

# **Europe Banks**

# Fintech 2.0: Latest funding dynamics and bank digital transformation efforts

Fintech funding levels have remained subdued as 2024 stands out as the lowest year of global fintech fundraising since 2018; funding fell c.5% y/y to \$54bn, down 72% on a 3-year view vs. the peak activity levels seen in 2021 (\$191bn). Among major geographies, the decline vs. peak funding levels seen in 2021 was broad based across China, Europe and the US, with China fundraising down to just \$16mn in 2024 (vs. \$3.9bn in 2021), and US and Europe declining by ~70%. While in 2022, the contraction in availability of capital to private fintech companies was mirrored by a reset in public market valuations, more recently, in 2024, we have seen a recovery in public market valuations (.KFTX up c.+35% y/y in 2024), which in our view could be a positive lead indicator to potential funding activity.

We note that even though private fintech companies are facing a difficult fundraising landscape, incumbent banks are advantaged by virtue of sustained organic capital generation and strong capital positions, which in turn supports their ability to self-fund neobank build-outs and invest in digital transformation capabilities. In addition to the ongoing development of in-house neobanks, European banks continue to enter partnerships and make selective investments in order to support their digital transformation efforts. From enhancing existing capabilities to offering new and improved functionalities, these smaller tech-focused partners enable banks to improve their operational efficiency metrics, complementing their in-house platforms and products.

From a regulatory standpoint, the ECB Banking Supervisors, as part of their latest 2024 Supervisory Review and Evaluation Process (SREP), highlight that they continue to assess banks' progress in digitalisation and track how they identify and mitigate any related risks. Furthermore, as a part of their medium-term strategy, they have set three priorities for 2025-27, and one of these is for banks to remain focused on strengthening their digitalisation strategies and tackle any emerging challenges stemming from the use of new technologies.

Overall, these latest dynamics reinforce our view that a confluence of cyclical and structural factors is driving a step change in competitive dynamics and corporate strategy — towards a Fintech 2.0 landscape for European Financials (see: <u>European</u>

#### Chris Hallam

+44(20)7552-2958 | chris.hallam@gs.com Goldman Sachs International

#### Benjamin Caven-Roberts

+44(20)7552-7066 | benjamin.d.cavenroberts@gs.com Goldman Sachs International

#### **Andin Kour Sason**

+1(332)245-7825 | andin.kour@gs.com Goldman Sachs India SPL

#### Patrik Nilsson

+44(20)7774-6019 | patrik.nilsson@gs.com Goldman Sachs International

#### Guangyan Wei

+44(20)7051-1167 | guangyan.wei@gs.com Goldman Sachs International

#### Sachin Nayar

+44(20)7051-2598 | sachin.x.nayar@gs.com Goldman Sachs International

Goldman Sachs does and seeks to do business with companies covered in its research reports. As a result, 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. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to <a href="https://www.gs.com/research/hedge.html">www.gs.com/research/hedge.html</a>. Analysts employed by non-US affiliates are not registered/qualified as research analysts with FINRA in the U.S.

<u>Banks - Adjusting to Fintech 2.0</u>, September 2022). Banks now operate with large capital buffers, generating significant organic capital which enables them to play a much more active role in the evolution of the Fintech industry in Europe through a variety of channels including their own build-outs.

# 2024 fintech funding dynamics

### Fintech funding levels remain subdued in 2024 as well...

2022 was a reset year for fintech funding as we saw a decline in the availability of equity and debt capital to private fintech companies. This dynamic continued into 2023 and was even more pronounced in 2024, which stands out as the lowest year of global fintech fundraising since 2018. **Fintech funding in 2024 fell 5% y/y to c.\$54bn, down 72% on a 3-year view vs. peak activity levels seen in 2021 (\$191bn),** Exhibit 1. However, if we exclude the \$6.5bn Stripe deal in the payments space (which contributed 36% of the total fundraising in Q1 2023), the funding levels in 2024 were actually up c.7% y/y vs. 2023.

