

## Internet - ASEAN

## Feb-23 app trends: Shopee stable, TikTok seller app traction continues

Industry Overview

## Shopee MAUs stable, TikTok seller app show MoM gains

Feb 23 Sensor Tower data indicates that Shopee DAU/MAU in most markets are largely flat in Jan/Feb-23 despite the company curtailing S&M and improving take-rates. This does not necessarily indicate GMV trends as it is possible that consumers are down trending and/or not shopping. Also, the DAU/MAU ratio, a function of retention at 35-40% remains highest for Shopee in all markets. Feb-23 numbers also indicate continued month-on-month improvement of TikTok Seller app DAU/MAU in SE Asian markets – implying merchant adoption is improving. While Indonesia leads in downloads and MAU/DAU numbers, Vietnam, Philippines and Thailand markets are also showing good traction for the seller-app. In fact, the DAUs in Vietnam and Philippines market are now largely similar. We see risks of TikTok's continued traction to existing e-com companies particularly Shopee given higher overlap of users and similar products categories.

## Stable momentum at Grab; Food apps &amp; FF declining trend

Feb-23 numbers indicate Grab app is showing improvement in DAUs when compared to GoJek in Indonesia/Vietnam and slight decline in Singapore (flattish for GoJek). Competitor delivery apps like Lineman, Foodpanda in markets like Thailand, Philippines are showing flat to declining trend in downloads and DAUs implying reducing appetite for food apps as the reopening trend continues along with some consumption slowdown. On gaming, FreeFire and FreeFire Max are showing declining global MAUs; even monthly worldwide revenues are declining in Jan/Feb-23.

In Feb 23, Shopee's **Indo** MAU/DAU were +0.7%/+1.2% MoM vs -2.8%/-5.3% for Lazada. **Thailand** MAUs flat for both apps, DAUs marginally improved for Shopee +1.6% MoM vs -2.9% for Lazada. **Singapore/Malaysia** MAUs/ DAUs remained flat for Shopee vs Lazada DAUs -3%/-8.9% MoM. **Philippines** MAU -0.4%/-1.6% for Shopee/Lazada, while DAUs -5.2% MoM for both apps. **Vietnam** Shopee MAU/DAU were +1.3%/+5.9% MoM vs -1.5%/flat MoM for Lazada. Lazada leads in user metrics in Thailand with MAUs/DAUs base 24.5mn/6.7mn vs Shopee at 6.2mn/ 2.1mn. Lazada is no more a distant second in Singapore and Vietnam.

## Steady momentum/cost-control; No exposure to SVB

We expect continued focus on cost-control initiatives by both Sea and Grab. Of note, we believe Sea's 1Q23 revenue growth will be positively impacted by further take-rate hike (offset by slower GMV growth). S&M in near-term also could be lower as the company may not spend much with decent growth. Beyond 1Q, it remains to be seen how company balances revenue growth with profitability. For Grab, we expect mobility business momentum to be strong as demand continues to improve; for delivery, we expect slower (flat to negative) GMV growth in 1Q partially offset by curtailing incentives. Both Sea and Grab do not have any exposure to SVB. Both banks with large global corporate and hence we do not expect any impact on them from the SVB ripple effect. In our view, any Fed rate pauses, or cuts may positively help the stock prices of these names. We reaffirm our Buy on Grab and Neutral on Sea.

17 March 2023

Equity  
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[Sea: Strong numbers, surprise profit: what next? Watch for sustainability/competition](#)

[TikTok in SE Asia: Steady traction continues for its seller-app in e-com](#)

MELI leads in NPS, but Amazon now #1 in trust & service, Shopee momentum fades.

Abbreviations at the end of note, p15

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**Refer to important disclosures on page 19 to 22. Analyst Certification on page 16. Price Objective Basis/Risk on page 15.**

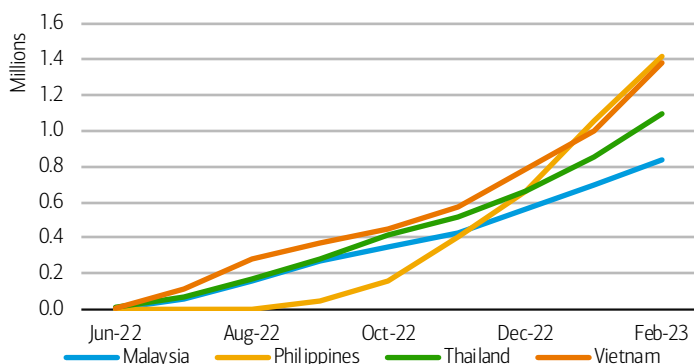
12530988

Timestamp: 17 March 2023 05:39AM EDT

# TikTok Seller App: Continued traction

## Exhibit 1: TikTok Seller app – Cumulative app downloads

Vietnam and Philippines neck-to-neck in terms of downloads

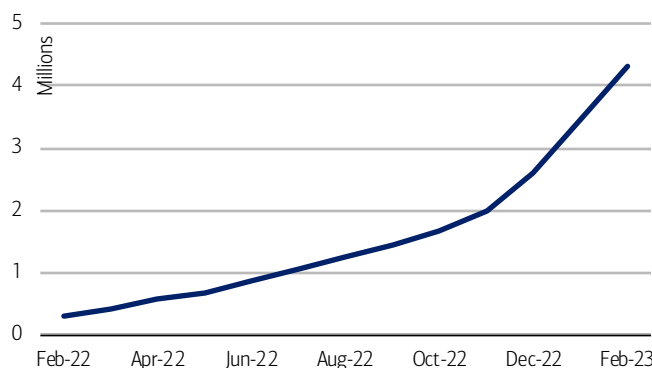


Source: Sensor Tower

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## Exhibit 2: Indonesia – TikTok Seller Cumulative app downloads

+25% MoM growth in Feb'23

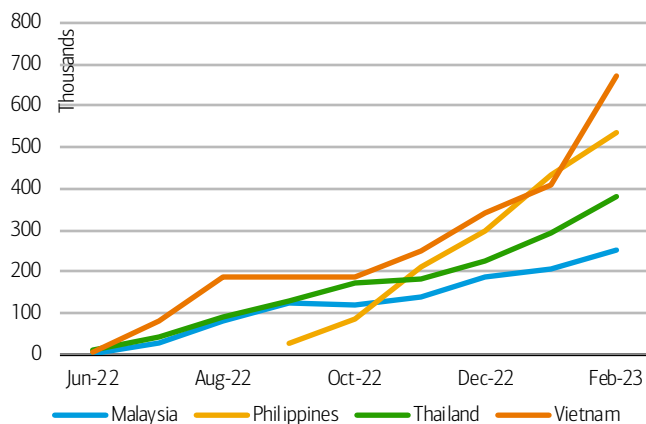


Source: Sensor Tower

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## Exhibit 3: TikTok Seller app - Monthly Active Users

TikTok gained traction from June; Leads in Vietnam

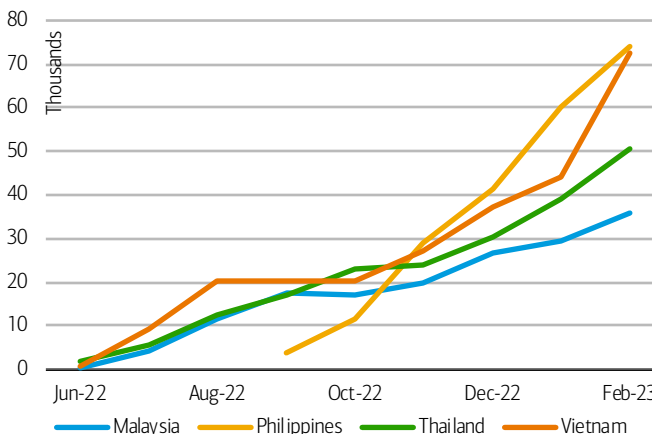


Source: Sensor Tower

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## Exhibit 4: Tiktok Seller app - Daily Active Users

Rapidly growing traction in Philippines

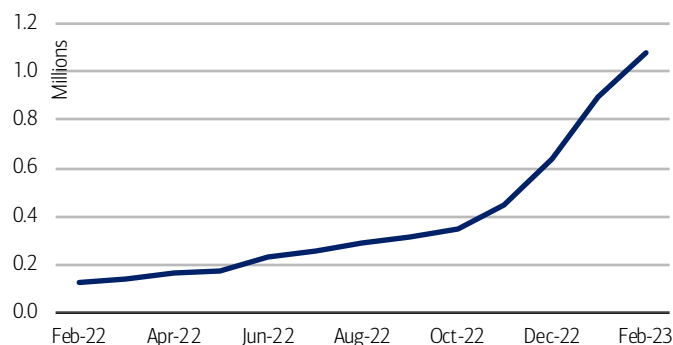


Source: Sensor Tower

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## Exhibit 5: Indonesia – TikTok Seller app Monthly Active Users

TikTok crossed c.1mn mark in MAUs

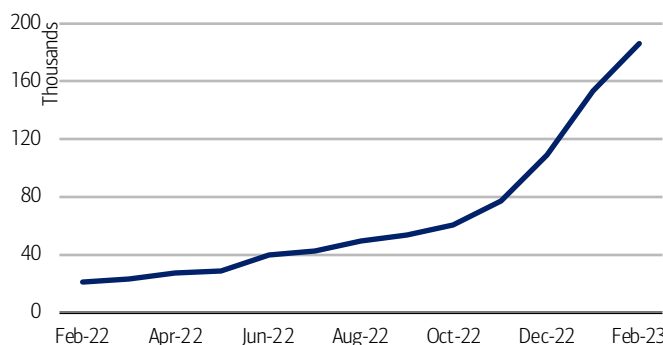


Source: Sensor Tower

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## Exhibit 6: Indonesia – TikTok Seller app Daily Active Users

