet purchasing as the pandemic puppy compare wanes, and potentially **(3)** a COVID hardgoods refresh cycle could all underpin this improved spending sentiment and support double-digit revenue growth for Chewy in 2023.

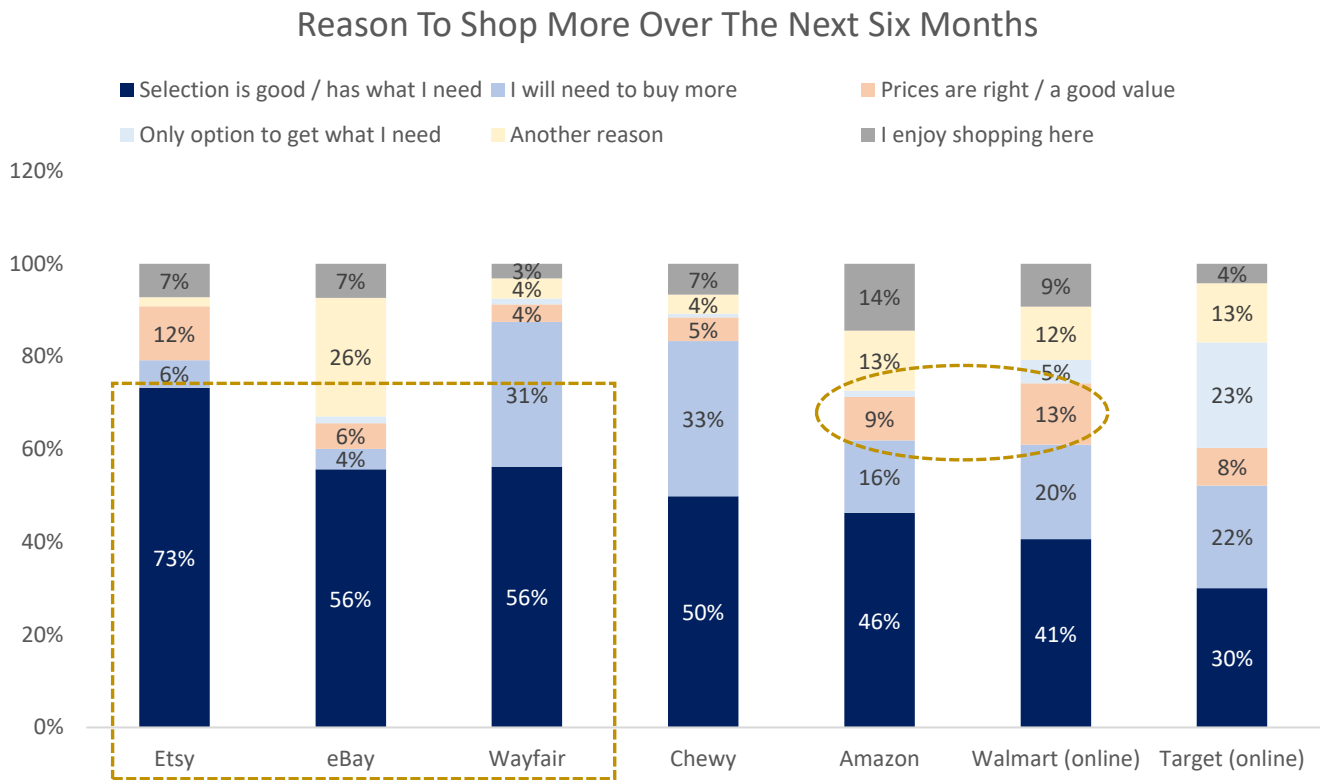
Figure 13: Do you expect to shop from the following more or less over the next six months



Source : dbDIG Survey, DB Research



Figure 14: What is the number one reason you expect to shop more at the following over the next six months compared with now



Source : dbDIG Survey, DB Research

High prices and less discretionary income are among the top reasons that could negatively impact shopping in next six months

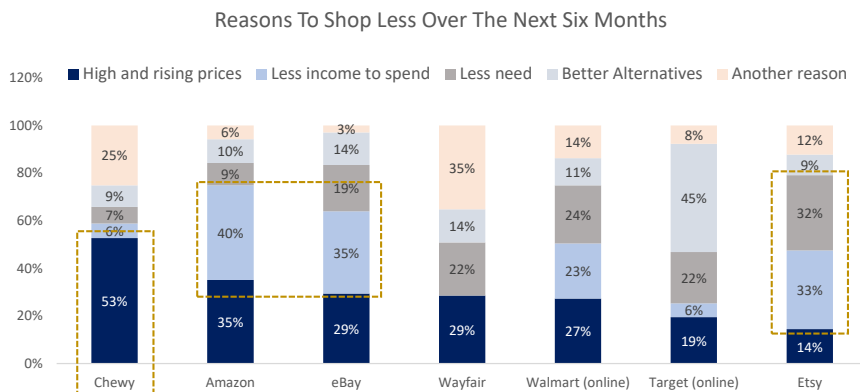
Despite what we believe looks to be an objectively healthy spend outlook for the next six months, income pressures combined with higher prices across many of the platforms are the key reasons why a certain cohort of consumers plans to spend less across e-commerce platforms in the next six months. **For Chewy, Amazon, and eBay**, these two answers accounted for 59%, 75%, and 54% of the reason respondents indicated plans to spend less on these platforms in the next six months. These inflationary pressures seem to be most acute for Amazon indicating a higher degree of discretionary purchasing on Amazon amongst US consumers than we would have thought. **That said, looking at the chart above (in Exhibit 13), only 18% of respondents indicated an intention to spend less on Amazon over the next six months, towards the low-end of the sample set** and in line with "big-box" retail peers like Walmart and Target.

Interestingly, for Etsy price is clearly not an issue with only 14% of respondents indicating this as a reason to lower spend. We believe that this speaks to the fact that Etsy sellers have generally not taken price in the last year, and the platform is increasingly being seen as a place for "affordable luxury". That said, **32% of respondents indicated "less need" to purchase on the platform, the highest across the platforms surveyed**. On the one hand, while this may not be that



surprising given that Etsy is likely the most seasonally dependent platform across all the names in question, it does speak to the ongoing structural challenge that Etsy faces in terms of convincing the consumer that they are the place to find almost all of their commerce needs across most verticals and shopping occasions. Additionally, 33% of respondents indicated that "less income" was a key driver, highlighting the concerns that discretionary platforms are going to be the places that could get squeezed most aggressively in 2023 by any consumer softness.

Figure 15: What is the number one reason you expect to shop less at the following over the next six months compared with now



Source : dbDIG Survey, DB Research

Cutting this question another way **for Etsy specifically**, among those that expect to spend less on Etsy in the next six months, **inflationary pressures was cited by 52% respondents and seasonality was cited by 48% of respondents as the reasons why they will spend less on Etsy in the next six months.** Thus, the seasonal strength that Etsy looks to be displaying into the holiday quarter could be short lived and we look for Etsy to continue to drive gains outside of seasonal periods driven by habitual buyer growth. Interestingly, the sheer volume of holiday supply seems to be creating issues for shoppers with 34% (up from 5% in the June survey) of respondents indicating that difficulty in finding the right item on the platform was part of the reason they will shop less moving forward. Conversely, reliability of product seems to be improving with only 12% of respondents indicating that this was part of their reason for spending less, down from 28% in the June survey. We believe this is likely an output of Etsy's purchase protection investments over the last several months.

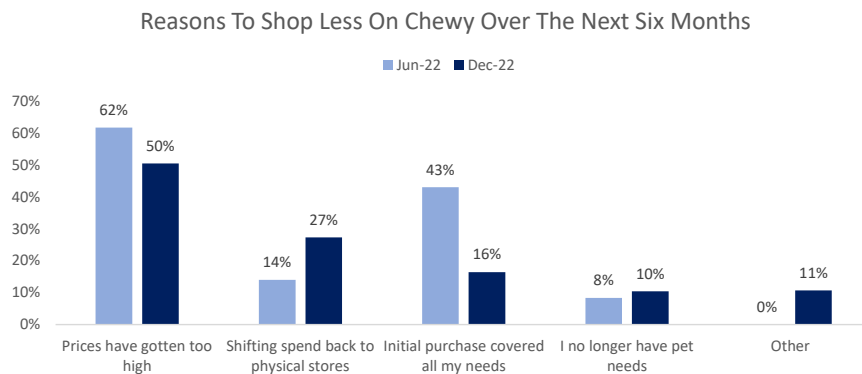


Figure 16: Are any of the following reasons why you expect to shop less on Etsy over the next six months?



Source : dbDIG Survey, DB Research

Figure 17: Are any of the following reasons why you expect to shop less on Chewy over the next six months?

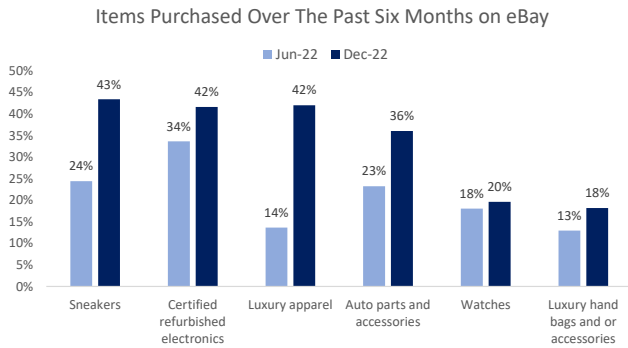


Source : dbDIG Survey, DB Research

Looking closely at spending trends on eBay, we see that the focus category strategy is clearly working with customers increasing spend on eBay across the focus categories in 2H22 vs. 1H22. Moreover, our survey data shows that the strong momentum in focus categories should continue as the customers are intending to spend more in next six months across most of the categories except Sneakers, which we believe is likely the most mature amongst the company's focus categories.

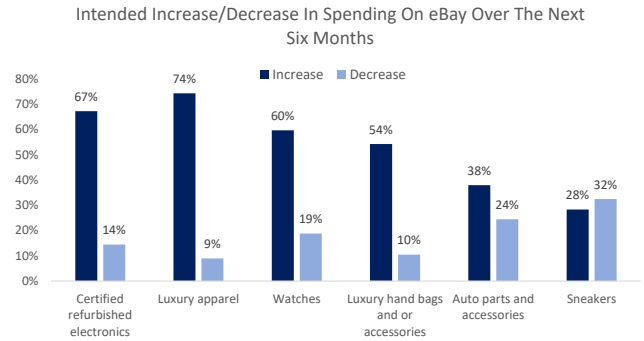


Figure 18: Have you purchased any of the following from eBay over the past six months?



Source : dbDIG Survey, DB Research

Figure 19: Compared with the past six months, do you expect to increase or decrease your spending from eBay on these categories over the next 6 months

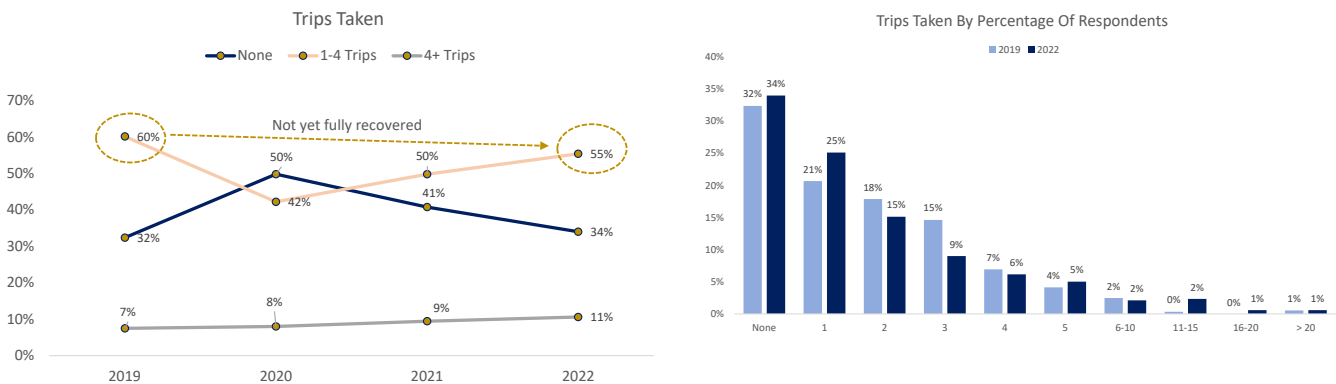


Source : dbDIG Survey, DB Research

Online Travel: US online travel plans for 2023 remain strong, with AA format demand showing some cracks

Looking back on travel demand through much of 2022, US demand has been undoubtedly strong. Interestingly, it strikes us that much of the demand recovery may have been driven by flexible work schedules whereby the percentage of respondents who indicated that they took 4+ trips back in 2019 was only 7% versus 2022 where this has risen to 11%. Drilling down one level more, we see cohorts like 11-15 trips up from ~0% in 19 to ~2% in 21. Conversely, it strikes us that pure traditional leisure travel has yet to fully recover with 1-4 trip respondents at 55% of respondents in 2022 below 2019 levels of 60%.

Figure 20: Approximately how many trips or vacations did you take during the following time periods?



