

Strategy Matters

Small beginnings: Is it time to buy Small caps?

European Small caps are down 16% since Jan-22, in total returns, while Large caps already got back to their January 2022 level (Exhibit 1). Small caps' 12-month forward P/E ratio has derated 36% over the period, tracking the evolution of bond yields and the worries associated to their leverage. They currently trade at par to large caps, for the first time since the GFC (Exhibit 3).

Bond yields have now peaked and our economists expect economic growth to pick up, so is it time to buy Small caps on expectations of an extension of their end-of-2023 rally?

We argue that improving economic growth should drive the outperformance of Small caps, and that their low relative valuation is a tailwind, as our macro model suggests. This echoes the recent views of our US colleagues: US Macroscope: Low valuations and a healthy growth outlook signal more upside for small-caps.

We highlight a Pure Growth screen for Small and Mid caps (SMIDs) in Exhibit 21. These companies are expected to grow their revenues faster than others, have not had any negative revenue growth over the past two years, and have derated the most among European SMIDs.

Lilia Peytavin +33(1)4212-1716 | lilia.peytavin@gs.com Goldman Sachs Bank Europe SE - Paris Branch

Peter Oppenheimer

+44(20)7552-5782 peter.oppenheimer@gs.com Goldman Sachs International

+44(20)7552-1341 | sharon.bell@gs.com Goldman Sachs International

Guillaume Jaisson

+44(20)7552-3000 guillaume.jaisson@gs.com Goldman Sachs International

Marcus von Scheele

+44(20)7774-7676 marcus.vonscheele@gs.com Goldman Sachs International

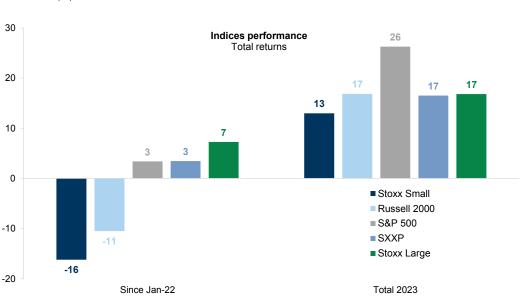


Exhibit 1: Small caps are still 16% below their January 2022 level Total returns (%)

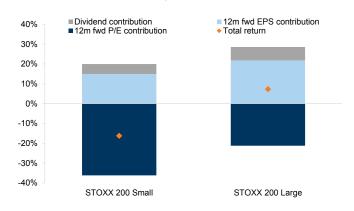
Source: Datastream, Goldman Sachs Global Investment Research

1. Rising rates and the economic downturn: The worst combination for Small caps
Since January 2022, Small caps' 12-month forward P/E ratio has derated 36% as
interest rates have risen (Exhibit 2), and their profits have lagged the market as
economic growth has been lackluster (Exhibit 2). Small caps underperformed Large
caps by more than 20% in price performance, twice as much as what our macro model
would have suggested. Their valuation is now at a decade low (Exhibit 3). Our macro
model predicts the relative performance of Small caps based on changes in economic
growth, in interest rates and based on relative valuations at the outset of the period.
Since 2022, it is mainly rates rather than growth which have driven the
performance of Small caps (Exhibit 4), as our US colleagues have found. The beta of
Small caps to changes in our Current Activity Indicator (CAI) has turned statistically
insignificant since 2022, as concerns about financial leverage due to rising interest rates
have become dominant. While Small caps are not especially indebted, about 50% of
their debt is floating, making them particularly sensitive to rising interest rates, as we
show in Strategy Espresso: The Wall of Debt (Exhibit 5).

From here, as bond yields stay flat, **we believe that Small caps will be driven by growth again**, and that their historically low valuation provides a tailwind, or at least a buffer in case activity improves slower than what our economists expect.