+21% MoM growth in Indonesia



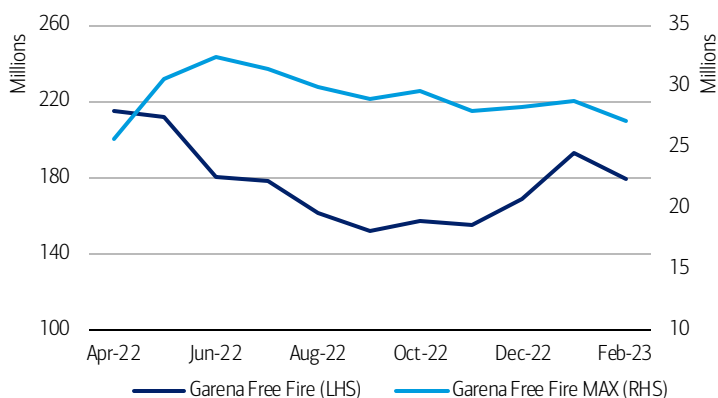
Source: Sensor Tower

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## Free Fire active user base trending down

**Exhibit 7: Garena Free Fire & Free Fire Max global MAU base**

Lower base sequentially

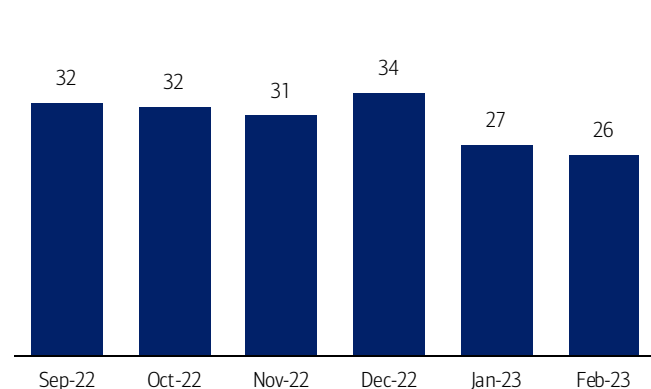


Source: Sensor Tower

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**Exhibit 8: Free fire - monthly worldwide revenues (\$mn)**

Revenues lower than past levels



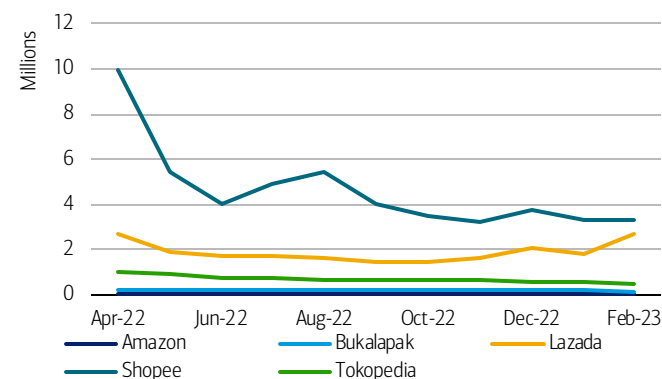
Source: Sensor Tower

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## E-com: Shopee user metrics remained flat

**Exhibit 9: Indonesia - Android app downloads (mn)**

Lazada witnessed a sharp growth of 53.4% MoM; Shopee remains flat

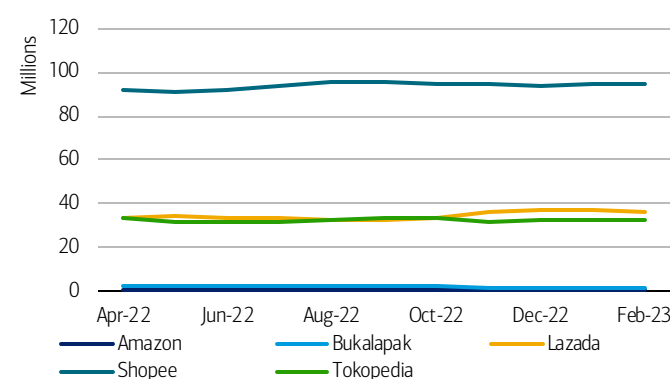


Source: Sensor Tower

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**Exhibit 10: Indonesia - Monthly Active Users (mn)**

Shopee flat; -5% MoM for Lazada

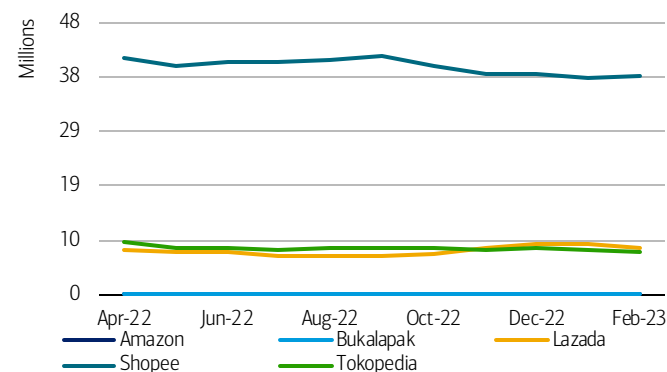


Source: Sensor Tower

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**Exhibit 11: Indonesia - Daily Active Users (mn)**

+1% for Shopee; -5% MoM for Lazada

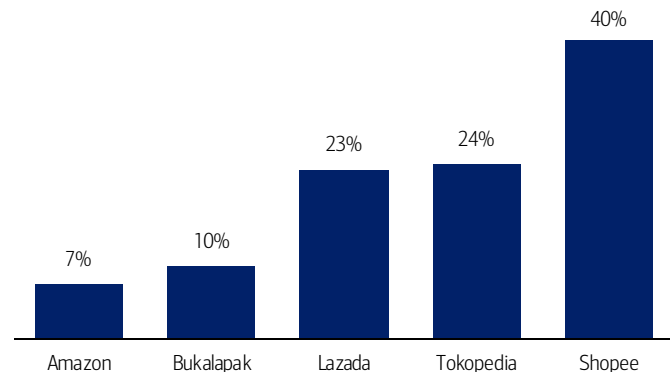


Source: Sensor Tower

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**Exhibit 12: Indonesia - DAU/MAU**

Retention highest for Shopee

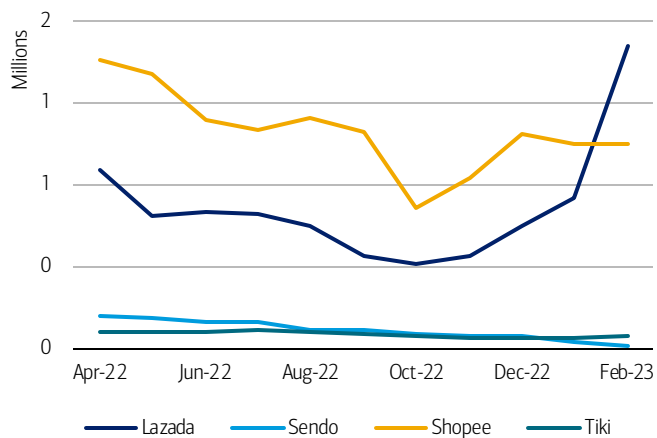


Source: Sensor Tower

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**Exhibit 13: Vietnam - Android app downloads (mn)**

Lazada grew strongly to be number-1; Shopee remained stable

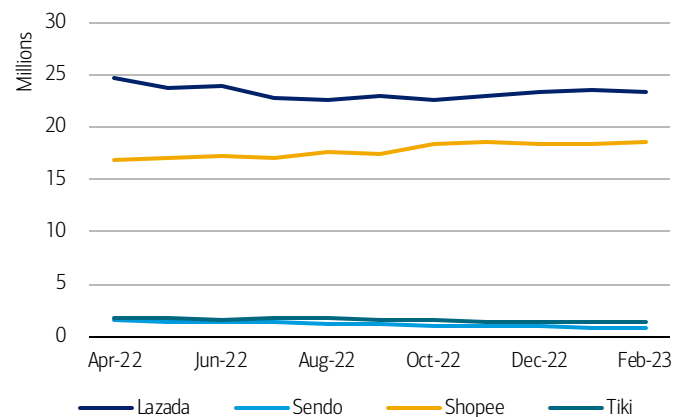


Source: Sensor Tower

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**Exhibit 14: Vietnam - Monthly Active Users (mn)**

+1% for Shopee; -1% MoM for Lazada

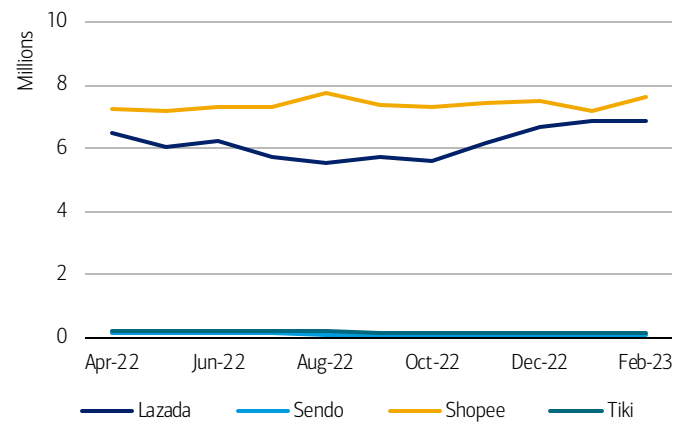


Source: Sensor Tower

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**Exhibit 15: Vietnam - Daily Active Users (mn)**

Shopee grew 6% MoM; Lazada remained flat

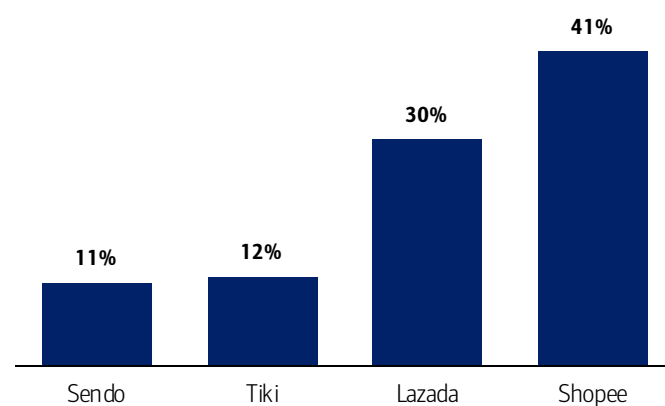


Source: Sensor Tower

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**Exhibit 16: Vietnam - DAU/MAU**

