

Derek Bergen, CFA
Partner

John Holt, CFA
Partner

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From your friends at Applied Finance, we hope you are off to a great start to 2022! In this quarter's review, we want to take inventory of the valuation and wealth creation characteristics of the US investment landscape to help our research partners confidently form allocation decisions for the coming year.

Most investors have likely encountered recent commentary that emphasizes historically high CAPE multiples prescribing allocation away from equities or price multiple value gaps prescribing to "sin a little" in favor of value stocks. While it's helpful to acknowledge this sentiment across the investment community, Applied Finance has long proven that better investment decisions are made when using a comprehensive valuation framework that incorporates profitability, growth, competition and risk instead of price multiple shortcuts. This also applies to macro commentary and tactical allocation.

Regarding CAPE multiples, it is important to acknowledge rising profits over the previous decade, as well as the low cost of capital environment that not only impacts the discounted value of future cash flows but also the hurdle rate for future investment. When incorporating recent profits, near-term forecasts, and the current discount rate environment into a valuation framework, most broad market US indices are fairly valued. This is an observation, however, that will require continuous monitoring of emerging interest rate and inflation details with an eye on a material rise in real rates.

Regarding price multiple value gaps, it is important to acknowledge the distinction between large and small cap value indices before allocating towards popular style methodologies. The largest cash flow generating firms with significant reinvestment opportunities, while already large components of the S&P 500, become even more concentrated in the S&P 500 Growth index. Most of these stocks are highly profitable, return substantial capital to shareholders, and what many believe are high prices simply reflect our low interest rate environment. In small cap stocks, however, we observe widening intrinsic value upside for several value methodologies compared to their growth peers, as well as in broad market indices that exclude unprofitable firms.

While our research indicates that valuation and wealth creation principles offer timeless insight in portfolio construction, the current characteristics of the small cap investment landscape make them as relevant as ever. In the Russell 2000, we have observed increasing levels of unprofitable firms and shareholder dilution tethered to decreasing market efficiency. Through this lens, we find the most credible parallels between current equity markets and the themes of the tech bubble. Based on these observations, we believe there is strong evidence to abandon small cap passive allocations in favor of more concentrated strategies explicitly tailored to capture valuation and wealth creation themes.

In this write-up, we will also explore recent factor performance and the valuation characteristics of each factor portfolio in large and small cap arenas. We will continue to review the implied expectations in the five largest market cap stocks (expanded to six as TSLA surpassed FB in market cap) and review broader performance of the top 100 market cap stocks, as well as performance trends by sector and industry. We will share AFG & Friends Favorite Stocks for 2022 provided at the end of 2021 to raise proceeds for a few noble charities. We also review Q4 attribution performance on Applied Finance's investment strategies and an overview of AFG multifactor grade performance globally.

Please contact your AFG representative if we can lend a hand with any questions or training needs. We are thankful for our research partnership, and we look forward to continuing to provide valuation-based insight to assist in your portfolio construction and asset allocation decisions!

The Rise of Negative Profits and Shareholder Dilution in US Small Caps

Chart 1: Russell 2000: Negative Operating Profits



Chart 2: Russell 2000: Financing Yield (\$B)



Chart 3: Russell 2000: Financing Yield %



Chart 4: Russell 2000: Mkt Wgt Intrinsic Value Upside

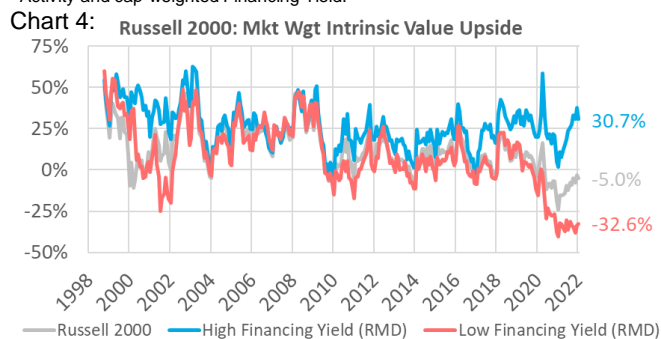
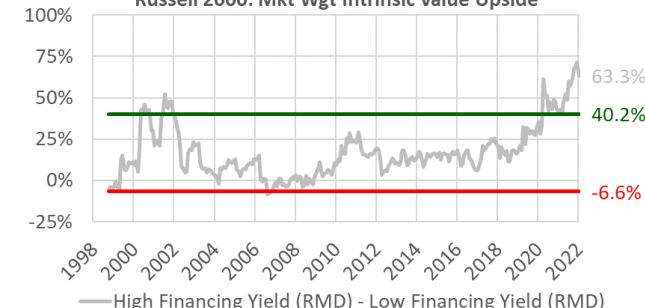


Chart 5: Russell 2000: Mkt Wgt Intrinsic Value Upside



An important theme that Applied Finance reviewed in 2021 focused on the [alarming rates of dilution](#) for a material number of firms in the Russell 2000. This theme is worth exploring in more detail, as its implications align tactical guidance in the current marketplace with valuation and wealth creation principles that are useful in forming long-term strategic decisions.

To better understand the current landscape of small cap US stocks, it is helpful to review trends on profitability and dilution across time. Chart 1 highlights the percentage of market cap and constituents in the Russell 2000 with negative operating profits. At the end of June 2021, 28.2% of Russell 2000 firms and 24.5% of overall market cap were represented by firms with negative profits; each higher than levels realized during the peak of the late-90s tech bubble. Negative profit firms underperformed in the second half of 2021, diminishing their market cap contribution to the overall Russell 2000 to 20.6% by year end. In the Russell 1000, for context, negative profit firms currently only represent 4.1% of the overall market cap and 11.6% of total constituents at year end.

Negative profits are often accompanied by reliance on external sources of financing. Chart 2 captures the aggregate financing cash flow activity for positive and negative operating profit firms in the Russell 2000, while Chart 3 presents this data in its cap-weighted yield form. (Financing Yield measures a firm's financing cash flow divided by enterprise value)

It is noteworthy that absolute levels of dilution accelerated for negative profitability firms as early as 2018 then further increased in March 2021 as 2020 financial statement data became broadly available. Financing Yield for unprofitable firms has hovered around -10% on a cap-weighted basis since 2014, but the overall index weight of unprofitable firms has nearly doubled over the last seven years. Over the previous four quarters, 266 firms in the Russell 2000 have increased weighted diluted shares by more than 25%.

Our final two charts study the intrinsic value characteristics of high and low Financing Yield portfolios. Chart 4 displays that the top 30% of Financing Yield stocks in the Russell 2000 has aggregate intrinsic value upside of 30.7% while the bottom 30% has aggregate upside of -32.6%. In Chart 5, we observe that the current valuation gap between the top 30% and bottom 30% Financing Yield portfolios is 63.3%, exceeding any level achieved during the peak of the tech bubble. It is also noteworthy that the valuation gap began to expand in 2018 when absolute levels of dilution began to increase for unprofitable firms. Over the course of 2021, the top 30% Financing Yield portfolio returned 42.9%, outperforming the bottom 30% portfolio by 37.6% in the Russell 2000, yet this valuation gap further expanded over the course of the last 12 months.

The Rise of Negative Profits and Shareholder Dilution in US Small Caps: Examples & Impact

AMC Entertainment (AMC) Communication				
	2018	2019	2020	2021
Price	12.28	7.24	2.12	27.20
Common Shares	103	104	224	513
Market Cap	1,271	752	476	13,963
Current Debt	82	30	33	30
Long-Term Debt	5,378	4,823	5,809	5,499
Other Liabilities	1,351	5,659	5,707	5,483
Enterprise Value	8,081	11,265	12,051	24,975
Net Income	110	(149)	(4,589)	

Spirit Airlines Inc (SAVE) Industrials				
	2018	2019	2020	2021
Price	57.92	40.31	24.45	21.85
Common Shares	68	68	98	108
Market Cap	3,954	2,759	2,389	2,369
Current Debt	164	259	384	208
Long-Term Debt	2,025	1,960	3,067	2,975
Other Liabilities	23	1,240	1,301	1,678
Enterprise Value	6,165	6,219	7,140	7,231
Net Income	156	335	(429)	

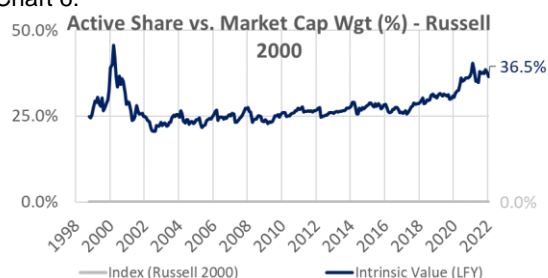
Dave & Buster's (PLAY) Consumer Discretionary				
	2018	2019	2020	2021
Price	44.56	40.17	30.02	38.40
Common Shares	38	31	48	48
Market Cap	1,672	1,229	1,430	1,856
Current Debt	15	15	0	0
Long-Term Debt	378	633	596	485
Other Liabilities	248	1,258	1,318	1,316
Enterprise Value	2,313	3,135	3,345	3,657
Net Income	117	100	(207)	

Invitae Corp (NVTA) Health Care				
	2018	2019	2020	2021
Price	11.06	16.13	41.81	15.27
Common Shares	75	99	186	226
Market Cap	835	1,594	7,772	3,454
Current Debt	9	2	2	4
Long-Term Debt	76	270	391	1,580
Other Liabilities	9	50	890	177
Enterprise Value	928	1,916	9,054	5,215
Net Income	(129)	(242)	(602)	

Plug Power Incorporated (PLUG) Industrials				
	2018	2019	2020	2021
Price	1.24	3.16	33.91	28.23
Common Shares	219	303	458	576
Market Cap	272	959	15,533	16,262
Current Debt	91	76	59	62
Long-Term Debt	181	341	389	505
Other Liabilities	28	143	173	258
Preferred Stock	52	17	0	0
Enterprise Value	624	1,536	16,154	17,087
Net Income	(78)	(86)	(596)	

Applied Finance Research: Price, Shares Outstanding, Enterprise Value and Profitability trends. 2018 to 2021.

Chart 6:



Applied Finance Research: Active Share of Intrinsic Value_{LFY} Weighted Index vs. Market Cap_{Current} Weighted Index of Russell 2000 constituents. 10/98 to 12/21, point-in-time data as of each calendar month end.

To fully grasp the impact of negative profits and dilution in the small cap arena, we can review several high-profile examples of firms that recently diluted ownership either by issuing additional shares or borrowing incremental debt. These examples represent both value (AMC, SAVE, PLAY) and growth (NVTA, PLUG) style index constituents.

The dilution by AMC Entertainment (AMC) earned notoriety over the past year. AMC initially issued an additional 114M shares in 2020 Q4, which only netted the firm \$262M in proceeds at \$2.30 per share. This occurred while net income fell to -\$4.5B due to theater closures and film production delays in the wake of COVID-related shutdowns. Over the first three quarters of 2021, AMC further increased shares outstanding another 289M shares. Of these, nearly 242M shares were related to secondary offerings netting \$1.8B in proceeds at \$7.40 per share. AMC's share price later rose to \$27.20 by the end of 2021, pushing its enterprise value to \$25.0B compared to only \$8.1B at the end of 2018.

Spirit Airlines (SAVE) has seen its price decline significantly from \$57.92 at the end of 2018 to \$21.85 at the end of 2021, which seems reasonable given the impacts on airlines and travel stocks related to COVID travel restrictions. Once we acknowledge the nearly 60% increase in shares outstanding, \$1.0B in incremental debt, and \$1.6B in incremental other liabilities, however, we observe that the enterprise value for SAVE is now \$1.1B higher than 2018 levels despite the 60% drop in share price. In 2020, SAVE issued nearly 30M new shares at an average price of \$12.59 per share, followed by 10M more shares YTD in 2021 at an average price of \$35.25 per share.

Early in the pandemic sell-off, Dave & Buster's (PLAY) issued an additional 17M shares for \$183M in net proceeds at less than \$11 per share. The stock price of PLAY has since recovered to pre-COVID levels, but their enterprise value is now 60% higher than it was in 2018.

Invitae Corp (NVTA) saw significant appreciation in 2020 despite increasing shares outstanding by nearly 90%. Its enterprise value has since fallen from \$9.0B to \$5.2B in 2021 despite issuance of 40M additional shares and more than \$1B in debt last year. NVTA's stock price is now below 2019 levels while its enterprise value is 175% higher due to significant dilution.

Plug Power (PLUG) was recently promoted to the Russell 1000 last summer, but it provides a cautionary tale on the impact of dilution over long-term horizons. Since 2018, PLUG has appreciated significantly while the firm has increased shares outstanding by 160%. Despite this recent outperformance pushing PLUG's market cap to an all-time high, its stock price is still significantly below its levels reached in the early 2000s due to the amount on incremental shares issued over the last twenty years.