Source : dbDIG Survey, DB Research

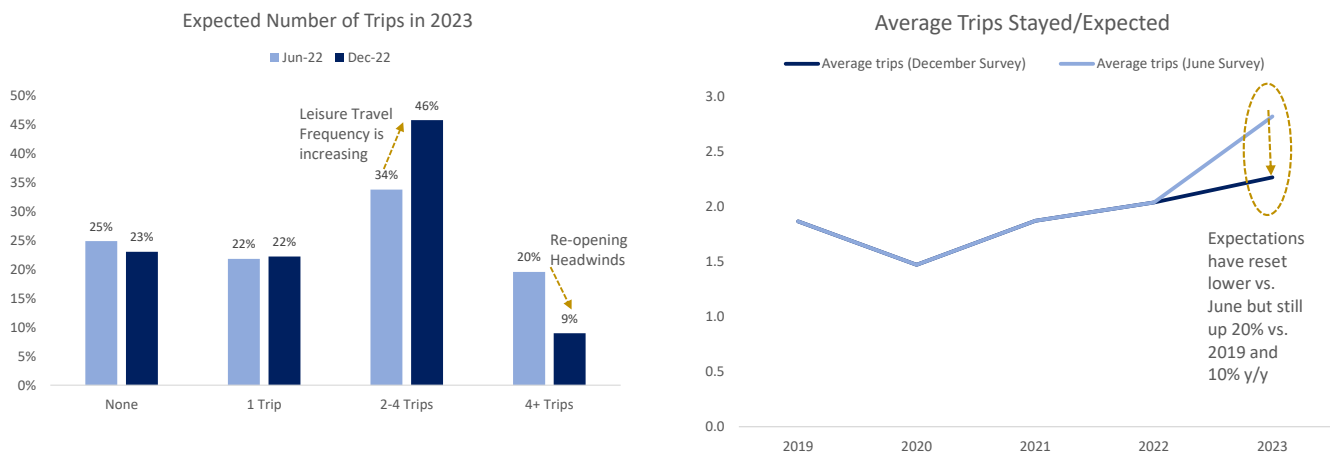


US consumers are expecting to increase number of trips in 2023 vs. 2022

Importantly looking out to 2023, as of December, US consumers still are expecting to increase the number of trips that they take despite the percolating macro concerns. In fact, **the "pure-leisure" travel intention bucket of 2-4 trips improved in December versus the June survey result, whereby currently 46% of respondents expect to take 2-4 trips next year versus 34% of respondents who expected to travel at this level next year back in June.** On the other hand, it strikes us that "return to office" could be impacting the more frequent travelers' plans in 2023, with +4 trip respondents dropping from 20% in the June survey to 9% in December.

All in, however, we believe that this survey indicates US consumers still expect travel-volume growth in the double digits in 2023. Weighting the night numbers by the percentage of respondents, from 19-23 (intention), we see that the average number of trips is expected to grow ~10% Y/Y in 2023 as of the December survey. While this is down from >20% as of the June survey given the pressure on the +4 trip bucket, we believe it points to healthy market level growth in 2023, particularly in the front half of the year and is generally consistent with our global night growth estimates for buy rated BKNG and EXPE of ~9% and 16% in 2023.

Figure 21: About how many trips or vacations do you expect to take during 2023?



Source : dbDIG Survey, DB Research

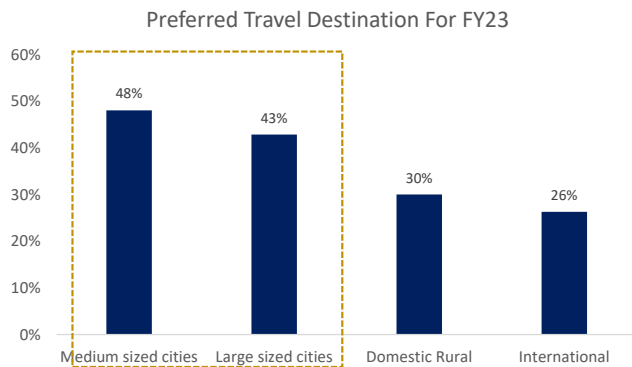
Preference for cities and hotels in 2023

When looking at travel intent in 2023, we dig one level deeper to understand the types of formats and locations that US consumers are favoring in 2023. Here we see a clear preference for cities versus rural destinations, with >40% of respondents indicating medium-to-large cities as their preferred destinations in 2023 versus domestic rural destinations at 30% and international destinations at 26%. More specifically, when asking if travelers expect to spend more or less at hotels, VR / home rentals, and rental apartments, there is a clear preference to grow spend at hotels only. Here, 24% of respondents indicated that they expect to spend more on hotels next year versus only 17% who expect to spend less. This compares with VR which was 14% more vs 25% less and rental apartments that are 8% more vs 31% less.



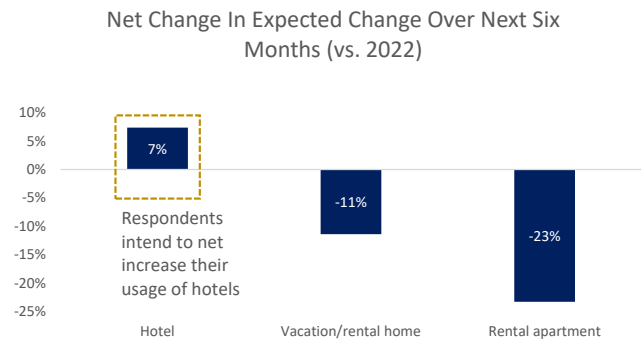
This data is supportive of our relatively more bullish outlook for our hotel levered OTA coverage (BKNG & EXPE) versus our more cautious view on our alternative accommodations coverage (ABNB & VCSA).

Figure 22: Which of the following do you plan to visit while traveling during 2023?



Source : dbDIG Survey, DB Research

Figure 23: In next 6 months, do you expect to use the following types of accommodations more or less than in 2022?



Source : dbDIG Survey, DB Research

Looking at intent on a platform level we are struck by the fact that despite the positive intent indicators at an industry level, across every platform in question more **respondents indicated that they were less likely to book on the major platforms than more likely in the next six months.** Here we think a number of things could be at play including: **1)** seasonality that weighs on travel demand over winter / early spring; **2)** a more mixed picture from the consumer that may plan to travel more in 2023, but is not ready to commit as they wait to see how the macro environment unfolds in the coming months; and **3)** a travel industry that simply does not engrain a high degree of brand affinity. Thus, while the US consumer may plan on traveling more next year, there is not a platform that they are sure they will return to book in the same way that an e-commerce buyer would gravitate towards Amazon.



Figure 24: Are you likely or unlikely to use the following to try to book travel in the next six months?



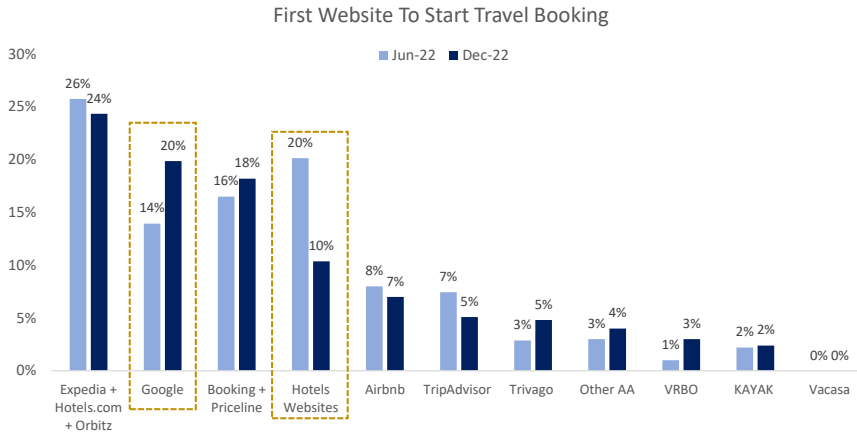
Source : dbDIG Survey, DB Research

Expedia is the most popular website for travel booking in the US

Going beyond the market level dynamics, we are struck by the fact that Google continues to take mindshare amongst US travelers. That is to say, as of the December survey, 20% of respondents indicated that Google was the first digital property where they began their travel booking journey. While this is still below Expedia properties at 24%, Google did gain 6 points of mindshare relative to the June survey. As it pertains to our coverage, Booking picked up 2 points (survey on survey) as they continue to press for share gains in the US, while Expedia was down around 2 points. Notably, Google's share gains seem to be coming from hotels' direct booking channels which lost 10 points of mindshare survey on survey.

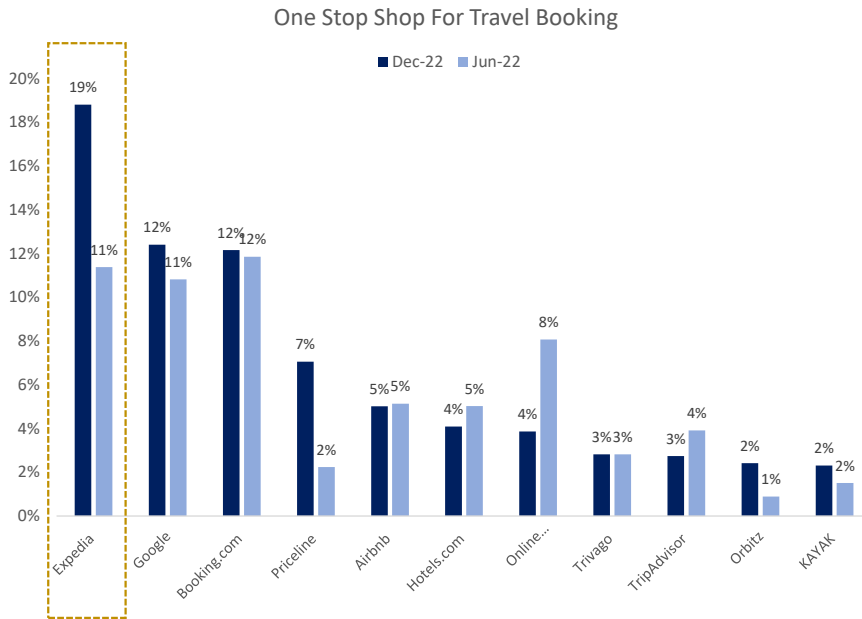


Figure 25: When booking a vacation, what is the first website you visit to start your travel booking process?



Source : dbDIG Survey, DB Research

Figure 26: When booking a vacation, do any of the following sites ever serve as your one stop for booking your travel needs



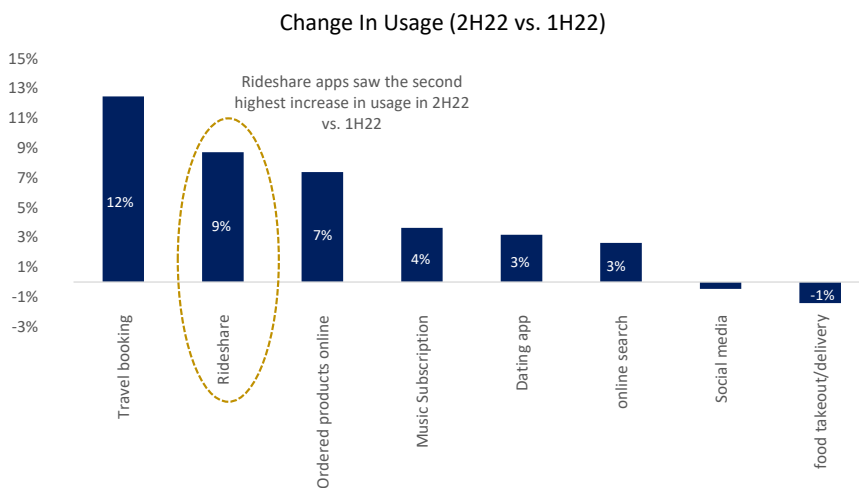
Source : dbDIG Survey, DB Research



Rideshare: The strong reopening trends appear to be continuing for both UBER and LYFT

For US rideshare, we see improving trends across the board. In fact, over the last six months, our survey results indicate that rideshare apps notched the second highest improvement in usage (9%) from 1H22 to 2H22 across most online services. **We believe continued momentum is likely on the back of the (1) post-pandemic reopening, (2) back-to-office push, (3) continued travel recovery, and easing driver supply constraints that could support lower surge/primetime (price) levels.**

Figure 27: Which of the following have you done in the past six months



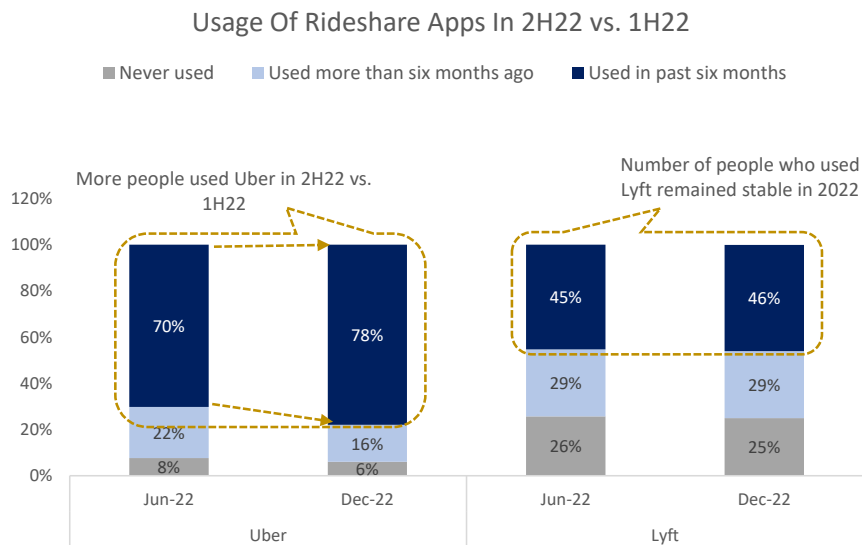
Source : dbDIG Survey, DB Research

Usage of rideshare apps increased in 2H22 vs. 1H22

Drilling down to Uber vs Lyft trends, our survey data indicates that Uber saw an ~8 point increase in the number of riders in 2H22 vs. 1H22, while the number of riders remained fairly stable at Lyft. This comports with slowing active rider reported results at Lyft, along with other 3P data suggesting that Uber is gaining share. Lyft, on the other hand, has highlighted that slower rider growth is a direct function of its geographical exposure to the West Coast (which has been slower to reopen) and the company's deliberate strategy to prioritize profitable growth. Looking at the most recent dataset suggests that a revival and inflection in active rider growth for the company in the upcoming quarter (4Q22) is perhaps less likely for Lyft.