Ratio highest for Shopee

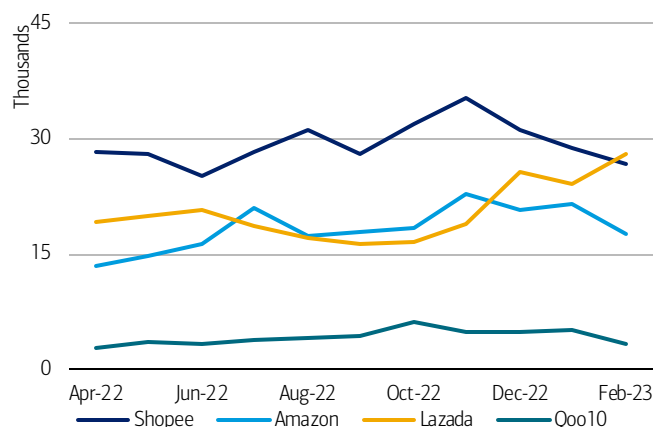


Source: Sensor Tower

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**Exhibit 17: Singapore - Android app downloads ('000s)**

Lazada up 16% MoM; Shopee and Amazon witnessed a decline

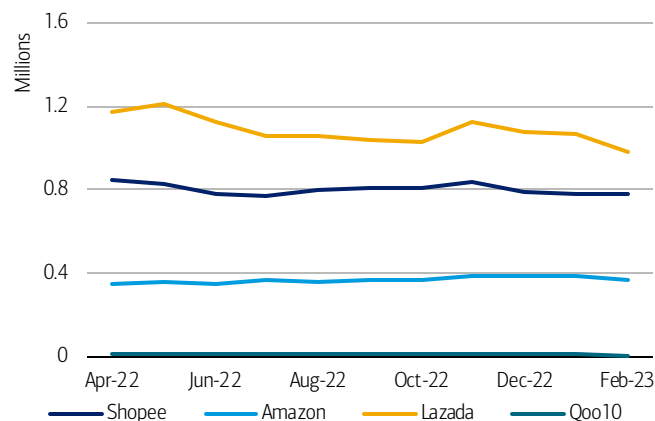


Source: Sensor Tower

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**Exhibit 18: Singapore - Monthly Active Users (mn)**

Amazon/Lazada down 3%/8% MoM; Shopee flat

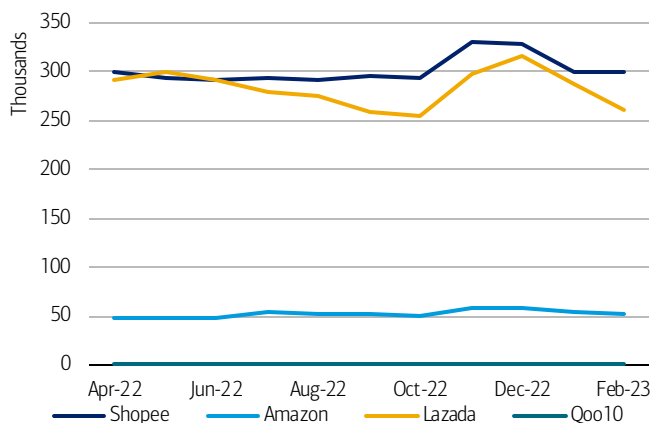


Source: Sensor Tower

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**Exhibit 19: Singapore - Daily active users ('000s)**

Amazon/Lazada declined 5%/8% MoM; Shopee flat

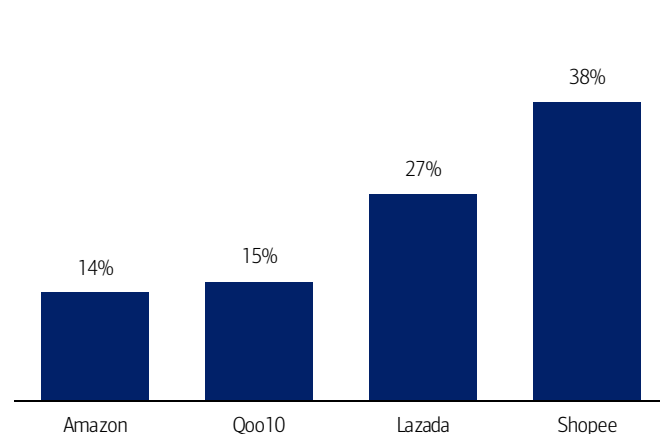


Source: Sensor Tower

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**Exhibit 20: Singapore - DAU/MAU**

Ratio highest for Shopee

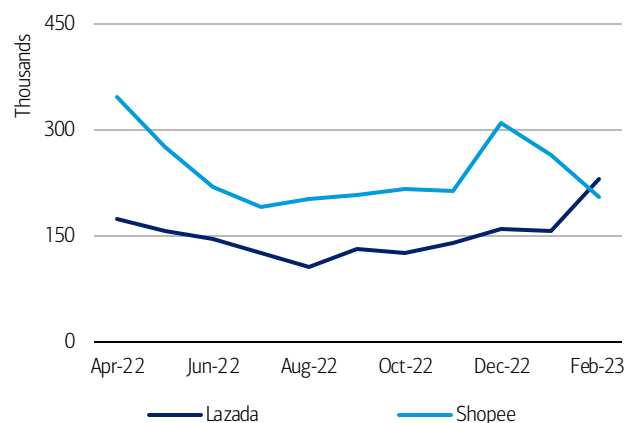


Source: Sensor Tower

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**Exhibit 21: Malaysia - Android app downloads ('000s)**

Uptick in downloads for Lazada; decline in Shopee

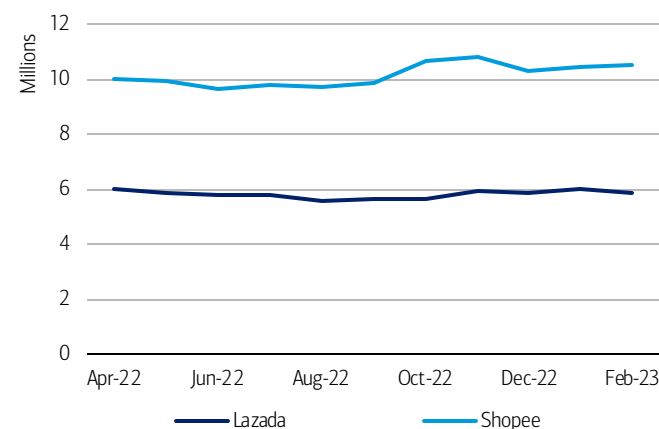


Source: Sensor Tower

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**Exhibit 22: Malaysia - Monthly Active Users (mn)**

-2.6% for Lazada; +1% MoM for Shopee

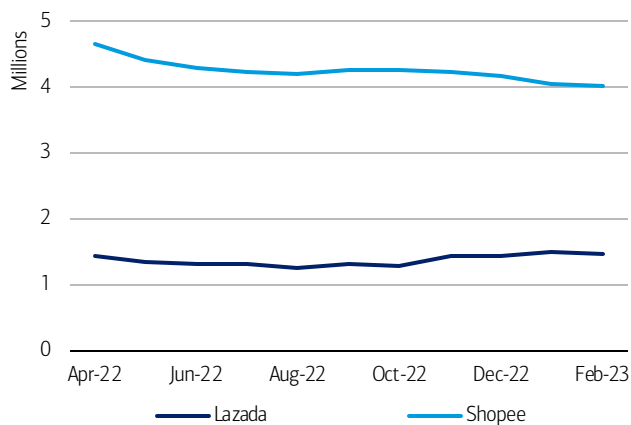


Source: Sensor Tower

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**Exhibit 23: Malaysia - Daily Active Users (mn)**

-3% MoM for Lazada; flat for Shopee

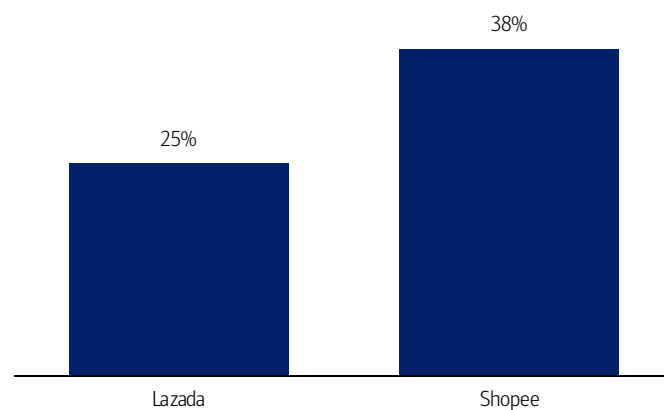


Source: Sensor Tower

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**Exhibit 24: Malaysia - DAU/MAU**

Ratio highest for Shopee

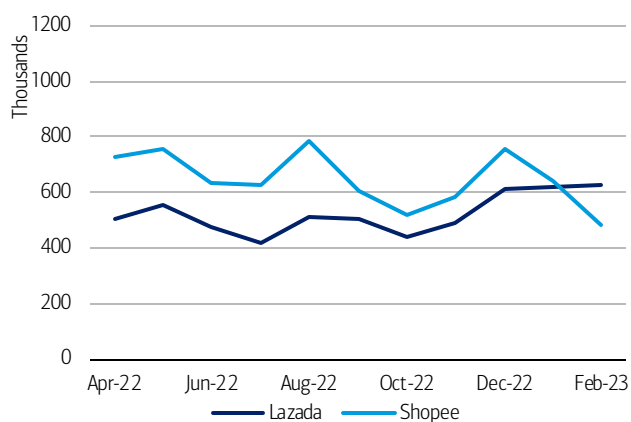


Source: Sensor Tower

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**Exhibit 25: Philippines - Android app downloads ('000s)**