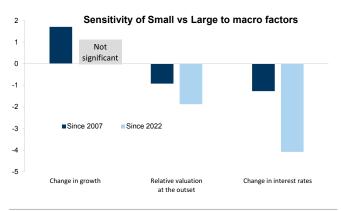
Exhibit 2: Small caps have derated more than 30% since the start of the Fed hiking cycle

Return Contribution since January 2022



Source: Datastream, STOXX, Goldman Sachs Global Investment Research

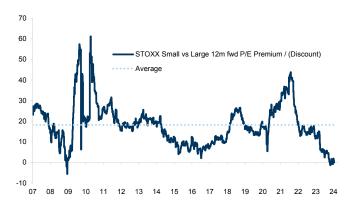
Exhibit 4: Small caps are usually driven by growth rather than rates Normalised coefficients. 6m returns of Small vs Large explained by changes in EA Current Activity Indicator, 10y German bond yields and relative valuation at the outset.



Source: Goldman Sachs Global Investment Research

Exhibit 3: Small caps trade at par to Large caps for the first time since the Global Financial Crisis

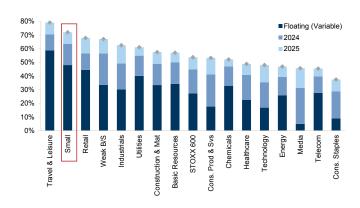
12m fwd P/E Premium / (Discount) STOXX Small vs STOXX Large



Source: IBES, Datastream, Goldman Sachs Global Investment Research

Exhibit 5: Small caps: When you hit the wall of debt

% share of the total debt floating* and refinanced in 2024-2025



*Bloomberg classification of Floating vs. Fixed Debt (%)

Source: Bloomberg, Goldman Sachs Global Investment Research

2. Rate relief for Small caps

The derating of Small caps has closely tracked the rise in bond yields (Exhibit 6) and our rate strategists now think that bond yields have peaked. The Fed and the ECB should embark on their first rate cut in March and April respectively, based on GS forecasts. That said, our policy rate forecast is broadly in line with market pricing, suggesting that most of the fall in bond yields is behind us.

While the rate tailwind for Small caps is probably limited, the accelerating economic growth that our economists expect should provide further upside.

Exhibit 6: The relative derating of Small caps has closely tracked the rise in bond yields

Price performance STOXX Small vs STOXX Large (indexed to 100 on Jan-19), US 10Y real rates (RHS, Inverted)



Source: Datastream, Goldman Sachs Global Investment Research

3. Further support from a healthy economic outlook

Consumer confidence (<u>Exhibit 7</u>) and economic growth (<u>Exhibit 8</u>) are very much correlated to the performance of Small caps (see <u>Strategy Matters - What drives</u> <u>European Small caps? Q&A</u>). <u>Our economists expect</u> Euro area growth to sequentially pick up in Q1 2024, driven by a rebound in real disposable income.

Exhibit 7: Small caps tend to outperform with rising consumer confidence

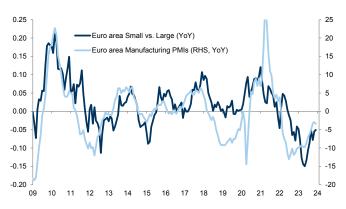
Europe Small vs. Large price index (YoY) and Europe Consumer confidence (YoY, RHS)



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

Exhibit 8: Small caps tend to outperform with improving activity

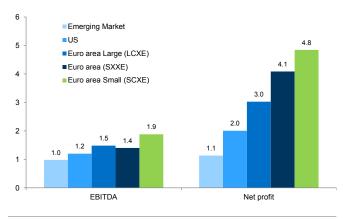
Euro area Small vs. Large price index (YoY) and Euro area Manufacturing PMIs (YoY, RHS)



Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 9: Small caps are highly geared operationally

Operational leverage = Median ratio of profit growth to sales growth since 1995



Source: Datastream, Factset, Goldman Sachs Global Investment Research

Exhibit 10: The sector composition of SXXE Small makes it cyclical Weights based on current market cap, free float adjusted

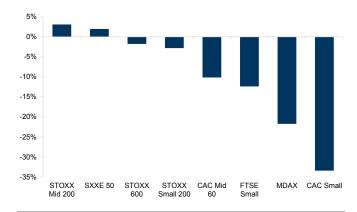
	Cyclicals - Defensives	Cyclicals	Defensives
MIB	39%	61%	23%
AEX	36%	56%	20%
OMX Stockholm	31%	63%	32%
DAX	27%	54%	27%
Euro Stoxx 50	17%	49%	32%
STOXX Small	15%	47%	32%
OBX Oslo	11%	30%	20%
IBEX	4%	47%	43%
FTSE 100	4%	43%	39%
STOXX 600	1%	41%	41%
STOXX Large	-2%	40%	42%
CAC	-6%	36%	42%
SMI	-49%	16%	65%
OMX Copenhagen	-59%	18%	77%

Cyclicals: Autos, Banks, Basic Resources, Financial Svs., Industrial Gds & Svs., Media, Technology, Travel & Leis. Defensives: Consumer Prod. & Svs., Food & Bev., Healthcare, Pers. Care, Drug & Gr. Stores, Retail, Telcos, Utilities.