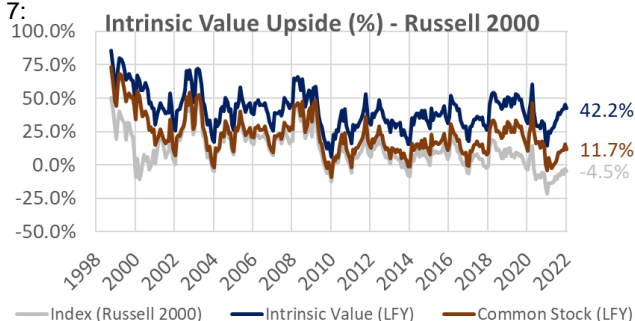
While each of these anecdotes provide insight into firm-specific levels of recent dilution, we can attempt to measure if these themes in aggregate have led to elevated market inefficiency. It's reasonable to conclude that investors have faced many complex themes over the last few years, including historically low interest rates, COVID lockdowns, reopening, accelerated digitization, shifting consumer/work/lifestyle preferences in addition to these dilution concerns. Tethering this to the rise of passive investing and the expansion of thematic concentrated ETFs, it is reasonable to assume that the elevated levels of active share between intrinsic value and cap-weighted indices provide a useful barometer for market inefficiency in small caps and the degree in which price discovery may be muted. In Chart 6, we observe that recent levels of active share are significantly higher than any level observed since early 2000, and this began to increase as early as 2018 alongside the expansion of unprofitable firms.

Strategic & Tactical Allocation in US Small Caps

Table 1: Small Cap Index & AFCM Strategy Data	Equity Positions	Intrinsic Value Upside	Financing Yield	Dividend Yield	EM+1
AFG US Small/Mid Cap	130	87.9%	2.3%	1.0%	9.1%
S&P 400 Growth (IJK)	232	-1.2%	-0.2%	0.8%	6.7%
S&P 400 (IJH)	400	8.8%	-0.1%	1.3%	4.4%
S&P 400 Value (IJJ)	299	19.1%	0.1%	1.7%	2.1%
S&P 600 Growth (IJT)	330	6.6%	-0.7%	0.8%	4.2%
S&P 600 (IJR)	601	8.0%	-0.2%	1.2%	2.1%
S&P 600 Value (IJS)	457	10.3%	0.4%	1.6%	-0.2%
Russell 2000 Growth (IWO)	1243	-20.8%	-2.6%	0.4%	1.4%
Russell 2000 (IWM)	2038	-4.6%	-2.2%	1.0%	0.7%
Russell 2000 Value (IWN)	1450	11.5%	-1.9%	1.6%	-0.1%
Morningstar Mid Growth (JKH)	367	-20.7%	-1.1%	0.6%	4.2%
Morningstar Mid (JKG)	564	-2.7%	-0.9%	1.3%	4.0%
Morningstar Mid Value (JKI)	385	14.8%	-0.8%	2.0%	4.0%
Morningstar Small Growth (JKK)	1179	-30.0%	-2.8%	0.5%	-0.8%
Morningstar Small (JKJ)	2009	-1.8%	-1.8%	1.1%	0.6%
Morningstar Small Value (JKL)	1231	25.1%	-0.4%	1.8%	2.0%

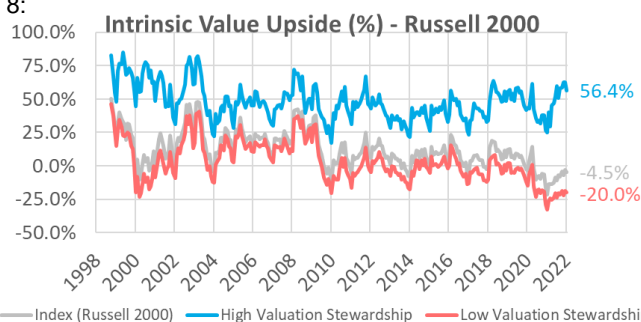
Applied Finance Research: Valuation & Wealth Creation traits for style indices & benchmarks. Benchmark constituents and weights provided by iShares ETF daily reports as of 12/31/2021.

Chart 7:



Applied Finance Research: Alternative value weighted intrinsic value upside characteristics of Russell 2000 constituents. 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing.

Chart 8:



Applied Finance Research: Russell 2000 constituents. Valuation Stewardship portfolios formed on Excess Intrinsic Value and Financing Yield characteristics, 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing. Chart displays cap-weighted Intrinsic Value (Plus 3)

Table 2: Russell 2000 Valuation Stewardship	Russell 2000		High Valuation Stewardship			Low Valuation Stewardship			Valuation Gap
	Annual Return	Avg Sector Weight	Return	Spread	Current Upside	Return	Spread	Current Upside	
All Sectors	9.6%	100%	13.8%	4.2%	56%	8.4%	-1.2%	-20%	76%
Financials	9.5%	21%	13.3%	3.7%	10%	8.9%	-0.6%	-19%	29%
Utilities	10.7%	3%	12.3%	1.5%	93%	10.7%	0.0%	-24%	118%
Energy & Extraction	4.5%	3%	8.3%	3.8%	186%	2.4%	-2.1%	74%	113%
Transportation	8.4%	3%	11.5%	3.1%	101%	4.5%	-3.9%	32%	69%
Health	12.1%	10%	17.1%	5.0%	56%	10.5%	-1.6%	-41%	97%
Technology	10.1%	13%	15.4%	5.2%	38%	8.9%	-1.2%	-51%	89%
Consumer Durable	7.7%	5%	9.9%	2.2%	53%	6.0%	-1.7%	5%	48%
Capital Goods	11.2%	9%	16.3%	5.1%	90%	8.6%	-2.6%	-6%	96%
Basic Material	10.9%	6%	12.0%	1.1%	37%	10.0%	-0.9%	15%	22%
Consumer Non Durable	14.2%	4%	13.2%	-1.0%	48%	12.6%	-1.6%	-23%	71%
Consumer Services	8.8%	16%	12.7%	3.9%	65%	6.3%	-2.5%	6%	59%
Miscellaneous	6.6%	6%	14.6%	8.0%	56%	5.2%	-1.4%	-37%	93%

Applied Finance Research: Russell 2000 constituents. Valuation Stewardship portfolios formed on Excess Intrinsic Value and Financing Yield characteristics, 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing. Tables displays annualized AFG sector performance of High / Low Valuation Stewardship portfolios, as well as the current valuation gap within each sector.

Based on these observations, small cap allocations may benefit from avoiding stocks with negative operating profits and dilution. S&P indices explicitly exclude non-earners, which improves aggregate upside to 8.0% compared to -4.6% for the Russell 2000. Table 1 highlights that intrinsic value upside further improves in small cap value indices, but higher upside is offset by lower Economic Margins or dilutive traits. As we noted earlier, broad value indices are also impacted by negative profit firms. (25.9% of the Russell 2000 Growth index is comprised of negative profit firms vs. 12.3% of the Russell 2000 Value index)

By specifically targeting valuation and wealth creation themes, Applied Finance's US Small/Mid Cap strategy only holds 130 stocks, but these positions have aggregate intrinsic value upside of 87.9%, 2.3% Financing Yield, and 9.1% forecasted Economic Margins, which vastly exceed broad small cap index alternatives. While there is merit to portfolio construction rooted in valuation and wealth creation principles across all market regimes (based on our [Valuation Beta](#) asset pricing research), the elevated levels of negative profit firms, dilution, and market inefficiency suggest that concentrated strategies built on these principles can distance investors from the poor capital allocation currently embedded in small cap and small cap value indices.

We can more broadly isolate the benefit of a valuation discipline in Chart 7 by comparing the aggregate upside of alternative approaches to position sizing based on market value, book value, and intrinsic value across all constituents in the Russell 2000. The cap-weight index has -4.5% upside, while upside improves to 42.2% when intrinsic value determines index weights. Forming position weights on book value mildly improves intrinsic value upside to 11.7%, similar to the upside calculated on the Russell 2000 Value index weights displayed in Table 1.

Next, we can incorporate wealth creation principles by forming High and Low Valuation Stewardship portfolios on the Excess Intrinsic Value and Financing Yield factors motivated in our asset pricing study. In Chart 8, we note that the valuation gap between each basket is 76.4%, which is a level last observed in the tech bubble.

We can further explore the historical performance and the current valuation gap on the High and Low Valuation Stewardship portfolios by sector in Table 2. This helps affirm the strategic and tactical benefits of valuation and wealth creation principles, as these concepts have performed incredibly well within each sector over the last 23 years and also provide significant valuation gap levels today. The current valuation disparity in Health & Technology is especially noteworthy, as more than 40% of non-earners by market cap are included in these sectors.

Asset Pricing Factors: 2021 Q4 Performance

We can study the performance of asset pricing factors in large cap and small cap indices over the previous quarter compared to long-term trends. (T30 = Top 30%, M40 = Middle 40%, B30 = Bottom 30% portfolios)

- Excess Intrinsic Value (VMC) & Financing Yield (RMD):** Applied Finance's contribution to asset pricing literature. In Q4, high VMC outperformed low VMC by 8.1% in the Russell 1000 and 11.1% in the Russell 2000. High RMD outperformed low RMD by 15.3% in the Russell 1000 and 9.3% in the Russell 2000. Since 1998, high VMC stocks and high RMD stocks have outperformed.
- Market Cap (SMB) & Book-to-Price (HML):** Fama French's three factor model contribution in 1992. In Q4, high SMB (large cap) outperformed low SMB (small cap) by 6.6% in the Russell 1000 and 3.1% in the Russell 2000. Low HML (growth) outperformed high HML (value) by 7.2% in the Russell 1000 but underperformed by 5.6% in the Russell 2000. Since 1998, smaller stocks and low HML have outperformed in the Russell 1000 while market cap trends are less clear and high HML stocks have outperformed in the Russell 2000.
- Operating Profitability (RMW) & Investment Rate (CMA):** Fama French's five factor expansion in 2014. In Q4, High RMW stocks outperformed low RMW stocks by 13.5% in the Russell 1000 and 15.2% in the Russell 2000. Low CMA (conservative growth) outperformed high CMA (aggressive growth) by 4.9% in the Russell 1000 and 4.9% in the Russell 2000. Since 1998, high RMW and low CMA (conservative growth) stocks outperformed.
- Percent to Target & Price Momentum (UMD):** AQR contributed Price Momentum to asset pricing literature in 2015, which pairs well to our valuation metric due to inverse correlation. In Q4, undervalued stocks outperformed overvalued stocks by 4.0% in the Russell 1000 and 11.7% in the Russell 2000. High UMD stocks outperformed low UMD stocks by 5.2% in the Russell 1000 and 2.1% in the Russell 2000. Since 1998, undervalued stocks and high momentum stocks outperformed.