Shopee downloads declined 24% MoM; Lazada flat

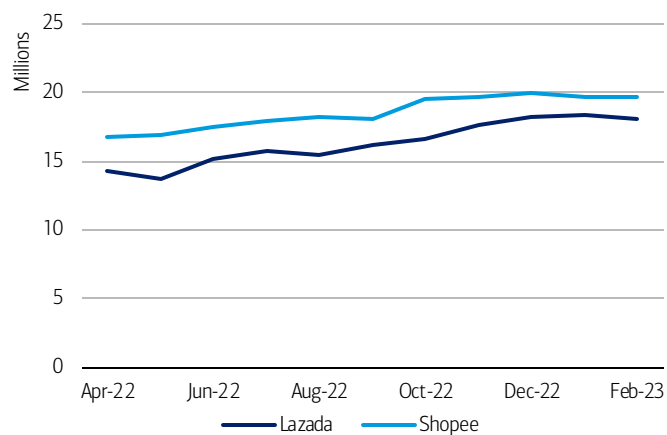


Source: Sensor Tower

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**Exhibit 26: Philippines - Monthly Active Users (mn)**

Flat MAUs for both Shopee and Lazada

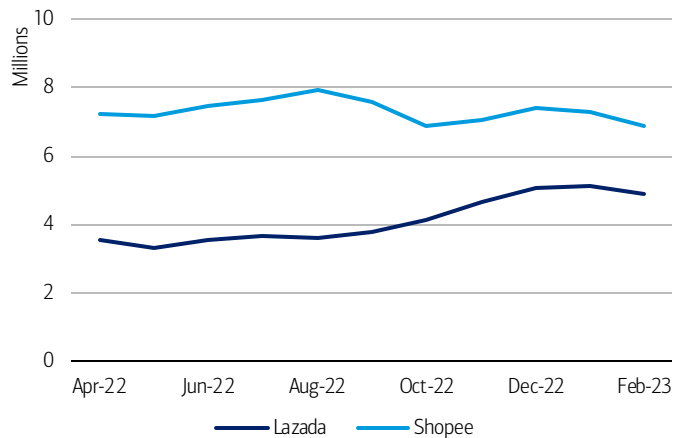


Source: Sensor Tower

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**Exhibit 27: Philippines - Daily active users (mn)**

Users declined 5% MoM for both Shopee and Lazada

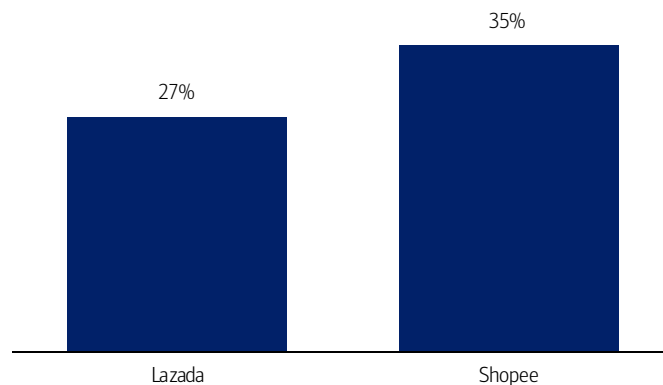


Source: Sensor Tower

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**Exhibit 28: Philippines - DAU/MAU**

Retention highest for Shopee

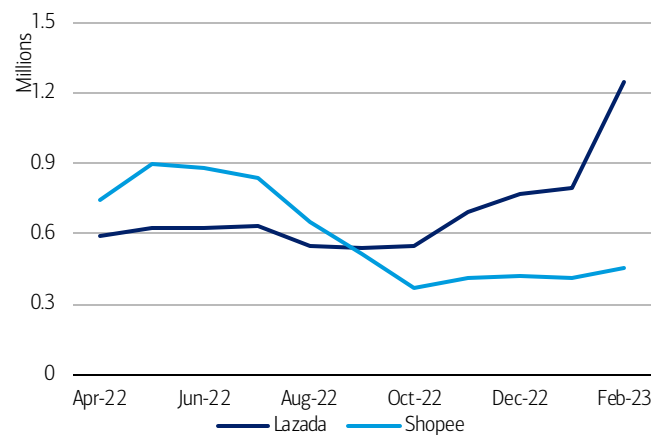


Source: Sensor Tower

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**Exhibit 29: Thailand - Android app downloads (mn)**

57% MoM Uptick seen in Lazada, widening gap with Shopee

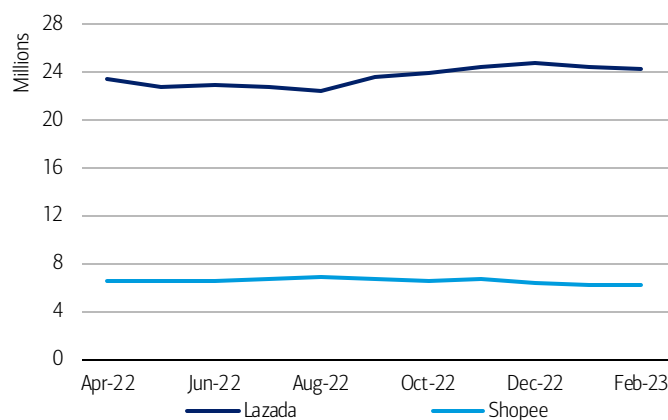


Source: Sensor Tower

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**Exhibit 30: Thailand - Monthly Active Users (mn)**

Both Lazada and Shopee remains flat

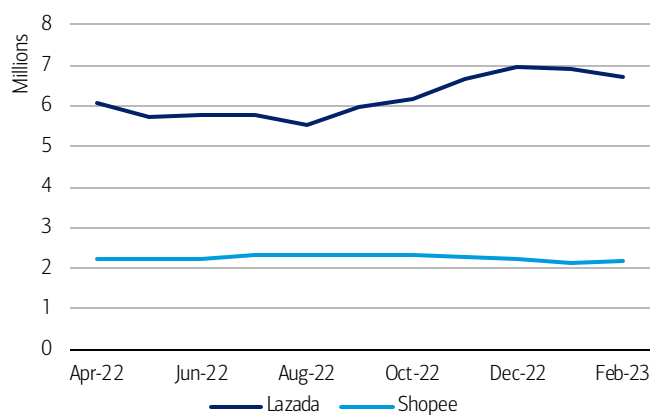


Source: Sensor Tower

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**Exhibit 31: Thailand - Daily active users (mn)**

+1.6% MoM for Shopee; -3% MoM for Lazada

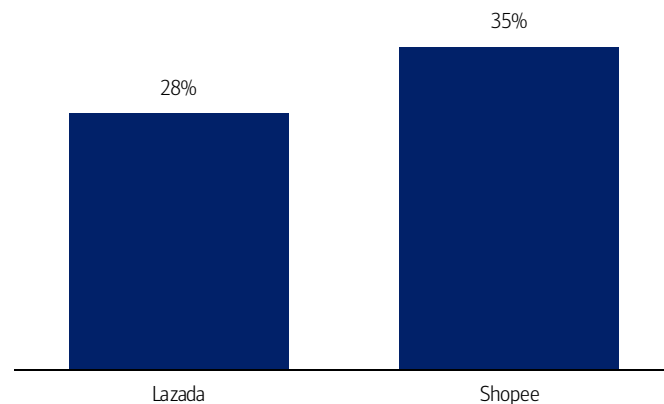


Source: Sensor Tower

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**Exhibit 32: Thailand - DAU/MAU**

Retention ratio highest for Shopee



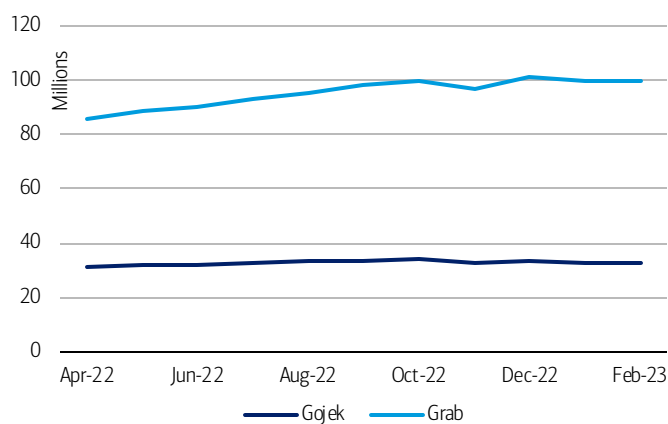
Source: Sensor Tower

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## Comparing Grab with peers

**Exhibit 33: ASEAN - Monthly Active Users (mn)**

Grab and Gojek both remained flat; Grab clearly leads

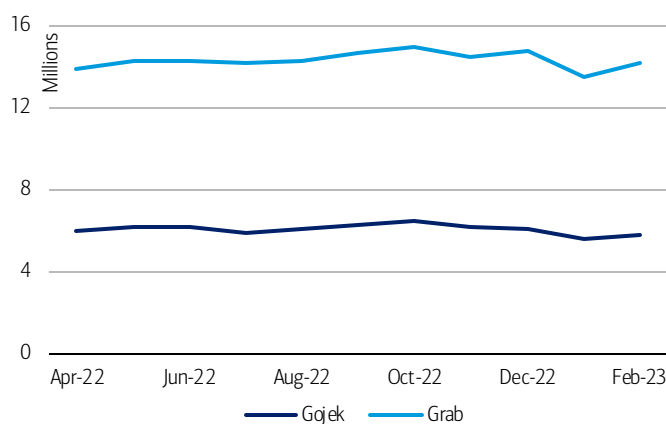


Source: Sensor Tower

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**Exhibit 34: ASEAN - Daily active users (mn)**