Source: Datastream, Goldman Sachs Global Investment Research

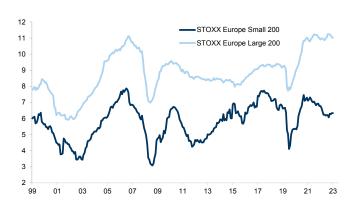
The bar for positive earnings surprise is very low for Small caps as their 2024 consensus EPS estimate has been significantly revised down since Jan-23. The smaller the companies, the sharper the impact on profit growth: French, German and UK SMIDs faced particularly sharp negative revisions (Exhibit 11). Net income margin of Small caps has fallen by about 100bp since 2021, while that of Large caps remained steady (Exhibit 12).

Exhibit 11: The bar for upside EPS surprise is low 2024E EPS revisions since Jan-23



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 12: Net income margin for Small caps has fallen
Net Income Margin (%) for STOXX Europe Small 200 and STOXX Europe
Large 200



Source: FactSet, STOXX, Goldman Sachs Global Investment Research

In 2024 and 2025, consensus expects annual EPS growth to be roughly twice higher for Small caps than for the SXXP (Exhibit 13).

60% **23/25 EPS CAGR** 49% 50% 40% 30% 19% 20% 14% 11% 10% 10% 7% 6% 0% **FTSE** MDAX STOXX SXXP SXXE STOXX CAC Small Small 200 Mid 200 Mid 60 50

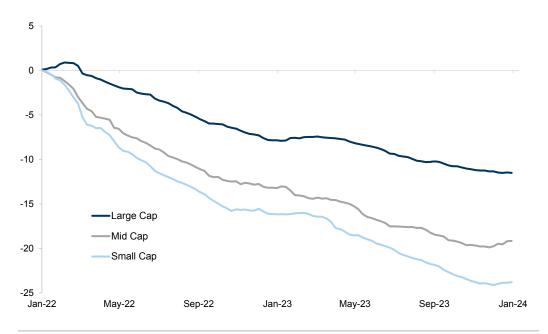
Exhibit 13: Consensus expects EPS growth to be roughly twice higher for Small caps than for the SXXP 2023/2025 EPS CAGR

Source: Datastream, Goldman Sachs Global Investment Research

4. Positioning looks attractive

Despite the fact that Small caps have rallied 6% over large caps since their low in October 2023, **cumulative flows into SMID cap funds remain deeply negative, which suggests a very light positioning** (Exhibit 14).

Exhibit 14: Fund flows into European Equity (cumulative %)
EPFR data for Flows into Small, Mid and Large Cap European Equity Funds



Source: EPFR, Goldman Sachs Global Investment Research

5. A stronger Euro favours Small caps

In 2024, <u>our FX strategists expect</u> the Euro to rise to 1.12, which tends to support Small caps as they derive 60% of their revenues from Europe, versus only 40% for Large caps (Exhibit 15 and Exhibit 28).

Exhibit 15: Small caps usually outperform as the Euro strengthens

Euro are Small vs. Large price index (YoY) and EUR/USD (YoY, RHS)



Source: Datastream, Goldman Sachs Global Investment Research

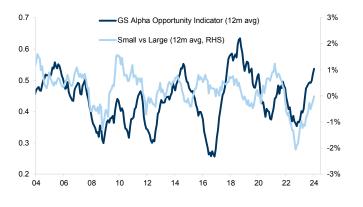
6. M&A and a better alpha opportunity environment should help

Usually, Small caps outperform when alpha opportunities improve (<u>Exhibit 16</u>), as we argue in <u>Strategy Espresso: Alpha opportunities to improve further</u>. This is because a better stock-picking environment tends to be one where economic growth accelerates, market returns are positive, M&A activity picks up and economic policy uncertainty is anchored. All these make an ideal environment for Small caps to outperform.

