

## Quantamentals

# 2021 US Factor Review

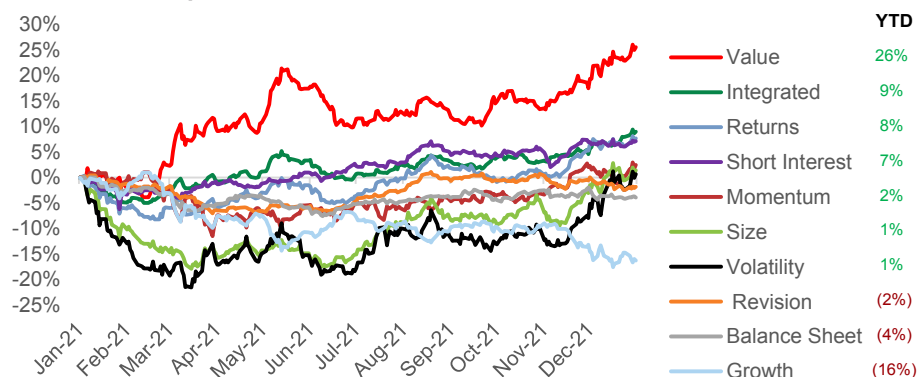
2021 was a year of pronounced factor moves and elevated volatility led by strong Growth to Value rotations. Unlike 2020 where all long/short factors except growth ended the year in negative territory, performance was more mixed in 2021. Key highlights:

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- **Value** was the best performing factor (+26%) in 2021, delivering positive returns after 4 years in the red. Value's outperformance over Growth (-16%) was significant, but it has lagged meaningfully over a longer time period. Despite the rally, Value is inexpensive vs history suggesting potential for further upside.
- The **Integrated** (Quality) factor delivered strong absolute /risk-adjust returns, maintaining its track record of resilience amidst factor/macro volatility. Through the year, the Integrated factor has become highly correlated with Value and Returns, and negatively correlated with Growth. Given the factor now is expensive vs. its own history, we highlight Buy-rated names that offer top quintile Integrated Scores but also skew towards Value (Q1 as well).
- **Momentum** had a lackluster year, and saw its composition shift towards Value and away from Growth. This was a result of elevated turnover as we lapped the Mar'20 sell-off and the Nov'20 vaccine announcement. The factor now trades cheap relative to its own history.

**Exhibit 1: 2021 factor performance: Value vs Growth rotation took center-stage**



Source: Goldman Sachs Global Investment Research

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## 2021 Factor Recap

*Note: For all factors referenced in this note, we refer to the Goldman Sachs Investment Profile (IP), which is a framework we use to better understand the investment context for a security by comparing key attributes of that security to the market (i.e., our coverage universe) and sector peers. We leverage our in-house analyst models and estimates, which we believe provide a more forward-looking/accurate measurement of company expectations/performance. Factor performance is measured on a **market neutral, sector neutral** basis. See appendix for more details on methodology. All performance data is as of 12/31/2021 unless specified otherwise.*

### Performance and Volatility Review

- A broad rotation **into Value and out of Growth** was the cornerstone of factor performance in 2021. At +26% vs. -16% they were the best and worst performing factors, respectively. It is worth noting that Value in 2021 had its best annual absolute performance since we started tracking factors (Sep 2006); while for Growth it was the worst year, marking a sharp reversal from 2020 (which was its best year since inception).
- Our **Integrated** factor (a blend of Growth, Value and Financial Returns) ended the year as the second best-performer in our factor suite (+9%), consistent with its track record of delivering superior risk-adjusted returns over time. Investor preference for defensiveness helped the **Financial Returns** factor post solid performance (+8%, its best year since 2015) though our **Balance Sheet** factor was down modestly over the year (-4%).
- The **Revisions** factor was weak in 2021 (-2%) as low revisions (Q5) consistently outperformed high revisions (Q1), particularly in 1H2021 — which stands in stark contrast vs Europe where the strategy had a strong year. To the extent the market becomes more micro-driven, we would expect this would inflect positively.
- **Fundamental factor volatility** (average of Growth, Value and Financial Returns) on average was elevated in 2021 (though was less so compared to 2020), even as the average market volatility (S&P 500) edged back towards pre-2020 historical averages. There were 3 notable spikes (Mar, May, Nov) in fundamental factor vol during the year.
- Even outside of fundamental factors, **volatility was high vs. history across our factor suite**.