Grab +5% MoM; Gojek remains flat



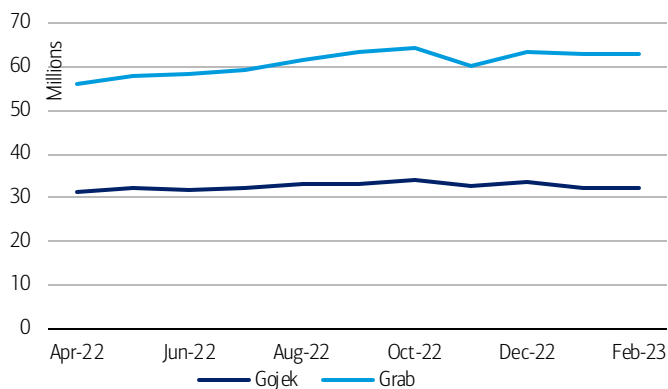
Source: Sensor Tower

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**Exhibit 35: MAUs in Indonesia, Singapore & Vietnam (mn)**

Grab leads in the three geographies Gojek operates in, remained flat MoM

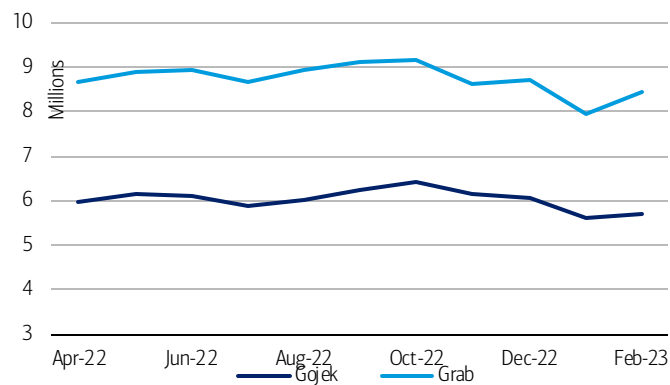


Source: Sensor Tower

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**Exhibit 36: DAUs in Indonesia, Singapore & Vietnam (mn)**

Grab leads in DAUs as well

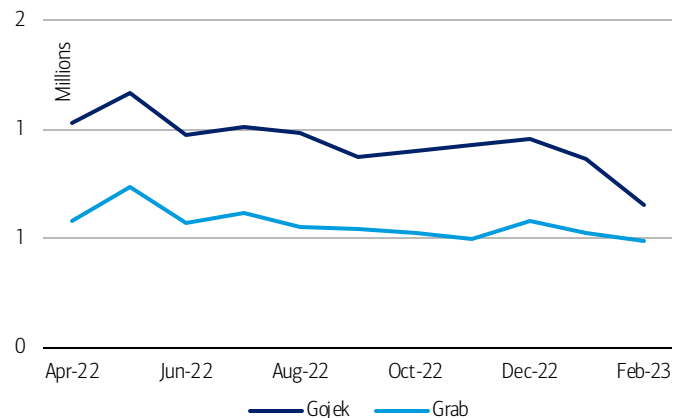


Source: Sensor Tower

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**Exhibit 37: Indonesia – Android app downloads (mn)**

Despite steep decline, GoJek continues to be the leader

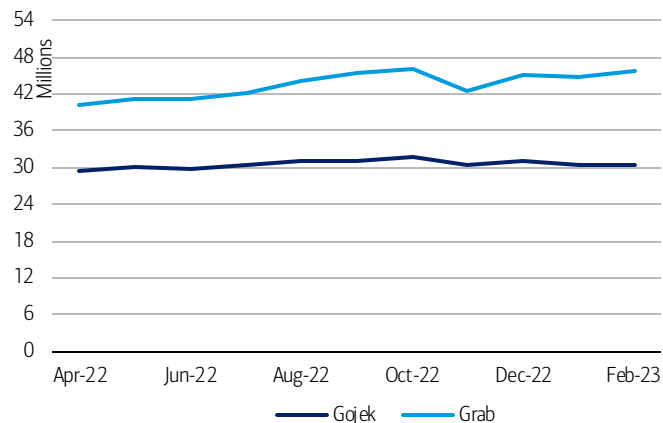


Source: Sensor Tower

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**Exhibit 38: Indonesia – Monthly Active Users (mn)**

+2% MoM for Grab; GoJek remains flat

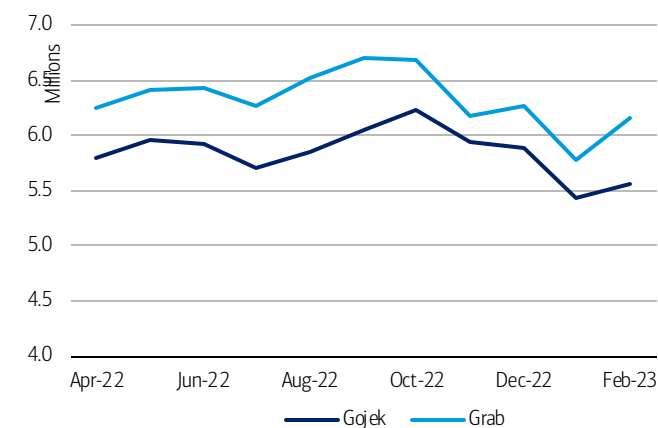


Source: Sensor Tower

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**Exhibit 39: Indonesia – Daily active users (mn)**

Both Grab and GoJek witnessed a recovery in Feb

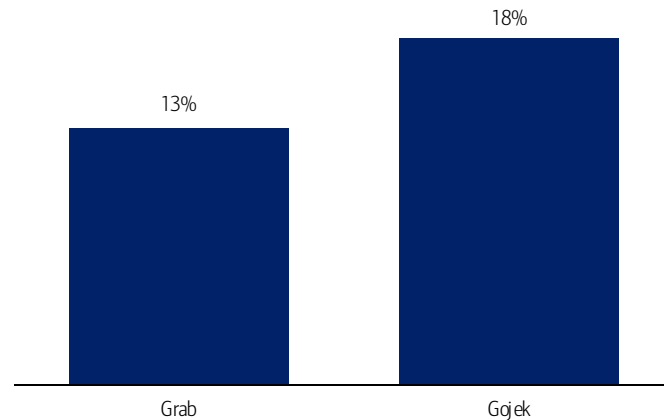


Source: Sensor Tower

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**Exhibit 40: Indonesia – DAU/MAU**

GoJek has higher retention vs Grab

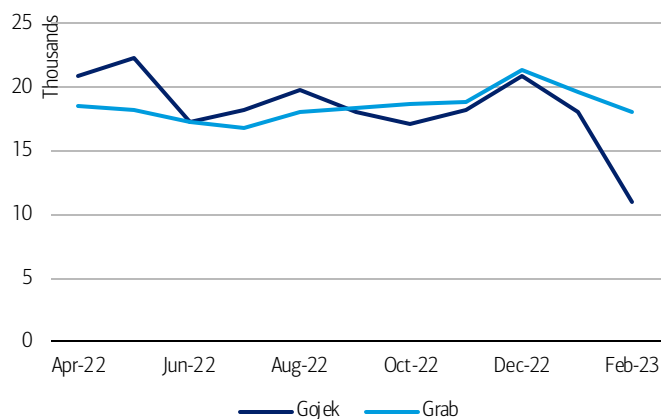


Source: Sensor Tower

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**Exhibit 41: Singapore - Androids app downloads ('000s)**

Steep decline in Gojek; Grab leads in downloads

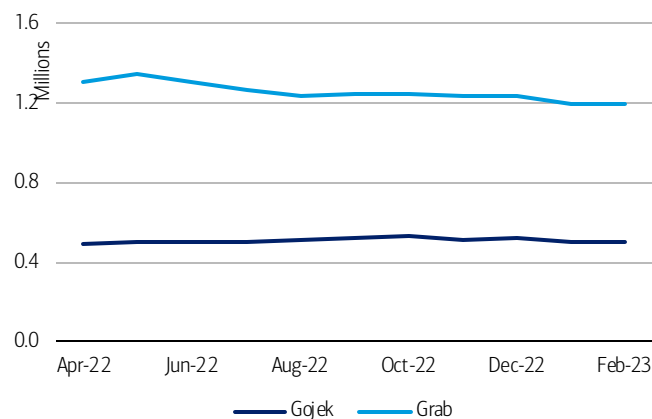


Source: Sensor Tower

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**Exhibit 42: Singapore - Monthly Active Users (mn)**

Grab Gojek remained flat MoM

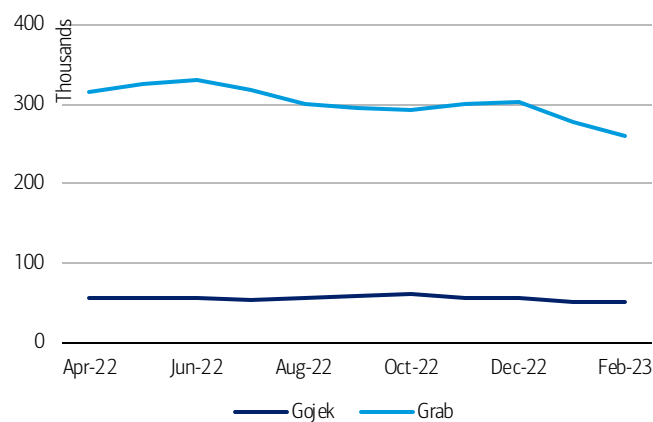


Source: Sensor Tower

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**Exhibit 43: Singapore - Daily active users ('000s)**