Russell 1000 Performance												
All-Time Results (October 98 - December 21)						Recent Results (2021 Q4)						
Annual Return		Excess Intrinsic Value (VMC)				3M Return		Excess Intrinsic Value (VMC)				
		All	B30	M40	T30			All	B30	M40	T30	
Financing Yield (RMD)	All		4.8%	8.8%	11.5%	Financing Yield (RMD)	All		2.9%	10.5%	11.0%	
	B30	7.2%	4.2%	7.0%	8.3%		B30	-0.1%	-3.3%	1.3%	9.3%	
	M40	9.0%	4.7%	8.8%	11.2%		M40	9.2%	8.6%	10.5%	7.5%	
	T30	11.0%	8.3%	10.1%	12.5%		T30	15.2%	7.4%	16.7%	15.1%	
Annual Return		Market Cap (SMB)				3M Return		Market Cap (SMB)				
		All	B30	M40	T30			All	B30	M40	T30	
Book-to-Price (HML)	All		11.2%	11.4%	8.8%	Book-to-Price (HML)	All		3.7%	6.0%	10.3%	
	B30	9.5%	9.8%	12.0%	9.2%		B30	12.4%	-1.9%	2.1%	13.8%	
	M40	10.2%	10.0%	10.7%	10.1%		M40	7.7%	4.1%	8.9%	7.7%	
	T30	7.3%	12.7%	9.6%	4.7%		T30	5.2%	6.0%	5.5%	5.1%	
Annual Return		Operating Profitability (RMW)				3M Return		Operating Profitability (RMW)				
		All	B30	M40	T30			All	B30	M40	T30	
Investment Rate (CMA)*	All		3.2%	10.5%	10.6%	Investment Rate (CMA)*	All		-0.2%	9.3%	13.3%	
	B30	8.0%	1.5%	9.8%	10.2%		B30	7.5%	-4.8%	8.7%	12.3%	
	M40	9.7%	6.5%	10.8%	9.6%		M40	10.1%	2.9%	9.8%	12.0%	
	T30	9.8%	5.0%	10.4%	11.8%		T30	12.4%	3.7%	9.5%	18.4%	
Annual Return		Percent to Target - LFY				3M Return		Percent to Target - LFY				
		All	B30	M40	T30			All	B30	M40	T30	
Price Momentum (UMD)	All		6.4%	9.1%	11.6%	Price Momentum (UMD)	All		5.7%	11.9%	9.7%	
	B30	6.8%	1.3%	8.0%	8.0%		B30	5.4%	-1.5%	10.6%	6.3%	
	M40	9.5%	5.8%	8.9%	13.9%		M40	12.2%	-0.1%	16.7%	12.5%	
	T30	10.6%	8.9%	10.5%	13.2%		T30	10.6%	17.4%	6.7%	9.0%	

Russell 2000 Performance												
All-Time Results (October 98 - December 21)						Recent Results (2021 Q4)						
Annual Return		Excess Intrinsic Value (VMC)				3M Return		Excess Intrinsic Value (VMC)				
		All	B30	M40	T30			All	B30	M40	T30	
Financing Yield (RMD)	All		6.7%	10.0%	13.3%	Financing Yield (RMD)	All		-2.6%	2.2%	8.5%	
	B30	6.5%	2.8%	7.6%	10.0%		B30	-0.9%	-8.2%	2.8%	4.2%	
	M40	10.2%	7.0%	10.0%	13.1%		M40	2.1%	-0.9%	0.8%	6.5%	
	T30	13.3%	11.8%	11.7%	15.4%		T30	8.4%	4.9%	5.4%	11.6%	
Annual Return		Market Cap (SMB)				3M Return		Market Cap (SMB)				
		All	B30	M40	T30			All	B30	M40	T30	
Book-to-Price (HML)	All		10.0%	11.4%	9.8%	Book-to-Price (HML)	All		1.0%	1.5%	4.1%	
	B30	8.8%	7.3%	9.8%	8.9%		B30	-0.9%	-6.9%	-6.7%	1.2%	
	M40	10.4%	9.7%	11.4%	10.1%		M40	6.2%	2.8%	5.4%	7.0%	
	T30	11.4%	10.4%	12.7%	9.4%		T30	4.7%	4.0%	3.2%	6.4%	
Annual Return		Operating Profitability (RMW)				3M Return		Operating Profitability (RMW)				
		All	B30	M40	T30			All	B30	M40	T30	
Investment Rate (CMA)*	All		6.1%	10.8%	12.2%	Investment Rate (CMA)*	All		-6.8%	7.5%	8.4%	
	B30	7.2%	2.7%	8.6%	9.9%		B30	-0.8%	-11.7%	6.9%	5.9%	
	M40	11.6%	8.0%	11.4%	12.9%		M40	7.5%	-1.8%	8.4%	9.9%	
	T30	11.7%	8.9%	11.9%	12.8%		T30	4.1%	-2.3%	5.6%	8.5%	
Annual Return		Percent to Target - LFY				3M Return		Percent to Target - LFY				
		All	B30	M40	T30			All	B30	M40	T30	
Price Momentum (UMD)	All		7.2%	9.8%	14.2%	Price Momentum (UMD)	All		-4.1%	7.8%	7.6%	
	B30	7.4%	-3.1%	9.1%	11.5%		B30	1.0%	-7.0%	4.9%	6.4%	
	M40	10.9%	7.4%	9.8%	13.7%		M40	6.6%	-0.6%	10.0%	6.9%	
	T30	11.7%	9.7%	10.9%	16.6%		T30	3.1%	-4.7%	7.2%	9.7%	

Asset Pricing Factors: 2021 Performance

We can also study the performance of asset pricing factors in large cap and small cap indices over the previous year compared to long-term trends. (T30 = Top 30%, M40 = Middle 40%, B30 = Bottom 30% portfolios)

• Excess Intrinsic Value (VMC) & Financing Yield (RMD):

In 2021, high VMC outperformed low VMC by 20.0% in the Russell 1000 and 25.5% in the Russell 2000. High RMD outperformed low RMD by 18.7% in the Russell 1000 and 37.7% in the Russell 2000. The intersection of high VMC and high RMD returned 37.0% in the Russell 1000, outperforming the intersection of low VMC and low RMD by 29.9%. The intersection of high VMC and high RMD returned 50.5% in the Russell 2000, outperforming the intersection of low VMC and low RMD by 60.0%!

• Market Cap (SMB) & Book-to-Price (HML):

In 2021, high SMB (large cap) outperformed low SMB (small cap) by 3.4% in the Russell 1000 but underperformed by 20.3% in the Russell 2000. High HML (value) outperformed low HML (growth) by 6.5% in the Russell 1000 and 40.6% in the Russell 2000.

• Operating Profitability (RMW) & Investment Rate (CMA):

In 2021, High RMW stocks outperformed low RMW stocks by 15.2% in the Russell 1000 and 43.6% in the Russell 2000. Low CMA (conservative growth) outperformed high CMA (aggressive growth) by 3.2% in the Russell 1000 and 28.9% in the Russell 2000.

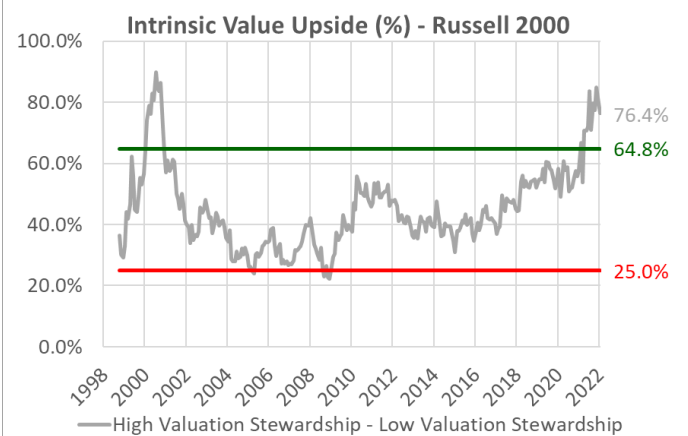
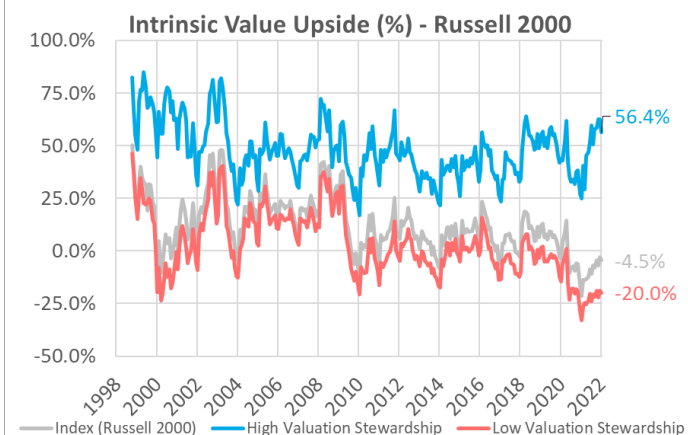
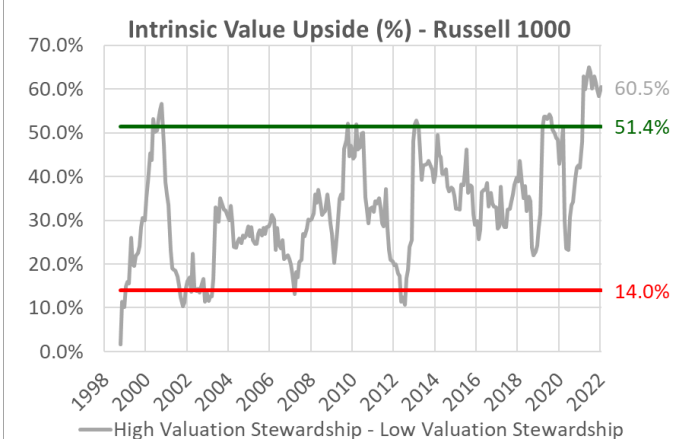
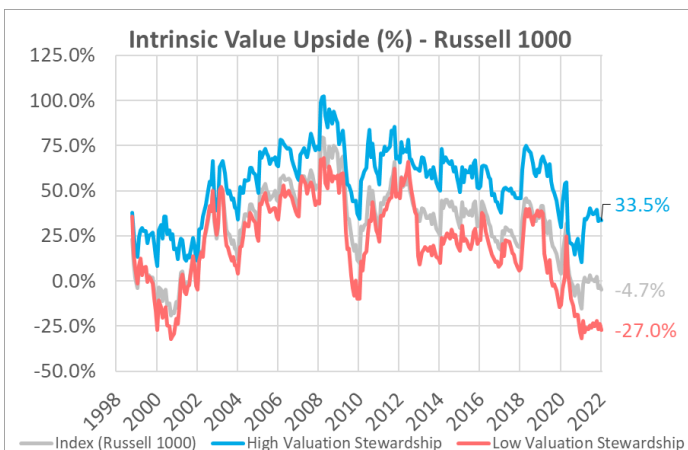
• Percent to Target & Price Momentum (UMD):

In 2021, undervalued stocks outperformed overvalued stocks by 21.2% in the Russell 1000 and 47.4% in the Russell 2000. Low UMD stocks outperformed high UMD stocks by 8.2% in the Russell 1000 and 5.9% in the Russell 2000.

Russell 1000 Performance												
All-Time Results (October 98 - December 21)						Recent Results (2021)						
Annual Return		Excess Intrinsic Value (VMC)				1Y Return		Excess Intrinsic Value (VMC)				
		All	B30	M40	T30			All	B30	M40	T30	
Financing Yield (RMD)	All		4.8%	8.8%	11.5%	Financing Yield (RMD)	All		13.7%	24.5%	33.7%	
	B30	7.2%	4.2%	7.0%	8.3%		B30	13.1%	7.1%	16.2%	27.0%	
	M40	9.0%	4.7%	8.8%	11.2%		M40	27.3%	18.9%	25.9%	31.3%	
	T30	11.0%	8.3%	10.1%	12.5%		T30	31.8%	28.4%	26.2%	37.0%	
Annual Return		Market Cap (SMB)				1Y Return		Market Cap (SMB)				
		All	B30	M40	T30			All	B30	M40	T30	
Book-to-Price (HML)	All		11.2%	11.4%	8.8%	Book-to-Price (HML)	All		23.0%	23.8%	26.5%	
	B30	9.5%	9.8%	12.0%	9.2%		B30	25.9%	4.8%	12.3%	27.8%	
	M40	10.2%	10.0%	10.7%	10.1%		M40	23.0%	18.6%	25.8%	22.7%	
	T30	7.3%	12.7%	9.6%	4.7%		T30	32.4%	37.3%	33.7%	31.2%	
Annual Return		Operating Profitability (RMW)				1Y Return		Operating Profitability (RMW)				
		All	B30	M40	T30			All	B30	M40	T30	
Investment Rate (CMA)*	All		3.2%	10.5%	10.6%	Investment Rate (CMA)*	All		13.0%	30.3%	28.2%	
	B30	8.0%	1.5%	9.8%	10.2%		B30	25.3%	5.4%	34.1%	27.2%	
	M40	9.7%	6.5%	10.8%	9.6%		M40	24.5%	15.3%	22.5%	27.5%	
	T30	9.8%	5.0%	10.4%	11.8%		T30	28.5%	17.9%	30.0%	32.7%	
Annual Return		Percent to Target - LFY				1Y Return		Percent to Target - LFY				
		All	B30	M40	T30			All	B30	M40	T30	
Price Momentum (UMD)	All		6.4%	9.1%	11.6%	Price Momentum (UMD)	All		10.8%	32.8%	32.0%	
	B30	6.8%	1.3%	8.0%	8.0%		B30	27.2%	10.7%	31.5%	28.6%	
	M40	9.5%	5.8%	8.9%	13.9%		M40	34.7%	2.9%	42.7%	40.4%	
	T30	10.6%	8.9%	10.5%	13.2%		T30	19.0%	21.2%	19.8%	20.7%	