## Exhibit 2: IP Factors through time: Value delivered its best risk adjusted returns since 2014 while 2021 was the worst year on record for Growth

Historical Performance, Volatility and Information Ratios of IP Factors

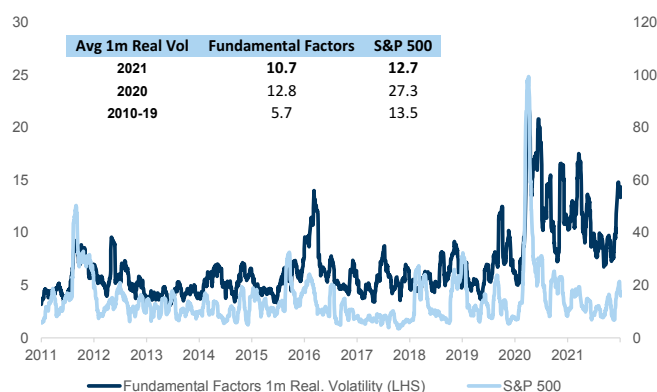
	Since Inception (Sept '06)*	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Performance (Total Return)</b> <i>Shading denotes best/worst performers</i>												
Valuation (Cheap vs Rich)	2%	0%	3%	6%	14%	2%	10%	-14%	-10%	-3%	-14%	26%
Integrated (High vs Low)	7%	4%	4%	0%	11%	8%	1%	5%	-4%	8%	-1%	9%
Returns (High vs Low)	0%	5%	-3%	-3%	8%	15%	-14%	4%	-3%	-1%	-15%	8%
Momentum (Leaders vs Laggards)	1%	7%	1%	1%	11%	19%	-24%	10%	9%	2%	-13%	2%
Size (Large vs Small)	-4%	0%	-7%	-8%	15%	13%	-21%	0%	2%	-5%	-29%	1%
Volatility (Low vs High)	-5%	8%	-7%	-7%	10%	18%	-18%	-2%	7%	-4%	-42%	1%
Revisions (High vs Low)	4%	7%	3%	7%	7%	12%	1%	16%	6%	6%	-8%	-2%
Balance Sheet (Strong vs Weak)	0%	4%	-5%	-3%	2%	12%	-8%	8%	4%	-6%	-10%	-4%
Growth (High vs Low)	4%	-4%	2%	0%	-6%	2%	0%	13%	6%	12%	25%	-16%
<b>Average Perf (absolute levels)</b>	<b>3%</b>	<b>4%</b>	<b>4%</b>	<b>4%</b>	<b>9%</b>	<b>11%</b>	<b>11%</b>	<b>8%</b>	<b>6%</b>	<b>5%</b>	<b>17%</b>	<b>8%</b>
<b>Volatility (Standard Deviation)</b> <i>Shading denotes lowest volatility</i>												
Valuation (Cheap vs Rich)	8%	6%	6%	4%	6%	5%	6%	6%	6%	8%	16%	13%
Integrated (High vs Low)	6%	4%	5%	3%	4%	4%	5%	4%	4%	5%	10%	7%
Returns (High vs Low)	9%	7%	6%	4%	5%	7%	11%	5%	5%	7%	16%	9%
Momentum (Leaders vs Laggards)	9%	8%	9%	6%	7%	10%	16%	8%	8%	14%	26%	13%
Size (Large vs Small)	12%	11%	7%	6%	8%	10%	16%	8%	8%	12%	22%	14%
Volatility (Low vs High)	17%	16%	10%	7%	10%	11%	20%	9%	10%	13%	26%	19%
Revisions (High vs Low)	4%	3%	4%	3%	3%	4%	5%	4%	4%	5%	14%	6%
Growth (High vs Low)	7%	5%	6%	4%	6%	4%	6%	5%	7%	6%	10%	11%
<b>Average Factor Volatility</b>	<b>9%</b>	<b>7%</b>	<b>7%</b>	<b>5%</b>	<b>6%</b>	<b>7%</b>	<b>10%</b>	<b>6%</b>	<b>7%</b>	<b>9%</b>	<b>17%</b>	<b>12%</b>
<b>Information Ratio</b> <i>Shading denotes Information Ratio &gt;1</i>												
Valuation (Cheap vs Rich)	0.3	0.1	0.6	1.4	2.4	0.5	1.8	-2.2	-1.6	-0.4	-0.9	2.0
Integrated (High vs Low)	1.3	1.1	0.8	0.0	2.7	1.7	0.2	1.4	-0.9	1.6	-0.1	1.3
Returns (High vs Low)	0.0	0.7	-0.6	-0.7	1.6	2.0	-1.3	0.8	-0.6	-0.1	-1.0	0.8
Momentum (Leaders vs Laggards)	0.1	0.9	0.1	0.1	1.5	1.9	-1.5	1.3	1.0	0.1	-0.5	0.2
Size (Large vs Small)	-0.3	0.0	-1.0	-1.4	1.8	1.4	-1.3	0.0	0.3	-0.4	-1.3	0.1
Volatility (Low vs High)	-0.3	0.5	-0.6	-1.0	1.0	1.7	-0.9	-0.2	0.8	-0.3	-1.6	0.0
Revisions (High vs Low)	1.0	2.0	0.6	2.2	2.2	2.9	0.1	4.2	1.5	1.1	-0.6	-0.3
Growth (High vs Low)	0.6	-0.7	0.4	0.0	-0.9	0.5	0.0	2.3	0.9	2.1	2.6	-1.4
<b>Average I.R. (absolute levels)</b>	<b>0.5</b>	<b>0.8</b>	<b>0.6</b>	<b>0.9</b>	<b>1.8</b>	<b>1.6</b>	<b>0.9</b>	<b>1.6</b>	<b>0.9</b>	<b>0.8</b>	<b>1.1</b>	<b>0.8</b>

\* Since Inception performance is presented on an annualized basis.

