Global Technology

Sustainable CSP capex to support AI trend through FY28e

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- CSP capex trend is intact to support sustainable AI trend and semi supply chain earnings
- Our scenarios show that sustained CSP capex momentum to FY28e could be achieved with justifiable leverage
- Reasonable ROIC for CSPs even in scenarios assuming additional debt to fund incremental capex

Semi earnings should be intact given the sustainable CSP capex trend: Despite recent bullish capex and capacity expansion announcements by semi supply chain stalwarts like TSMC,Intel,and ASML,market concerns have emerged over CSP capex peaking given that most hyperscalers'free cashflow generation could turn negative in FY27.This has increased market focus on hyperscalers generating positive ROIC from their heavy investments.As a result,the SOX index is-16% (vs S&P 500+3%)since 1 July.However,we believe hyperscalers'capex trend remains sustainable with acceptable leverage and ROIC going forward to support semi supply chain capex guidance,as well earnings growth expectations.

Room for upside to FY27-28 CSP capex as increased leverage is justifiable: As per consensus;1)collective CSP capex growth willdecelerate from 95%y-0-y in 2026e(USD731bn)to 46%in 2027e(USD1.1trn)and 11%in 2028e(USD1.2trn); and 2)CSPs will start to see negative free cash flow starting from FY27.We perform a scenario analysis to see how much incremental debt CSPs need to raise to exceed consensus FY27-28 capex forecasts.Our scenario implies a net debt/equity ratio of 8-30%to meet potential FY27e capex of USD1.0-1.6trn or capex growth of 37-119% y-o-y.In FY28e,the net debt/equity ratio would need to increase to 25-43%to meet potential capex of USD1.9-2.5trn or capex growth of 46-92%y-o-y(assuming FY27e capex of USD1.3trn based on Case II in our FY27e scenario).

Overall CSP ROIC declining but still acceptable to support capex trend: Another concern investors have with the significant CSP capex trend is the ROIC(return on invested capital)that CSP players would generate.Based on consensus estimates, we see overall CSP ROIC declining from 35%in FY24e to 22%in FY26.However,we expect that CSP ROIC could remain at 22%and 21%in FY27 and FY28,respectively, based on consensus capex,or contract to 19%in FY27 and 17%in FY28e based on our scenarios,which we believe is still acceptable to support the ongoing capex trend.

Overall AI semi trade and earnings visibility are intact:We conclude that CSPs fundamentally have more room to raise debt without signifcantly compromising their ROIC to fund the ongoing capex trend.Therefore,semiconductor companies could see sustained growth to 2028e and market concerns about funding issues at CSPs for continued capex expansion seem overdone in our view.We do not see any significant earnings downside to the overall AI semi supply chain in FY27 and into FY28.Our top AI semi names remain Marvell,Intel,TSMC,and ASML given company specific drivers that should continue to surprise the market on the upside into FY27e.

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Ratings and target prices

Company	Ticker	Currency	Current price	TP	Rating	Implied upside	Mkt cap USDm	EPS growth FY26e	EPS growth FY27e
TSMC	2330 TT	TWD	2,380.00	3,400.00	Buy	43%	1,913,413	63%	28%
Intel	INTC US	USD	97.52	200.00	Buy	105%	491,891	245%	70%
Marvell	MRVL US	USD	208.56	300.00	Buy	44%	182,650	80%	44%
ASML	ASML NA	USD	1,513.80	2,149.00	Buy	42%	678,241	63%	43%
Alphabet	GOOGL US	USD	357.52	420.00	Buy	17%	4,280,539	91%	-27%
Amazon	AMZN US	USD	278.09	310.00	Buy	11%	2,999,567	77%	-19%
Microsoft	MSFT US	USD	506.06	595.00	Buy	18%	3,757,772	24%	19%
Meta	META US	USD	594.92	830.00	Buy	40%	1,515,932	34%	11%
Oracle	ORCL US	USD	151.05	316.00	Buy	109%	435,095	27%	6%

Source:HSBC estimates, Bloomberg. Priced at close of 10 Aug 2026

Market concerns despite bullish semi demand outlook

With demand and supply for traditional AI use cases stillnot in equilibrium,agentic AI came to the fore earlier this year.The unprecedented surge in demand for server CPUs-a primary enabler of agentic AI use cases-has widened the demand/supply gap further.As a result,key semi players like TSMC,Intel,and ASML provided enhanced visibility around their capacity expansion plans through 2028e during their June-Q financial results.