Russell 2000 Performance												
All-Time Results (October 98 - December 21)						Recent Results (2021)						
Annual Return		Excess Intrinsic Value (VMC)				1Y Return		Excess Intrinsic Value (VMC)				
		All	B30	M40	T30			All	B30	M40	T30	
Financing Yield (RMD)	All		6.7%	10.0%	13.3%	Financing Yield (RMD)	All		12.2%	8.2%	37.7%	
	B30	6.5%	2.8%	7.6%	10.0%		B30	5.3%	-9.5%	7.6%	28.9%	
	M40	10.2%	7.0%	10.0%	13.1%		M40	11.7%	12.8%	4.0%	28.5%	
	T30	13.3%	11.8%	11.7%	15.4%		T30	42.9%	68.8%	20.5%	50.5%	
Annual Return		Market Cap (SMB)				1Y Return		Market Cap (SMB)				
		All	B30	M40	T30			All	B30	M40	T30	
Book-to-Price (HML)	All		10.0%	11.4%	9.8%	Book-to-Price (HML)	All		33.2%	27.1%	12.9%	
	B30	8.8%	7.3%	9.8%	8.9%		B30	1.1%	-2.1%	0.4%	2.1%	
	M40	10.4%	9.7%	11.4%	10.1%		M40	26.1%	34.6%	36.6%	20.5%	
	T30	11.4%	10.4%	12.7%	9.4%		T30	41.7%	55.2%	41.2%	37.4%	
Annual Return		Operating Profitability (RMW)				1Y Return		Operating Profitability (RMW)				
		All	B30	M40	T30			All	B30	M40	T30	
Investment Rate (CMA)*	All		6.1%	10.8%	12.2%	Investment Rate (CMA)*	All		-6.9%	25.8%	36.7%	
	B30	7.2%	2.7%	8.6%	9.9%		B30	4.4%	-20.9%	16.1%	32.3%	
	M40	11.6%	8.0%	11.4%	12.9%		M40	25.3%	2.5%	26.4%	33.7%	
	T30	11.7%	8.9%	11.9%	12.8%		T30	33.3%	15.4%	33.5%	50.3%	
Annual Return		Percent to Target - LFY				1Y Return		Percent to Target - LFY				
		All	B30	M40	T30			All	B30	M40	T30	
Price Momentum (UMD)	All		7.2%	9.8%	14.2%	Price Momentum (UMD)	All		-3.7%	28.1%	43.7%	
	B30	7.4%	-3.1%	9.1%	11.5%		B30	21.9%	-5.1%	25.9%	41.9%	
	M40	10.9%	7.4%	9.8%	13.7%		M40	24.3%	4.7%	28.8%	35.0%	
	T30	11.7%	9.7%	10.9%	16.6%		T30	16.0%	-5.2%	29.2%	58.7%	

Russell 1000 & Russell 2000: Valuation Stewardship 9/30/1998 – 12/31/2021



Equipped with the review of recent factor performance over the past year, we can also take inventory of the intrinsic value characteristics of these factor portfolios as we head into 2022.

Applied Finance's [Valuation Beta](#) research provides motivation for several factors consistent with the valuation and wealth creation principles of the Economic Margin framework. Excess Intrinsic Value captures the overlooked component of a comprehensive intrinsic value estimate that is ignored by "value" shortcuts based on the book-to-price factor. Financing Yield reinterprets the dividend discount framework used by Fama French to motivate independent preferences for high profitability and low growth as a single shareholder yield factor.

In tandem, Excess Intrinsic Value and Financing Yield factors can be used to form Valuation Stewardship portfolios. High Valuation Stewardship simply excludes index constituents with negative Financing Yield characteristics, which is likely a sign of dilution through external financing. We then use the valuation characteristics of each firm to set position sizes in the portfolio. Low Valuation Stewardship portfolios are formed on market cap weights of the negative Financing Yield stocks, as well as firms that could not be included in the High Valuation Stewardship portfolio due to poor valuation traits.

In the Russell 1000, the High Valuation Stewardship portfolio has aggregate intrinsic value upside of 33.5% while Low Valuation Stewardship peers have aggregate upside of -27.0%. This overall valuation gap of 60.5% is slightly below recent levels that reflect all-time valuation gap highs since 1998.

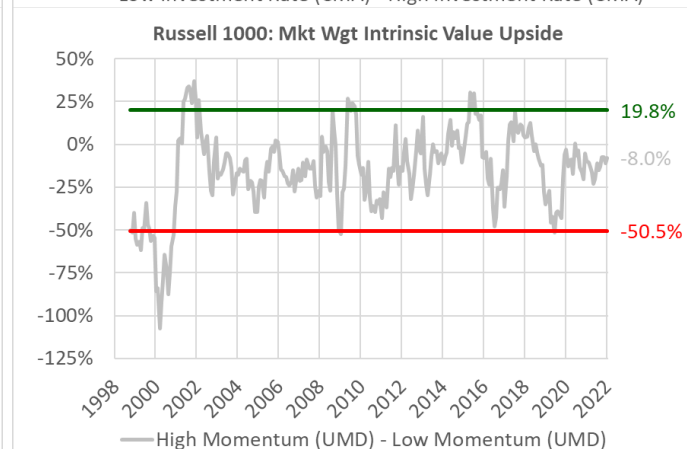
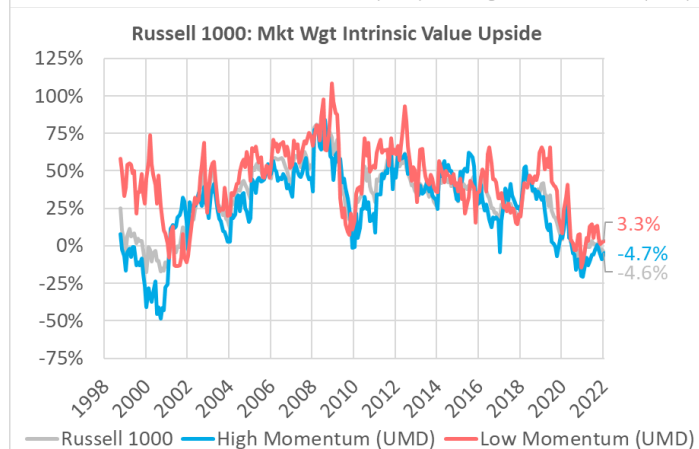
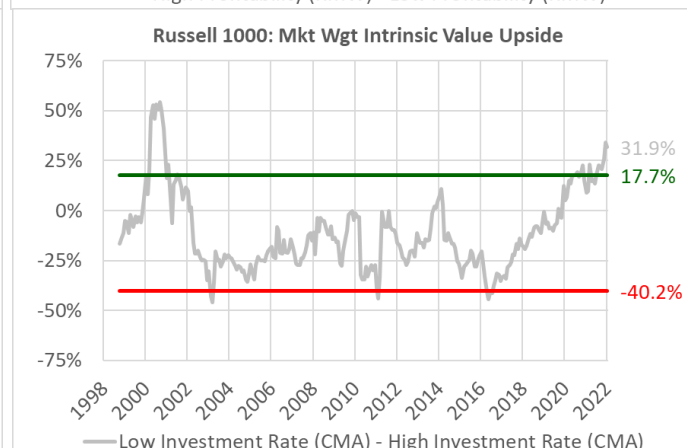
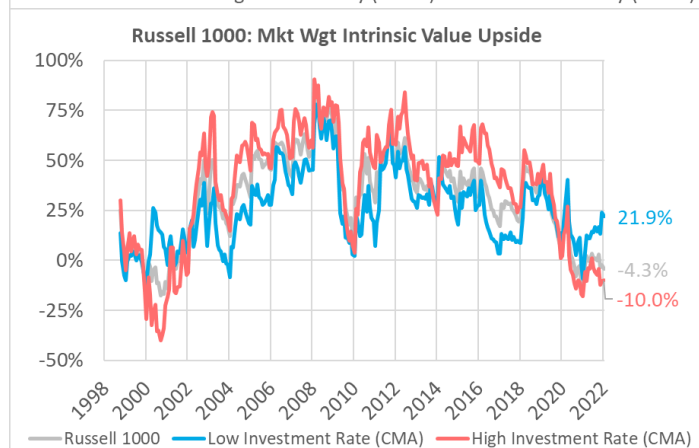
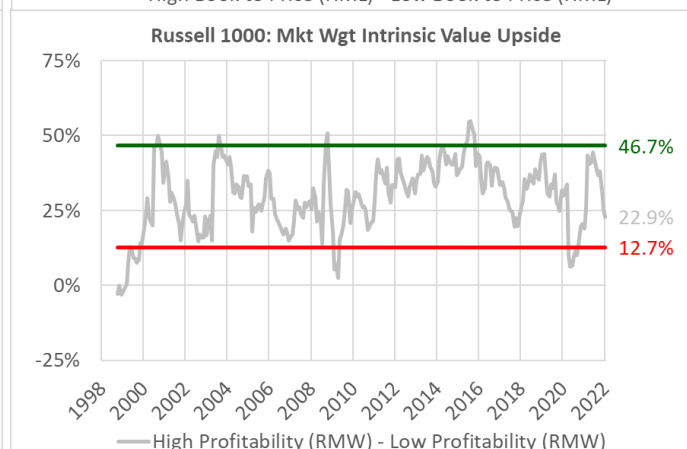
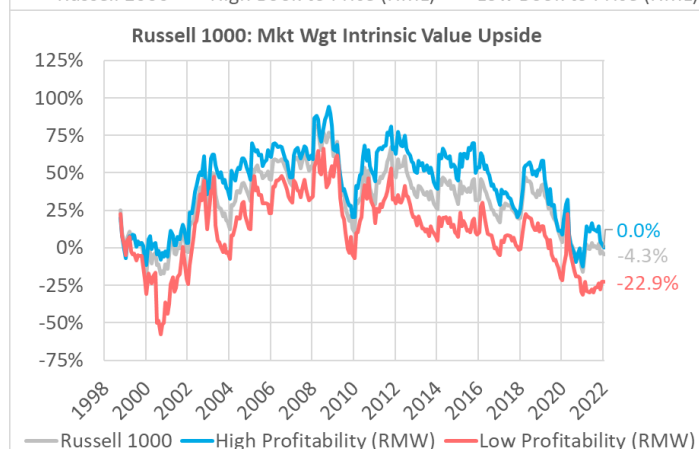
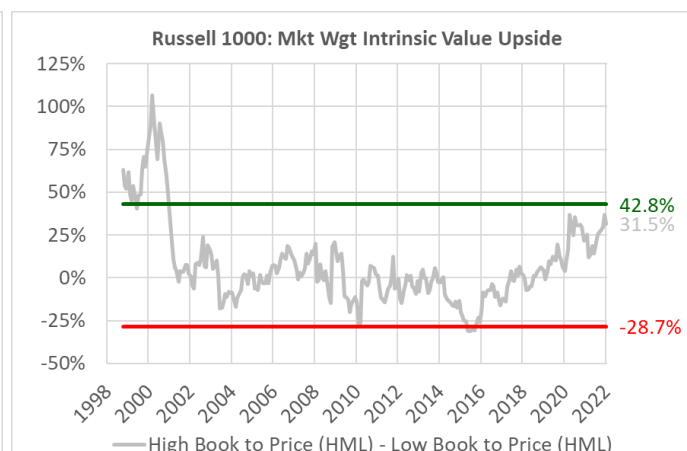
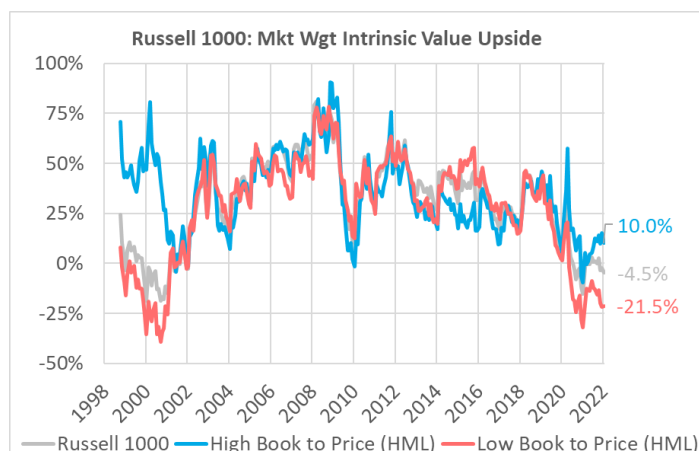
In the Russell 2000, the High Valuation Stewardship portfolio has aggregate intrinsic value upside of 56.4% while low Valuation Stewardship peers have aggregate upside of -20.0%. This overall valuation gap of 76.4% is slightly below recent levels, as well as previous highs observed in the early 2000s.

For comparison purposes, on the following pages we also review the intrinsic value characteristics of commonly studied 30/40/30 factor portfolios in the large and small cap arenas. In the Russell 1000, the valuation gap between high and low Book-to-Price (HML) is 31.5%. Other valuation gap levels include Operating Profitability (RMW) at 22.9%, Investment Rate (CMA) at 31.9% and Momentum (UMD) at -8.0%. Of these, only the Investment Rate valuation gap is historically significant based on a +/- 1.5 standard deviation threshold vs. historical averages.