Source: Goldman Sachs Global Investment Research

## Exhibit 3: Fundamental factor vol spiked 3 times in 2021, and remained elevated vs history

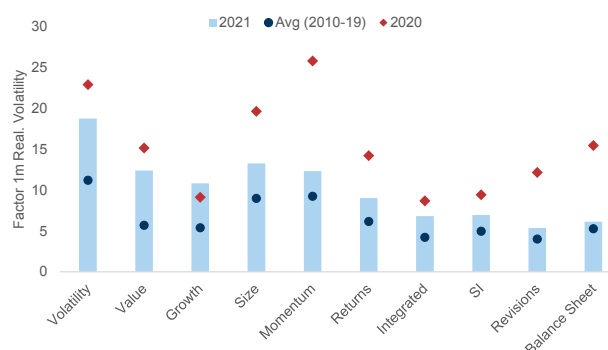
1-m realized vol, fundamental factors include Growth, Value & Returns



Source: Goldman Sachs Global Investment Research

## Exhibit 4: Factor Volatility was higher than historical averages across our factor suite

Average 1m realized volatility. Sorted by diff. between 2021 and Avg (2010-19)



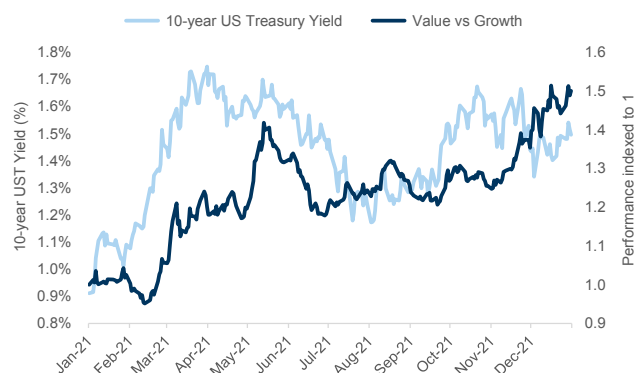
Source: Goldman Sachs Global Investment Research

## Digging into the Value vs. Growth Rotation

After 4 straight years of sharp underperformance vs. Growth, Value staged a comeback in 2021, delivering positive returns for the first time since 2016. This outperformance of Value has come against the backdrop of a rising 10 year, particularly in 1H21, and we have seen this trend take hold again since the start of December. We note the following:

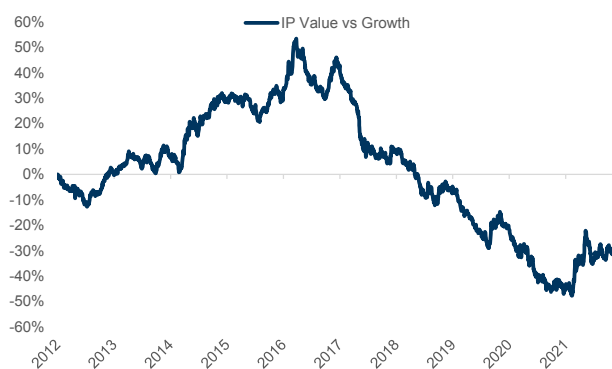
- While Value's strong performance in 2021 has helped its relative performance vs. Growth to come well off its decade lows, it still lags by -18% since 2012 (as of 12/31). This longer-term underperformance of Value suggests there could be room to run particularly as we navigate an environment of rising rates in 2022, given Value's typically positive correlation with 10-year yields.
- The correlation between the two factors is also more negative than has historically been the case though has moderated somewhat since 1H2021. Also, the overlap between High Growth and Expensive Value is now below historical average (40% vs 45% over the past 5 years), indicating high growth is increasingly not necessarily the most expensive companies.
- Digging into the Value vs Growth rotation in 2021, Value outperformance has been more prominent in Consumer sectors (Staples and Discretionary) and Energy, while the underperformance of Growth was most evident in Healthcare.
- Using factor valuation as measure for "crowdedness," we note Value remains 'cheap' relative to history despite its strong run in 2021, while L/S valuation for Growth has reverted to more normal levels (but is still above 1x) — indicating there could be more room for the trade to run.

**Exhibit 5: Value vs Growth performance closely tracked the moves in interest rates in 2021**



Source: Goldman Sachs Global Investment Research

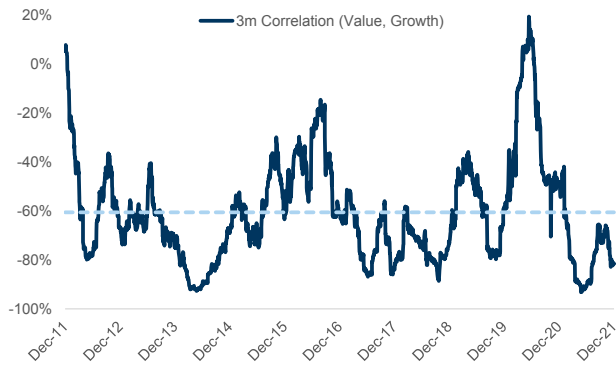
**Exhibit 6: Value outperformance vs Growth is coming off multi-year lows**