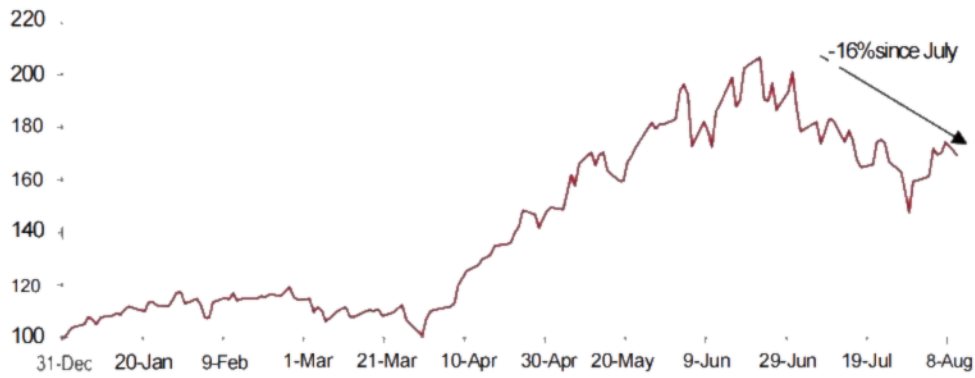
- **TSMC:**At its 2Q26 results announcement(16 July,*Increasing CAPEX reiterates LT demand confidence*),TSMC raised its FY26e capex guidance from the high-end of USD52-56bn,to USD60-64bn.While TSMC did not provide any capex guidance beyond FY26,it announced an incremental USD100bn capital investment in Arizona,US,on top of the previously announced USD165bn.TSMC also acknowledged that its 2nm capacity could expand at a CAGR of >70%through FY26-28(vs our pre-2Q26 result estimate of 55%).

- **Intel:** At its 2Q26 results announcement(24 July,*Another beat &raise;enhanced foundry confidence*),Intel raised its FY26e capex guidance to>USD20bn from previous guidance of USD17.7bn(with tool spending up 40%y-0-y)vs pre-2Q26 result consensus estimates of USD15bn.Intel acknowledged that its FY27e capex willcontinue to increase further.

- **ASML:**In its 2Q26 results announcement (16 July,*ASML opens the lithography tool spigot*),ASML announced plans to increase capacity for EUV tools by 30%in FY27e and investigating increasing EUV capacity by a further 30%in FY28e.This implied low NA EUV tool capacity of 110 tools in FY28e vs consensus estimates(pre-2Q26 results)of 89 tools. ASML acknowledged that its capacity increase guidance follows the strong end market demand dynamics,which has motivated its customers to not only increase their capex,but also accelerate their plans.

Despite the enhanced capacity addition plans suggesting strong demand visibility through FY28e,the market's reaction was underwhelming.It was reported(Bloomberg,July 1)that Meta Platforms is planning to launch a new cloud computing business to monetise its large surplus AI infrastructure.The revelation that a major hyperscaler already has "excess"capacity led investors to fear that the aggressive capex cycle-which has fuelled record gains for semiconductor providers-may be nearing a peak.As a result,the SOX index has traded -16% (vs S&P 500+3%)since 1 July.

Exhibit 1:SOX index performance YTD



Source:FactSet

Exhibit 2:Hyperscalers free cash flow

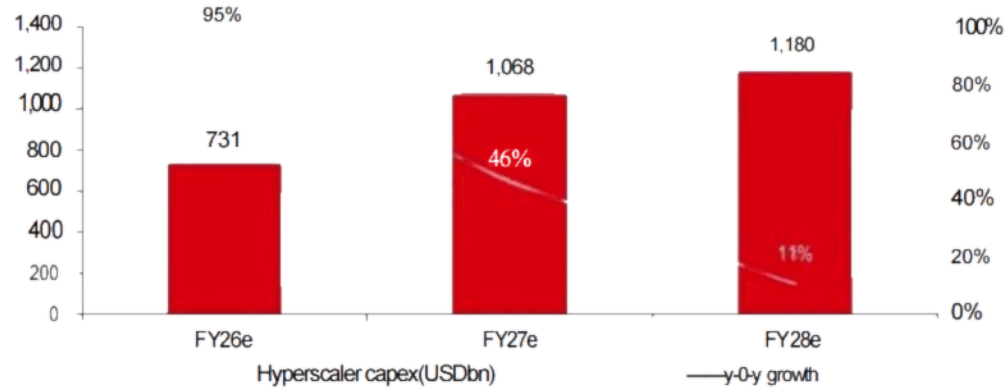
(USDbn)	FY25	FY26e	FY27e	FY28e
Google	73	6	(26)	3
Amazon	11	(13)	(29)	28
Microsoft	44	(3)	(27)	(7)
Meta	72	67	26	37
Oracle	(0)	(24)	(48)	(42)
Total free cash flow	199	34	(104)	18