Among major geographies, the decline vs. peak funding levels seen in 2021 was broad based across China, Europe and the US, with China fundraising down to just \$16mn in 2024 (vs. \$3.9bn in 2021), and US and Europe declining by ~70%. Moreover, Europe has seen a decrease in its global market share to c.20% of global fintech funding in 2024, vs. 2023 levels of c.30% (Exhibit 3). In terms of deal size, large deals continued to decline for the third year in a row, with deals >\$100mn down 27% y/y (Exhibit 4) while sub-\$100mn deals saw a +50% improvement vs. 2023 to reach \$24.3bn. As a result, larger deals have lost their share as a % of total after witnessing a decline in 2024 (55% in 2024 vs. 72% in 2023, Exhibit 5), albeit still accounting for >50% of annual deal activity.

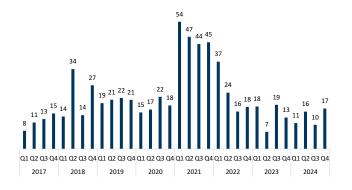
### ...with public market valuations starting to see a recovery since the start of 2024

In 2022, the slowdown in fintech funding was mirrored by a reset in public market valuations — with a 51% reduction y/y in total fintech funding compared to a 53% peak-to-trough move in the Nasdaq Fintech Index (.KFTX) in 2022. This trend continued in 2023 as well, with muted fintech funding levels vs. history and no material recovery in valuations. Recently, however, public market valuations have been rising since the start of 2024, with .KFTX staging a clear recovery, up c.35% in 2024 and c.70% to date vs late October 2023 trough levels, albeit with some fluctuations ytd (Exhibit 7).

We view these improved public market valuations as a positive lead indicator for potential funding activity, which looks set to see some improvement starting this year (similar to how 2020-21 recorded a two-three quarter lag between valuations picking up and funding levels rising), particularly as this coincides with the expectation of a broader reopening and increase in activity levels across debt and equity capital markets. However, it is clear that funding activity levels have yet to show any signs of a nascent recovery, while at the same time incumbent banks are pressing ahead with their own Fintech investment strategies (funded by organic capital generation and excess capital buffers).

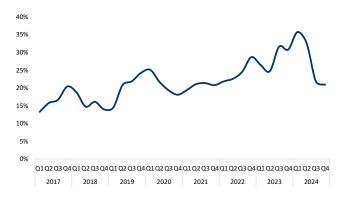
# Exhibit 1: 2024 saw the lowest level of global fintech fundraising since 2018...

Global Fintech fundraising per quarter (\$bn)



Source: CB Insights, Data compiled by Goldman Sachs Global Investment Research

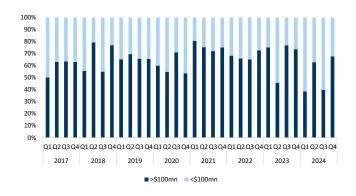
# Exhibit 3: ...and accounting for c.20% of total global funding European fintech deals as % of total



Source: CB Insights, Goldman Sachs Global Investment Research

# Exhibit 5: ...albeit still accounting for >50% of the total capital raised in 2024

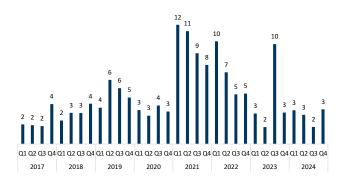
Big (>\$100mn) vs. small (<\$100mn) deals mix (%) for global fintech funding 2017-2024



 $Source: CB\ Insights,\ Data\ compiled\ by\ Goldman\ Sachs\ Global\ Investment\ Research$ 

# Exhibit 2: ...with European fundraising in particular down c.70% vs. peak levels in 2021...

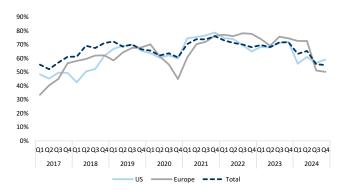
European Fintech fundraising per quarter (\$bn)



Source: CB Insights, Data compiled by Goldman Sachs Global Investment Research

# Exhibit 4: Larger deal activity slowed across US, Europe and China, and lost share as a % of total fundraising...

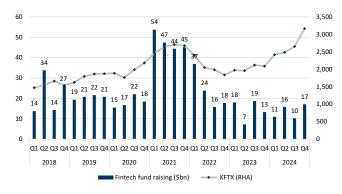
Fintech deals >\$100mn as % of total



Source: CB Insights, Goldman Sachs Global Investment Research

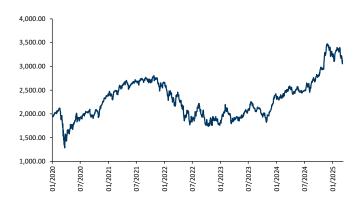
# Exhibit 6: Fundraising activity continued to decline for the third year in a row...