-6% MoM for Grab; +3% MoM for Gojek

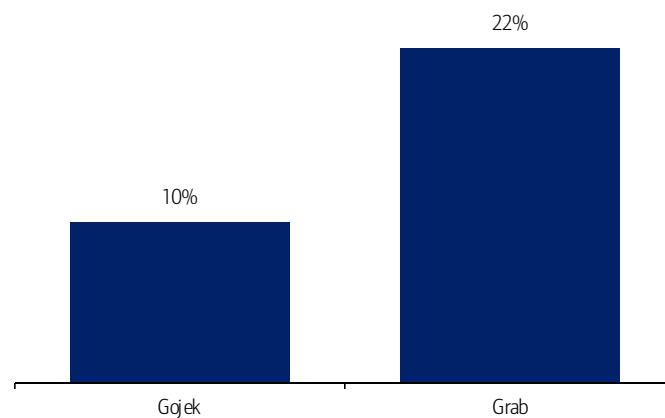


Source: Sensor Tower

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**Exhibit 44: Singapore - DAU/MAU**

Grab has better retention vs Gojek

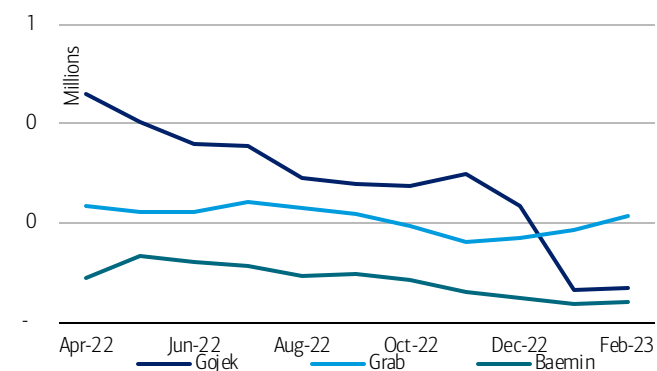


Source: Sensor Tower

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**Exhibit 45: Vietnam – Androids app downloads (mn)**

Gojek witnessed steep decline in Jan; Grab tops in downloads

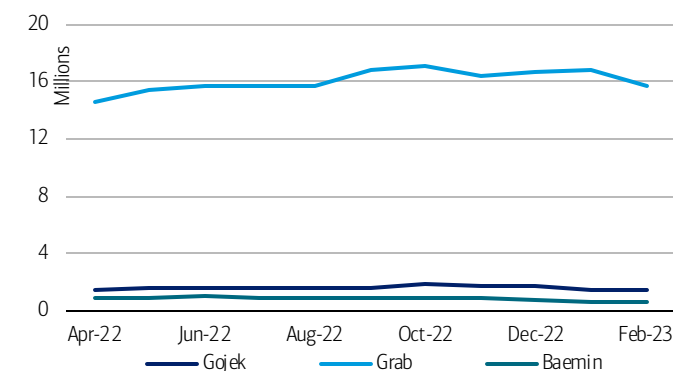


Source: Sensor Tower

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**Exhibit 46: Vietnam – Monthly Active Users (mn)**

Grab maintains leadership position and widens lead

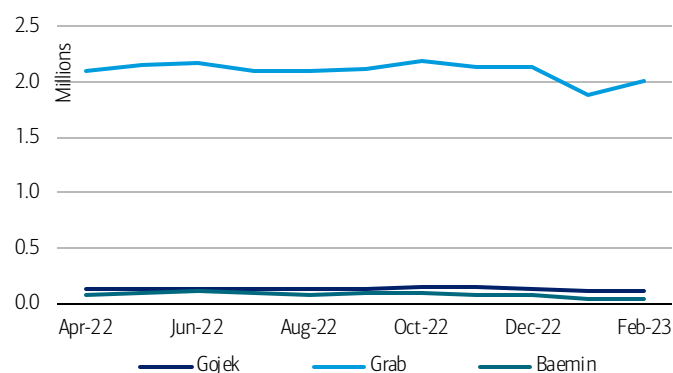


Source: Sensor Tower

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**Exhibit 47: Vietnam – Daily Active Users (mn)**

Grab clear leader in DAUs

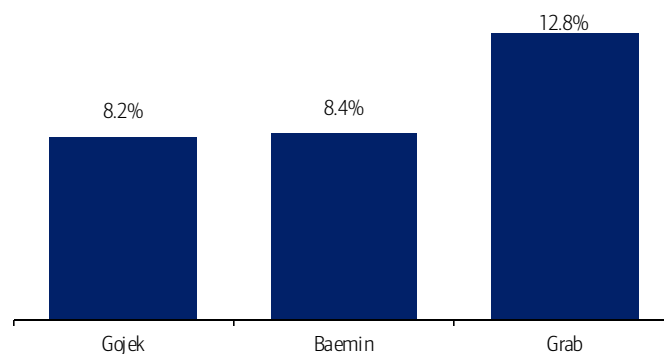


Source: Sensor Tower

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**Exhibit 48: Vietnam – DAU/MAU**

Retention ratio highest for Grab

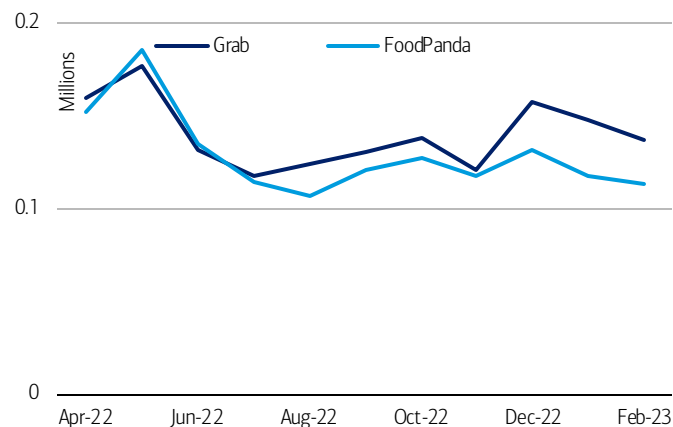


Source: Sensor Tower

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**Exhibit 49: Malaysia - Androids app downloads (mn)**

Despite decline, Grab slightly better placed

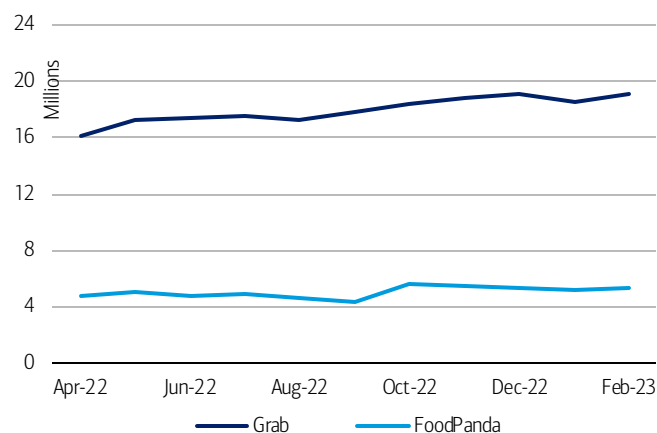


Source: Sensor Tower

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**Exhibit 50: Malaysia - Monthly Active Users (mn)**

Grab widens gap vs Foodpanda

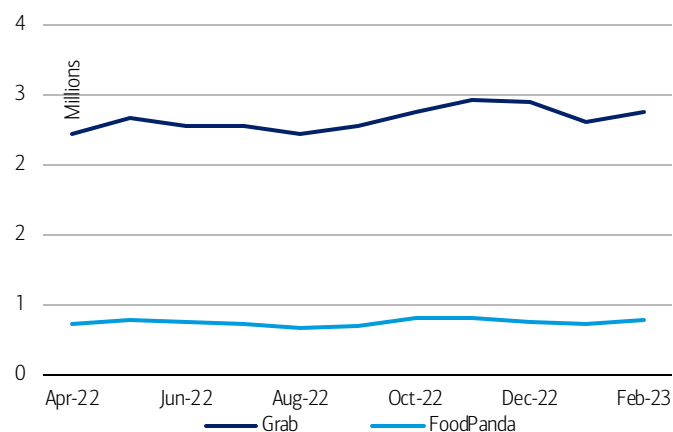


Source: Sensor Tower

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**Exhibit 51: Malaysia - Daily active users (mn)**

Grab leads in DAUs as well

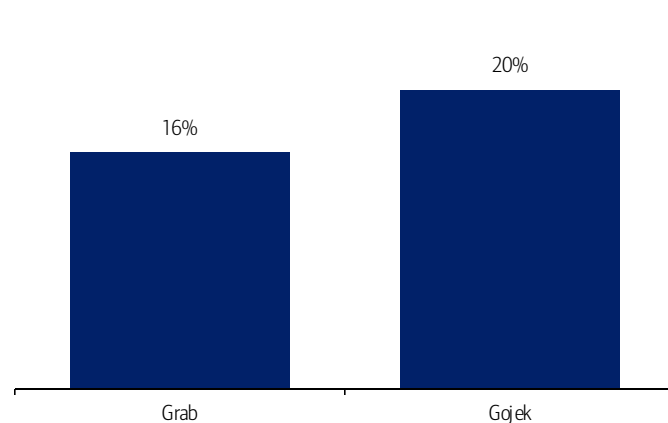


Source: Sensor Tower

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**Exhibit 52: Malaysia - DAU/MAU**

Grab has higher retention than FoodPanda

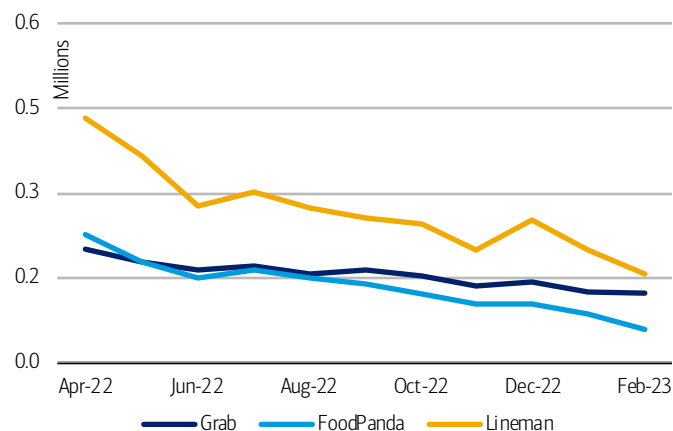


Source: Sensor Tower

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**Exhibit 53: Thailand - Androids app downloads (mn)**