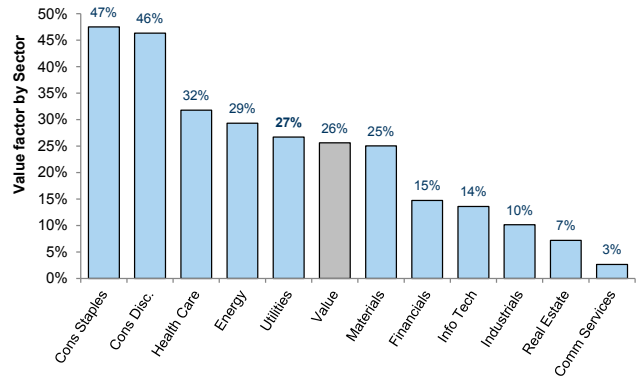
Source: Goldman Sachs Global Investment Research

**Exhibit 7: Value and Growth are more negatively correlated vs history**

3-month realized correlation



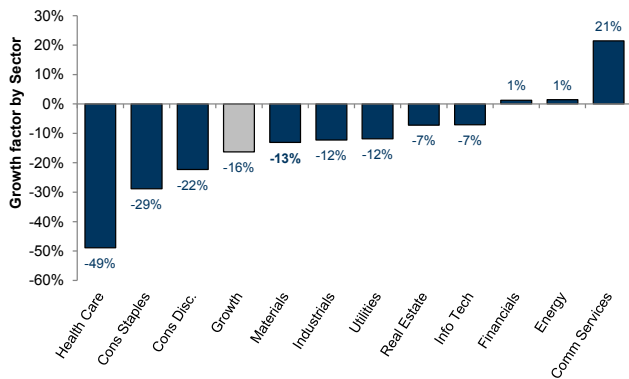
Source: Goldman Sachs Global Investment Research

**Exhibit 8: The Value rotation this year has been more pronounced in Consumer & Energy, and less so in Financials, Industrials & Tech**  
 GICS sector Value factor performance


Source: Goldman Sachs Global Investment Research

**Exhibit 9: Growth underperformance was the most acute in HC and Consumer, while Comm Services saw outperformance**

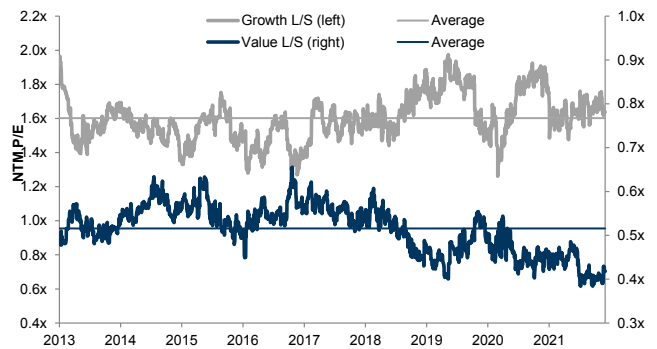
GICS sector Growth factor performance



Source: Goldman Sachs Global Investment Research

**Exhibit 10: Value still trades "cheap" relative to history, while Growth's NTM P/E is more in-line with historical averages**

IP Value and Growth L/S NTM P/E



Source: Goldman Sachs Global Investment Research

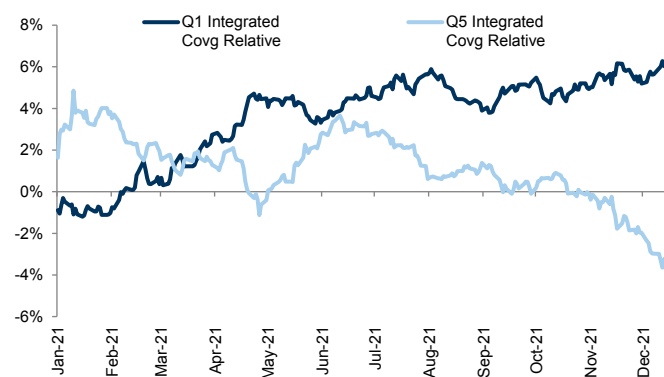
## Integrated (Quality) Factor: Acting defensive in a volatile environment

Amidst all the factor rotations, the Integrated (Quality) factor — a blend of Growth, Value and Returns — managed to maintain its track record of strong risk-adjusted returns. We note the following:

- The factor ended the year up 8% — only behind Value, both on an absolute and risk-adjusted basis, and had low factor volatility (only behind Revisions). We note that the factor was particularly strong in the 2nd half, driven by greater underperformance in the Q5 leg.
- Over the course of the year, the factor has become increasingly correlated with Value and Returns (and negatively correlated with Growth). Additionally, the factor exhibits low sensitivity with macro variables suggesting it is less sensitive to large swings. This may appeal to investors given the uncertain growth, rate and inflation backdrop.
- Strong performance has pushed the factor's NTM P/E valuation above historical averages (0.95 vs 0.85), though remains off peaks.