Global fintech deal funding (\$mn) 2018- 2024. Nasdaq Fintech Index (.KFTX, RHA)



Source: CB Insights, Thomson Reuters Eikon, Data compiled by Goldman Sachs Global Investment Research

Exhibit 7: ...despite a recovery in public market valuations in 2024 Nasdaq Fintech Index (.KFTX)



Source: Thomson Reuters Eikon

### 2024 saw a continued contraction in equity funding levels

2024 witnessed a continued contraction in fintech funding levels across the globe, with a more notable decline in equity fundraising, which was down c.10% in 2024 vs. debt fundraising which remained broadly stable at \$22bn. Furthermore, the funding mix shift dynamic from equity to debt which we highlighted in our 2023 report, Fintech 2.0:

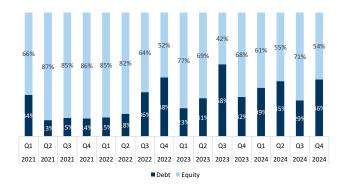
Shifting Sands in Funding Markets, continued even in 2024. In 2021, funding was split 80/20 equity/debt; in H2'22, this mix started to shift to 60/40, reflecting the broader strategy shift enforced on fintech companies by changing capital market conditions, i.e. that highly cash-consumptive growth was no longer a feasible strategy for many fintechs. For FY24, the share of debt in total funding remained closer to 40% levels. However, we also note that it may be too soon to call a shift in the narrative of debt gaining share, when the overall fundraising levels have contracted sharply.

Exhibit 8: We continued to see a slowdown in equity deals in 2024, while debt funding levels remained broadly stable y/y...

Debt vs. equity funding (\$bn 2021-2024)

Exhibit 9: ...accounting for c.40% of the total funding share Debt vs. equity funding mix (%) for global fintech funding, 2021-2024





Source: CB Insights, Data compiled by Goldman Sachs Global Investment Research

Source: CB Insights, Data compiled by Goldman Sachs Global Investment Research

# European Banks: Strong capital positions and increasing supervisory focus driving Fintech investment

### European banks continue to push their own neobank strategies

European banks continue to make progress on the build-out of their own neobanks, focusing on providing an enhanced offering to their clients at a lower cost. More favourable financial conditions and strong bank capital positions have accelerated the pace at which European banks are investing in the development of their own digital banks. Such investments have driven digital customer acquisition and improved service offerings at lower costs, driving efficiency gains. Some notable developments in the neobank space were highlighted by the management teams for the banks in our coverage:

- Societe Generale's digital bank, *BoursoBank*, saw a 461k quarterly addition in the number of clients in Q4'24, reaching 7.2 million in total at the end of 2024 (Exhibit 10), above the planned target.
- **BNP Paribas** further grew the customer base of its neobank, *Hello Bank*, to reach c.3.7mn customers as at the end of 2024, up 8.6% y/y vs. Q4'23.
- Caixabank's neobank *Imagin* saw an 11% y/y increase in the number of customers in 2024, reaching >3.5mn, vs. the target of a 3.5mn customer base. At the app user level, i.e. the number of customers who make use of their app's non-banking services (and do not make financial operations), the base has actually reached >4.5mn by end 2024.
- Intesa continues to develop its technology backbone, Isytech, which has been rolled out to its retail clients, having deployed ~2,320 IT specialists and €4.2bn in IT investments as at the end of 2024. Looking ahead, Intesa continues to expect the wider Group to benefit from this, and guides to ~€150mn additional gross income vs its initial 2025 business plan. In addition to this, it also expects to benefit from i) Fideuram Direct, its new digital wealth platform, which aims to increase the client base for Intesa's Private Banking division from ~60k clients in 2022 to ~150k clients by 2025 (with ~77k clients already by the end of 2024); and ii) adoption of artificial intelligence, which should contribute ~€100mn of additional gross income vs its initial 2025 plan. Overall, Intesa believes these contributions from Isybank, Isytech, Fideuram Direct and AI should result in ~€500mn additional gross income vs its initial 2025 business plan.