M&A activity was down 30% in 2023, and as we show in <u>Strategy Espresso: Positioning in Europe as we start 2024</u>, lower rates should help to boost both Private Equity demand for listed stocks and M&A activity. This usually supports the outperformance of Small caps which are typically M&A targets, as we explain in <u>Strategy Matters - Small Caps</u>, *Big Problems* (Exhibit 17).

Exhibit 16: Small caps generally outperform as Alpha opportunities rise

GS Alpha Opportunity Indicator (12m avg) and Small vs Large (12m avg, RHS)



Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

Exhibit 17: Small caps tend to outperform when M&A activity picks up

% change in STOXX Small vs. Large and % change in rolling Deal count over 6 months

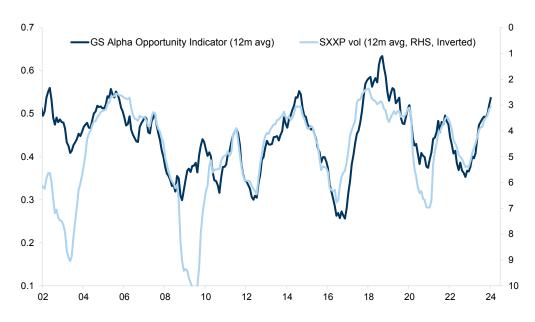


M&A deals in Western Europe, minimum deal value EUR 50 mln.

Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

Exhibit 18: Alpha opportunities rise when SXXP volatility increases

GS Alpha Opportunity Indicator (12m avg) SXXP vol (12m avg, RHS, Inverted)



Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

7. Where to find growth within Small caps?

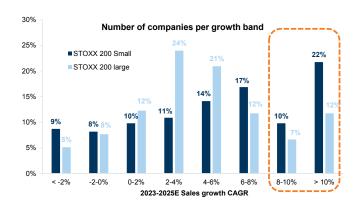
About one-third of Small cap companies are expected to deliver a revenue growth above 8% per annum by 2025, which is twice higher than for Large caps (Exhibit 19).

We derive a screen of SMID companies (market cap <€10bn) which are expected to grow faster than the market, have not had any negative revenue growth over the past two years, and have seen their valuation contract the most since Jan-22. We believe that the 'goldilocks' outlook of our economists — where economic activity improves and bond yields have peaked — should support the outperformance of these companies, after a particularly sharp derating (Exhibit 20). They offer a mix of cyclical

growth and duration, similarly to our Pure Growth basket (<u>GSSTGROW</u>). Our SMIDs screen is shown in <u>Exhibit 21</u>.

Exhibit 19: One-third of Small caps are expected to grow faster than 8% per annum by 2025

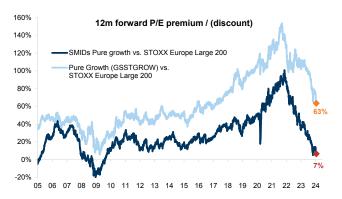
% of companies by sales growth bands - 2023-25E



Source: Factset, Datastream, STOXX, Goldman Sachs Global Investment Research

Exhibit 20: Both our SMIDs Pure Growth screen and Pure Growth basket have de-rated sharply

SMIDs Pure growth and Pure Growth (GSSTGROW) vs STOXX Europe Large 200 12m fwd P/E Premium / (Discount)