Figure 28: Have you used either of the following rideshare/car hire apps in the past six months?



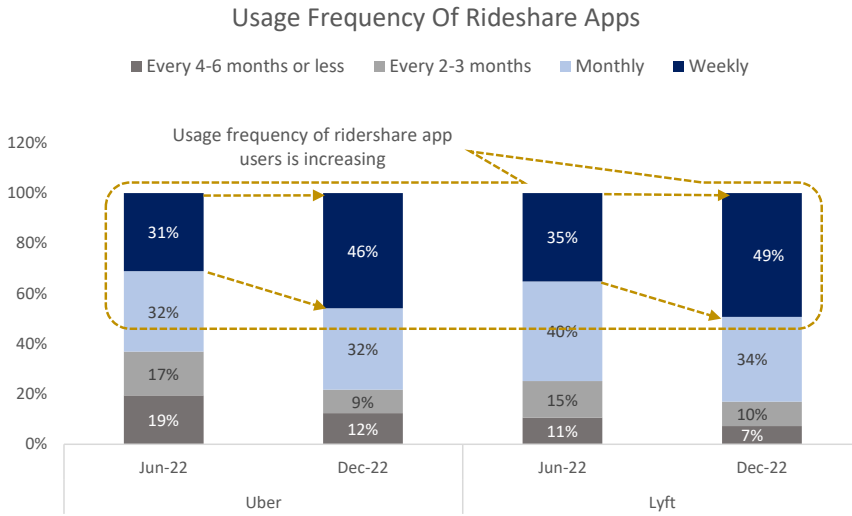
Source : dbDIG Survey, DB Research

Usage frequency has increased over the last six months

More encouragingly, it appears that rider frequency has improved for both Uber and Lyft over the last six months. **Our survey results indicate that daily usage increased by 15 points to 46% of all respondents, for Uber.** Perhaps just as importantly, the percentage of low-frequency users has appeared to contract, with low-frequency users comprising 21% of all responses in December, down from 36% in June. We see similar (though less pronounced) trends at Lyft, with high-frequency users increasing by 14 points and low-frequency respondents contracting by 9 points. We expect frequency tailwinds to largely persist in the US as continued reopening trends and improving driver supply levels support both sides of the marketplace.



Figure 29: About how often do you use the following?

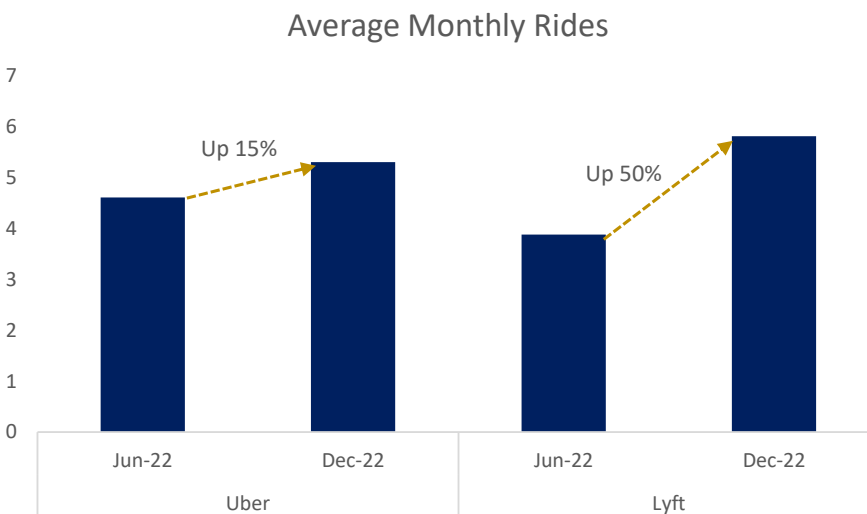


Source : dbDIG Survey, DB Research

Average number of monthly rides has increased for both Uber and Lyft

Dissecting the increase in frequency on rideshare apps one level further, we see that the average number of monthly rides on both Uber and Lyft has increased over the last six months. Interestingly, Lyft saw a 50% uptick in monthly usage frequency, well above Uber's 15%.

Figure 30: On average, how many rides do you take per month using the following?



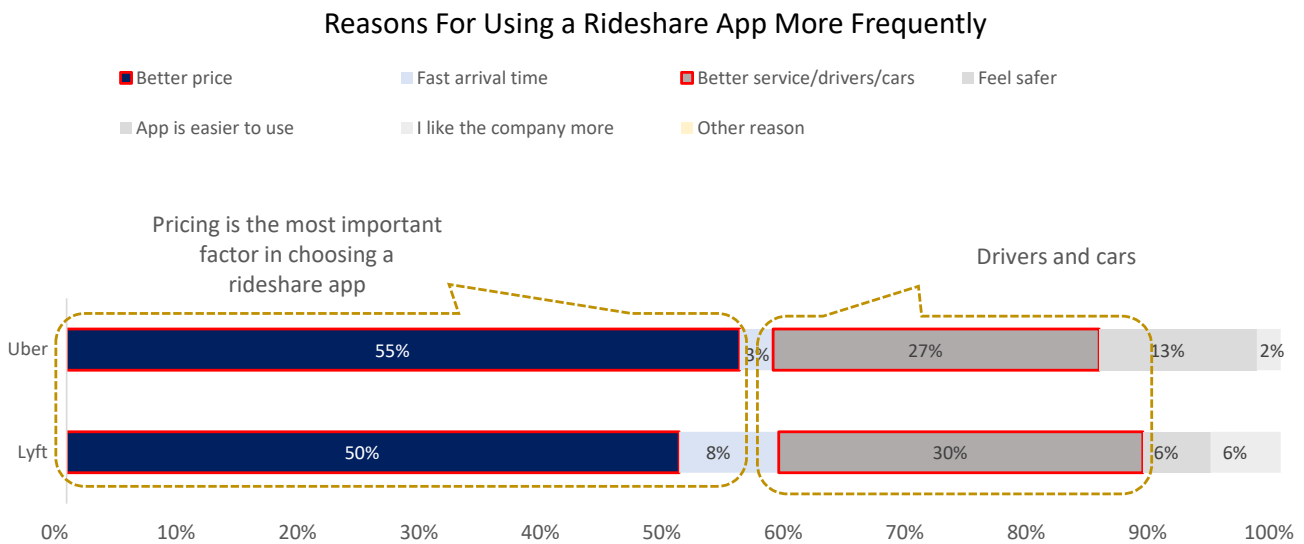
Source : dbDIG Survey, DB Research



Price is the biggest factor determining user frequency

Perhaps unsurprisingly, price is the biggest factor determining user frequency, with respondents indicating a modest preference for Uber on the back of pricing. More specifically, 55% of Uber riders use the service because of better pricing, which speaks to the better pricing strategy of Uber vs. Lyft. By contrast, Lyft appears to have the upper hand on better cars, drivers, and ETA. On the other hand, we see that Uber has an advantage in the safety category, which is becoming an important criteria for users.

Figure 31: Why do you use the following more frequently?



Source : dbDIG Survey, DB Research

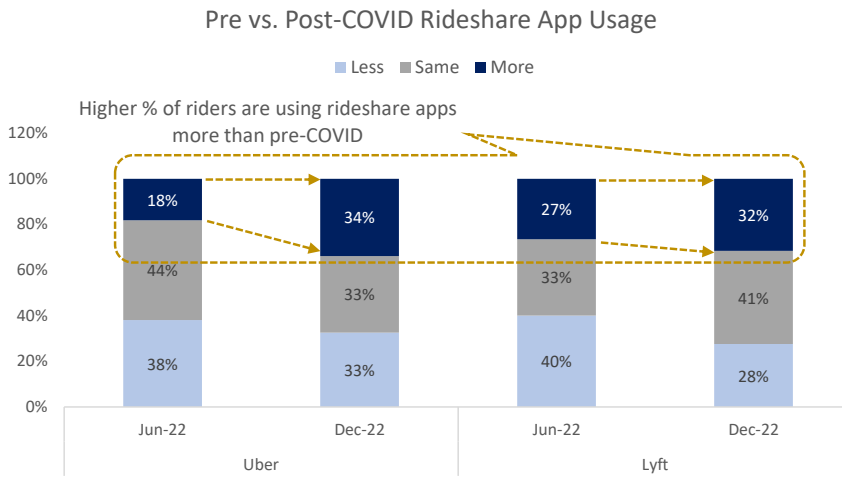
Improvement in the percentage of riders using the service more than they had prior to the pandemic

Now looking at the post-pandemic demand for rideshare apps, our survey data shows an improvement in the percentage of riders (in Dec vs. June 2022) using the service vs. pre-pandemic levels.

For current Uber users, as of the December survey, we find an even split between people using the service more/less/the same as pre-pandemic levels. Importantly, the number of respondents indicating greater usage vs pre-pandemic times almost doubled between our June survey and our December survey, highlighting very strong momentum in recovery trends. At Lyft, we observe very comparable trends, with the greatest improvement actually in fewer respondents indicating they use Lyft less frequently than before the onset of the pandemic. In our June survey, 40% of respondents highlighted lower frequency, and this contracted to 28% in our most recent questionnaire.



Figure 32: Compared with before the COVID-19 pandemic, do you use the following more, less or the same amount?

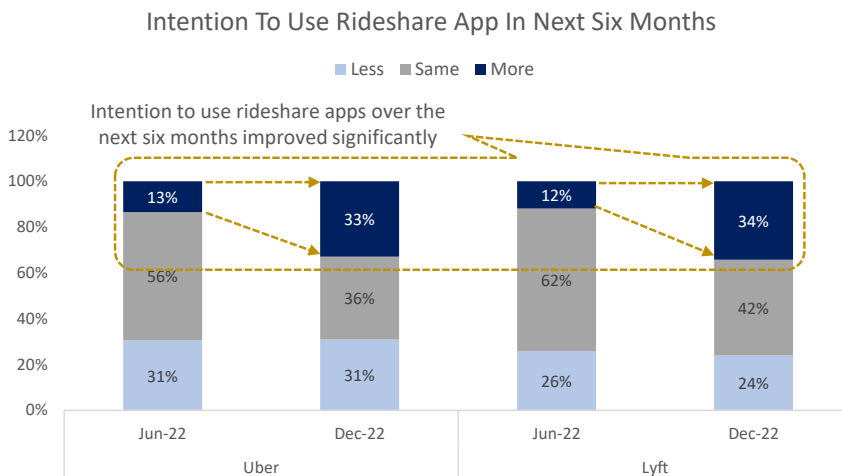


Source : dbDIG Survey, DB Research

Intention to use rideshare apps in next six months has increased

In terms of intention to use rideshare apps over the next six months, our survey data indicates that expected usage has increased across both Uber and Lyft compared with the June 2022 survey results. This, we believe, is supported by the back-to-office push and travel recovery, and should support (at the very least) pre-pandemic seasonality in US rideshare gross bookings trends in early FY23.

Figure 33: Over the next six months, do you expect to use the following more, less or the same amount?