At the same time as developing these new banking platforms/facilities, banks under our coverage have continued to modernise their traditional bank offerings. Among our Euro Area coverage, **BBVA** continues to increase its customer base, with ~7.5mn digitally acquired customers in 2024 vs. ~7.2mn digital customers in 2023 (<u>Exhibit 11</u>). **Credit Agricole SA's** digital customers reached ~76% of the total by mid 2024, up c.8pp since 2020. In terms of its target for *Blank*, its neobank offering, CASA continues to aim for 250,000 customers by 2025 including through white-label distribution (as laid out in its medium-term plan in 2022). **Erste Bank's** Retail digital banking platform, *George*, has

grown its customers to 10.8mn by the end of 2024, across six markets.

Among the UK banks, NatWest has grown its active digital users and digital engagement, with 79% of its retail banking customers banking entirely digitally in 2024 (up 2ppt vs. 2023); and 83% of its Commercial and Institutional customers banking digitally in 2024 (up c.2ppt vs. 2023). Turning to Lloyds, the group is the UK's largest digital bank, with 23mn digitally active users (as of 2024, up +7% yoy), with >20mn customers using its mobile application.

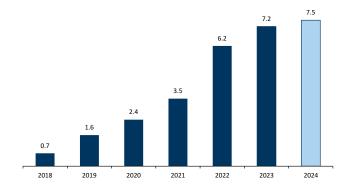
Exhibit 10: BoursoBank grew to 7.2mn customers by the end of 2024 BoursoBank total customers at period end (millions)...



Source: Company data

Exhibit 11: ... and BBVA had ~7.5mn digitally acquired customers, +5% y/y in 2024

BBVA digital customers at period end (millions)



Source: Company data

## Partnerships and M&A remain a key avenue to expanding product offerings...

In addition to the ongoing development of in-house digital banking platforms, European banks have continued to join hands with smaller tech-focused partners. The combination of partnerships and strategic acquisitions enables a broad suite of financial services (payments, wealth management, trade finance, analytics, etc.) to be continually offered and improved. From enhancing existing capabilities to offering new and improved functionalities, these smaller tech-focused partners enable banks to improve their operational efficiency metrics, complementing their in-house platforms and products.

Among the recent notable developments in the European banking space over 2024, we continue to see a trend among banks entering into partnerships in order to support their payments systems/ processes. For instance, Santander UK entered into a payments partnership with *Token.io* to leverage its open banking infrastructure. **Commerzbank** has also entered into a joint venture with Global Payments (paytech) in order to cater to German SMEs, offering them new digital payment services. They have announced a collaboration with credit card fintech *Pliant* for the launch of fully digital credit cards. Additionally, Commerzbank has expanded its partnership with: i) Worldline (payment service provider) which enables real-time Euro transfers for its customers; and ii) Visa (global payments technology company) for its cards business. To facilitate faster and secure payments, ING has partnered with Mastercard, enabling 'Click to Pay' payment options for its customers on their app. **DNB** has announced a plan to leverage Worldline's Swift Service Bureau to enhance its payments infrastructure and capabilities and expand its reach. ABN Amro has entered into a commercial partnership with payments service provider Buckaroo. Some banks in our coverage have also renewed their already existing partnerships. For instance, i) Intesa, in order to drive financial inclusion, has reinforced its partnership with Visa; ii) Worldline has extended its long-term issuing deal with KBC; and iii) Lloyds has renewed its contract with Visa and further expanded its partnership with Paypoint across the UK to >60k SMEs. Garanti BBVA International has also signed a deal with Worldline in order to leverage its instant payments solutions. Furthermore, in order to boost its payments systems and processes and benefit from the offerings of these tech players, BNP Paribas has entered into strategic alliances with a) BPCE to create a new French leader in payment processing, Estreem; and b) Ant International in order to facilitate cross-border payment solutions for merchants and consumers in Europe. Credit Agricole Consumer Finance has announced the acquisition of a Buy Now Pay Later (BNPL) services provider, Pledg. Additionally, Caixabank has also started providing BNPL services to customers using Apple Pay. Lastly, ABN Amro has recently announced the launch of a 'Pay Later' pilot feature for its B2B transactions, in collaboration with paytech company Two.