Slight decline in downloads for FoodPanda and Lineman; Grab remains flat

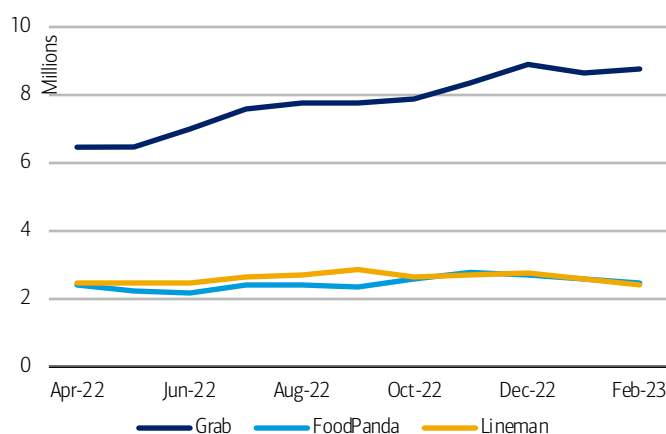


Source: Sensor Tower

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**Exhibit 54: Thailand - Monthly Active Users (mn)**

Grab widens gap; neck-to-neck competition between FoodPanda and Lineman

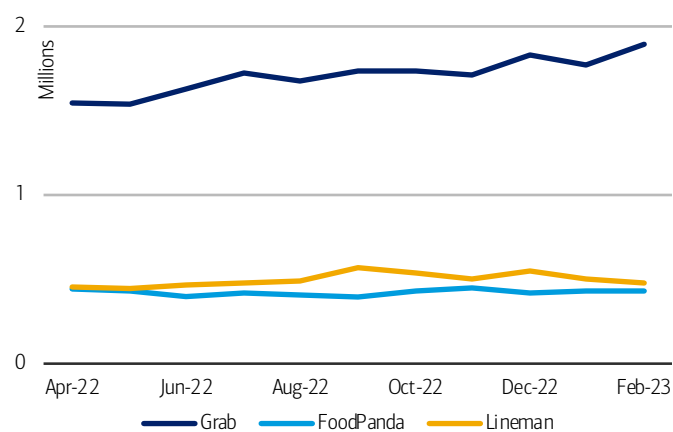


Source: Sensor Tower

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**Exhibit 55: Thailand - Daily active users (mn)**

Grab is the clear leader in DAUs, Lineman and Foodpanda remains flat

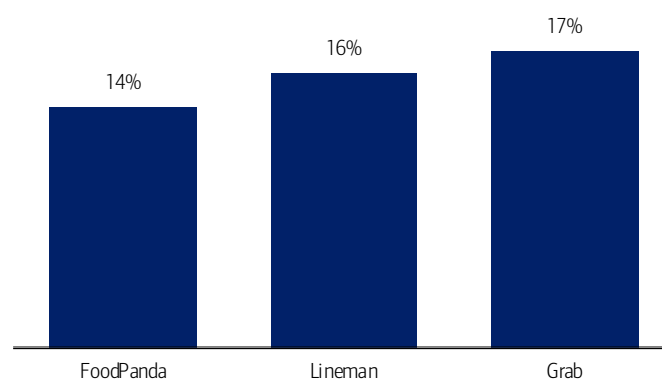


Source: Sensor Tower

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**Exhibit 56: DAU/MAU**

Grab leads in user retention; closely followed by Lineman

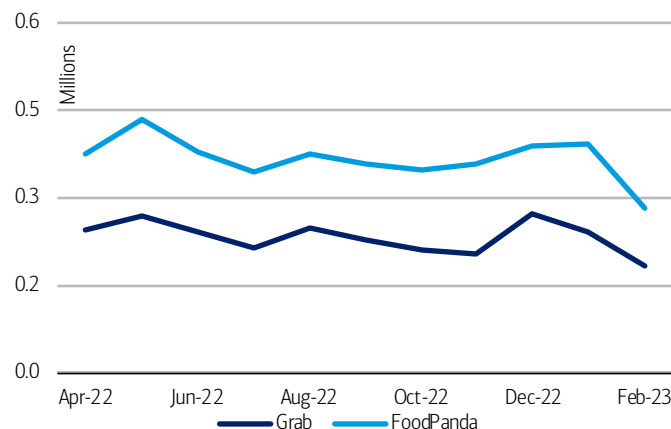


Source: Sensor Tower

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**Exhibit 57: Philippines- Androids app downloads (mn)**

Decline in downloads for both Grab and FoodPanda



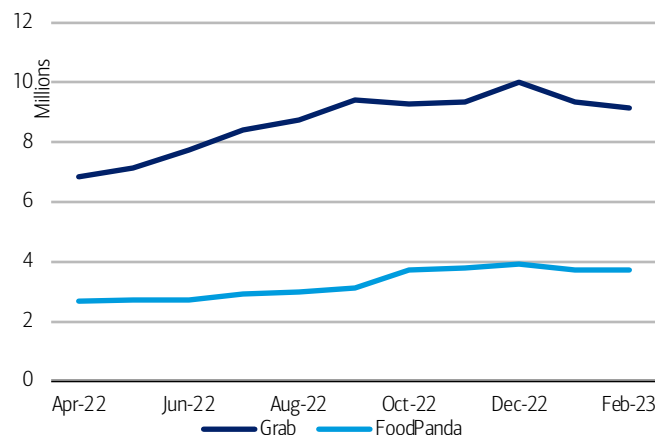
Source: Sensor Tower

\*\* Not directly comparable; FoodPanda is primarily a food delivery platform

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**Exhibit 58: Philippines - Monthly Active Users (mn)**

Grab widens lead in MAUs; MoM growth remains flat

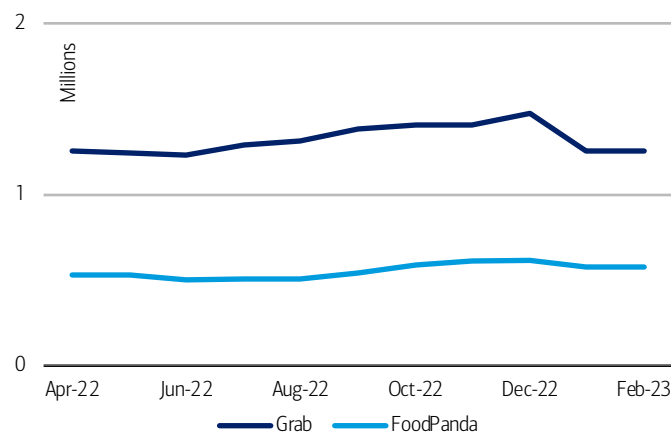


Source: Sensor Tower

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**Exhibit 59: Philippines - Daily active users (mn)**

Despite decline in Jan'23 Grab leads in DAUs

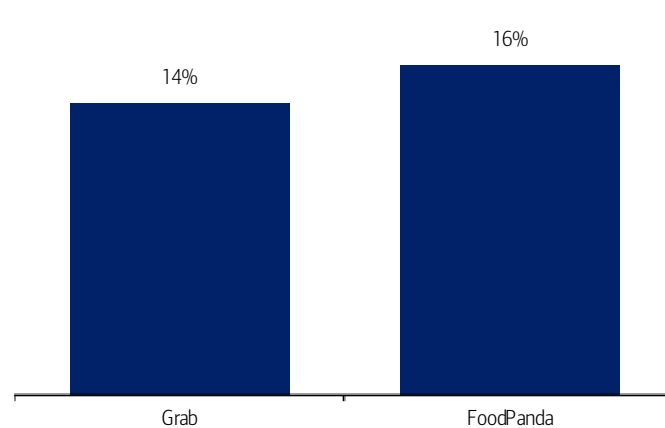


Source: Sensor Tower

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**Exhibit 60: Philippines - DAU/MAU**

User retention highest better for FoodPanda



Source: Sensor Tower

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**Abbreviations:**

MAU: Monthly active users; DAU: daily active users; MoM: Month on month; FF: Free Fire; SVB: Silicon Valley Bank; GMV: Gross merchandise value; G&A: General & admin spends; S&M: Selling & marketing

**Price objective basis & risk****Grab Holdings (GRAB; C-1-9; \$2.84)**

We calculate our \$4.5 PO as the average of DCF and SOTP valuations

SOTP: In this method, we value Grab's delivery and mobility segments on EV/GMV, and financial services on EV/TPV on 2023 numbers. We use 0.5X EV/GMV on 2023 numbers for food delivery and 0.7X EV/GMV on 2023 numbers for mobility given lower TAM and take-rates. For financial services, we use 0.1X 2023 EV/TPV given the nascent stage of business. Our SOTP value is \$3.8.



DCF: As Grab is currently in early stages of its evolution, we expect the company to be EBITDA profitable in 2025 on a consolidated level. We hence use a 10-year DCF to capture the longer-term cash flow when company evolves into a steady-state company. Our WACC and TGR are largely in line with peer internet companies. The TGR of 5% factors sustained growth for Grab given lower penetration of mobility, delivery and fintech services across ASEAN. Our DCF value is \$5.1.

Risks: 1) Potential material stake sale by pre-IPO holders limiting upside, 2) loss of market share in mobility Singapore business impacting overall profitability, 3) higher than expected cash-burn in the financial services, and 4) Adverse 4Q quarter/guidance.

### **Sea Limited (SE; C-2-9; U\$78.29)**

Our PO of USD92 is based on a sum-of-the-parts valuation. We value Garena's gaming business at USD14 per share or 5.5x 2024E EV/EBITDA, which is at a discount to global peers.

The Shopee business is valued at USD63 per share based on 0.4x 2024E EV/GMV (vs 0.3x 2023E EV/GMV earlier) and in our view fairly reflects Shopee's rapid growth, increasingly dominant position in one of the fastest-growing e-commerce regions in the world and optionality in Latin America.