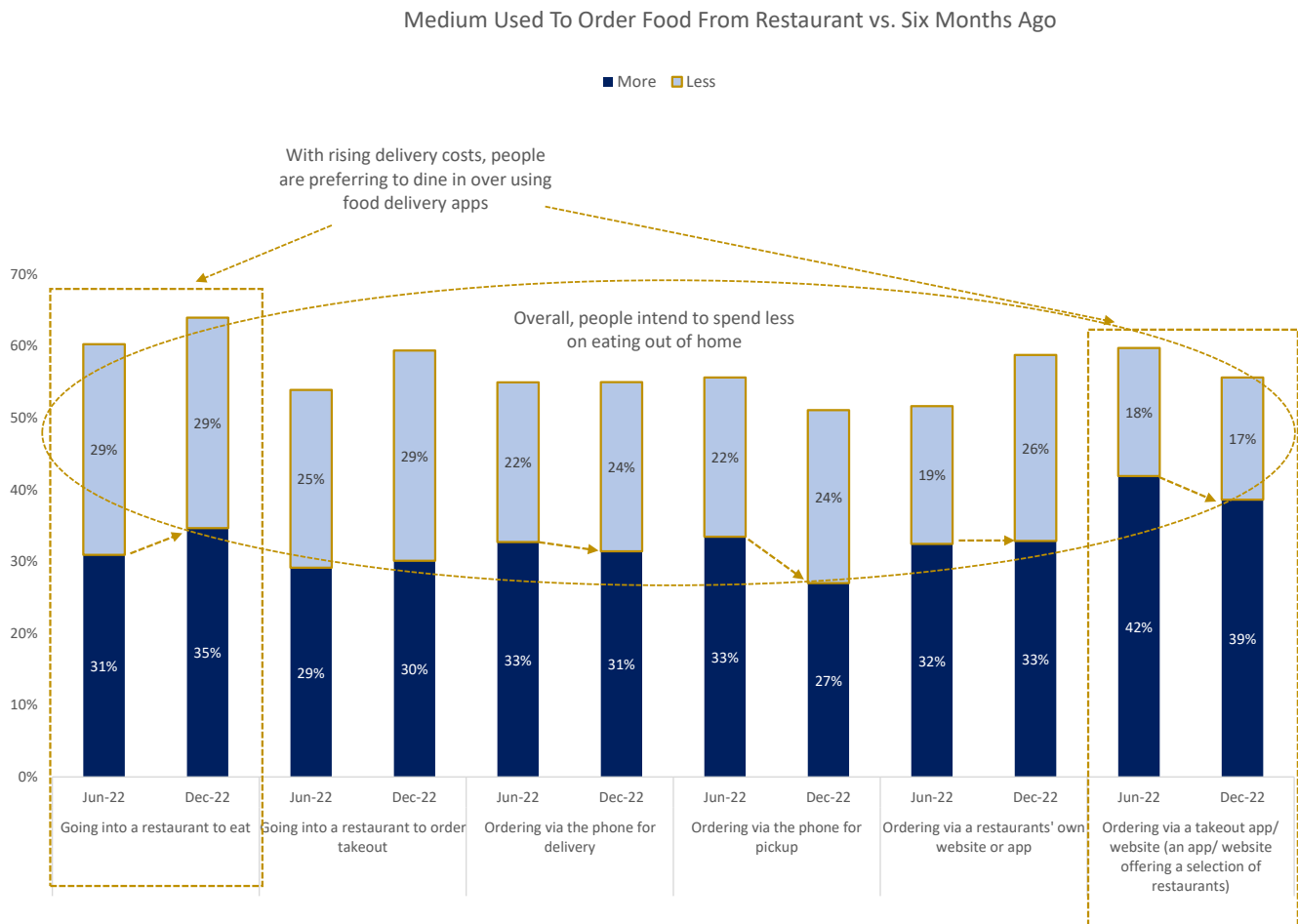
Source : dbDIG Survey, DB Research



Food Delivery: User trends have moderated over the last six months

Across the board, it appears that alternative forms of food ordering are becoming less prevalent, though we also observe a modest contraction in the usage rates of food delivery apps between our June and December US surveys. Interestingly, we also observe a growing preference for on-premise dining, highlighting perhaps growing sensitivity towards incremental fees associated with delivery services. This is in line with the view that delivery services are potentially more discretionary in nature and therefore more exposed to macro challenges.

Figure 34: Compared with 6 months ago, are you now ordering restaurant food in the following ways more or less



Source : dbDIG Survey, DB Research

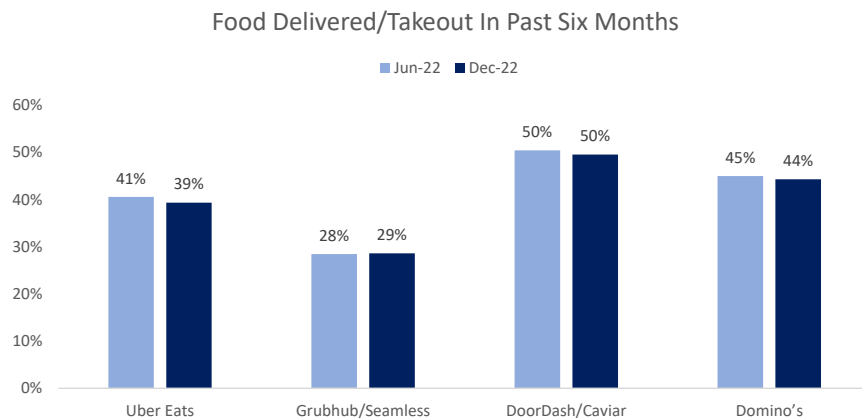
Delivery market share appears to be relatively stable

Across the food delivery apps, we note relative stability in user market share in the US. Given the early concerns around the potential impact the Grub/Amazon deal could have on US market share trends, we view this as incrementally positive for both Uber and Dash. Going forward, we expect the scaled 3P players such as Uber and Dash to revert to being parallel share winners within the broader food delivery



space.

Figure 35: Which of the following food takeout/delivery apps or sites have you used in the past six months



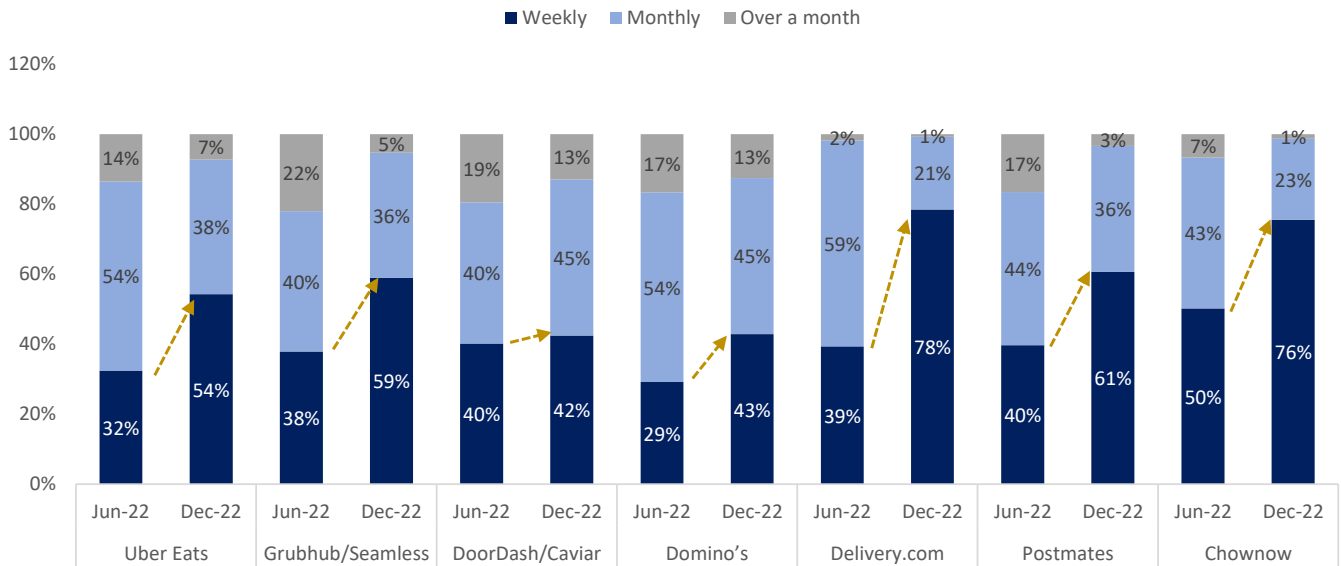
Source : dbDIG Survey, DB Research

Our survey data indicates very favorable delivery frequency for Uber's brands (Uber Eats and also Postmates). Here we see users that leverage the service at least weekly comprising 54% of all eaters in December, up 22 points from our June survey. At Postmates, the increase was 21 points, going from 40% in June to 61% in December. We also observe comparable trends at Grub/Seamless over our two survey periods. While typical seasonality can certainly be a contributing factor (users have a higher propensity to utilize food delivery apps in the colder months), we do not observe a similar magnitude of frequency strength at Dash. In fact, between our June 2022 and December 2022 surveys, high-frequency users only increased by 2 points, the lowest across all delivery platforms.



Figure 36: About how often do you use the following to order food

How Often Food Delivery Service Is Used Now vs. Six Months Ago



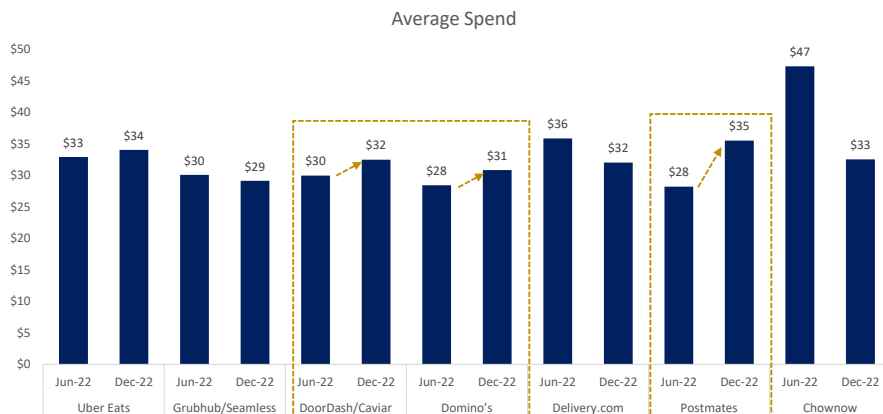
Source : dbDIG Survey, DB Research

AOV trends are positive for DASH, Uber Eats, and Postmates

On the other hand, average order volume (AOV) trends are slightly more positive for Dash. Between the two survey periods, we find a \$2 increase in basket size (up 8.5% between June and December). For Uber Eats, the increase is more modest, with AOV going from \$33 in June to \$34 in July (up 3.5%). Uber's Postmates is the big callout in AOV, with basket sizes actually growing by over 25% in our sample period, moving from \$28 in June to \$35 in December. Our view broadly is that gross booking growth driven by AOV will be increasingly difficult to replicate in FY23 in a more challenging macro backdrop. As such, we tend to favor the names that are still able to deliver frequency growth as a means of supporting gross bookings growth over the next 12-18 months. That said, we also believe that some of the observed AOV expansion is also a function of consumers spending across more categories than just food delivery such as alcohol, groceries, quick commerce, etc. We contend this is a clear positive as it pivots consumer demand towards more durable and higher frequency categories.



Figure 37: Approximately how much are you usually spending per order when using each of the following?



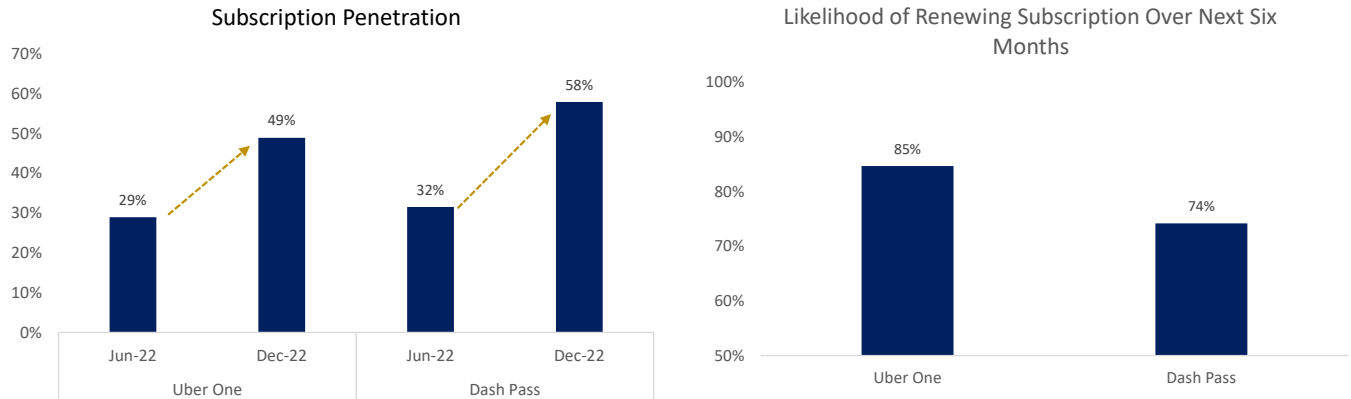
Source : dbDIG Survey, DB Research

Positive trends for membership programs: Uber One and Dash Pass

Our survey results also indicate very positive subscriber trends. **Many more delivery (and also rideshare) customers are opting for subscriptions vs. six months ago. For Uber, we observe a 20-point increase in the percent of respondents indicating they will subscribe to Uber One. For Dash, the increase was 26 points between June and December, going to 58% from 32%.** Perhaps this too underpins the stronger frequency trends we highlighted above. Both companies have indicated that subscribers have significantly higher frequency characteristics than non-members. Just as important, as order frequency grows, the propensity to become a member increases as the delivery cost savings more than offset subscription fees. **Looking ahead, while a high percentage of users have indicated their willingness to renew their subscriptions (well over 70%) over the next few months, we note that the likelihood of renewal is over 10 points higher for Uber vs Dash.** This perhaps indicates the more robust offering from Uber One, which also includes rideshare discounts and perks. Looking past these favorable user trends, we think the ability to bundle Delivery and Mobility into a single membership and loyalty umbrella has the potential to increase consumer captivity/drive down churn and grow consumer wallet share across transportation, meal delivery, groceries, alcohol, and convenience categories. We think this is a unique advantage to Uber, and we think the implications ultimately result in industry-leading demand and supply density. The resulting efficiency advantages are powerful: Greater driver utilization rates -> higher earnings potential -> lower need to incentivize supply -> lower prices for consumers (or higher margins for Uber) -> more demand from consumers/more demand from merchants, etc. Perhaps just as importantly, with an uncertain macro backdrop, we note that the company with the more compelling subscriber mousetrap will likely prove more resilient to the downturn, especially within delivery, which is the category with greater discretionary characteristics.