Other than these payment-related initiatives, banks also remain focused on enhancing their digital capabilities and banking features, which in turn can be leveraged to improve the quality of services. **BBVA** in partnership with *Telefonica Tech* has launched a dedicated centre in Mexico to drive its cybersecurity efforts. In an effort to develop a global platform to offer to SMEs, **Santander** Corporate and Commercial Banking has announced a partnership with *dentsu*. In 2024, the bank also announced a deal with digital asset platform *Crypto.ai*. **BNP Paribas** has launched a UK fintech incubator, in partnership with *SuperTech*. **Intesa Sanpaolo** Private Bank has collaborated with

BlackRock to accelerate the growth of its digital wealth management offering in Italy and across Europe. In addition to partnerships, a few banks in our coverage also made acquisitions over 2024, including: i) UniCredit announced the acquisition of Vodeno (banking-as-a-service venture) and Aion (a Belgian digital bank); ii) Bawag announced the takeover of digital bank Knab, and iii) ABN Amro Bank completed the acquisition of BUX. Across our coverage, we have also seen a growing focus by banks on leveraging digitalisation and partnering with tech players in order to enhance their trade finance/ trade management solutions. For instance, Commerzbank has entered into an agreement with Surecomp, a trade finance solutions provider based in Canada, to automate its trade finance business's back office capabilities. Deutsche Bank leverages Saphyre's (fintech using automated intelligence technology to solve pre-trade activities and post trade issues) platform for better management of its trading relationships and agreements. Lloyds has announced a partnership with WaveBL in order to join its electronic trade documentation platform. Additionally, SEB leverages Broadridge's international post-trade processing solutions, while Danske uses Broadridge's solutions to boost its multi-asset trading, pricing and position management. Lastly, Credit Agricole CIB has launched a digital receivables and supply chain finance platform for APAC markets, in partnership with Demica. Societe Generale has deployed Intellect Global Transaction Banking's, Corporate and Treasury eXchange platform (CTX) in an effort to enhance and automate liquidity management across accounts and currencies. We also highlight a continued trend of collaborations with cloud solutions providers with: i) **BNP** announcing a partnership with *Oracle*; and ii) **Danske** signing a cloud deal, with Amazon Web Services (AWS). Some other partnerships include KBC and Doconomy (Swedish fintech) in an effort to boost financial well-being for young adults; Erste Group's collaboration with an open banking solutions provider, SaltEdge; Lloyds' partnership with ApTap, a fintech startup, to help mortgage customers manage their bills better; Handelsbanken and UK-based fintech Meniga, as well as Danske and Backbase, mainly in order to leverage their customer management tools; and lastly, ABN Amro's partnership with nCino for its digital banking platform to boost corporate lending operations and collateral management across business lines.

# ...and banks continue to make selective small investments in fintechs despite continued muted fundraising levels

2024 was the lowest year of global fintech fundraising since 2018. This contraction in the availability of capital to private fintech companies, however, has not impacted banks' selective investment strategy as they continue to invest proactively in the space, building on their domain expertise.

This strategy is evident across the Euro Area, where banks continue to make investments in future partners and enablers. For instance, **Deutsche Bank** has invested \$20mn in Singapore-based fintech *Partior*, in its Series B funding round. **Intesa Sanpaolo Private Banking**, Fideuram, has announced a SFr40mn investment (with contributions from other existing investors) in *Alpian* (digital bank in Switzerland), acquiring the majority stake in the bank upon receiving all regulatory approvals. In February 2024, **UBS Next** announced an investment in a London-based data firm, *Synthesised Ltd.* Furthermore, the fintech VC arm of Commerzbank,