We value its Digital Banking unit at 1x EV/IC (USD2/share) given growth optionality, its SeaMoney digital payments business at 0.05x EV/TPV for 2024E (USD8/share), and Sea Capital PE fund at 1.2x EV/IC (USD2/share).

Upside: 1) faster-than-expected revenue growth with profitability, 2) good traction of more self-developed games

Downside: 1) continued higher losses, 2) higher competition in SE Asia e-com markets, leading to slowing revenue growth.

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

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## APR - Internet, Media and Software Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>				
	Agora	API	API US	Daley Li, CFA
	AiHuiShou	REER	REER US	Joyce Ju
	Alibaba Group	BABA	BABA US	Joyce Ju
	Alibaba Group	BABAF	9988 HK	Joyce Ju
	Alibaba Health	ALBHF	241 HK	Miranda Zhuang, CFA
	Baidu.com	BIDU	BIDU US	Miranda Zhuang, CFA
	Baidu.com	BAIDF	9888 HK	Miranda Zhuang, CFA
	Bilibili	BILI	BILI US	Lei Zhang
	Bilibili	BLBLF	9626 HK	Lei Zhang
	Chinasoft International	CFTLF	354 HK	Paul Dewberry
	Cloud Music	XWJF	9899 HK	Lei Zhang
	Dada Nexus	DADA	DADA US	Lei Zhang
	DBAPPSecurity	XDBAF	688023 CH	Daley Li, CFA
	Dingdong	DDL	DDL US	Joyce Ju
	East Money	XEQTF	300059 CH	Michael Li
	Glodon Company	XGCOF	002410 CH	Daley Li, CFA
	Grab Holdings	GRAB	GRAB US	Sachin Salgaonkar
	Hello Group	MOMO	MOMO US	Lei Zhang
	iQIYI	IQ	IQ US	Lei Zhang
	JD Health	JDHIF	6618 HK	Miranda Zhuang, CFA
	JD.com	JD	JD US	Joyce Ju
	JD.com	JDCMF	9618 HK	Joyce Ju
	JYP Entertainment	ALNNF	035900 KS	Susie Lee
	Kingdee International Software	KGDEF	268 HK	Daley Li, CFA
	Kuaishou	KUASF	1024 HK	Lei Zhang
	Makemytrip Limited	MMYT	MMYT US	Sachin Salgaonkar
	Meituan	MPNGF	3690 HK	Lei Zhang
	Naver Corporation	NHNCF	035420 KS	Susie Lee
	NCSOFT	NCSCF	036570 KS	Susie Lee
	NetEase	NETTF	9999 HK	Lei Zhang
	NetEase, Inc	NTES	NTES US	Lei Zhang
	Nine Entertainment Company	NNMTF	NEC AU	Ware Kuo
	Nykaa	XQQGF	NYKAA IN	Sachin Salgaonkar
	PB Fintech	XPFXF	POLICYBZ IN	Sachin Salgaonkar
	Pinduoduo Inc.	PDD	PDD US	Joyce Ju
	PT Bukalapak.com	BKLPF	BUKA IJ	Sachin Salgaonkar
	PVR Ltd.	PVRLF	PVRL IN	Sachin Salgaonkar
	Qi An Xin	XQTF	688561 CH	Daley Li, CFA
	REA Group	RPGRF	REA AU	Ware Kuo
	Seek Limited	SKLTF	SEK AU	Ware Kuo
	Tencent Holdings	TCTZF	700 HK	Miranda Zhuang, CFA
	Tencent Music	TME	TME US	Lei Zhang
	Tencent Music	XWFWF	1698 HK	Lei Zhang
	ThunderSoft	XSTS	300496 CH	Daley Li, CFA
	Trip.com Group	TCOM	TCOM US	Joyce Ju
	Trip.com Group	TRPCF	9961 HK	Joyce Ju
	Vipshop Holdings	VIPS	VIPS US	Joyce Ju
	Weibo Corporation	WB	WB US	Miranda Zhuang, CFA
	Weibo Corporation	WEIBF	9898 HK	Miranda Zhuang, CFA
	YG Entertainment	XYEIF	122870 KS	Susie Lee
	Yonyou Network	XYNIF	600588 CH	Daley Li, CFA
	YY	YY	YY US	Lei Zhang
<b>NEUTRAL</b>				
	AfreecaTV	WNTHF	067160 KS	Susie Lee
	Autohome	ATHM	ATHM US	Miranda Zhuang, CFA
	Autohome	XXYZF	2518 HK	Miranda Zhuang, CFA
	Baozun	BZUN	BZUN US	Joyce Ju
	Carsales	CSSSF	CAR AU	Ware Kuo
	Coupang	CPNG	CPNG US	Susie Lee
	Delhivery	XDVLF	DELHIVER IN	Sachin Salgaonkar
	Huya	HUYA	HUYA US	Lei Zhang
	HYBE	XBGOF	352820 KS	Susie Lee
	Kakao Corp.	DAUCF	035720 KS	Susie Lee

## APR - Internet, Media and Software Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	KE Holdings	BEKE	BEKE US	Miranda Zhuang, CFA
	KE Holdings	XSQRF	2423 HK	Miranda Zhuang, CFA
	Krafton	XKINF	259960 KS	Susie Lee
	NavInfo	XWLHF	002405 CH	Daley Li, CFA
	Paytm	XUXBF	PAYTM IN	Sachin Salgaonkar
	Plan B Media PCL	XMKTF	PLANB TB	Thititthep Nophaket
	PropertyGuru	PGRU	PGRU US	Sachin Salgaonkar
	Sea Limited	SE	SE US	Sachin Salgaonkar
	Seven West Media	WANHF	SWM AU	Ware Kuo
	The ONE Enterprise	XUFCF	ONEE TB	Thititthep Nophaket
	VGI Public Company Limited	XZQHF	VGI TB	Thititthep Nophaket
	WiseTech Global Limited	WTCHF	WTC AU	Ware Kuo
	XD Inc.	XDNCF	2400 HK	Lei Zhang
	Zomato Limited	XMWRF	ZOMATO IN	Sachin Salgaonkar

## UNDERPERFORM

	Altium Limited	ALMFF	ALU AU	Ware Kuo
	Appen Ltd	APPEF	APX AU	Ware Kuo
	BEC World	XBJHF	BEC TB	Thititthep Nophaket
	CJ ENM	CJHOF	035760 KS	Susie Lee
	Com2uS Corp	XOYAF	078340 KS	Jeehoon Jeong, CFA
	Douyu	DOYU	DOYU US	Lei Zhang
	Indiamart Intermesh Limited	XEITF	INMART IN	Sachin Salgaonkar
	Info Edge	IFOEF	INFOE IN	Sachin Salgaonkar
	Kakao Games	XKKGf	293490 KS	Susie Lee
	Ming Yuan Cloud	XWTAF	909 HK	Daley Li, CFA
	Netmarble	XLGHF	251270 KS	Susie Lee
	Pearl Abyss Corp	XEPAF	263750 KS	Susie Lee
	Ping An Healthcare and Technology	PANHf	1833 HK	Miranda Zhuang, CFA
	Technology One Limited	THNOF	TNE AU	Ware Kuo
	Weimob	WEMXF	2013 HK	Daley Li, CFA
	Xero Limited	XROLf	XRO AU	Ware Kuo
	Zip Co Limited	ZIZTF	ZIP AU	Ware Kuo

## Disclosures

## Important Disclosures

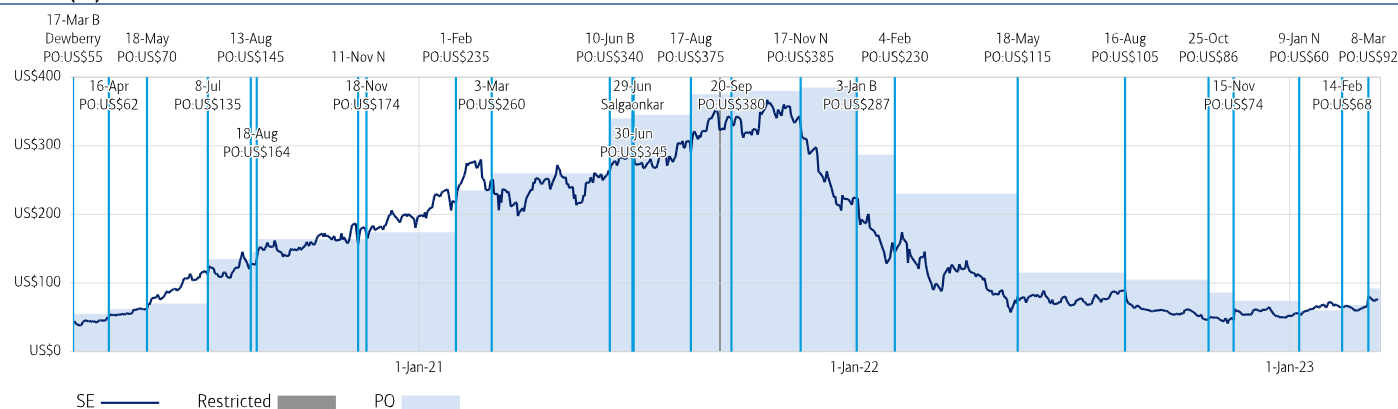
## Grab (GRAB) Price Chart



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

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

## Sea Limited (SE) Price Chart



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

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

## Equity Investment Rating Distribution: Technology Group (as of 31 Dec 2022)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	216	50.35%	Buy	113	52.31%
Hold	119	27.74%	Hold	58	48.74%
Sell	94	21.91%	Sell	31	32.98%

## Equity Investment Rating Distribution: Global Group (as of 31 Dec 2022)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	1853	52.58%	Buy	1040	56.13%
Hold	840	23.84%	Hold	493	58.69%
Sell	831	23.58%	Sell	404	48.62%

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

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

<sup>R2</sup> Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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