In the Russell 2000, the valuation gap between high and low Book-to-Price (HML) is 49.2%. Other valuation gap levels include Operating Profitability (RMW) at 82.4%, Investment Rate (CMA) at 53.3% and Momentum (UMD) at 33.3%. Of these, the Operating Profitability, Investment Rate and Momentum valuation gap levels are historically significant based on a +/- 1.5 standard deviation threshold vs. historical averages.

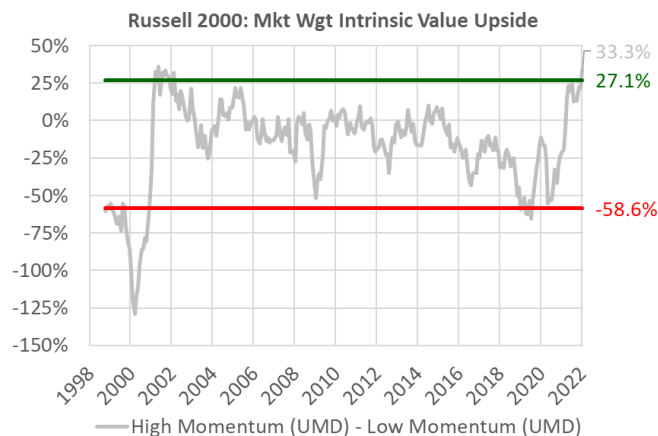
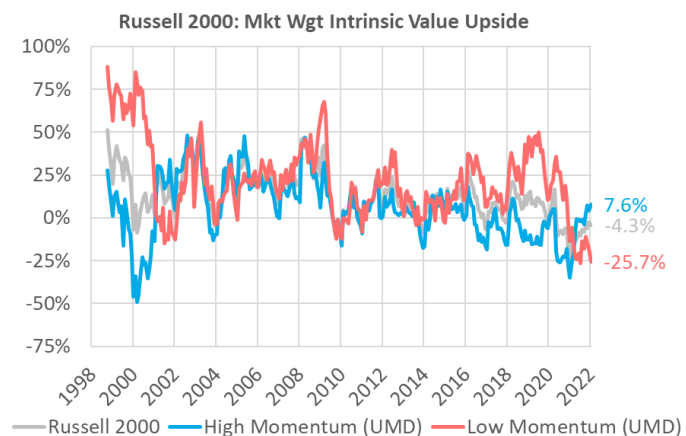
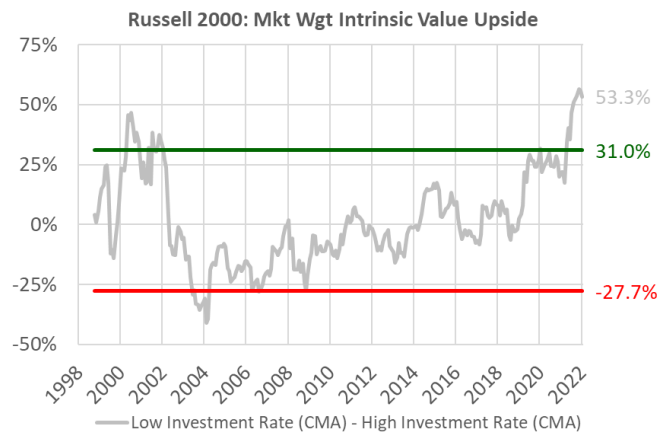
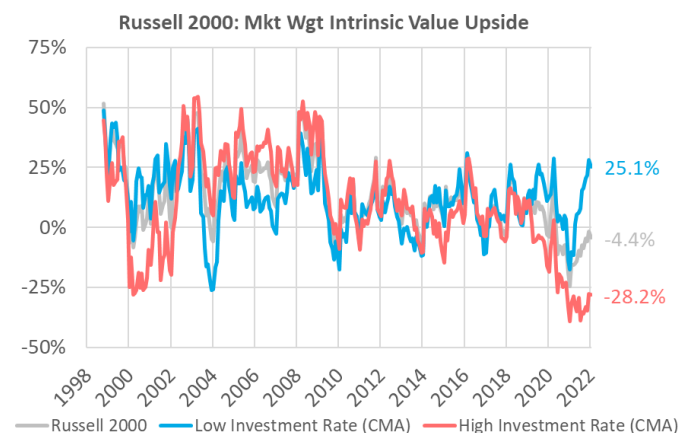
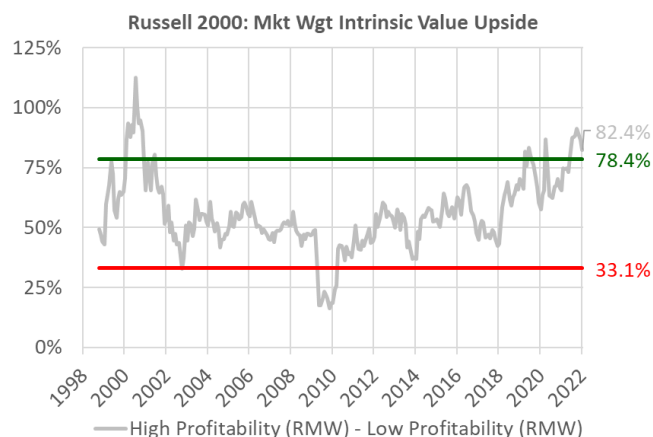
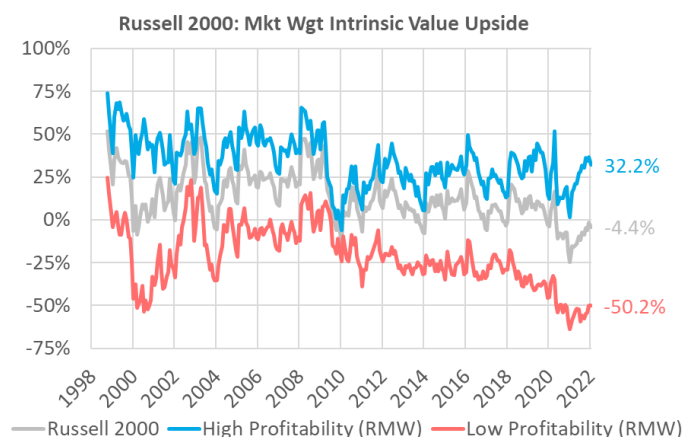
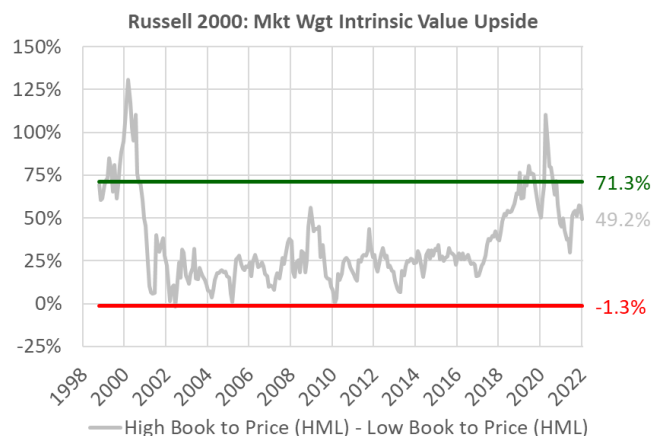
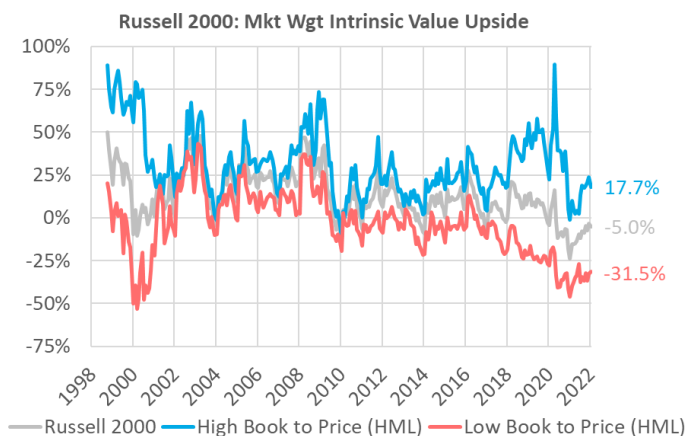
We conclude with an expanded review of popular large cap and small cap style indices which indicates, among these choices, a preference towards small cap value and small/mid cap strategies that exclude unprofitable firms.

Russell 1000 Factor Valuation 9/30/1998 – 12/31/2021



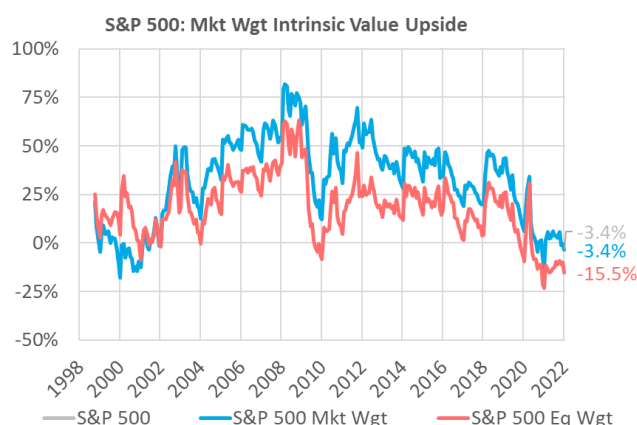
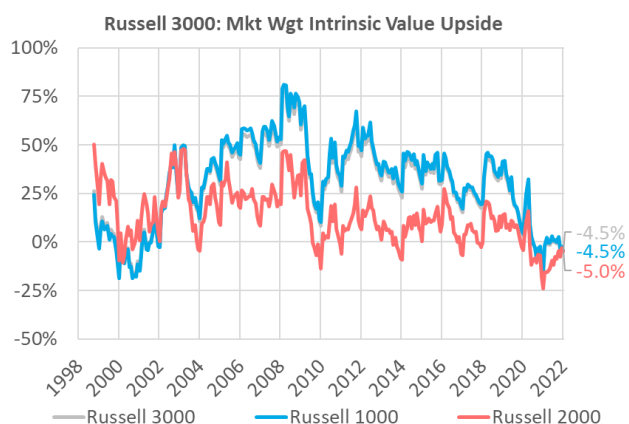
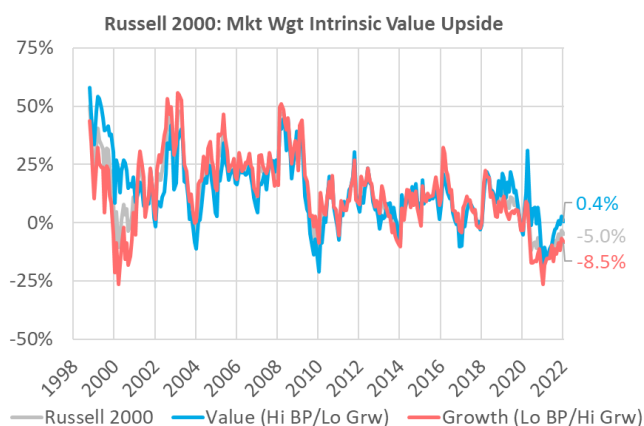
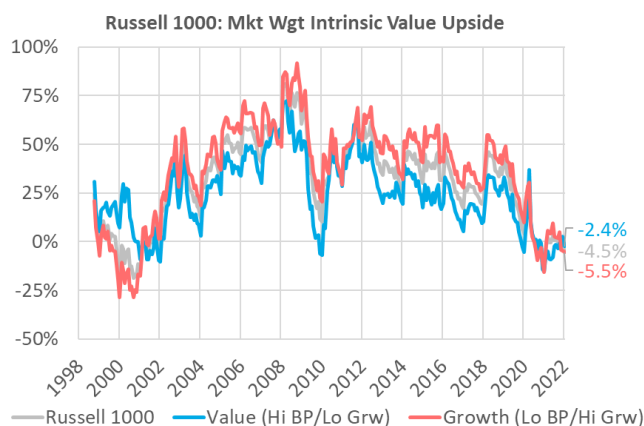
Applied Finance Research: Russell 1000 constituents. Portfolios formed on top 30% and bottom 30% of Book-to-Price, Operating Profitability, Investment Rate, and Price Momentum, 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing. Chart displays cap-weighted Intrinsic Value (Plus 3) % Upside.

Russell 2000 Factor Valuation 9/30/1998 – 12/31/2021



Applied Finance Research: Russell 2000 constituents. Portfolios formed on top 30% and bottom 30% of Book-to-Price, Operating Profitability, Investment Rate, and Price Momentum, 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing. Chart displays cap-weighted Intrinsic Value (Plus 3) % Upside.