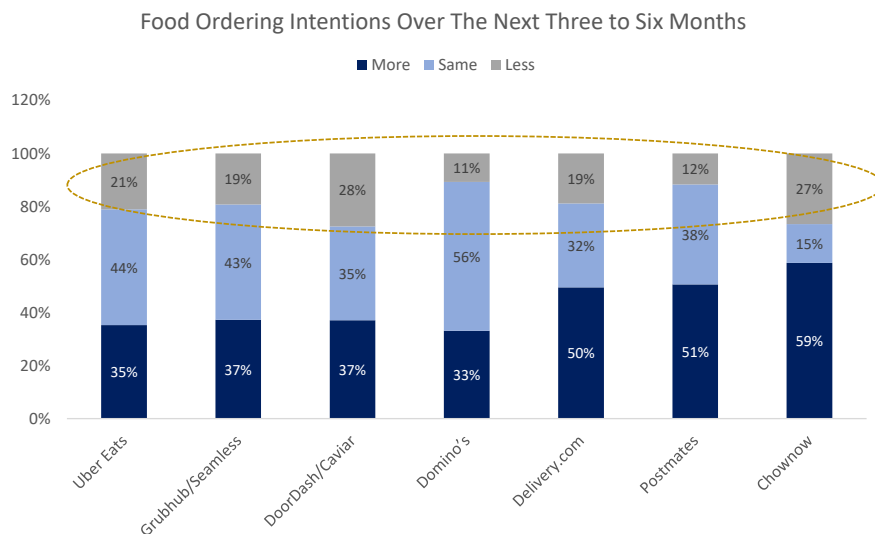
Figure 38: Do you subscribe to the following and how likely are you to renew the following over the next six months



Source : dbDIG Survey, DB Research

Looking at the next three to six months, the majority of the respondents of our survey plan to increase or maintain their level of spend on ordering food through takeout platforms, implying a healthy underlying industry demand, in our view. For Uber's Postmates, we observe the greatest divergence between user's willingness to spend more vs. less, with >4x of the users indicating an expectation to spend more over the next 3 months. At Eats, the spread is 70% in favor of spending more. Dash has one of the smaller spreads between users with higher vs lower spending expectations, with only ~40% more users flagging intentions to raise spending levels over the next 3 months.

Figure 39: In the next three to six months, do you expect to order food using the following more, less, or about the same amount as now



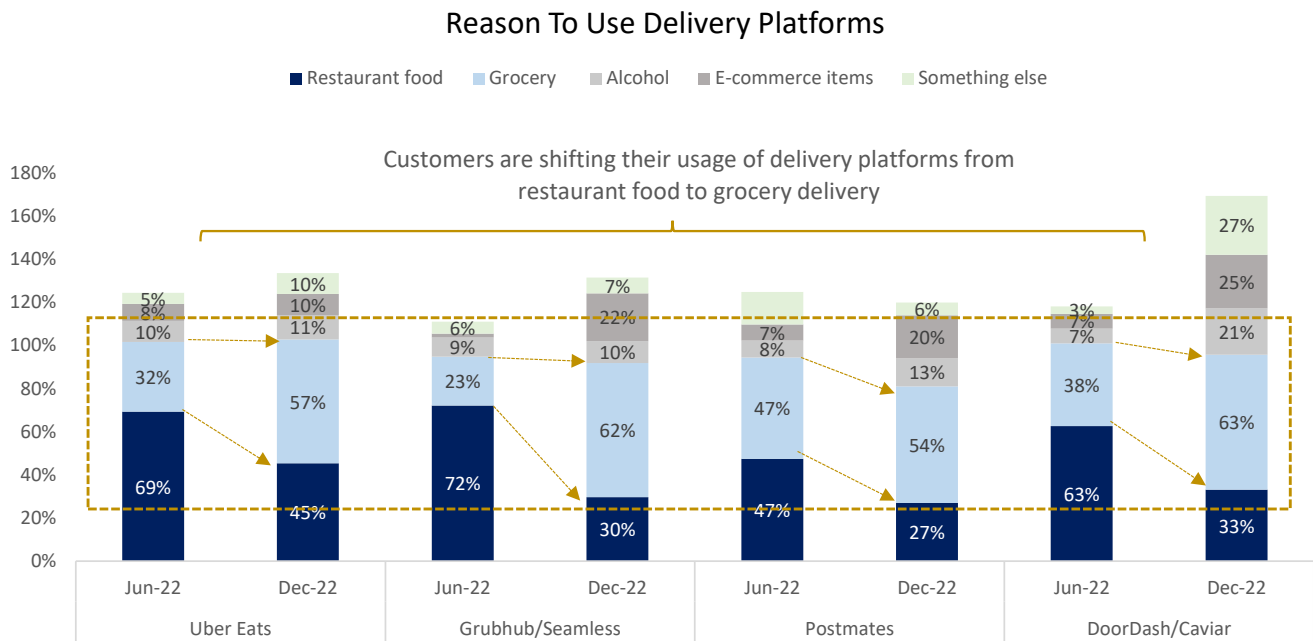
Source : dbDIG Survey, DB Research



Delivery expanding beyond food

Over the last six months, our comparison of survey data from 1H22 vs. 2H22 highlights that consumers have been shifting usage of delivery platforms towards grocery. With most delivery services expanding into grocery/convenience/quick commerce, given the higher-frequency nature of these categories, we do not see this as a surprise. Looking forward to FY23, we think the player with the broadest offering is likely to benefit from durable frequency tailwinds. This could insulate the services from potentially slowing food delivery trends amidst a slowing macro environment.

Figure 40: In the past 6 months, how have you used delivery apps?



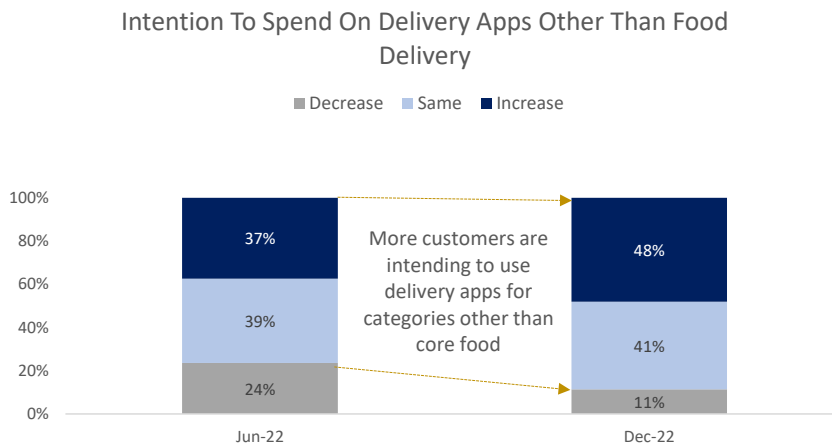
Source : dbDIG Survey, DB Research

Higher intent to spend on non-restaurant delivery in the next six months

Over the next six months, a higher percentage of our survey respondents plan to increase their spend on delivery apps for non-restaurant delivery which speaks to the strong momentum of grocery/alcohol/other items. We contend this is a positive shift, as it implies higher AOVs, a greater potential for order batching (which lowers cost per transaction), and a diversification of consumer demand toward more durable / higher frequency categories.



Figure 41: In the next six months, do you expect to increase or decrease your use of delivery apps for non-restaurant deliveries?



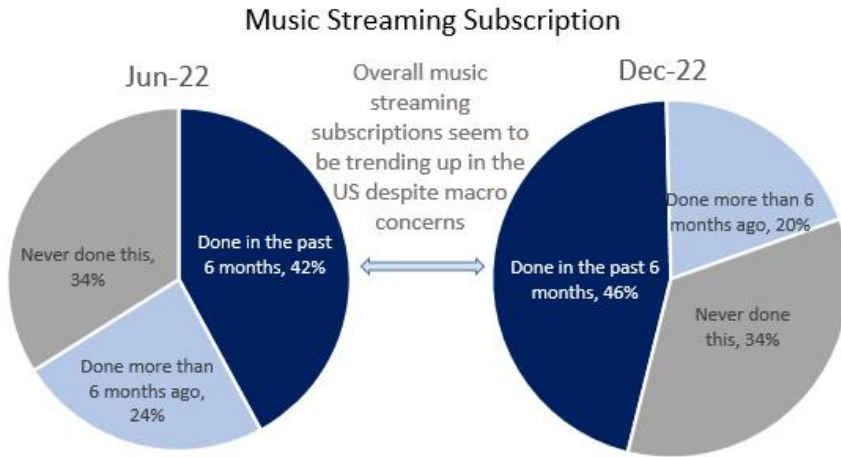
Source : dbDIG Survey, DB Research

Music: Overall music streaming subscriptions seem to be trending up in the US despite macro concerns

Despite ongoing macro concerns, we continue to see growing music streaming subscription adoption in the US. In fact, between June and December, across our survey respondents, we observe a 4 point improvement in users paying for a music subscription offerings. This represents yet another datapoint supporting the thesis that music is not only recession resilient, but also still has pricing power (given that headline nominal subscription fees have remained basically unchanged over the last decade and have certainly declined when adjusting for inflation). Looking forward, with considerable pricing power and only a small portion of revenue associated with advertising, **we contend that music broadly (and the music labels in particular) screen relatively recession resilient - a defensible characteristic that will be increasingly in focus (and valuable) as we cycle into FY23.**



Figure 42: Have you subscribed to any online music streaming service?

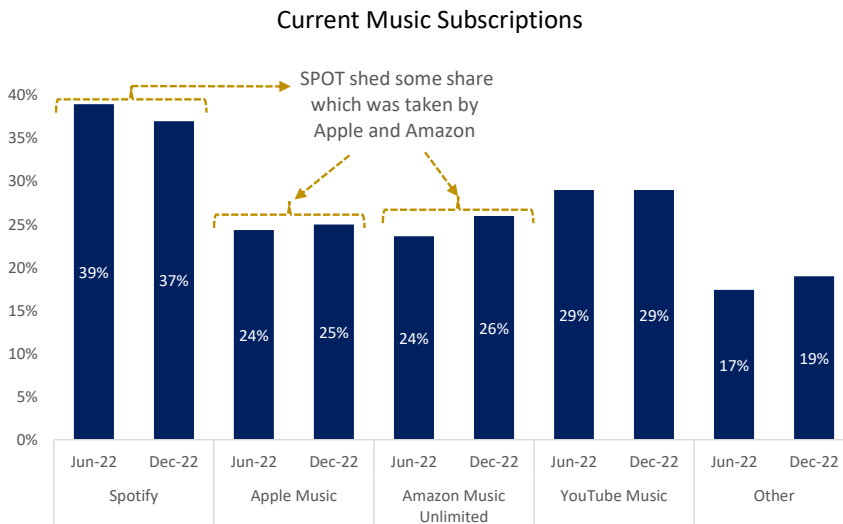


Source : dbDIG Survey, DB Research

Apple Music and Amazon Music picked up share from Spotify

We observe broad stability in market share between the different subscription players. That said, from June through December, SPOT has modestly shed share (~2 points), with the gains flowing largely to Apple and Amazon. We are very interested to see if this becomes a sustainable trend, particularly with Apple raising prices in the US in 4Q22.

Figure 43: Do you have a subscription to any of the following music streaming services?



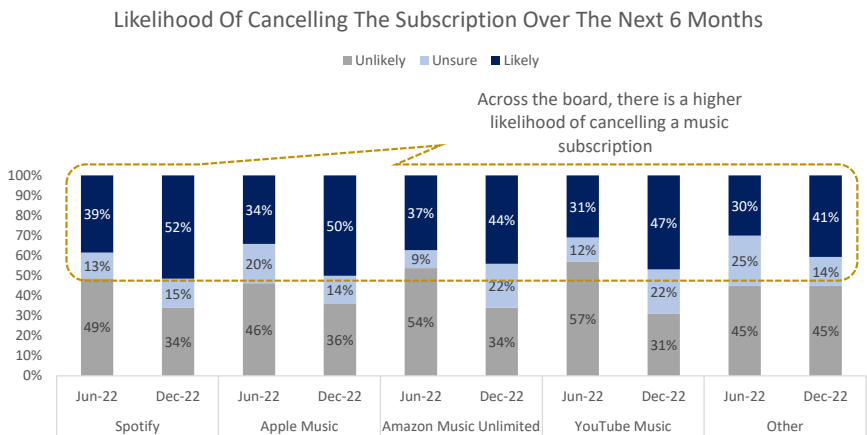
Source : dbDIG Survey, DB Research



Likelihood of cancelling the subscription has increased

Somewhat surprisingly, in the most recent data set, we have seen a meaningful uptick in our panels' intentions to cancel their music service. This is not limited to one singular service but rather broad-based. Empirically, we have seen that music tends to be one of the most recession resilient entertainment categories. We will continue to monitor trends going forward to identify if the users expressing growing likelihood of cancelling their subscriptions translates into slowing subscriber growth across the industry.

Figure 44: How likely are you to cancel your subscription to the following in the next six months?

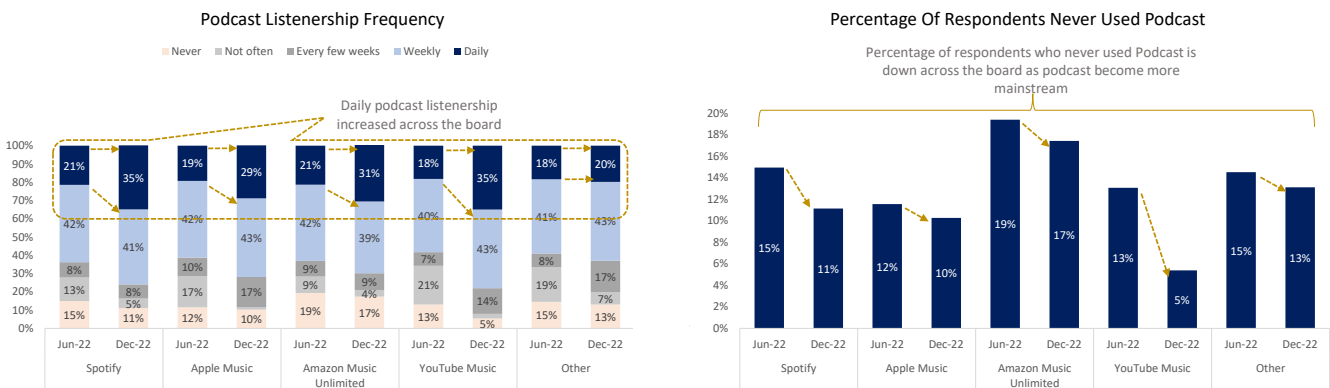


Source : dbDIG Survey, DB Research

Podcasts are becoming mainstream

Interestingly, our survey indicates growing adoption of podcasts across the board. With the percentage of users who have never engaged with podcast content contracting meaningfully, we think it's fair to classify podcasts as mainstream at this point.