Source:VisibleAlpha consensus estimates, companydata

CSPs could fund incremental capex with justifiable leverage

According to Visible Alpha consensus estimates,the capex growth for hyperscalers will significantly decelerate from 95%in FY26e to 11%in FY28e.Apart from the concerns of hyperscalers'capex peaking,investors have also been unsure about the hyperscalers ability to fund any incremental capex without materially deteriorating ROIC.

Exhibit 3:Hyperscalers'capex—consensus estimates



Source:Visible Alpha consensus estimates

Note:Hyperscalers include Alphabet, **Amazon**,Microsoft and Meta

Exhibit 4:Consensus estimates for hyperscalers'capex

(USDbn)	FY25	FY26e	FY27e	FY28e
Alphabet	91	202	302	340
Amazon.com	129	218	283	296
Meta Platforms	70	140	196	216
Microsoft	65	116	194	223
Oracle	21	56	93	106
Total capex	**376**	731	1,068	1,180
y-o-y		95%	46%	11%

Source:Visible Alpha consensus estimates

We perform a scenario analysis wherein we analyse the potential for hyperscalers to raise incremental debt to fund incremental capex and its impact on their leverage ratios.We assume incremental debt as the funding source beyond the operating cash flow as current debt on balance sheet would already be deployed elsewhere.For our scenarios,we look at hyperscalers as a group and not individually,including the top five hyperscalers-Alphabet, Amazon,Microsoft,Meta,and Oracle.

For FY27e,we perform three scenarios assuming hyperscalers raise the required debt to fund capex of USD1.0-1.6trn.With operating cash flow estimates of USD962bn,incremental debt of USD38-638bn would need to be raised to fund the capex.This would drive the net debt/equity ratio to 8-30%vs the current leverage ratio of 7%according to consensus estimates.The USD1.0-1.6trn capex would imply y-0-y growth of 37-119%vs current consensus estimate of 46%y-0-y growth.

Exhibit 5:Scenarios-debt raised and impact on leverage to fund higher CSP capex in FY27e

(USDbn)	CaseI	CaseII	CaseIII
Operating cash flow			
Alphabet	274	274	274
Amazon.com	251	251	251
Meta Platforms	172	172	172
Microsoft	219	219	219
Oracle	45	45	45
Total operating cash flow	962	962	962
Incremental debt	38	338	638
Total fund for capex	**1,000**	**1,300**	**1,600**
y-0-y vs 2026 consensus capex	37%	78%	119%
Net debt			
Alphabet	(102)	(102)	(102)
Amazon.com	111	111	111
Meta Platforms	52	52	52
Microsoft	(15)	(15)	(15)
Oracle	147	147	147
Total net debt before incremental debt	193	193	193
ncremental debt	38	338	638
Total net debt including incremental debt	231	531	831
Shareholder equity			
Alphabet	947	947	947
Amazon.com	747	747	747
Meta Platforms	415	415	415
Microsoft	554	554	554
Oracle	69	69	69
Total shareholder equity	2,733	2,733	2,733
Total net debt to equity	**8%**	**19%**	**30%**

Source:Visible Alpha consensus estimates,HSBC estimates

For FY28e,we perform three scenarios assuming hyperscalers raise the required debt to fund capex of USD1.9-2.5trn.With operating cash flow estimates of USD1.2trn,incremental debt of USD698-1.3trn would need to be raised to fund the capex.This would drive the net debt/equity ratio to 25-43%vs the current ratio of 5%according to consensus estimates.The USD1.9-2.5trn capex would imply y-0-y growth of 78-134%vs FY28e consensus capex estimates of 11%y-0-y growth.However,if we assume FY27e capex of USD1.3trn based on Case II of our scenario, y-0-y growth would be 46-92%.