Size & Style Valuation 9/30/1998 – 12/31/2021



Shifting our tactical valuation focus towards traditional size & style portfolios, we can explore the aggregate intrinsic value characteristics of popular style methodologies and benchmarks.

We can first approximate Russell's style methodology historically by ranking stocks on book-to-price, 5Y sales growth per share, and EPS+2 growth characteristics to divide an index into cap-weighted value and growth partitions on a top half/bottom half basis. In the Russell 1000, the overall index reflects upside of -4.5%, while the aggregate upside is -2.4% for value and -5.5% for growth. In the Russell 2000, the overall index reflects aggregate upside of -5.0%; small/mid cap value stocks offer improved valuation characteristics of 0.4% vs. -8.5% for growth peers.

Our third chart compares valuation characteristics of the Russell 1000 and Russell 2000 universes. Recently, the valuation gap between large cap (-4.5%) and small cap (-5.0%) indices has narrowed. Shifting focus to the S&P 500, a cap-weight (-3.4%) portfolio of index constituents continues to offer elevated intrinsic value upside vs. an equal-weight (-15.5%) alternative.

We can also study the current intrinsic value characteristics of an expanded set of style methodologies and popular benchmarks using the actual investment weights of published ETF holdings as of the end of 2021 Q4. Under Morningstar's style methodology (which expands to 10 factors vs. the three used by Russell), value is more attractive than growth across each size tier, with a widening valuation gap in smaller arenas. Large cap benchmarks (QQQ/IVV) offer mildly improved intrinsic value upside compared to more diversified (IWB)/smaller cap (IWM) alternatives. As we reviewed earlier, S&P's methodology that excludes unprofitable firms improves intrinsic value upside in mid (IJH) and small (IJR) indices.

Benchmark	Equity Positions	Intrinsic Value Upside (%)	Financing Yield	Dividend Yield	EM+1
Nasdaq 100 (QQQ)	101	-2.7%	1.1%	0.6%	10.3%
S&P 500 Growth (IVW)	239	-7.5%	0.6%	0.7%	12.5%
S&P 500 (IVV)	505	-3.4%	0.5%	1.3%	8.6%
S&P 500 Value (IVE)	449	1.3%	0.3%	2.0%	4.2%
S&P 400 Growth (IJK)	232	-1.2%	-0.2%	0.8%	6.7%
S&P 400 (IJH)	400	8.8%	-0.1%	1.3%	4.4%
S&P 400 Value (IJJ)	299	19.1%	0.1%	1.7%	2.1%
S&P 600 Growth (IJT)	330	6.6%	-0.7%	0.8%	4.2%
S&P 600 (IJR)	601	8.0%	-0.2%	1.2%	2.1%
S&P 600 Value (IJS)	457	10.3%	0.4%	1.6%	-0.2%
Russell 1000 Growth (IWF)	502	-11.7%	0.9%	0.7%	12.1%
Russell 1000 (IWB)	1030	-4.5%	0.3%	1.3%	7.9%
Russell 1000 Value (IWD)	853	3.8%	-0.4%	1.9%	3.1%
Russell 2000 Growth (IWO)	1243	-20.8%	-2.6%	0.4%	1.4%
Russell 2000 (IWM)	2038	-4.6%	-2.2%	1.0%	0.7%
Russell 2000 Value (IWN)	1450	11.5%	-1.9%	1.6%	-0.1%
Russell 3000 (IWW)	2746	-4.4%	0.1%	1.2%	7.5%
Morningstar Large Growth (JKE)	498	-18.5%	0.3%	0.4%	9.4%
Morningstar Large (JKD)	792	-5.3%	0.3%	1.2%	7.9%
Morningstar Large Value (JKF)	563	7.6%	0.3%	2.0%	6.6%
Morningstar Mid Growth (JKH)	367	-20.7%	-1.1%	0.6%	4.2%
Morningstar Mid (JKG)	564	-2.7%	-0.9%	1.3%	4.0%
Morningstar Mid Value (JKI)	385	14.8%	-0.8%	2.0%	4.0%
Morningstar Small Growth (JKK)	1179	-30.0%	-2.8%	0.5%	-0.8%
Morningstar Small (JKJ)	2009	-1.8%	-1.8%	1.1%	0.6%
Morningstar Small Value (JKL)	1231	25.1%	-0.4%	1.8%	2.0%

Applied Finance Research: Weighted Intrinsic Value (Plus 3) % Upside for style indices & benchmarks. Benchmark constituents and weights provided by iShares ETF daily reports as of 12/31/2021.

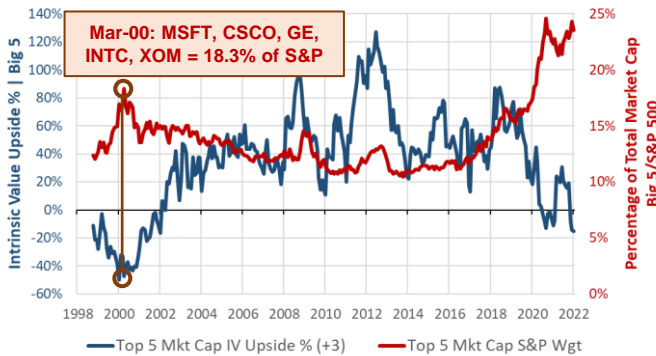
Applied Finance Research: S&P 500, Russell 1000 & Russell 2000 constituents. Value/Growth portfolios formed on top half/bottom half ranks of Book-to-Price & Composite of Sales Growth / Share and EPS Growth, 9/30/98 to 12/31/21, point-in-time data with monthly rebalancing. Chart displays cap-weighted & equal-weighted Intrinsic Value (Plus 3) % Upside.

Concentration of Top 5 Market Cap Stocks in S&P 500

2021 Q4 Return Trends	Market Weight			Equal Weight			Company Analysis		
	9/30-11/8	11/8-12/31	Q4	9/30-11/8	11/8-12/31	Q4	Mkt Cap (\$B)	Biggest Contributors	% Due to Top 5
Market Cap Analysis									
Top 5 Largest Stocks	9.8%	3.2%	13.3%	8.7%	2.0%	10.8%	8869	AAPL (25.7%), MSFT (19.5%), GOOGL (8.4%), AMZN (1.5%), FB (-0.9%)	100.0%
Next 95 Largest Stocks	9.9%	-0.1%	9.8%	8.3%	0.2%	8.6%	18408	TSLA (36.3%), NVDA (42.0%), UNH (28.9%), HD (26.9%), PFE (38.5%)	43.5%
All Remaining Stocks	8.5%	-2.2%	6.2%	8.9%	-6.6%	1.7%	20998	F (47.4%), MU (31.4%), ZM (-29.7%), MRVL (45.2%), LRCX (26.6%)	5.7%
All Russell 3000 Stocks	9.3%	-0.4%	8.9%	8.9%	-6.4%	1.9%	48275	AAPL (25.7%), MSFT (19.5%), TSLA (36.3%), NVDA (42.0%), GOOGL (8.4%)	38.7%

Applied Finance Research: Russell 3000 Size Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 9/30/21 & 11/8/21.

Valuation & Concentration: Largest 5 Stocks S&P 500

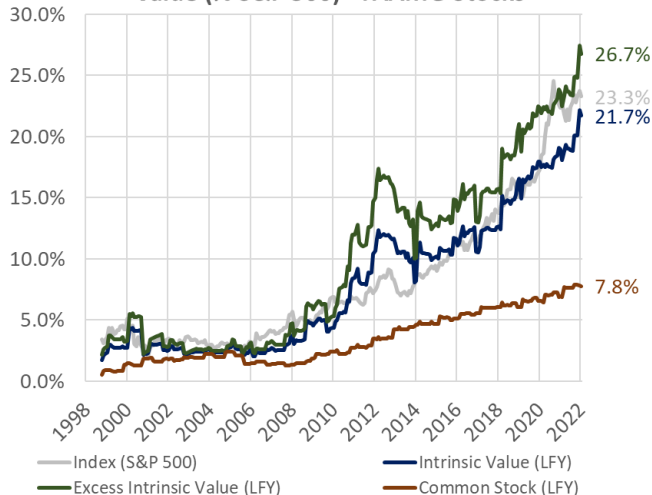


S&P 500 Top 5 Market Cap Constituent Analysis, 9/30/98 to 12/31/21. Line Graph reflects calendar month snapshots of cap-weight Intrinsic Value (Plus 3) % Upside characteristics of top 5 stocks by market cap & their combined market cap weight within the S&P 500.

Monday 1/24	Tuesday 1/25	Wednesday 1/26	Thursday 1/27	Friday 1/28
Monday 1/31	Tuesday 2/1	Wednesday 2/2	Thursday 2/3	Friday 2/4

Estimated Earnings Date provided by Zack's Research, as of 1/12/2021. TSLA/AMZN earnings dates are preliminary estimates

Value (% S&P 500) - FAAMG Stocks



Applied Finance Research: AAPL, MSFT, AMZN, GOOGL & FB value contribution to the overall S&P 500, 9/30/98 to 12/31/21. Line charts reflect alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) of FAAMG stocks as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.

The five largest stocks (AAPL, MSFT, GOOGL, AMZN, FB) led US market returns in Q4, gaining 13.3% on a cap-weight basis vs. 7.9% for all other Russell 3000 constituents. In 2021, these five largest stocks gained 35.3% while all other Russell 3000 stocks gained 23.4%. By mid-October, TSLA surpassed FB as the fifth largest stock and continues to remain in the top 5 at year end.

At the start of 2022, the top 5 US stocks by market cap (AAPL, MSFT, GOOGL, AMZN, TSLA) now represent 23.6% of the S&P 500's total market cap. Due to Q4 appreciation of AAPL/MSFT and inclusion of TSLA, the intrinsic value upside of the top 5 megacaps has fallen from 19.1% on 9/30/21 to -15.1% as of 12/31/21.

Due to the impact that these stocks have on cap-weighted benchmarks, we will continue to review their valuation prospects on a quarterly basis. Many investors presume that all these stocks are due to underperform based on their large market caps, expensive GAAP accounting-based price multiples and high rates of investment, but we can better identify each firm's investment prospects and potential impact on equity benchmarks by studying each stock's intrinsic value contribution and implied expectations.

It was useful in 2021 to acknowledge the compelling intrinsic value levels of these megacap stocks as they propelled overall market returns higher. While we no longer observe significant upside, it's worth noting that current intrinsic value levels are nowhere near tech bubble levels of -49.9% observed at the start of 2000. Next quarter's update may also change dramatically, as it will include 2021 annual reports for GOOG, AMZN, TSLA and FB which will fully capture the strong revenue growth and margin improvement already delivered through 2021 Q3.

FAAMG Stocks: Intrinsic Value Contribution

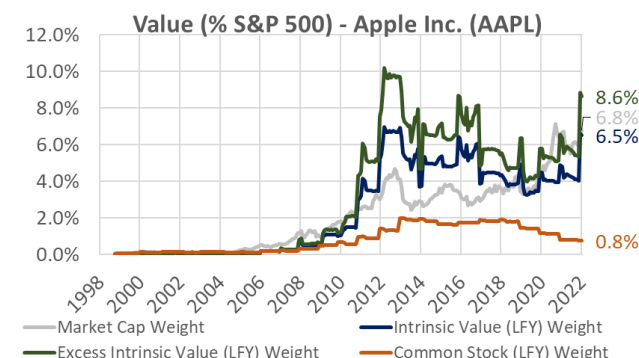
FAAMG stocks contribute 23.3% of the S&P 500's total market cap, 21.7% of intrinsic value (based on LFY financial statement data), 7.8% of book value, and 26.7% of intrinsic value in excess of book value. We have excluded TSLA, as their market value is almost entirely derived from future growth and profitability improvements.

Further incorporating forecast data into our intrinsic value analysis will allow us to compare consensus estimates against the implied expectations embedded in each firm's stock price at the end of 2021. This is especially important for GOOGL, AMZN, TSLA and FB due to their massive EPS and revenue growth expectations.

Ticker	EPS LFY (adjusted for Special Items)	Consensus '24 Median EPS	EPS Growth	Revenue LFY (\$B)	Consensus '24 Revenue (\$B)	Revenue Growth
AAPL	\$5.76	\$6.93	20.2%	365.8	436.5	19.3%
MSFT	\$8.02	\$11.57	44.2%	168.1	244.1	45.2%
GOOGL	\$52.43	\$181.86	246.8%	182.5	409.6	124.4%
AMZN	\$42.41	\$89.71	111.5%	386.1	749.7	94.2%
TSLA	\$0.72	\$12.72	1670.3%	31.5	109.3	246.5%
FB	\$10.23	\$19.43	90.0%	86.0	196.1	128.2%

Applied Finance Research: Consensus EPS and Revenue forecasts through 2024. Consensus EPS & Revenue data as of 12/31/2021 provided by Zacks Investment Research, Inc.