Source: FactSet, Goldman Sachs Global Investment Research

Exhibit 21: Our Pure Growth screen for SMIDs

<u></u>		SMIDs Pure Grow	th Screen				
Campany Nama	Sector	Country	Market Cap	NTM	Valuation Drawdown	Sales Growth (%)	
Company Name	Sector	Country	(EUR Bn)	P/E	(since 2022)	CAGR 2025/23	FY 2025
D'Ieteren Group	Automobiles and Parts	Belgium	9.5	12.0	-39%	9.4	5.8
Volvo Car	Automobiles and Parts	Sweden	8.7	6.2	-66%	7.3	8.2
Forvia	Automobiles and Parts	France	4.0	6.7	-28%	5.3	5.9
Brembo	Automobiles and Parts	Italy	3.7	11.1	-31%	5.9	6.9
Valeo	Automobiles and Parts	France	3.4	6.6	-50%	6.4	7.1
Dottikon ES Holding	Chemicals	Switzerland	3.5	31.0	-51%	14.7	13.0
Eckert & Ziegler Strahlen	Chemicals	Germany	0.9	26.1	-49%	10.3	10.4
BELIMO Holding	Construction and Materials	Switzerland	6.1	38.3	-31%	8.0	8.8
Webuild	Construction and Materials	Italy	1.9	9.5	-33%	7.3	6.6
Maire Tecnimont	Construction and Materials	Italy	1.6	10.1	-26%	19.2	14.8
PUMA	Consumer Products and Services	Germany	7.6	16.0	-59%	8.7	8.9
Brunello Cucinelli	Consumer Products and Services	Italy	6.0	45.5	-38%	10.9	10.7
HUGO BOSS	Consumer Products and Services	Germany	4.7	14.3	-34%	9.2	9.0
Sixt	Consumer Products and Services	Germany	4.2	13.6	-42%	6.6	7.6
Watches of Switzerland	Consumer Products and Services	United Kingdom	2.0	12.5	-64%	9.8	13.0
Keywords Studios	Consumer Products and Services	United Kingdom	1.5	15.6	-57%	11.8	10.0
TODS	Consumer Products and Services	Italy	1.1	20.7	-91%	5.4	6.3
Nordex	Energy	Germany	2.5	48.5	-47%	6.3	8.3
Energean		United Kingdom	2.3	3.3	-47% -72%	30.0	10.9
TGS	Energy	_		3.3 7.8	-72% -78%	30.0 15.6	5.2
	Energy Haalth Care	Norway	1.6 8.8	7.8 32.7			5.2 9.4
Carl Zeiss Meditec	Health Care	Germany			-42%	7.9	
Amplifon	Health Care	Italy	7.1	29.7	-32%	8.2	8.0
Evotec	Health Care	Germany	3.8	93.1	-65%	19.2	19.4
ALK-Abello	Health Care	Denmark	3.0	28.1	-69%	10.3	10.4
Nexi	Industrial Goods and Services	Italy	9.7	11.7	-53%	7.0	7.2
Rational	Industrial Goods and Services	Germany	7.9	36.8	-39%	7.0	8.6
AutoStore Holdings	Industrial Goods and Services	Norway	6.1	30.3	-59%	12.5	16.4
Azelis Group	Industrial Goods and Services	Belgium	5.4	19.6	-41%	5.7	5.1
Worldline	Industrial Goods and Services	France	4.4	7.6	-67%	5.5	6.9
Krones	Industrial Goods and Services	Germany	3.6	12.8	-33%	7.3	6.0
TOMRA Systems	Industrial Goods and Services	Norway	3.3	33.6	-59%	5.7	11.0
SES-imagotag	Industrial Goods and Services	France	2.2	28.5	-58%	29.9	29.6
Alfen	Industrial Goods and Services	Netherlands	1.3	29.8	-51%	25.2	23.8
Stroeer	Media	Germany	3.0	15.2	-24%	8.1	7.7
4Imprint Group	Media	United Kingdom	1.5	15.8	-53%	8.5	7.8
HelloFresh	Personal Care, Drug and Grocery Stores	Germany	2.5	13.0	-72%	7.9	7.8
JD Sports Fashion	Retail	United Kingdom	9.9	11.0	-57%	8.1	8.4
Nemetschek	Technology	Germany	9.1	48.7	-46%	12.6	14.8
Scout24	Technology	Germany	4.8	22.7	-31%	10.7	9.6
Alten	Technology	France	4.7	15.5	-32%	7.3	7.4
Reply	Technology	Italy	4.5	21.3	-44%	9.5	9.8
Melexis	Technology	Belgium	3.7	17.3	-45%	5.9	6.5
Elmos Semicond	Technology	Germany	1.3	12.2	-43%	8.4	7.9
Accor	Travel and Leisure	France	9.2	16.7	-74%	5.3	5.3
Dalata Hotel	Travel and Leisure	Ireland	1.0	11.2	-81%	7.0	6.3
Elia Group	Utilities	Belgium	8.3	24.5	-17%	16.0	16.3
Neoen	Utilities	France	4.6	51.1	-33%	24.0	27.7
Encavis	Utilities	Germany	2.5	28.2	-27%	10.9	12.1
Solaria Energia	Utilities	Spain	2.3	18.6	-47%	27.7	25.6
Befesa	Utilities	Germany	1.4	15.1	-25%	6.5	5.2
dian		<u> </u>	3.7	16.3	-46%	8.3	8.5
ope SMIDs ex Financials m			1.5	14.1	-22%	4.0	5.3