CommerzVentures, has led a €25mn Series B funding round in *Tuum*, an Estonian core banking provider. In early 2024, **BNP Paribas** along with Citi announced an investment in *United Fintech*, a neutral digital transformation platform. Among the UK banks, in 2024, **NatWest** announced an investment in payments technology and consultancy services fintech *Icon Solutions*. More recently, as a part of its *Fintech Growth programme*, it has selected five startups to help it scale up. **Lloyds**, on the other hand, has announced a GBP3mn investment in a proptech startup, *Coadjute*. **Barclays** completed a Series B funding round for *Funding Xchange* (provider of white label software for lenders to SMEs) in 2024, and has also announced a GBP4mn seed round in a wealthtech startup, *WealthOS*. Lastly, among the Nordics, we note i) **SEB** announcing a minority stake in *Kivra*, a digital document exchange firm offering the bank its platform and tailor-made products and services; ii) **Danske's** investment in *United Fintech*; iii) **DNB's** venture arm investing €1.7mn in an Oslo-based fintech startup, *Receipts*; and iv) **SEB** venture capital arm's investment in *Lumera*, a Swedish player in the insurance administration software space.

# Supervisors remain focused on ensuring risk mitigation strategies related to digital transformation - further encouraging Fintech investment by incumbent Banks

Supervisors continue to highlight the importance of developing digital transformation capabilities for banks, while also ensuring sound business models and adequate risk mitigation strategies. **The ECB Banking Supervisors** as part of their latest 2024 Supervisory Review and Evaluation Process (SREP) note that they continue to assess banks' progress in digitalisation and track how they identify and mitigate any related risks. In this context, they have also published key assessment criteria and sound practices that should be considered when thinking about the impact of digitalisation, which are grouped together according to three focus areas: (1) **business model impact** (identify, assess and monitor the current and forward-looking impact of digital trends on business environment), (2) **governance** (management body should have necessary digital knowledge and skills to evaluate digital strategies and initiatives and understand risks related to these activities) and (3) **risk management** (impact of digitalisation on the institution's risk profile).

The main observation from the SREP exercise was that the banks which were highly focused on digital transformation efforts to drive operational efficiency witnessed incremental digital improvements and transformed both their front and back office operations, albeit with still some scope for improvement in terms of having granular key performance indicators to measure the impact of these strategies on P&L. Going ahead, the supervisors note that they will expand their focus to also include reviewing the use of specific technologies more broadly, and look more closely at how banks evaluate various digitalisation efforts in the context of their investment decisions.

Furthermore, in December 2024, as part of their medium-term strategy, ECB Banking Supervisors set three priorities for 2025-27, and one of these is for banks to remain focused on progress related to digital transformation efforts, strengthen their digitalisation strategies and tackle any emerging challenges stemming from the use of new technologies.

17 March 2025

### Confluence of cyclical and structural factors continue to support our Fintech 2.0 view

Going forward, over the medium term we expect rates to settle higher vs. historical levels. This, coupled with improving fee-income and manageable opex, should continue to support bank profitability and returns. Banks across our coverage continue to be better capitalised and highly capital generative, while the growth in technology enablers is supporting ongoing fintech innovation among incumbent banks, enabling the build-out of innovative in-house neobank platforms. Even though private fintech companies are facing a difficult landscape for raising capital, leading to a sharp contraction in global fintech funding levels, banks across our coverage continue to i) invest in the development of their own neobanks; ii) enter partnerships and make strategic acquisitions in order to support their digital transformation efforts; and iii) make selective investments, building on their domain expertise. Finally, regulatory scrutiny is also increasing, especially in Europe with regard to entry into and conduct within the European banking market.

Exhibit 12: We see the current environment marked by Fintech 2.0 operating conditions



Source: Goldman Sachs Global Investment Research

See: European Banks - Adjusting to Fintech 2.0

# Disclosure Appendix

### Reg AC

We, Chris Hallam, Benjamin Caven-Roberts, Andin Kour Sason, Patrik Nilsson, Guangyan Wei and Sachin Nayar, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

#### **GS Factor Profile**

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our universe of rated stocks) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

**Growth** is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

#### M&A Rank

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

#### Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

#### **Disclosures**

#### Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	48%	34%	18%	64%	57%	43%

As of January 1, 2025, Goldman Sachs Global Investment Research had investment ratings on 3,021 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by the FINRA Rules. See 'Ratings, Coverage universe and related definitions' below. The Investment Banking Relationships chart reflects the percentage of subject companies within each rating category for whom Goldman Sachs has provided investment banking services within the previous twelve months.

### Regulatory disclosures

### Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

**Distribution of ratings:** See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at <a href="https://www.gs.com/research/hedge.html">https://www.gs.com/research/hedge.html</a>.

## Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. Australia: Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of Global Investment Research of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. Brazil: Disclosure information in relation to CVM Resolution n. 20 is available at https://www.gs.com/worldwide/brazil/area/gir/index.html. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Resolution n. 20, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. Canada: This information is being provided to you for information purposes only and is not, and under no circumstances should be construed as, an advertisement, offering or solicitation by Goldman Sachs & Co. LLC for purchasers of securities in Canada to trade in any Canadian security. Goldman Sachs & Co. LLC is not registered as a dealer in any jurisdiction in Canada under applicable Canadian securities laws and generally is not permitted to trade in Canadian securities and may be prohibited from selling certain securities and products in certain jurisdictions in Canada. If you wish to trade in any Canadian securities or other products in Canada please contact Goldman Sachs Canada Inc., an affiliate of The Goldman Sachs Group Inc., or another registered Canadian dealer. Hong Kong: Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. India: Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. Investment in securities market are subject to market risks. Read all the related documents carefully before investing. Registration granted by SEBI and certification from NISM in no way guarantee performance of the intermediary or provide any assurance of returns to investors. Goldman Sachs (India) Securities Private Limited compliance officer and investor grievance contact details can be found at this link: https://publishing.gs.com/disclosures/hedge.html - /general/equity. Japan: See below. Korea: This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. New Zealand: Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. Russia: Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. Singapore: Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), which is regulated by the Monetary Authority of Singapore, accepts legal responsibility for this research, and should be contacted with respect to any matters arising from, or in connection with, this research. Taiwan: This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. United Kingdom: Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

**European Union and United Kingdom:** Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council (including as that Delegated Regulation is implemented into United Kingdom domestic law and regulation following the United Kingdom's departure from the European Union and the European Economic Area) with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at <a href="https://www.gs.com/disclosures/europeanpolicy.html">https://www.gs.com/disclosures/europeanpolicy.html</a> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan Type II Financial Instruments Firms Association, The Investment Trusts Association, Japan, and Japan Investment Advisers Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

#### Ratings, coverage universe and related definitions

Buy (B), Neutral (N), Sell (S) Analysts recommend stocks as Buys or Sells for inclusion on various regional Investment Lists. Being assigned a Buy or Sell on an Investment List is determined by a stock's total return potential relative to its coverage universe. Any stock not assigned as a Buy or a Sell on an Investment List with an active rating (i.e., a stock that is not Rating Suspended, Not Rated, Early-Stage Biotech, Coverage Suspended or Not Covered), is deemed Neutral. Each region manages Regional Conviction Lists, which are selected from Buy rated stocks on the respective region's Investment Lists and represent investment recommendations focused on the size of the total return potential and/or the likelihood of the realization of the return across their respective areas of coverage. The addition or removal of stocks from such Conviction Lists are managed by the Investment Review Committee or other designated committee in each respective region and do not represent a change in the analysts' investment rating for such stocks.

**Total return potential** represents the upside or downside differential between the current share price and the price target, including all paid or anticipated dividends, expected during the time horizon associated with the price target. Price targets are required for all covered stocks. The total return potential, price target and associated time horizon are stated in each report adding or reiterating an Investment List membership.

Coverage Universe: A list of all stocks in each coverage universe is available by primary analyst, stock and coverage universe at https://www.gs.com/research/hedge.html.

Not Rated (NR). The investment rating, target price and earnings estimates (where relevant) are removed pursuant to Goldman Sachs policy when

Goldman Sachs is acting in an advisory capacity in a merger or in a strategic transaction involving this company, when there are legal, regulatory or policy constraints due to Goldman Sachs' involvement in a transaction, and in certain other circumstances. **Early-Stage Biotech (ES)**. An investment rating and a target price are not assigned pursuant to Goldman Sachs policy when this company neither has a drug, treatment or medical device that has passed a Phase II clinical trial nor a license to distribute a post-Phase II drug, treatment or medical device. **Rating Suspended (RS)**. Goldman Sachs Research has suspended the investment rating and price target for this stock, because there is not a sufficient fundamental basis for determining an investment rating or target price. The previous investment rating and target price, if any, are no longer in effect for this stock and should not be relied upon. **Coverage Suspended (CS)**. Goldman Sachs has suspended coverage of this company. **Not Covered (NC)**. Goldman Sachs does not cover this company.