Exhibit 6:Scenarios-debt raised and impact on leverage to fund higher CSP capex in FY28e

(USDbn)	CaseI	CaseII	CaseIII
Operating cash flow			
Alphabet	344	344	344
Amazon.com	318	318	318
Meta Platforms	213	213	213
Microsoft	260	260	260
Oracle	66	66	66
Total operating cash flow	1,202	1,202	1202
Incremental debt	698	968	1,298
Total fund for capex	**1,900**	**2,200**	**2,500**
y-0-y vs 2027 consensus capex	78%	106%	134%
y-0-y vs 2027scenario (case II)Capex	16%	68%	92%
Net debt			
Alphabet	(102)	(102)	(102)
Amazon.com	60	60	60
Meta Platforms	57	57	57
Microsoft	(21)	(21)	(21)
Oracle	179	179	179
Total net debt before incremental debt	169	169	169
Incremental debt	698	968	1,298
Total net debt including incremental debt	868	1,168	1,168
Shareholder equity			
Alphabet	1,192	1,192	1,192
Amazon.com	922	922	922
Meta Platforms	531	531	531
Microsoft	688	688	688
Oracle	86	86	86
Total shareholder equity	3,423	3,423	3,423
Total net debt to equity	**25%**	**34%**	**43%**

Source:Visible Alpha consensus estimates, HSBC estimates

We believe the most bullish leverage ratio of 43%is justifiable in this intensive AI investment phase.We also acknowledge that enhanced earnings,higher operating cash flows,and equity funding could reduce the need for additional debt.

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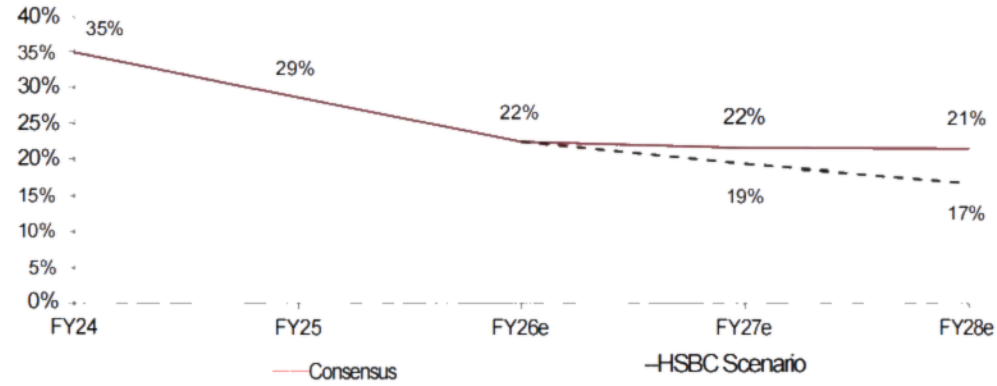
ROIC holds up even with CSP capex surge

To close the debate around negative or low returns on increased hyperscalers'capex,we further look at the ROIC of the hyperscalers prior and post raising incremental debt as per our scenarios.Given the lack of clear disclosures around specific CSP AI revenues,we have looked at the overall ROIC of the entire company given that most capex is AI related.

With increasing capex,the ROIC of hyperscalers declined from 35%in FY24 to 29%in FY25. According to consensus estimates,the ROIC is expected to be 22%in FY26e and FY27e;and 21%in FY28e.

In our scenario,assuming increased capex is equal to the amount in Case II of our scenarios, which assumes USD1.3tm and USD2.2trn in FY27e and FY28e,the FY27e ROIC drops from 22%to 19%and FY28e ROIC drops from 21%to 17%.We believe the returns are strong enough to dismiss concerns about negative ory low returns(see our 6 August report, *Cloudnomics-Benchmarking analysis reveals risk and valuation difference* for our latest benchmarking analysis on underlying CSP revenue and returns).

Exhibit 7:Hyperscalers ROIC-as per consensus vs HSBC scenarios



Source:Visible Alpha consensus estimates,HSBC estimates

Exhibit 8:ROIC for hyperscalers-individually and as a group

	FY24	FY25	FY26e	FY27e	FY28e
Alphabet	45%	32%	23%	25%	23%
Amazon.com	25%	19%	15%	16%	17%
Meta Platforms	48%	38%	30%	24%	22%
Microsoft	35%	34%	30%	27%	26%
Oracle	21%	19%	15%	13%	15%
ROIC for hyperscalers	35%	**29%**	**22%**	**22%**	**21%**

Source:Visible Apha consensus estimates

We believe the hyperscalers stillhave meaningful headroom to increase leverage to finance additional capex,without materially diluting returns on invested capital(ROIC).In other words, their balance sheets appear sufficiently robust to support incremental debt-funded investment while maintaining disciplined capital efficiency.