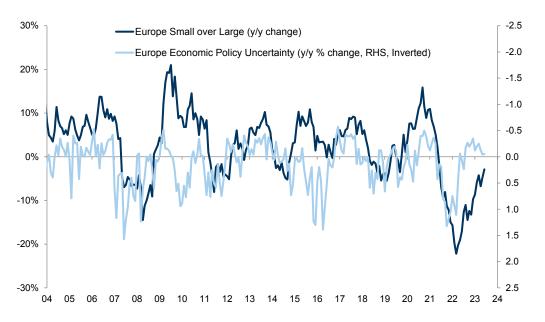
Source: Datastream, FactSet, Worldscope, Goldman Sachs Global Investment Research

8. What are the risks?

Slower growth than what our economists expect and renewed policy uncertainty could weigh on Small caps. Small caps are sensitive to economic growth and, historically, the performance of Small vs. Large caps has been negatively correlated with measures of risk such as the Economic Policy Uncertainty Index (Exhibit 22). Small, as a factor, is positively correlated with risk indices such as our Risk Appetite Indicator (GSRAII) and negatively correlated with credit spreads (i.e., Small caps underperform when spreads widen). Over the past year, higher economic policy uncertainty, which resulted from the invasion of Ukraine and the energy crisis, has reduced, but could increase again.

Exhibit 22: Small caps outperform as policy uncertainty decreases

Europe Small vs Large (YoY change) and Europe Economic Policy Uncertainty (YoY % change, RHS, Inverted)



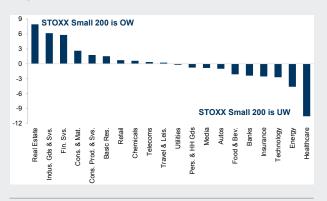
Source: Haver Analytics, Datastream, Goldman Sachs Global Investment Research

What are Small caps

STOXX Europe Small (SCXP)

European Small caps are underweight Banks and Energy, as well as Healthcare and Technology relative to European Large caps (Exhibit 23). These are four sectors on which we have been overweight through most of 2023. By contrast, **Small caps are overweight Real Estate and manufacturing sectors** such as Industrial Goods & Services and Construction & Materials, two sectors which have suffered from the rising rate environment and the manufacturing recession. Meanwhile, Nordics are over-represented in Small caps, while Switzerland and the UK are underrepresented (Exhibit 24).

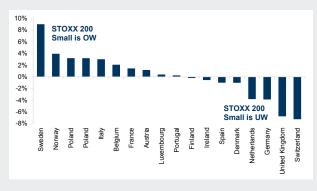
Exhibit 23: Small caps are overexposed to Real Estate, Industrials and Construction, sectors impaired by the rising rate environment and the manufacturing downturn STOXX 200 Small sector weights minus STOXX 200 Large sector weights



Source: FactSet, STOXX, Goldman Sachs Global Investment Research

Exhibit 24: Nordics are overrepresented in Small caps, while Switzerland and the UK are underrepresented

STOXX 200 Small country weights minus STOXX 200 Large country weights (market cap adjusted)



Source: Datastream, Goldman Sachs Global Investment Research

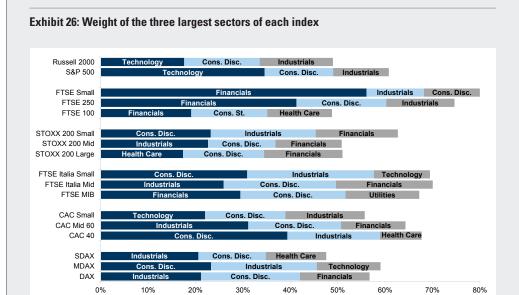
Small caps are not the same in each country

For instance, **the weight of Energy is much larger among French Small caps than UK ones**. Exposure to Tech companies is also larger among French and Italian ones than among UK or broader European Small cap indices (Exhibit 25).