### Global product; distributing entities

Goldman Sachs Global Investment Research produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Public Communication Channel Goldman Sachs Brazil: 0800 727 5764 and / or contatogoldmanbrasil@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Canal de Comunicação com o Público Goldman Sachs Brasil: 0800 727 5764 e/ou contatogoldmanbrasil@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom.

Goldman Sachs International ("GSI"), authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA, has approved this research in connection with its distribution in the United Kingdom.

European Economic Area: GSI, authorised by the PRA and regulated by the FCA and the PRA, disseminates research in the following jurisdictions within the European Economic Area: the Grand Duchy of Luxembourg, Italy, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Norway, the Republic of Finland and the Republic of Ireland; GSI - Succursale de Paris (Paris branch) which is authorised by the French Autorité de contrôle prudentiel et de resolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de resolution and the Autorité des marches financiers ("AMF") disseminates research in France; GSI - Sucursal en España (Madrid branch) authorized in Spain by the Comisión Nacional del Mercado de Valores disseminates research in the Kingdom of Spain; GSI - Sweden Bankfilial (Stockholm branch) is authorized by the SFSA as a "third country branch" in accordance with Chapter 4, Section 4 of the Swedish Securities and Market Act (Sw. lag (2007:528) om värdepappersmarknaden) disseminates research in the Kingdom of Sweden; Goldman Sachs Bank Europe SE ("GSBE") is a credit institution incorporated in Germany and, within the Single Supervisory Mechanism, subject to direct prudential supervision by the European Central Bank and in other respects supervised by German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and Deutsche Bundesbank and disseminates research in the Federal Republic of Germany and those jurisdictions within the European Economic Area where GSI is not authorised to disseminate research and additionally, GSBE, Copenhagen Branch filial af GSBE, Tyskland, supervised by the Danish Financial Authority disseminates research in the Kingdom of Denmark; GSBE - Sucursal en España (Madrid branch) subject (to a limited extent) to local supervision by the Bank of Spain disseminates research in the Kingdom of Spain; GSBE - Succursale Italia (Milan branch) to the relevant applicable extent, subject to local supervision by the Bank of Italy (Banca d'Italia) and the Italian Companies and Exchange Commission (Commissione Nazionale per le Società e la Borsa "Consob") disseminates research in Italy; GSBE - Succursale de Paris (Paris branch), supervised by the AMF and by the ACPR disseminates research in France; and GSBE - Sweden Bankfilial (Stockholm branch), to a limited extent, subject to local supervision by the Swedish Financial Supervisory Authority (Finansinpektionen) disseminates research in the Kingdom of Sweden.

### **General disclosures**

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by Global Investment Research. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (<a href="https://www.sipc.org">https://www.sipc.org</a>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analyst's published price target expectations for such stocks. Any such trading strategies are distinct from and do not affect the analyst's fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage universe as described herein.

We and our affiliates, officers, directors, and employees will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research, unless otherwise prohibited by regulation or Goldman Sachs policy.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors.

Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at <a href="https://www.theocc.com/about/publications/character-risks.jsp">https://www.theocc.com/about/publications/character-risks.jsp</a> and

https://www.fiadocumentation.org/fia/regulatory-disclosures\_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018.

Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by Goldman Sachs Global Investment Research may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to https://research.gs.com.

Disclosure information is also available at <a href="https://www.gs.com/research/hedge.html">https://www.gs.com/research/hedge.html</a> or from Research Compliance, 200 West Street, New York, NY 10282.

#### © 2025 Goldman Sachs.

You are permitted to store, display, analyze, modify, reformat, and print the information made available to you via this service only for your own use. You may not resell or reverse engineer this information to calculate or develop any index for disclosure and/or marketing or create any other derivative works or commercial product(s), data or offering(s) without the express written consent of Goldman Sachs. You are not permitted to publish, transmit, or otherwise reproduce this information, in whole or in part, in any format to any third party without the express written consent of Goldman Sachs. This foregoing restriction includes, without limitation, using, extracting, downloading or retrieving this information, in whole or in part, to train or finetune a machine learning or artificial intelligence system, or to provide or reproduce this information, in whole or in part, as a prompt or input to any such system.