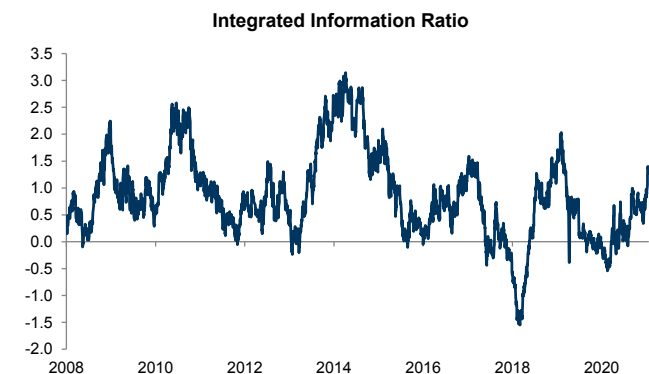
**Exhibit 11: Integrated factor performance: Underperformance of the Q5 leg intensified in 2H21**

Price perf relative to GS Coverage



Source: Goldman Sachs Global Investment Research

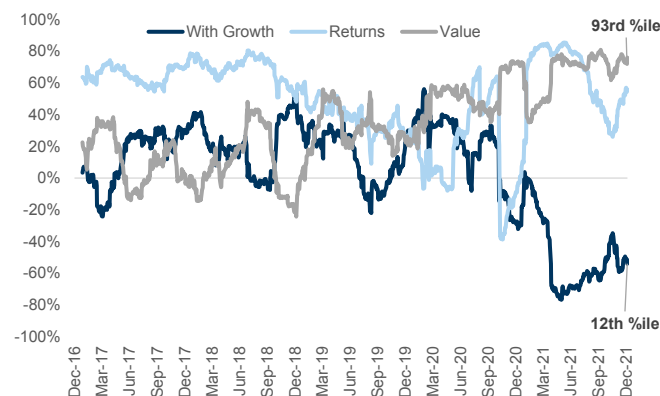
**Exhibit 12: Integrated post solid risk-adjusted returns in a volatile year**



Source: Goldman Sachs Global Investment Research

**Exhibit 13: Integrated correlation with Value and Growth is at historical extremes**

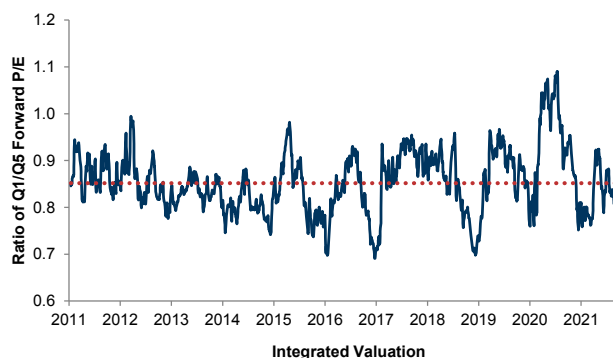
Integrated 1m realized correlation



Source: Goldman Sachs Global Investment Research

**Exhibit 14: The move higher this year has pushed the factor's valuation above historical average**

Ratio of Q1/Q5 Forward P/E



Source: Goldman Sachs Global Investment Research

In Exhibit 15, we highlight stocks from our GS North America coverage that offer both High Quality (Q1 Integrated or top 20% in the sector) and Cheap Value (Q1 Value or cheapest 20%). We include names where our analysts have assigned a Buy-rating and see at least 10% upside to target prices.