Exhibit 25: Small Cap Indices and STOXX 600 sector breakdown Weights based on current market cap

	SDAX	CAC Small	FTSE Italia Small	STOXX 200 Small	FTSE Small	Russell 2000	STOXX 600
Basic Materials	3%	1%	3%	5%	2%	3%	5%
Consumer Discretionary	14%	17%	31%	23%	12%	14%	17%
Consumer Staples	6%	1%	8%	7%	1%	3%	9%
Energy	4%	6%	1%	1%	2%	8%	6%
Financials	11%	15%	5%	17%	56%	15%	16%
Health Care	13%	12%	7%	8%	0%	16%	15%
Industrials	21%	17%	27%	22%	12%	18%	16%
Real Estate	11%	5%	3%	6%	11%	6%	1%
Technology	10%	22%	12%	4%	3%	13%	7%
Telecommunications	4%	1%	2%	3%	0%	1%	3%
Utilities	3%	3%	1%	3%	1%	2%	4%

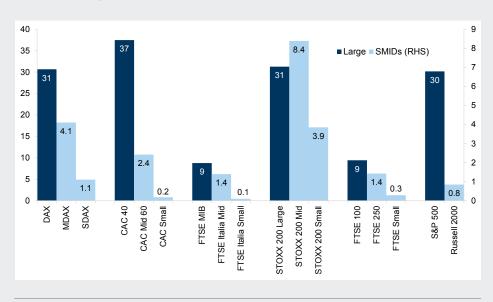
Source: Datastream, STOXX, Goldman Sachs Global Investment Research



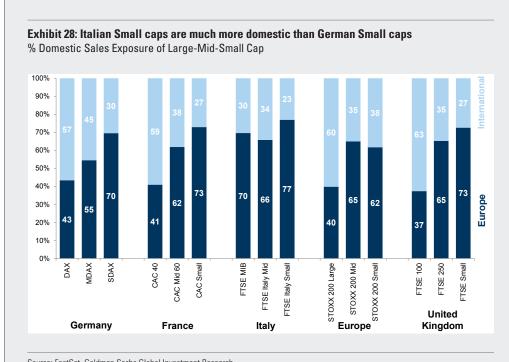
Source: Datastream, Goldman Sachs Global Investment Research

Also, Italian Small caps have the lowest median market cap and, compared to other European indices, they are also the least exposed to the international market (<u>Exhibit 27</u> and <u>Exhibit 28</u>).

Exhibit 27: Italian Small caps are smaller than German Small caps Median Market Cap (EUR bn.)



Source: Datastream, Goldman Sachs Global Investment Research



Source: FactSet, Goldman Sachs Global Investment Research

18 January 2024 14

Disclosure Appendix

Reg AC

We, Lilia Peytavin, Peter Oppenheimer, Sharon Bell, Guillaume Jaisson and Marcus von Scheele, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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

Disclosures

Other disclosure

Basket Disclosure: The ability to trade the basket(s) in this report will depend upon market conditions, including liquidity and borrow constraints at the time of trade.

Marquee Disclosure: Marquee is a product of Goldman Sachs Global Banking & Markets. Any Marquee content linked in this report is not necessarily representative of GS Research views. If you need access to Marquee, please contact your GS salesperson or email the Marquee team at gs-marquee-sales@gs.com.

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.

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 Investor Grievance E-mail: india-client-support@gs.com. Compliance Officer: Anil Rajput |Tel: + 91 22 6616 9000 | Email: anil.m.rajput@gs.com. 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 https://www.gs.com/disclosures/europeanpolicy.html 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.

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 (https://www.sipc.org).

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.

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 focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe.

Any trading recommendation in this research relating to an equity or credit security or securities within an industry or sector is reflective of the

18 January 2024

16

investment theme being discussed and is not a recommendation of any such security in isolation.

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 https://www.theocc.com/about/publications/character-risks.jsp 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 https://www.gs.com/research/hedge.html or from Research Compliance, 200 West Street, New York, NY 10282

© 2024 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.