Against this backdrop,the semiconductor sector could continue to benefit from sustained demand and growth through FY28e,supported by ongoing CSP infrastructure buildouts.As a result,current market concerns that CSPs may face funding constraints that could slow or halt further capex expansion look overstated,in our view,given their capacity to access debt markets without undermining investment returns.

Valuation and risks

		Valuation	Risks
TSMC **2330 TT** **Buy**	Current price: TWD2,380.00 Target price: TWD3,400.00 Up/downside: +42.9%	**Methodology**:Our target price of TWD3,400 is derived by applying a target P/E multiple of 25x to our FY27e EPS of TWD137.29.We believe our target P/E multiple of 25x is reasonable as TSMC's pricing power has never been as strong as **now**,due to strong AI demand and higher incentives for TSMC to adjust pricing to reflect higher costs.With c43%implied upside,we maintain our Buy rating. Our target price for the ADR TSM US,USD418.47 as of the close of 10 Aug)is USD632.19,which is based on a 5:1 share conversion,HSBC TWDUSD forecast of 32.0,and one-year average share price premium of 19% We believe the trading premium on the ADR is justified given TSMC's active capacity expansion plan(additional USD100bn)in Arizona,US. **Frank Lee*** |frank.lee@hsbc.com.hk|+85229966916	**Downside risks:**1)weaker-than-expected 5nm orders; 2)intensified US-China trade tensions and tighter restrictions on shipments to companies with businesses related to mainland China region;3)slower ramp-up of advanced node production and yield rates,and 4)higher depreciation costs from investing in advanced nodes
Intel Corp **INTC US** **Buy**	Current price: USD97.52 Target price: USD200.00 Up/downside: +105.1%	**Methodology:** PE-based SOTP **Assumptions**:Target FY27e P/E multiple of 30x(based on 2SD above the historical average P/E)applied to our core business 2027e EPS of USD4.25 implying core business value of USD125. Target FY27e P/B of 3.1x(in line with second tier foundries) applied to foundry BVPS of USD24.42 implying foundry business value of USD75.00. More details on valuation methodology *here*. **Frank Lee***|frank.lee@hsbc.com.hk|+85229966916	**Downside risks**:1)Worse-than-expected server CPU unit shipments;2)weaker-than-expected server CPU pricing hike;and 3)higher margin dilution due to foundry ramp.
Marvell **MRVL US** Buy	Current price: USD208.56 Target price: USD300.00 Upldownside: +43.8%	Methodology:FY28e target P/E multiple. Assumptions:Target FY28e P/E of 42x applied to FY28e EPS of USD7.13. Our 42xFY28e target P/E multiple is the multiple between 2SD above the three-year historical average and the peak P/E multiple (45x).Marvell trades at c29xFY28e P/E based on our EPS estimates,between the three-year historical average and 1SD above three-year historical average.We believe the optical interconnect revenue opportunity is still severely underestimated by the market and there could be significant earnings upside surprise driven by stronger-than-expected optical interconnect revenue growth.In addition,we think CXL demand is also underestimated,hence we expect Marvell o re-rate higher than 2SD above the 3-year historical average PE and towards the peak PE multiple. Frank Lee*|frank.lee@hsbc.com.hk|-85229966916	Downside risks Slower-than-expected growth of optical transceivers market. Higher-than-expected market share loss in DSPs. Delays in ASIC projects.

	Valuation	Risks
ASML **ASML NA** **Buy**	Current price: EUR1,513.80 Target price: EUR2,149.00 Up/downside: +42.0%	**Methodology**:Multiples-based valuation.Forward P/E multiple of 27.5xapplied to our 2028e EPS estimate **Assumptions**:Our target multiple is at a 20%discount to the historical average forward 12-month P/E of 33.2x.We see this as fair given low visibility on growth beyond 2028,and after the 306% EPS growth we model over 2024-28e,we cannot rule out a growth slowdown in 2029 until visibility improves. Our TP implies 2027e P/E of 37.4x,in the upper halfof the historical P/E range of 22-50x,and c13%premium to the five year average.Given the strong demand backdrop and growth we expect to 2028,we see this premium as warranted,and we reiterate our Buy rating. **Secondary listing:** For the ADRs(ASMLN,USD1,733.48),we caculate a target price of USD2,471.00,based on a EURUSD spot exchange rate of 1.15 and an ADR share conversion ratio of 1 to 1.	**Downside risks** Ongoing trade and tariff tensions and slower-than expected macroeconomic/AI trends leading to weaker demand in 2026/27 than we expect and a weaker demand improvement post 2027 than we currently model. Slower transition in technology at some customers leading to lower demand for ASML's tools. Lower-than-expected profitability driven by inflationary cost increases or tariff-related pricing pressures. Supply disruptions. Slower adoption of high NA EUV tools,without any offsetting increase in adoption of low NA tools. Higher impact than we expect from geopolitical risks leading to downside to expectations.