Apple Inc (AAPL) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: AAPL value contribution to the overall S&P 500, 9/30/98 to 12/31/21. Alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.



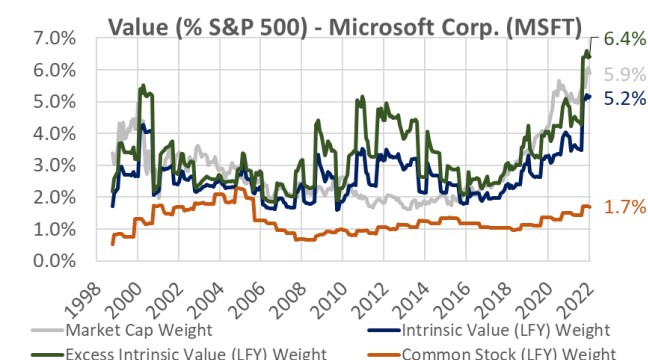
Applied Finance Research: AAPL Implied Expectations (Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 asset turn levels.

AAPL contributes 6.8% of the S&P 500's total market cap, 6.5% of intrinsic value (based on LFY financial statement data), 0.8% of book value, and 8.6% of intrinsic value in excess of book value. The recent jump in intrinsic value contribution is partially due to AAPL's September fiscal year end and will likely normalize in early 2022 once firms with December fiscal year ends report their 2021 results.

Implied sales growth for AAPL from 2022 forward is 8.8%, which is 3.5% higher than consensus 2022 forecasts of 5.3%. In 2021, AAPL's Economic Margins jumped from 12.4% to 21.4%, their highest level since 2012. Due to substantially higher Economic Margins, AAPL's Economic Profit Horizon has fallen from 26 years in 2019 to 20 years now.

While higher margins are typically difficult to maintain due to lower returns on incremental investment and increased competition, AAPL's recent increase in economic profitability is due to the expansion of their higher margin service segment, as well as substantial increases in revenue and cash flow despite minimal change in invested capital. It would be prudent to first confirm that AAPL will be able to sustain these higher margins despite the strength of their competitive advantages. If it is deemed reasonable to assume an above average Economic Profit Horizon of 24 years, implied sales growth falls to 0.70%.

Microsoft Corp (MSFT) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: MSFT value contribution to the overall S&P 500, 9/30/98 to 12/31/21. Alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.



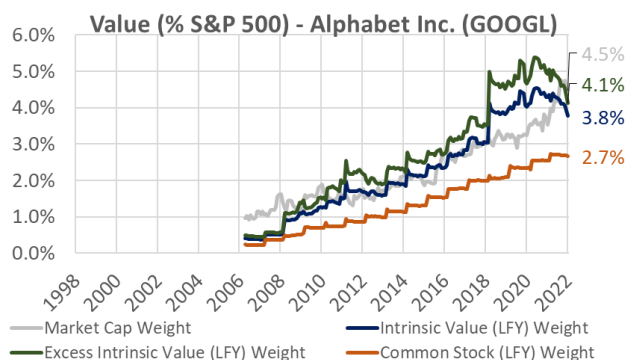
Applied Finance Research: MSFT Implied Expectations (Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2022 consensus sales forecasts / total assets projected on YTD asset growth

MSFT contributes 5.6% of the S&P 500's total market cap, 5.2% of intrinsic value (based on LFY financial statement data), 1.7% of book value, and 6.4% of intrinsic value in excess of book value. Similar to AAPL, the recent jump in valuation contribution is partially due to MSFT's June fiscal year end and will likely normalize in early 2022 once firms with December fiscal year ends report their 2021 results.

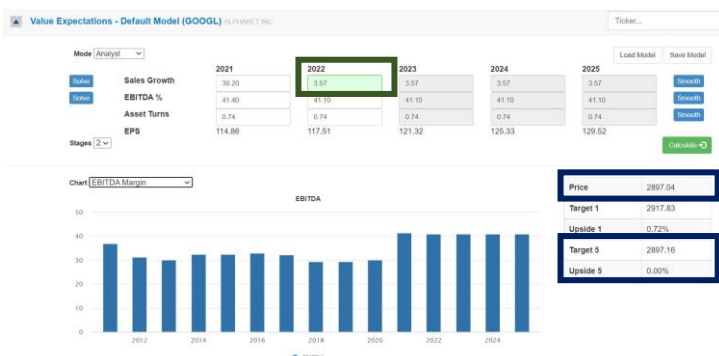
Implied sales growth for MSFT from 2022 forward is 15.2%, which is 0.8% lower than consensus 2022 forecasts of 16.0%. In 2021, MSFT's Economic Margins improved from 12.7% to 15.0%, their highest level since 2012. Mildly higher EMs coincide with a mild drop in their Economic Profit Horizon from 27 years in 2019 to 25 years now.

Due diligence in the AAPL example led us to consider an adjustment to the default Economic Profit Horizon (given that a 20-year period is "average" for Russell 1000 firms and understates the competitive advantages and network effects that these megacap firms have developed). For MSFT, it is reasonable to accept the slightly lower profit horizon of 25 years as it continues to reflect above-average levels compared to other Russell 1000 firms.

Alphabet Inc. (GOOGL) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: GOOGL value contribution to the overall S&P 500, 3/31/06 to 12/31/21. Alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.



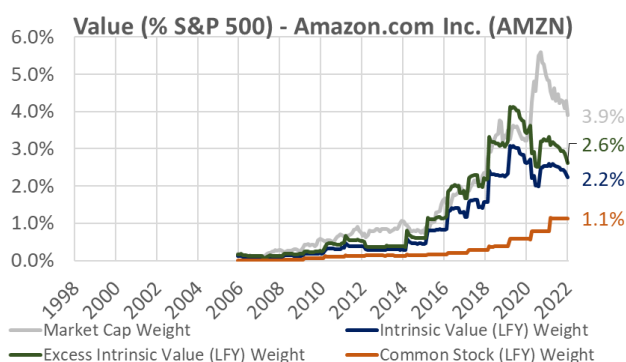
Applied Finance Research: GOOGL Implied Expectations. Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 consensus sales forecasts / total assets projected on YTD asset growth

GOOGL contributes 4.5% of the S&P 500's total market cap, 3.8% of intrinsic value (based on LFY financial statement data), 2.7% of book value, and 4.1% of intrinsic value in excess of book value. Through 2021 Q3, GOOGL has delivered significant gains in revenue and margins which indicate that these valuation contributions should increase once financial statement data from their next annual report is filed.

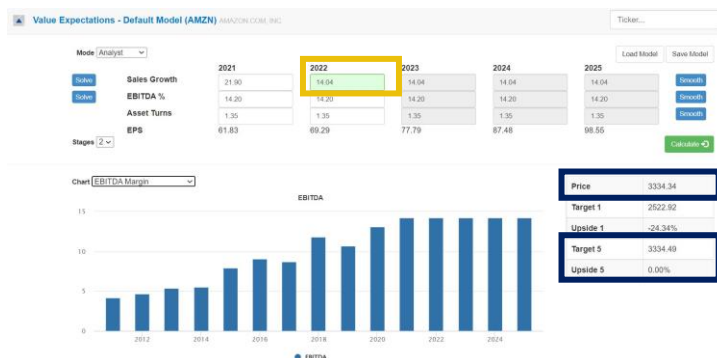
Implied sales growth for GOOGL from 2022 forward is 3.6%, which is 13.3% lower than consensus 2022 forecasts of 16.9%. Based on 2021 forecasts, GOOGL's Economic Margins are expected to improve from 7.8% to nearly 16%, which would be the highest level since 2007. Meanwhile, their Economic Profit Horizon has fallen from 25 years in 2019 to 21 years now.

It will be important for investors to monitor the sustainability of GOOGL's recent levels of higher profitability, but this decision does not alter an investment thesis formed on implied expectations. Implied sales are already significantly below consensus forecasts using a 21-year Economic Profit Horizon. If investors believe it is prudent to assume a longer than "average" profit horizon, GOOGL's implied sales growth falls to -2.0% when a 24-year assumption is applied.

Amazon.com Inc (AMZN) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: AMZN value contribution to the overall S&P 500, 11/30/05 to 12/31/21. Alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.



Applied Finance Research: AMZN Implied Expectations (Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 consensus sales forecasts / total assets projected on YTD asset growth

AMZN contributes 3.9% of the S&P 500's total market cap, 2.2% of intrinsic value (based on LFY financial statement data), 1.1% of book value, and 2.6% of intrinsic value in excess of book value.

Implied sales growth for AMZN from 2022 forward is 14.0%, which is 3.6% lower than consensus 2022 forecasts of 17.6%. Based on 2021 forecasts, AMZN's Economic Margins are anticipated to be comparable to 2020 levels of 6.7%. Recent margin stability has elevated AMZN's Economic Profit Horizon from 25 years in 2019 to 27 years now.

In case investors are concerned about AMZN's elevated Economic Profit Horizon compared to other megacap firms studied in this format, we can adjust the horizon to 24 years and note that implied sales increase to 16.2% from 2022 forward, which is within 1.4% of consensus forecasts.

Tesla Inc. (TSLA) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: TSLA Implied Expectations. Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 consensus sales forecasts / total assets projected on YTD asset growth



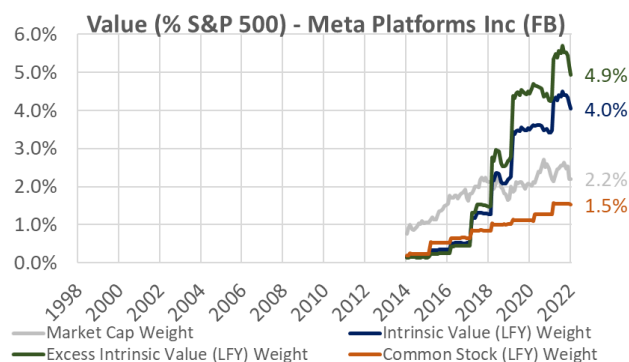
Applied Finance Research: TSLA Implied Expectations. Implied EBITDA Margin based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 consensus sales forecasts / total assets projected on YTD asset growth

TSLA contributes 2.5% of the S&P 500's total market cap, 0.1% of intrinsic value (based on LFY financial statement data), 0.3% of book value, and 0.1% of intrinsic value in excess of book value. Through 2021 Q3, TSLA has delivered significant revenue and EBITDA expansion; their valuation contribution should increase once 2021 full year data is available. Unlike other megacap stocks reviewed here, nearly all of TSLA's market value is derived from forecasts that assume significant growth and margin improvement.

In our first model, implied sales growth for TSLA from 2022 forward is 77.9%, which is 38.2% higher than consensus 2022 forecasts of 39.7%. This analysis includes a revision of the Economic Profit Horizon from 16 years to 24 years to include competitive advantages TSLA has potentially built in their loyal customer base and technology but not captured by the inputs in default profit horizon assumptions.

The bull case for TSLA assumes margin improvement on top of massive revenue growth. (In Q3, EBITDA margins reached 20.5%) Using consensus sales forecasts, we can instead solve for implied EBITDA margins, which are 25.3% from 2022 forward. This is much higher than the margins delivered by legacy automakers, and it may be difficult for TSLA to further expand EBITDA margins as competition accelerates in the EV space. Taken together, this analysis provides a sense of the revenue growth, margin expansion and profit horizon embedded in TSLA's current market price.

Meta Platforms, Inc (FB) Intrinsic Value Contribution & Implied Expectations



Applied Finance Research: FB value contribution to the overall S&P 500, 12/31/13 to 12/31/21. Alternative value weights (market value, book value, intrinsic value & Excess Intrinsic Value) as a percentage of total value of point-in-time S&P 500 constituents as of each calendar month end. Intrinsic Value LFY assumes EM decay after the most recent fiscal year.



Applied Finance Research: FB Implied Expectations (Implied Sales Growth based on 12/31/21 closing prices, assuming R4Q EBITDA (adjusted for non-operating income) used as EBITDA forecast and asset turns based on 2021 consensus sales forecasts / total assets projected on YTD asset growth

FB contributes 2.2% of the S&P 500's total market cap, 4.0% of intrinsic value (based on LFY financial statement data), 1.5% of book value, and 4.9% of intrinsic value in excess of book value.

Implied sales growth for FB from 2022 forward is -9.1%, which is 28.1% lower than consensus 2022 forecasts of 19.0%. Based on 2021 forecasts, FB's Economic Margins are expected to increase from 15.2% to nearly 18%. FB's Economic Profit Horizon has also mildly improved from 23 years in 2019 to 24 years now.