**Exhibit 15: Buy-rated stocks that are High Quality and Cheap Value**

Sorted by Company Name

Ticker	Company Name	Sector Relative IP Quintiles				Sector	Market Cap (\$B)	Last Close	Rating	Upside to Target
		Integrated	Value	Growth	Financial Returns					
ASO	Academy Sports & Outdoors Inc.	1	1	4	3	Retail Specialty Hardlines	4.0	41.82	Buy	39%
ATVI	Activision Blizzard Inc.	1	1	4	2	Video Games, Select Internet & Toys	50.0	63.82	Buy*	74%
AMGN	Amgen Inc.	1	1	4	1	Biotechnology	127.7	225.17	Buy	19%
AVYA	Avaya Holdings	1	1	4	2	Hardware and Comm Tech	1.8	19.63	Buy	38%
BRBR	Belling Brands Inc.	1	1	1	1	HHPC/Packaged Food	1.1	27.18	Buy	51%
EAT	Brinker International Inc.	1	1	5	1	Restaurants	1.8	38.10	Buy	36%
BMJ	Bristol-Myers Squibb Co.	1	1	2	3	Biopharma	137.9	61.48	Buy	17%
CF	CF Industries Holdings	1	1	5	1	Agribusiness & Packaging	14.9	69.24	Buy	14%
CC	Chemours	1	1	3	1	Chemicals	5.9	35.69	Buy	51%
COMM	CommScope Holding	1	1	3	3	Hardware and Comm Tech	2.7	10.96	Buy	92%
DRI	Darden Restaurants Inc.	1	1	4	2	Restaurants	19.2	147.42	Buy	13%
DKS	Dick's Sporting Goods	1	1	5	2	Retail Specialty Hardlines	9.0	108.14	Buy	57%
DVAX	Dynavax Technologies	1	1	5	1	Emerging Biotech	1.6	13.11	Buy	190%
EIX	Edison International	1	1	1	2	Utilities	24.6	64.62	Buy	18%
EPRT	Essential Properties Realty Trust	1	1	1	3	REITs	3.5	28.36	Buy	20%
HALO	Halozyne Therapeutics Inc.	1	1	5	1	SMID Biotech	5.5	38.59	Buy	30%
HRMY	Harmony Biosciences	1	1	3	1	SMID Biotech	2.3	40.48	Buy	36%
INCY	Incyte Corp.	1	1	3	1	Biotechnology	16.0	72.63	Buy	87%
INTU	Intuit Inc.	1	1	4	1	Software	162.4	586.39	Buy	43%
KFY	Korn Ferry	1	1	4	2	Information and Business Services	4.2	77.54	Buy	15%
KOS	Kosmos Energy Ltd.	1	1	1	1	Integrated Oil and Refiners	1.9	4.27	Buy	17%
LVS	Las Vegas Sands Corp.	1	1	2	1	Gaming, Lodging and Leisure	28.7	37.83	Buy	77%
LDOS	Leidos Holdings	1	1	3	2	Aerospace & Defense	13.0	90.97	Buy*	36%
LNC	Lincoln National Corp.	1	1	2	2	Insurance	13.7	72.59	Buy	21%
MGA	Magna International Inc.	1	1	2	3	Autos & Industrial Tech	25.9	85.45	Buy	16%
FB	Meta Platforms, Inc.	1	1	5	2	Internet	950.5	332.46	Buy	34%
MSFT	Microsoft Corp.	1	1	4	1	Software	2,375.1	313.88	Buy*	27%
MRNA	Moderna Inc.	1	1	5	1	Biotechnology	87.4	216.06	Buy	83%
NRG	NRG Energy Inc.	1	1	1	1	Utilities	10.0	40.64	Buy*	13%
OVV	Ovintiv Inc.	1	1	1	3	E&P	9.9	38.04	Buy	24%
R	Ryder System Inc.	1	1	3	2	Transportation	4.2	79.34	Buy	32%
SU	Suncor Energy Inc.	1	1	1	4	Integrated Oil and Refiners	51.7	26.58	Buy	13%
AES	The AES Corp.	1	1	4	1	Utilities	15.5	23.24	Buy	29%
TNL	Travel + Leisure Co.	1	1	4	2	Gaming, Lodging and Leisure	5.0	57.13	Buy	19%
VRTX	Vertex Pharmaceuticals Inc.	1	1	4	1	Biotechnology	57.5	221.65	Buy*	47%
VCIT	Victory Capital Holdings	1	1	4	1	Asset Managers & Capital Markets	2.5	33.98	Buy	47%
YELP	Yelp Inc.	1	1	3	3	Video Games, Select Internet & Toys	2.8	35.70	Buy	46%
ZBH	Zimmer Biomet Holdings	1	1	4	3	Medical Technology & Providers	27.2	128.93	Buy*	39%

\* denotes on the Conviction List; all price targets have a 12-month time horizon; As of Jan-6 2022

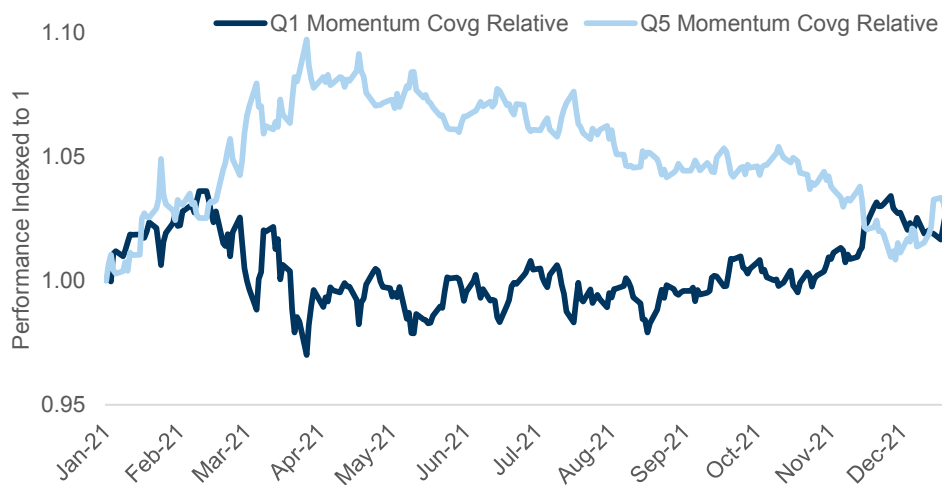
Source: Goldman Sachs Global Investment Research

## Momentum: Assessing the setup into 2022 post a weak year

Momentum had a lackluster performance in 2021 overall, amidst heightened volatility seen in other factors. We note the following:

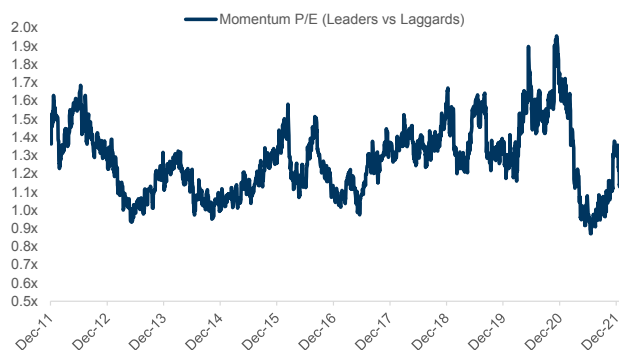
- The factor — which is based on 12 months' performance excluding the last month (12-1M) — underperformed sharply in 1Q21, followed by a steady reversion through the course of the year (+2% in 2021). Alongside the underperformance in 1Q, the factor saw its valuation dip to the lowest level on record, before recovering somewhat in 2H (currently at 35th %ile vs 10-year history).
- A key driver of performance this year (and valuation) was likely the composition of the factor which saw significant changes, evidenced by high factor turnover, particularly in March/April (as we lapped the 2020 sell-off), and in Nov as we lapped the Nov-2020 vaccine announcement that kick started the Value rally. Turnover remains high particularly for laggards compared to historical levels.
- As a result of these changes and the ensuing rotations, the factor's overlap with Value and Growth in its Q1/Q5 legs (both at extremes vs history) saw significant changes this year while most other factor overlaps remained consistent with history.

**Exhibit 16: Momentum's performance saw steady reversion from strong 1Q underperformance**

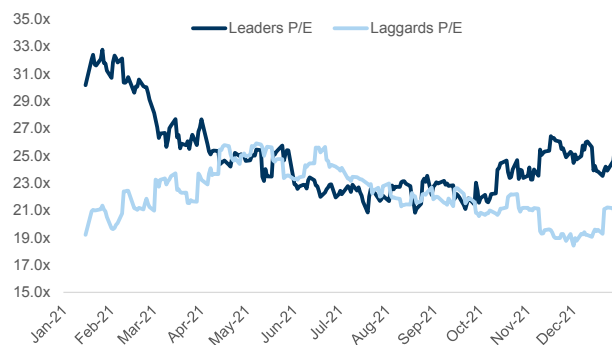


Source: Goldman Sachs Global Investment Research

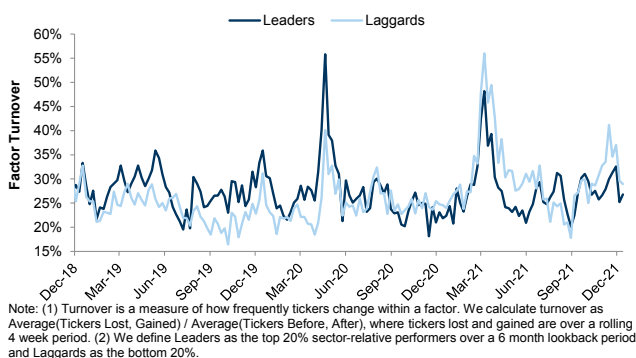


**Exhibit 17: Momentum long/short P/E hit the lowest level on record in Jun 21...**

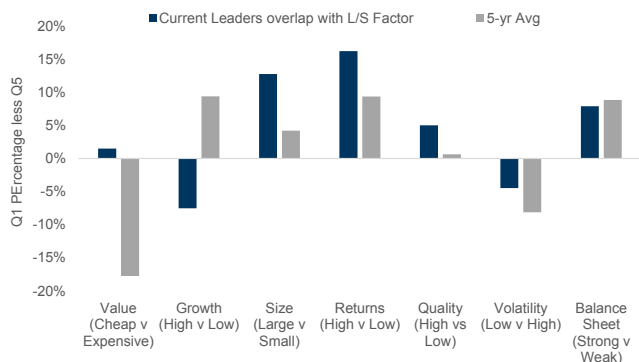
Source: Goldman Sachs Global Investment Research

**Exhibit 18: ...driven by a decline in Leaders P/E through 3Q21, and some reversal thereafter**

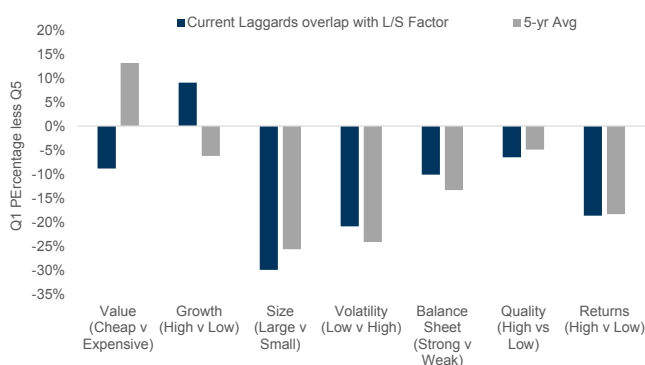
Source: Goldman Sachs Global Investment Research

**Exhibit 19: Momentum saw high turnover particularly in laggards**

Source: Goldman Sachs Global Investment Research

**Exhibit 20: Leaders have a higher overlap with Value, Returns, Size vs history, and a significantly lower overlap with Growth Sorted by absolute change vs 5-yr Avg**