Figure 45: How often do you listen to podcasts?



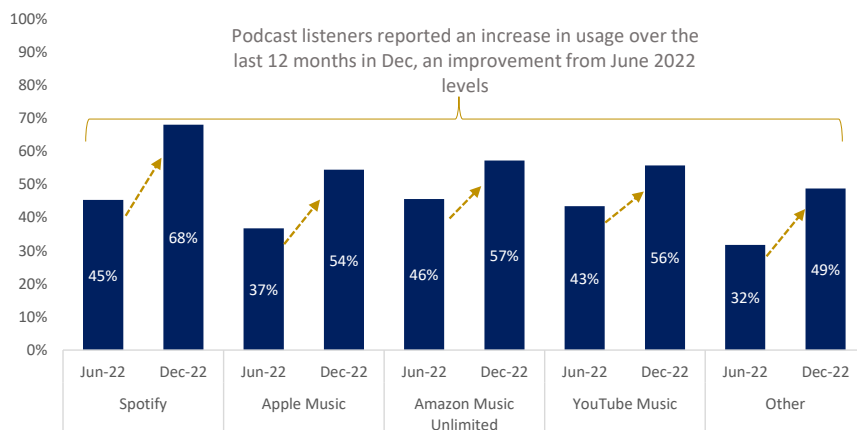
Source : dbDIG Survey, DB Research



In terms of the actual listenership, **we see the biggest uplift at Spotify with 71% of users indicating greater listenership over the last 12 months vs. only 3% pointing to less podcast consumption (net score of 68%)**. We observe comparable (albeit not as pronounced) trends at Apple, Amazon, and YouTube Music. For SPOT specifically, if these growing consumption trends continue into 2023, this would imply growing podcast advertising inventory available for sale, which should support overall ad-supported revenue growth. That said, with the uncertain macro-backdrop, CPM pressure (pricing) could become an offset to near-term outperformance. All in, however, the growth in overall consumption levels is certainly a positive as it pertains to the company's ability to scale the ad-supported business.

Figure 46: How has your podcast listening changed over the past 12 months?

Net Change in Podcast Usage Over The Last Twelve Months



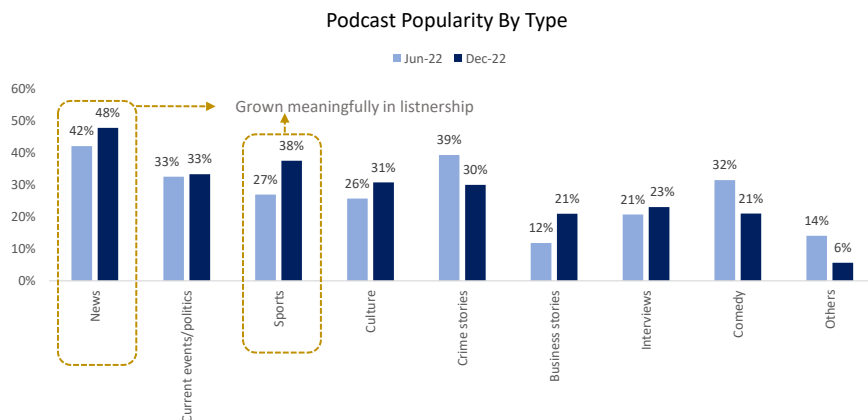
Source : dbDIG Survey, DB Research

News, Current Events, and Sports have grown to be the most popular type of Podcasts

On the other hand, in terms of the type of content consumption, we now see that News, Current Events, and Sports have grown to become the three largest genre. **These categories have lower content shelf-life, which likely implies that in order to continue to scale consumption, podcast platforms (like SPOT) will need to maintain content investment levels going forward, with little leverage on current content assets, in our view.** Looking to 2023, with the ad market softening, we think the ability for more nascent formats like Podcast to outgrow the industry (versus tried and true alternative formats) is limited. As such, we contend that even with a scaling audience, CPM pressures is likely to preclude meaningful podcast advertising revenue upside. That, in combination with the need to maintain content investment levels, likely limits meaningful Podcast gross margin leverage in the near term. That in combination with the need to maintain content investment levels, likely limits meaningful Podcast gross margin leverage in the near term.



Figure 47: What type of podcasts do you listen to?



Source : dbDIG Survey, DB Research

Dating: All apps appear to be growing users

Looking across the online dating apps, we observe that most apps are showing growth with the exception of Match.com and notably Tinder. This comports to MTCH's public guidance that calls for potential sequential contraction in payers at Tinder in the 4Q.

While miss-execution on "optimizations" have led to a lack of product momentum at **Tinder**, MTCH's current trading range implies that investors think there is a structural issue (or that Tinder is simply mature) and will not revert to more sustained payer growth. We think the confluence of: **(1)** the soft macro environment, **(2)** pandemic-related disruption, **(3)** a lack of leadership continuity at Tinder, and **(4)** product execution mis-steps have led to the very drastic decelerating top-line trends at Tinder. However, for the stock to see a more sustained sentiment revival, investors need to gain confidence that Tinder revenue growth re-acceleration is indeed underway. **The results of our December survey suggest that the inflection in trends at Tinder has not yet fully materialized in the US.**

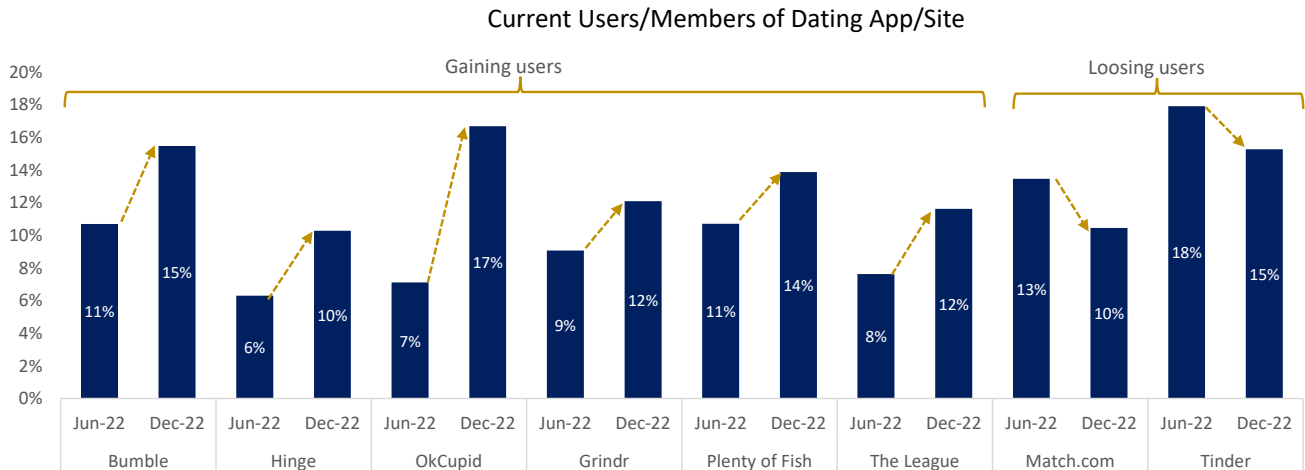
On a more positive note, **Hinge** continues to see strong user adoption, with the number of users/subscribers scaling by 4 points to 10% of our survey respondents. This highlights the strong current momentum at Hinge, but given that Hinge still has the lowest user penetration across our survey sample, it also highlights the large potential runway ahead. Since being acquired by MTCH in July, **The League** has been growing in adoption. In the six months between our June and December survey, we observed a 50% increase in user/member penetration, up to 12% of our panel. **OkCupid** is another callout, with users more than doubling across our survey panel. In December, 17% of respondents noted they used the service, which is up 10 points relative to June's 7%.

At **Bumble**, trends also appear very healthy, with users/subscribers growing by 4 points to 15% in the US (drawing level with Tinder in this survey). The last few months at the **Bumble App** have been busy on the product release front. Complements have been fully rolled out, and the Student tier is available in campuses across the country. Looking ahead, we expect the company to launch new tiers targeting underpenetrated groups such as women, which should support



ongoing penetration throughout FY23.

Figure 48: Are you a current user/member of any of the following dating apps/sites



Source : dbDIG Survey, DB Research

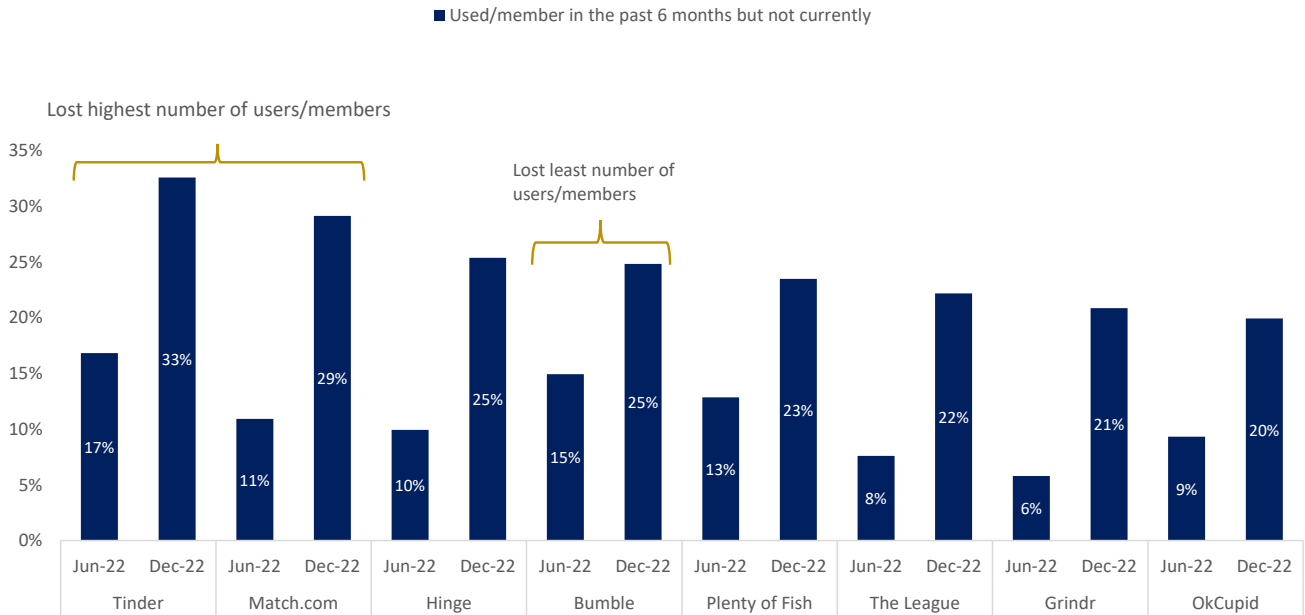
Potential signs of churn at Tinder and Match.com

Pivoting to the percent of respondents indicating they have never used one of the dating apps, we identify that **Tinder** and **Match.com** are by far the lowest in the group at 36% and 43%, respectively. On the one hand, this speaks to the success both apps have had over the last decade. On the other hand, it could also point to growing maturity across Millennials and the Gen X cohort. Perhaps unsurprisingly, this could be the genesis of the company's marketing plans aimed at growing awareness across Gen Zs, the next wave of daters. For **Bumble** and **Hinge**, ~55% of respondents have not yet used either service, indicating potential runway in driving ongoing user penetration. Penetration is also relatively low at both **Grindr** and **The League**, which is to be expected given their more narrow target demographic.