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Alphabet **GOOGL US** **Buy**	Current price: USD357.52 Target price: USD420.00 Up/downside: +17.5%	**Methodology**:We use an SOTP analysis to reach our target price of USD420,based on peer group multiples.Our TP implies c18% upside.We rate Alphabet a Buy as we see scope for further margin expansion alongside our positive view across both Search,Cloud and YouTube.We see Alphabet as being wellplaced to deal with market shocks. More details on valuation methodology here.	**Downside risks** Google Search losing meaningful query market share Google Cloud failing to win further contracts and reaching a lower market share than expected Price war within cloud server providers market-impacting margins Adverse FX scenarios Chasing growth,including expensive M&A Limited valuation support.

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Amazon **AMZN US** **Buy**	Current price: USD278.09 Target price: USD310.00 Up/downside: +11.5%	**Methodology**:We use a DCF-based sum-of-the-parts(SOTP)to value Amazon. **Assumptions:** We assume a WACC of 8.0%with a cost of equity at 9.1%.This is based on a risk-free rate of 4.25%,equity risk premium of 4.0%,and company-specific beta of 1.32(all unchanged). Our target price of USD310.00 implies c12%upside,and we have a Buy rating,supported by continued upside potential from the AWS,N.America,and International businesses in the short, medium,and long-term supported by an increase in theinvestment /capex run rate and early stage of the cloud and AI cycles.	**Downside risks** ◆ Incremental macro-/tariff-induced weakness. ◆ Slower-than-expected recovery in growth/margin ◆ Escalation of regulatory risk Chasing growth including expensive M&A Limited valuation support

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Microsoft **MSFT US** **Buy**	Current price: USD506.06 Target price: USD595.00 Up/downside: +17.6%	**Methodology**:Our TPof USD595 is based on 29xour NTM non-GAAP EPS estimate of USD20.51. **Assumptions:** We conservatively use the same P/NTM multiple as the average over the past five years,even though we expect strong Azure growth to drive an even higher EPS CAGR for Microsoft going forward than was realized historically.	**Downside risks:**Higher-than-expected competitive intensity,weaker-than-expected stock market or macroeconomic environment,adverse regulatory action, higher than expected competitive pressures in the GPT cloud space,default by major customers (particularly AI labs),and cybersecurity risks

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		Valuation	Risks
Meta Platforms **META US** Buy	Current price: USD594.92 Target price: USD830.00 Up/downside: +39.5%	**Methodology:**FY27e target P/E multiple. **Assumptions:**Target FY27e P/E of 19.0x(slightly lower than the global peer average of 21x, to account for growing capital requirements and product execution risks)applied to our FY27e non-GAAP EPS estimate of USD46.00;to this we add a regulatory risk discount of 5%given the considerable pressure on the company. Our TP of USD830 implies c40%upside and we therefore retain our Buy rating. Advertising activity remains strong, supported by AI.	**Downside risks:** ◆ Regulatory action that prevents Meta from leveraging data from its large user base to feed its AI models in certain regions Higher competition in the advertising market if AI tools at Meta become relatively less efficient Higher-than-anticipated capex intensity to fuel AI development

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Oracle **ORCL US** Buy	Current price: USD151.05 Target price: USD316.00 Upldownside: 109.2%	**Methodology:**Target PEG **Assumptions:**We use a target PEG of 1.75x(in line with major peers in the sector), along with our long-term non-GAAP EPS CAGR of 22.3%and next 12-month non-GAAP EPS estimate of USD8.11 to arrive at our target price of USD316.0ur TP implies c109%upside and we maintain our Buy rating.	**Downside risks:**Unfavourable stock market and m acroeconomic conditions;higher-than expected co mpetitive pressures;potential negative impact from an ex ternal IT hack;cloud infrastructure outage;and disruption d ue to management turnover

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