Source: Goldman Sachs Global Investment Research

**Exhibit 21: Laggards have a higher overlap with Growth, and a significantly lower overlap with Value vs 5-yr Avg Sorted by absolute change vs 5-yr Avg**

Source: Goldman Sachs Global Investment Research

**Exhibit 22: Value and Growth correlation with momentum are elevated vs history 3m realized correlation**

Factor Correlation with Momentum	31-Dec	30-Sep	Diff	5YR Med	5YR %ile	Current 5YR Percentile
Financial Returns	52%	-40%	92%	49%	55%	~50%
Integrated	40%	-4%	44%	3%	95%	~95%
Size	36%	-59%	95%	53%	36%	~36%
Short Interest	32%	-7%	39%	35%	47%	~47%
Value	31%	17%	14%	-63%	99%	~99%
Balance Sheet	23%	-21%	44%	53%	19%	~19%
Volatility	22%	-70%	92%	35%	39%	~39%
Growth	-33%	25%	-59%	40%	2%	~2%

Source: Goldman Sachs Global Investment Research

## Appendix

### Calculation methodology for the GS Investment Profile (IP) scores:

- The Goldman Sachs Investment Profile (IP Scores) is a tool we use to better understand the investment context for a security by comparing key attributes of that security to the market (i.e., our coverage universe) and sector peers. We leverage our in-house analyst models and estimates, which we believe provide a more forward looking/accurate measurement of company expectations/performance.
- Financial Returns and Valuation use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters away. Growth uses the value for the fiscal year at least seven quarters away compared with the year at least three quarters away (on a per-share basis for all metrics).
- These metrics are normalized by assigning a Z-score based on the company's position within the overall distribution of all IP scores (assuming a normal distribution). The average of these normalized metrics is taken (or average of the applicable metrics in case of Financials) and is then used to generate a percentile score from 1 to 100 for each factor.
- We bucket these company scores into highest quintile (Q1 or top 20%) and lowest quintile (20%) within each coverage sector, and construct portfolios with an equal number of stocks under Q1 and Q5. The performance of these top and bottom quintile tails, as well as a sector-neutral portfolio (Buy Q1, Sell Q5) of the two, is tracked and rebalanced on a weekly basis.

### Measures used in each factor:

- **IP Integrated:** calculated as an aggregate score based on Financial Returns, Growth and Valuation. Q1: stocks with the highest Integrated score within their sectors; Q5: stocks with the lowest Integrated score.
- **IP Financial Returns:** calculated using an average of return on equity (ROE), return on capital employed (ROCE), and cash return on cash invested (CROCI) for each stock. Only ROE is considered for Financials. Q1: stocks with the highest returns within their sectors; Q5: stocks with the lowest returns.
- **IP Growth:** calculated using an average of a company's sales, EBITDA and EPS growth. For Financials, we use only EPS and sales growth. Q1: stocks with the highest growth within their sectors; Q5: stocks with the lowest growth.
- **IP Valuation:** calculated using an average of price/earnings, price/book, dividend yield, enterprise value/EBITDA, enterprise value/free cash flow and enterprise value/debt adjusted cash flow. Only P/E, P/B and dividend yield are used for Financials. Q1: stocks with the lowest multiples within their sectors; Q5: stocks with the highest multiples.
- **IP Volatility:** calculated as the standard deviation of daily total returns over a trailing 12-month period. Q1: stocks with the lowest volatility within their sectors; Q5: stocks with the highest volatility.

- **IP Balance Sheet:** calculated using net debt/EBITDA (leverage). This is used only for non-Financial stocks. Q1: stocks with the lowest leverage within their sectors; Q5: stocks with the highest leverage.
- **IP Size:** calculated using market capitalization. Q1: stocks with the largest market caps within their sectors; Q5: stocks with the smallest market caps.
- **IP Momentum:** based on performance over the preceding 12 months excluding the last month. Q1: sector leaders (top 20% performers); Q5: sector laggards (bottom 20%).
- **IP Short Interest:** based on Short Interest Days (SI / ADTV). Q1: stocks with the lowest Days-to-Cover within their sectors; Q5: stocks with the highest Days-to-Cover. Based on exchange data which is released with a lag.
- **IP Revision:** based on 1M revision in calendar year Sales estimates based on FactSet consensus. We look at sales estimates with calendar year-end at-least 6 months away from the date of re-balancing. Q1: stocks with the highest revisions within their sectors; Q5: stocks with the lowest revisions.

### A note on Sector Decomposition

While the Investment Profile (IP) model is sector-neutral, there is often significant performance differences across the sectors which can often drive the broader factor. As a result, we find the GICS level aggregation a useful tool to provide perspective. That said, we note: (1) Because our factor model is based on GS-defined conviction sectors and not GICS, the number of companies in each GICS sector will vary by quintile (there are equal numbers in Q1/Q5 in our model); and (2) Because IP is based on equal-weighting companies within quintiles, sectors with more companies will have a larger influence on the overall factor performance.

# Disclosure Appendix

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**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.

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