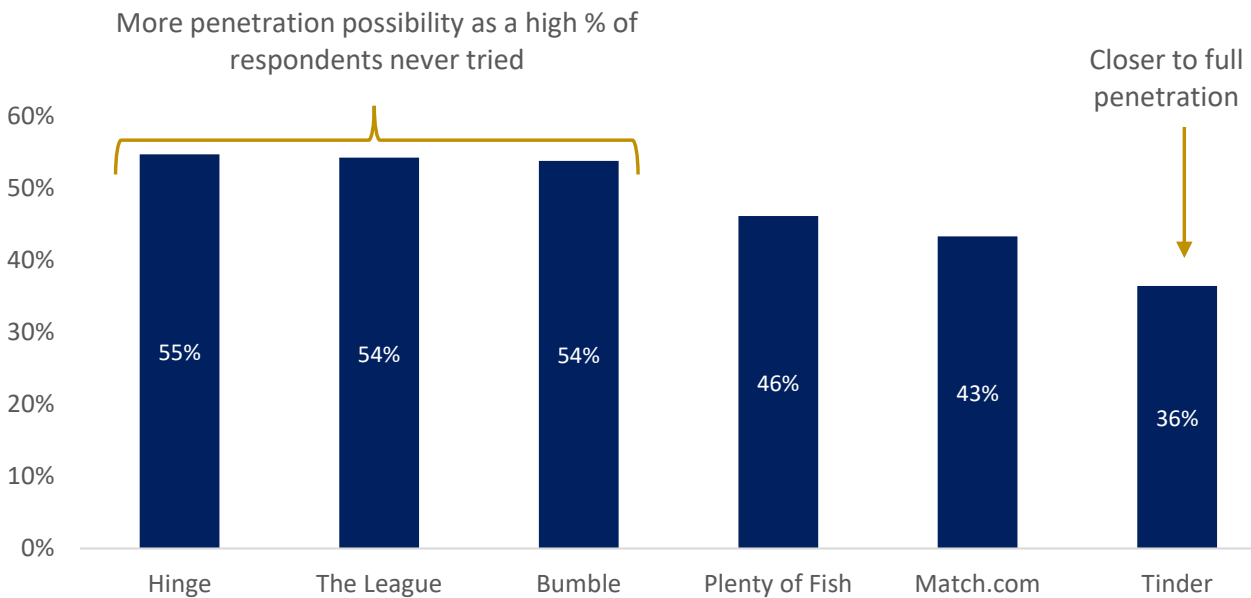


Figure 49: Have you used/been a member of any of the following dating apps/sites

Used/Member In The Past Six Months But Not Currently



Percentage Of Respondents Who Never Used Dating App



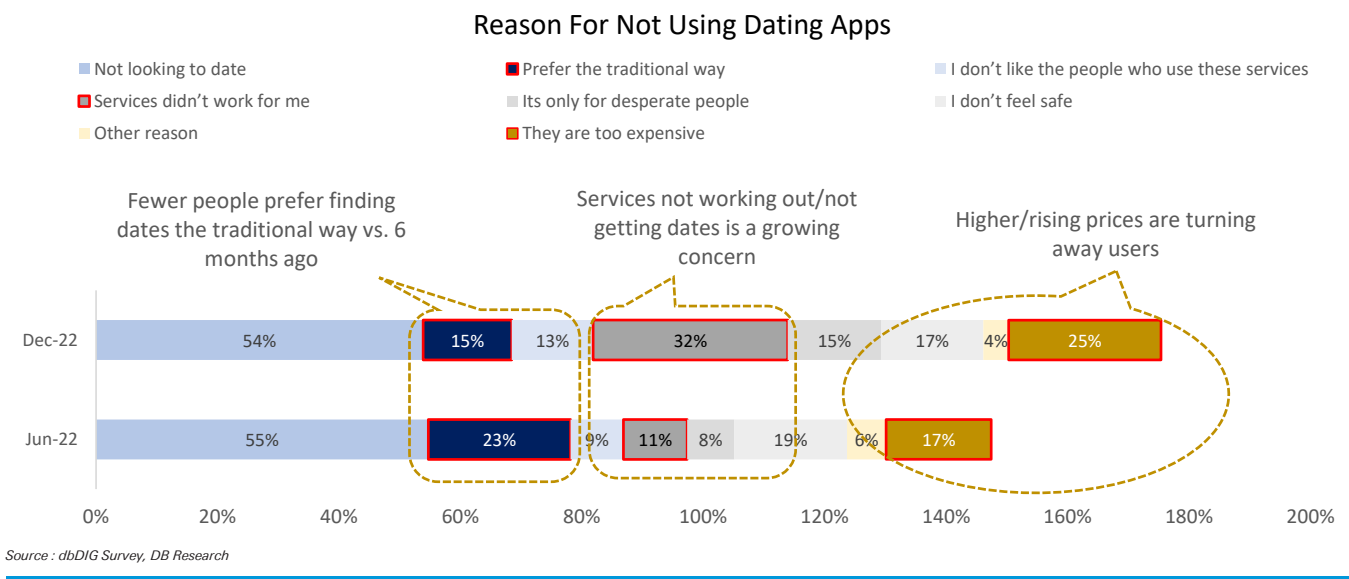
Source : dbDIG Survey, DB Research



Pricing and lack of matches are among the top reasons for not using dating apps

Across respondents not leveraging online dating services, we observe that the number of people citing a preference for "traditional" offline channels has decreased by 8 points to 15% as of the December survey. Our interpretation of this data relative to generally sluggish user trends being reported across our online dating coverage is that user headwinds are not coming as a function of changing dating behavior back to offline alternatives. With this in mind, our data suggests that elevated prices and challenges in finding a match are the most pertinent gating factors for user growth at the moment, with a growing number of respondents indicated they were having less success in finding matches and that prices have become too elevated. In fact, the percent of our panel indicting a lack of matches almost tripled to 32% in December, up from 11% in June, while high prices (pointing to price sensitivity) increased by 8 points to 25%. We think these issues point to the lack of product innovation, perhaps a marketplace imbalance coming out of pandemic restrictions, and general macro softness, which is weighing on propensity to spend in the current environment.

Figure 50: Why are you not currently using these apps/sites?

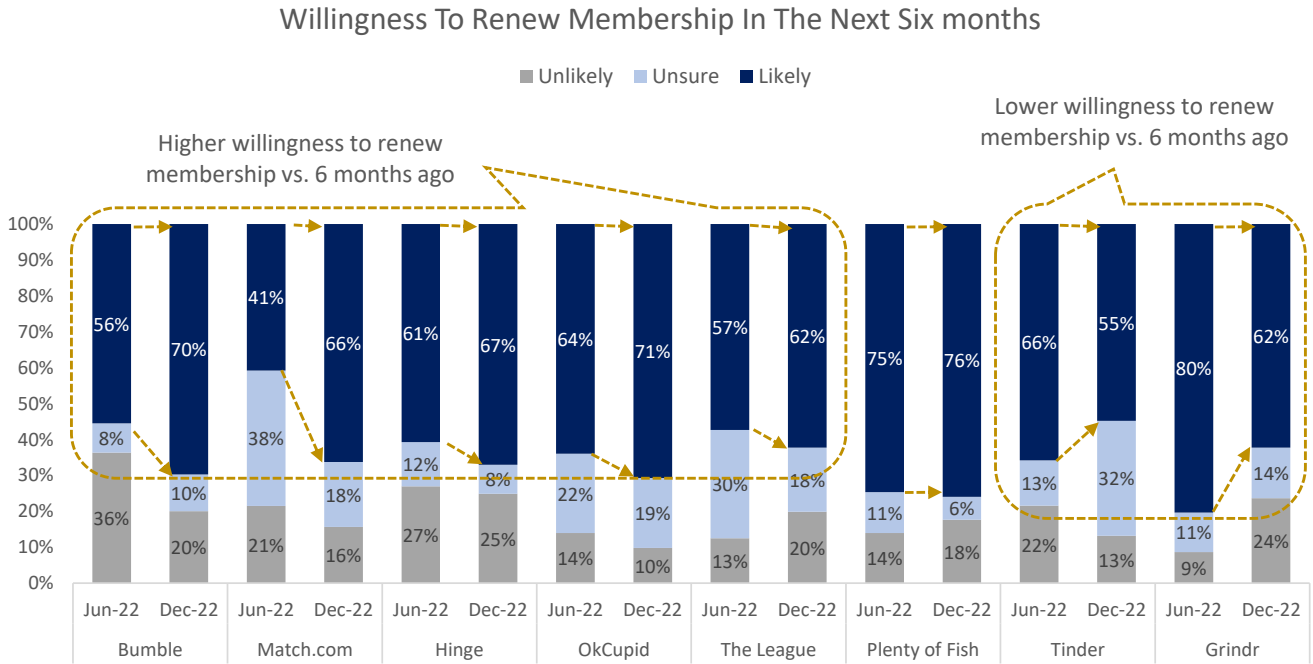


Intention to renew dating app membership over the next six months has increased

Broadly speaking, we observed an improving willingness to renew dating app memberships over the next six months. In fact, for all apps with the exception of Tinder and Grindr, respondents indicated a higher willingness to renew their membership in our December survey vs. our June survey. Again, the Bumble App stands out positively, notching a 14 point increase to 70% willing to renew over the next six months, with the percentage of respondents unwilling to renew their memberships contracting by 16 points to 20% in our December sample. On the other hand, willingness to renew memberships at Tinder contracted by 11 points to 55%, and at Grindr we observed an 18 point contraction.



Figure 51: How likely are you to renew your membership/keep using the following in the next six months



Source : dbDIG Survey, DB Research



Appendix 1

Important Disclosures

*Other information available upon request

*Prices are current as of the end of the previous trading session unless otherwise indicated and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Other information is sourced from Deutsche Bank, subject companies, and other sources. For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <https://research.db.com/Research/Disclosures/EquityResearchDisclosures>. Aside from within this report, important risk and conflict disclosures can also be found at <https://research.db.com/Research/Disclosures/Disclaimer>. Investors are strongly encouraged to review this information before investing.

Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst about the subject issuers and the securities of those issuers. In addition, the undersigned lead analyst has not and will not receive any compensation for providing a specific recommendation or view in this report. Benjamin Black, Lee Horowitz.

Equity Rating Key

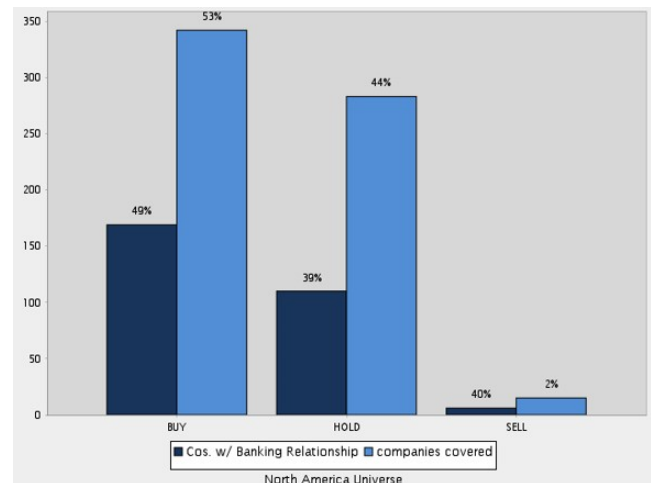
Buy: Based on a current 12- month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus projected dividend yield), we recommend that investors buy the stock.

Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock.

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Newly issued research recommendations and target prices supersede previously published research.

Equity rating dispersion and banking relationships





Additional Information

The information and opinions in this report were prepared by Deutsche Bank AG or one of its affiliates (collectively 'Deutsche Bank'). Though the information herein is believed to be reliable and has been obtained from public sources believed to be reliable, Deutsche Bank makes no representation as to its accuracy or completeness. Hyperlinks to third-party websites in this report are provided for reader convenience only. Deutsche Bank neither endorses the content nor is responsible for the accuracy or security controls of those websites.

If you use the services of Deutsche Bank in connection with a purchase or sale of a security that is discussed in this report, or is included or discussed in another communication (oral or written) from a Deutsche Bank analyst, Deutsche Bank may act as principal for its own account or as agent for another person.

Deutsche Bank may consider this report in deciding to trade as principal. It may also engage in transactions, for its own account or with customers, in a manner inconsistent with the views taken in this research report. Others within Deutsche Bank, including strategists, sales staff and other analysts, may take views that are inconsistent with those taken in this research report. Deutsche Bank issues a variety of research products, including fundamental analysis, equity-linked analysis, quantitative analysis and trade ideas. Recommendations contained in one type of communication may differ from recommendations contained in others, whether as a result of differing time horizons, methodologies, perspectives or otherwise. Deutsche Bank and/or its affiliates may also be holding debt or equity securities of the issuers it writes on. Analysts are paid in part based on the profitability of Deutsche Bank AG and its affiliates, which includes investment banking, trading and principal trading revenues.

Opinions, estimates and projections constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Deutsche Bank and are subject to change without notice. Deutsche Bank provides liquidity for buyers and sellers of securities issued by the companies it covers. Deutsche Bank research analysts sometimes have shorter-term trade ideas that may be inconsistent with Deutsche Bank's existing longer-term ratings. Some trade ideas for equities are listed as Catalyst Calls on the Research Website (<https://research.db.com/Research/>), and can be found on the general coverage list and also on the covered company's page. A Catalyst Call represents a high-conviction belief by an analyst that a stock will outperform or underperform the market and/or a specified sector over a time frame of no less than two weeks and no more than three months. In addition to Catalyst Calls, analysts may occasionally discuss with our clients, and with Deutsche Bank salespersons and traders, trading strategies or ideas that reference catalysts or events that may have a near-term or medium-term impact on the market price of the securities discussed in this report, which impact may be directionally counter to the analysts' current 12-month view of total return or investment return as described herein. Deutsche Bank has no obligation to update, modify or amend this report or to otherwise notify a recipient thereof if an opinion, forecast or estimate changes or becomes inaccurate. Coverage and the frequency of changes in market conditions and in both general and company-specific economic prospects make it difficult to update research at defined intervals. Updates are at the sole discretion of the coverage analyst or of the Research Department Management, and the majority of reports are published at irregular intervals. This report is provided for informational purposes only and does not take into account the particular investment objectives, financial situations, or needs of individual clients. It is not an offer or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy. Target prices are inherently imprecise and a product of the analyst's judgment. The financial instruments discussed in this report may not be suitable for all investors, and investors must make their own informed investment decisions. Prices and availability of financial instruments are subject to change without notice, and investment transactions can lead to losses as a result of price fluctuations and other factors. If a financial instrument is denominated in a currency other than an investor's currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results. Performance calculations exclude transaction costs, unless otherwise indicated. Unless otherwise indicated, prices are current as of the end of the previous trading session and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is also sourced from Deutsche Bank, subject companies, and other parties.

The Deutsche Bank Research Department is independent of other business divisions of the Bank. Details regarding our organizational arrangements and information barriers we have to prevent and avoid conflicts of interest with respect to our research are available on our website (<https://research.db.com/Research/>) under Disclaimer.

Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed-rate instruments (thus receiving these cash flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or liquidation of positions), and settlement issues related to local clearing houses are also important risk factors. The sensitivity of fixed-income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates – these are common in emerging markets. The index fixings may – by construction – lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. Funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Options on swaps (swaptions) the risks typical to options in addition to the risks related to rates movements.

Derivative transactions involve numerous risks including market, counterparty default and illiquidity risk. The appropriateness



of these products for use by investors depends on the investors' own circumstances, including their tax position, their regulatory environment and the nature of their other assets and liabilities; as such, investors should take expert legal and financial advice before entering into any transaction similar to or inspired by the contents of this publication. The risk of loss in futures trading and options, foreign or domestic, can be substantial. As a result of the high degree of leverage obtainable in futures and options trading, losses may be incurred that are greater than the amount of funds initially deposited – up to theoretically unlimited losses. Trading in options involves risk and is not suitable for all investors. Prior to buying or selling an option, investors must review the 'Characteristics and Risks of Standardized Options', at <http://www.optionsclearing.com/about/publications/character-risks.jsp>. If you are unable to access the website, please contact your Deutsche Bank representative for a copy of this important document.

Participants in foreign exchange transactions may incur risks arising from several factors, including the following: (i) exchange rates can be volatile and are subject to large fluctuations; (ii) the value of currencies may be affected by numerous market factors, including world and national economic, political and regulatory events, events in equity and debt markets and changes in interest rates; and (iii) currencies may be subject to devaluation or government-imposed exchange controls, which could affect the value of the currency. Investors in securities such as ADRs, whose values are affected by the currency of an underlying security, effectively assume currency risk.

Unless governing law provides otherwise, all transactions should be executed through the Deutsche Bank entity in the investor's home jurisdiction. Aside from within this report, important conflict disclosures can also be found at <https://research.db.com/Research/> on each company's research page. Investors are strongly encouraged to review this information before investing.

Deutsche Bank (which includes Deutsche Bank AG, its branches and affiliated companies) is not acting as a financial adviser, consultant or fiduciary to you or any of your agents (collectively, "You" or "Your") with respect to any information provided in this report. Deutsche Bank does not provide investment, legal, tax or accounting advice, Deutsche Bank is not acting as your impartial adviser, and does not express any opinion or recommendation whatsoever as to any strategies, products or any other information presented in the materials. Information contained herein is being provided solely on the basis that the recipient will make an independent assessment of the merits of any investment decision, and it does not constitute a recommendation of, or express an opinion on, any product or service or any trading strategy.

The information presented is general in nature and is not directed to retirement accounts or any specific person or account type, and is therefore provided to You on the express basis that it is not advice, and You may not rely upon it in making Your decision. The information we provide is being directed only to persons we believe to be financially sophisticated, who are capable of evaluating investment risks independently, both in general and with regard to particular transactions and investment strategies, and who understand that Deutsche Bank has financial interests in the offering of its products and services. If this is not the case, or if You are an IRA or other retail investor receiving this directly from us, we ask that you inform us immediately.

In July 2018, Deutsche Bank revised its rating system for short term ideas whereby the branding has been changed to Catalyst Calls ("CC") from SOLAR ideas; the rating categories for Catalyst Calls originated in the Americas region have been made consistent with the categories used by Analysts globally; and the effective time period for CCs has been reduced from a maximum of 180 days to 90 days.

United States: Approved and/or distributed by Deutsche Bank Securities Incorporated, a member of FINRA, NFA and SIPC. Analysts located outside of the United States are employed by non-US affiliates that are not subject to FINRA regulations.

European Economic Area (exc. United Kingdom): Approved and/or distributed by Deutsche Bank AG, a joint stock corporation with limited liability incorporated in the Federal Republic of Germany with its principal office in Frankfurt am Main. Deutsche Bank AG is authorized under German Banking Law and is subject to supervision by the European Central Bank and by BaFin, Germany's Federal Financial Supervisory Authority.

United Kingdom: Approved and/or distributed by Deutsche Bank AG acting through its London Branch at Winchester House, 1 Great Winchester Street, London EC2N 2DB. Deutsche Bank AG in the United Kingdom is authorised by the Prudential Regulation Authority and is subject to limited regulation by the Prudential Regulation Authority and Financial Conduct Authority. Details about the extent of our authorisation and regulation are available on request.

Hong Kong SAR: Distributed by Deutsche Bank AG, Hong Kong Branch except for any research content relating to futures contracts within the meaning of the Hong Kong Securities and Futures Ordinance Cap. 571. Research reports on such futures contracts are not intended for access by persons who are located, incorporated, constituted or resident in Hong Kong. The author(s) of a research report may not be licensed to carry on regulated activities in Hong Kong and, if not licensed, do not hold themselves out as being able to do so. The provisions set out above in the 'Additional Information' section shall apply to the fullest extent permissible by local laws and regulations, including without limitation the Code of Conduct for Persons Licensed or Registered with the Securities and Futures Commission. This report is intended for distribution only to 'professional investors' as defined in Part 1 of Schedule of the SFO. This document must not be acted or relied on by persons who are not professional investors. Any investment or investment activity to which this document relates is only available to professional investors and will be engaged only with professional investors.

India: Prepared by Deutsche Equities India Private Limited (DEIPL) having CIN: U65990MH2002PTC137431 and registered office at 14th Floor, The Capital, C-70, G Block, Bandra Kurla Complex Mumbai (India) 400051. Tel: + 91 22 7180 4444. It is registered by the Securities and Exchange Board of India (SEBI) as a Stock broker bearing registration no.: INZ000252437;



Merchant Banker bearing SEBI Registration no.: INM000010833 and Research Analyst bearing SEBI Registration no.: INH000001741. DEIPL may have received administrative warnings from the SEBI for breaches of Indian regulations. Deutsche Bank and/or its affiliate(s) may have debt holdings or positions in the subject company. With regard to information on associates, please refer to the "Shareholdings" section in the Annual Report at: <https://www.db.com/ir/en/annual-reports.htm>.

Japan: Approved and/or distributed by Deutsche Securities Inc.(DSI). Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association and The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. We may also charge commissions and fees for certain categories of investment advice, products and services. Recommended investment strategies, products and services carry the risk of losses to principal and other losses as a result of changes in market and/or economic trends, and/or fluctuations in market value. Before deciding on the purchase of financial products and/or services, customers should carefully read the relevant disclosures, prospectuses and other documentation. 'Moody's', 'Standard Poor's', and 'Fitch' mentioned in this report are not registered credit rating agencies in Japan unless Japan or 'Nippon' is specifically designated in the name of the entity. Reports on Japanese listed companies not written by analysts of DSI are written by Deutsche Bank Group's analysts with the coverage companies specified by DSI. Some of the foreign securities stated on this report are not disclosed according to the Financial Instruments and Exchange Law of Japan. Target prices set by Deutsche Bank's equity analysts are based on a 12-month forecast period.

Korea: Distributed by Deutsche Securities Korea Co.

South Africa: Deutsche Bank AG Johannesburg is incorporated in the Federal Republic of Germany (Branch Register Number in South Africa: 1998/003298/10).

Singapore: This report is issued by Deutsche Bank AG, Singapore Branch (One Raffles Quay #18-00 South Tower Singapore 048583, 65 6423 8001), which may be contacted in respect of any matters arising from, or in connection with, this report. Where this report is issued or promulgated by Deutsche Bank in Singapore to a person who is not an accredited investor, expert investor or institutional investor (as defined in the applicable Singapore laws and regulations), they accept legal responsibility to such person for its contents.

Taiwan: Information on securities/investments that trade in Taiwan is for your reference only. Readers should independently evaluate investment risks and are solely responsible for their investment decisions. Deutsche Bank research may not be distributed to the Taiwan public media or quoted or used by the Taiwan public media without written consent. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation to trade in such securities/instruments. Deutsche Securities Asia Limited, Taipei Branch may not execute transactions for clients in these securities/instruments.

Qatar: Deutsche Bank AG in the Qatar Financial Centre (registered no. 00032) is regulated by the Qatar Financial Centre Regulatory Authority. Deutsche Bank AG - QFC Branch may undertake only the financial services activities that fall within the scope of its existing QFCRA license. Its principal place of business in the QFC: Qatar Financial Centre, Tower, West Bay, Level 5, PO Box 14928, Doha, Qatar. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available only to Business Customers, as defined by the Qatar Financial Centre Regulatory Authority.

Russia: The information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Kingdom of Saudi Arabia: Deutsche Securities Saudi Arabia (DSSA) is a closed joint stock company authorized by the Capital Market Authority of the Kingdom of Saudi Arabia with a license number (No. 37-07073) to conduct the following business activities: Dealing, Arranging, Advising, and Custody activities. DSSA registered office is Faisaliah Tower, 17th Floor, King Fahad Road - Al Olaya District Riyadh, Kingdom of Saudi Arabia P.O. Box 301806.

United Arab Emirates: Deutsche Bank AG in the Dubai International Financial Centre (registered no. 00045) is regulated by the Dubai Financial Services Authority. Deutsche Bank AG - DIFC Branch may only undertake the financial services activities that fall within the scope of its existing DFSA license. Principal place of business in the DIFC: Dubai International Financial Centre, The Gate Village, Building 5, PO Box 504902, Dubai, U.A.E. This information has been distributed by Deutsche Bank AG. Related financial products or services are available only to Professional Clients, as defined by the Dubai Financial Services Authority.

Australia and New Zealand: This research is intended only for 'wholesale clients' within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act, respectively. Please refer to Australia-specific research disclosures and related information at https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD000000000521304.xhtml. Where research refers to any particular financial product recipients of the research should consider any product disclosure statement, prospectus or other applicable disclosure document before making any decision about whether to acquire the product. In preparing this report, the primary analyst or an individual who assisted in the preparation of this report has likely been in contact with the company that is the subject of this research for confirmation/clarification of data, facts, statements, permission to use company-sourced material in the report, and/or site-visit attendance. Without prior approval from Research Management,



analysts may not accept from current or potential Banking clients the costs of travel, accommodations, or other expenses incurred by analysts attending site visits, conferences, social events, and the like. Similarly, without prior approval from Research Management and Anti-Bribery and Corruption ("ABC") team, analysts may not accept perks or other items of value for their personal use from issuers they cover.

Additional information relative to securities, other financial products or issuers discussed in this report is available upon request. This report may not be reproduced, distributed or published without Deutsche Bank's prior written consent.

Backtested, hypothetical or simulated performance results have inherent limitations. Unlike an actual performance record based on trading actual client portfolios, simulated results are achieved by means of the retroactive application of a backtested model itself designed with the benefit of hindsight. Taking into account historical events the backtesting of performance also differs from actual account performance because an actual investment strategy may be adjusted any time, for any reason, including a response to material, economic or market factors. The backtested performance includes hypothetical results that do not reflect the reinvestment of dividends and other earnings or the deduction of advisory fees, brokerage or other commissions, and any other expenses that a client would have paid or actually paid. No representation is made that any trading strategy or account will or is likely to achieve profits or losses similar to those shown. Alternative modeling techniques or assumptions might produce significantly different results and prove to be more appropriate. Past hypothetical backtest results are neither an indicator nor guarantee of future returns. Actual results will vary, perhaps materially, from the analysis.

The method for computing individual E,S,G and composite ESG scores set forth herein is a novel method developed by the Research department within Deutsche Bank AG, computed using a systematic approach without human intervention. Different data providers, market sectors and geographies approach ESG analysis and incorporate the findings in a variety of ways. As such, the ESG scores referred to herein may differ from equivalent ratings developed and implemented by other ESG data providers in the market and may also differ from equivalent ratings developed and implemented by other divisions within the Deutsche Bank Group. Such ESG scores also differ from other ratings and rankings that have historically been applied in research reports published by Deutsche Bank AG. Further, such ESG scores do not represent a formal or official view of Deutsche Bank AG. It should be noted that the decision to incorporate ESG factors into any investment strategy may inhibit the ability to participate in certain investment opportunities that otherwise would be consistent with your investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of sustainable investments may be lower or higher than portfolios where ESG factors, exclusions, or other sustainability issues are not considered, and the investment opportunities available to such portfolios may differ. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

Copyright © 2023 Deutsche Bank AG



David Folkerts-Landau

Group Chief Economist and Global Head of Research

Pam Finelli
Global Chief Operating
Officer Research

Steve Pollard
Global Head of Company
Research and Sales

Anthony Klarman
Global Head of
Debt Research

Jim Reid
Global Head of
Macro and Thematic
Research

Tim Rokossa
Head of Germany
Research

Gerry Gallagher
Head of European
Company Research

Matthew Barnard
Head of Americas
Company Research

Peter Milliken
Head of APAC
Company Research

Debbie Jones
Global Head of
Company Research ESG

Sameer Goel
Head of APAC
Research

Francis Yared
Global Head of Rates Research

George Saravelos
Global Head of FX Research

Peter Hooper
Vice-Chair of Research

International Production Locations

Deutsche Bank AG

Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG

Equity Research
Mainzer Landstrasse 11-17
60329 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG

Filiale Hongkong
International Commerce Centre,
1 Austin Road West, Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.

2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6000

Deutsche Bank AG

1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank Securities Inc.

The Deutsche Bank Center
1 Columbus Circle
New York, NY 10019
Tel: (1) 212 250 2500