FB's recent announcement that they plan on spending significant levels of capex on investment in the metaverse will have a material impact on future cash flows. High levels of free cash flow had been used on share repurchases that lowered outstanding shares from 2.91B at the end of 2017 to 2.79B through the end of 2021 Q3; much of this excess cash flow will now likely be routed towards capex instead. The success of this initiative plays a material role in determining if FB will be able to sustain high levels of economic profitability over this 24-year profit horizon.

Top 100 US Stocks by Market Cap – 2021 Q4

2021 Q4 Return Trends	Market Weight			Equal Weight			Company Analysis		
	9/30-11/8	11/8-12/31	Q4	9/30-11/8	11/8-12/31	Q4	Mkt Cap (\$B)	Biggest Contributors	% Due to Top 5
Market Cap Analysis									
Top 5 Largest Stocks	9.8%	3.2%	13.3%	8.7%	2.0%	10.8%	8869	AAPL (25.7%), MSFT (19.5%), GOOGL (8.4%), AMZN (1.5%), FB (-0.9%)	100.0%
Next 95 Largest Stocks	9.9%	-0.1%	9.8%	8.3%	0.2%	8.6%	18408	TSLA (36.3%), NVDA (42.0%), UNH (28.9%), HD (26.9%), PFE (38.5%)	43.5%
All Remaining Stocks	8.5%	-2.2%	6.2%	8.9%	-6.6%	1.7%	20998	F (47.4%), MU (31.4%), ZM (-29.7%), MRVL (45.2%), LRCX (26.6%)	5.7%
All Russell 3000 Stocks	9.3%	-0.4%	8.9%	8.9%	-6.4%	1.9%	48275	AAPL (25.7%), MSFT (19.5%), TSLA (36.3%), NVDA (42.0%), GOOGL (8.4%)	38.7%

Applied Finance Research: Russell 3000 Size Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 9/30/21 & 11/8/21.

Continuing the theme regarding performance from megacap stocks, we can expand our focus to review the performance of the 100 largest stocks in the US in 2021 Q4. The top 5 stocks appreciated by 13.3% in Q4, while the next 95 largest stocks appreciated by 9.8% and all remaining stocks appreciated by 6.2% on a cap-weighted basis.

In Q4, deviations from overall market returns in the top 100 market cap stocks were most common in Technology, Health Care, Communication and Industrials. In Technology, QCOM, NVDA, AMD, AVGO, ACN, AAPL, ADP and AMAT appreciated by more than 20% while SQ, PYPL and CRM declined by more than -5%. In Health Care, PFE, UNH, ABBV, ZTS, ANTM and CVS appreciated by more than 20% while MRNA and MDT declined by more than -5%. In Communication, no stocks appreciated by 20%, but CHTR, CMCSA, TMUS, DIS and T declined by more than -5%. In Industrials, UNP appreciated by 20% while BA, GE, and UBER declined by more than -5%.

Other notable stocks that appreciated by at least 20% last quarter include TSLA, PLD, LOW, HD, COST and EL. Other notable laggards that declined by at least -5% in Q4 include C.

Ticker	Name	Sector	Mkt Cap - 9/30/21	Q4 Return	Ticker	Name	Sector	Mkt Cap - 9/30/21	Q4 Return
AAPL	APPLE INC.	Technology	2342808	25.7%	MRNA	MODERNA INC	Health Care	155098	-34.0%
MSFT	MICROSOFT CORPORATION	Technology	2119757	19.5%	NEE	NEXTERA ENERGY INC	Utilities	154056	19.4%
GOOGL	ALPHABET INC	Communication	1784941	8.4%	LIN	LINDE PLC	Materials	151505	18.5%
AMZN	AMAZON.COM, INC.	Discretionary	1662230	1.5%	PM	PHILIP MORRIS INTL	Staples	147738	1.6%
FB	META PLATFORMS INC	Communication	959116	-0.9%	INTU	INTUIT INC.	Technology	147413	19.4%
TSLA	TESLA INC	Discretionary	763073	36.3%	HON	HONEYWELL INTERNATIONAL	Industrials	146558	-1.3%
BRKB	BERKSHIRE HATHAWAY INC.	Financials	617000	9.5%	QCOM	QUALCOMM INCORPORATED	Technology	145490	42.3%
NVDA	NVIDIA CORPORATION	Technology	517072	42.0%	C	CITIGROUP INC.	Financials	142240	-13.3%
JPM	JPMORGAN CHASE & CO.	Financials	489131	-2.7%	LOW	LOWE'S COMPANIES INC.	Discretionary	141799	27.9%
V	VISA INCORPORATION	Technology	439709	-2.5%	SCHW	CHARLES SCHWAB CORP	Financials	137508	15.7%
JNJ	JOHNSON & JOHNSON	Health Care	425066	6.6%	CHTR	CHARTER COMMUNICATIONS	Communication	133742	-10.4%
WMT	WALMART INC	Staples	389009	4.2%	AXP	AMERICAN EXPRESS CO	Financials	133689	-2.1%
UNH	UNITEDHEALTH GROUP INC	Health Care	368468	28.9%	BMJ	BRISTOL-MYERS SQUIBB	Health Care	131476	5.4%
BAC	BANK OF AMERICA CORP	Financials	360280	5.3%	SBUX	STARBUCKS CORPORATION	Discretionary	130056	6.5%
HD	HOME DEPOT INC	Discretionary	346642	26.9%	RTX	RAYTHEON TECHNOLOGIES	Industrials	129618	0.7%
MA	MASTERCARD, INC.	Technology	343508	3.5%	BA	BOEING CO	Industrials	128857	-8.5%
PG	PROCTER & GAMBLE CO	Staples	339672	17.7%	UNP	UNION PACIFIC CORP	Industrials	127985	29.2%
PYPL	PAYPAL HOLDINGS INC	Technology	305746	-27.5%	BLK	BLACKROCK, INC	Financials	127727	9.7%
DIS	WALT DISNEY CO	Communication	301292	-8.4%	GS	GOLDMAN SACHS GROUP INC	Financials	127500	1.7%
ADBE	ADOBE INC	Technology	274619	-1.5%	AMD	ADVANCED MICRO DEVICES	Technology	124817	39.8%
NFLX	NETFLIX INC	Communication	270134	-1.3%	IBM	INTL BUSINESS MACHINES	Technology	124526	2.1%
CRM	SALESFORCE.COM, INC.	Technology	265253	-6.3%	NOW	SERVICENOW INC	Technology	123272	4.3%
CMCSA	COMCAST CORPORATION	Communication	256704	-9.6%	AMGN	AMGEN INC.	Health Care	121125	6.7%
XOM	EXXON MOBIL CORP	Energy	249044	5.5%	AMT	AMERICAN TOWER CORP	Real Estate	120770	10.8%
PFE	PFIZER INC.	Health Care	240813	38.5%	ISRG	INTUITIVE SURGICAL, INC.	Health Care	118005	8.4%
ORCL	ORACLE CORPORATION	Technology	238997	0.4%	AMAT	APPLIED MATERIALS, INC.	Technology	116243	22.4%
CSCO	CISCO SYSTEMS INC	Technology	229379	17.2%	GE	GENERAL ELECTRIC CO	Industrials	113092	-8.2%
NKE	NIKE INC.	Discretionary	229173	15.0%	TGT	TARGET CORPORATION	Discretionary	112017	1.5%
KO	COCA-COLA CO	Staples	226408	13.7%	CVS	CVS HEALTH CORP	Health Care	111846	22.3%
TMO	THERMO FISHER SCIENTIFIC	Health Care	224772	16.8%	SQ	SQUARE INC	Technology	109805	-32.7%
VZ	VERIZON COMMUNICATIONS	Communication	223608	-2.7%	EL	ESTEE LAUDER COMPANIES	Staples	108502	23.6%
LLY	ELI LILLY AND COMPANY	Health Care	221016	19.9%	CAT	CATERPILLAR INC.	Industrials	105098	8.3%
DHR	DANAHER CORPORATION	Health Care	217309	8.1%	DE	DEERE & COMPANY	Industrials	103892	2.6%
INTC	INTEL CORPORATION	Technology	216157	-2.7%	SPGI	S&P GLOBAL INC	Financials	102398	11.3%
ABT	ABBOTT LABORATORIES	Health Care	209423	19.6%	MMM	3M COMPANY	Industrials	101505	2.1%
PEP	PEPSICO INC.	Staples	207866	16.3%	SYK	STRYKER CORPORATION	Health Care	99449	1.7%
ACN	ACCURETTE PLC	Technology	203133	30.0%	TEAM	ATLASSIAN CORPORATION	Technology	98500	-2.6%
AVGO	BROADCOM INC	Technology	199791	38.1%	BKNG	BOOKING HOLDINGS INC	Discretionary	97470	1.1%
COST	COSTCO WHOLESALE CORP	Staples	198676	26.5%	LMT	LOCKHEED MARTIN CORP	Industrials	95564	3.9%
CVX	CHEVRON CORPORATION	Energy	196196	17.0%	PLD	PROLOGIS INC	Real Estate	92741	34.8%
T	AT&T INC.	Communication	192847	-7.2%	ZTS	ZOEITIS INC	Health Care	92063	25.8%
WFC	WELLS FARGO & COMPANY	Financials	190652	3.8%	ANTM	ANTHEM INC	Health Care	90934	24.7%
ABBV	ABBVIE INC	Health Care	190609	27.0%	SNOW	SNOWFLAKE INC	Technology	90906	12.0%
MRK	MERCK & CO., INC.	Health Care	190235	3.0%	COP	CONOCOPHILLIPS	Energy	90749	7.5%
MCD	MCDONALD'S CORP	Discretionary	180061	11.8%	USB	US BANCORP	Financials	88126	-4.7%
MS	MORGAN STANLEY	Financials	178503	1.6%	GILD	GILEAD SCIENCES, INC.	Health Care	87592	5.0%
TXN	TEXAS INSTRUMENTS INC	Technology	177426	-1.3%	ADP	AUTOMATIC DATA PROCESS	Technology	84706	23.9%
MDT	MEDTRONIC PLC	Health Care	168554	-17.0%	UBER	UBER TECHNOLOGIES INC	Industrials	84238	-6.4%
TMUS	T-MOBILE US INC	Communication	159434	-9.2%	MO	ALTRIA GROUP, INC.	Staples	83998	6.1%
UPS	UNITED PARCEL SERVICE	Industrials	158737	18.3%	PNC	PNC FINANCIAL SERVICES	Financials	83147	3.1%

Applied Finance Research: Top 100 US Stocks by 9/30/21 Market Cap: AFG Data as of 12/31/21. 2021 Q4 Returns are 9/30/21 to 12/31/21.

Top 100 US Stocks by Market Cap – 2021

2021 Q4 Return Trends	Market Weight			Equal Weight			Company Analysis		
	12/31-6/30	6/30-12/31	2021	12/31-6/30	6/30-12/31	2021	Mkt Cap (\$B)	Biggest Contributors	% Due to Top 5
Market Cap Analysis	16.3%	16.3%	35.3%	19.6%	13.4%	35.6%	7538	MSFT (52.5%), AAPL (34.6%), GOOGL (65.3%), FB (23.1%), AMZN (2.4%)	100.0%
Top 5 Largest Stocks	16.3%	16.3%	35.3%	19.6%	13.4%	35.6%	16267	NVDA (125.5%), TSLA (49.8%), HD (59.5%), BRKB (29.0%), UNH (45.2%)	30.0%
Next 95 Largest Stocks	13.2%	10.3%	24.9%	14.8%	8.6%	24.7%	17904	MRNA (143.1%), F (137.5%), SCHW (60.2%), COP (86.7%), LRCX (53.7%)	5.6%
All Remaining Stocks	15.9%	5.3%	22.1%	23.2%	0.0%	23.4%	41708	MSFT (52.5%), AAPL (34.6%), GOOGL (65.3%), NVDA (125.5%), TSLA (49.8%)	29.8%

Applied Finance Research: Russell 3000 Size Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 12/31/20 & 6/30/21.

We can also review the performance of the 100 largest stocks in the US for the entire 2021 calendar year. The top 5 stocks appreciated by 35.3% in 2021, while the next 95 largest stocks appreciated by 24.9% and all remaining stocks appreciated by 22.1% on a cap-weighted basis.

In 2021, deviations from overall market returns in the top 100 market cap stocks were most common in Technology, Communication and Health Care. In Technology, NVDA, AMAT, INTU, ACN, AMD, AVGO and MSFT appreciated by more than 50% while ZM, SQ, FIS, PYPL and FISV declined by more than -5%. In Communication, GOOGL appreciated by more than 50% while DIS, TMUS, T and VZ declined by more than -5%. In Health Care, PFE, LLY and CVS appreciated by more than 50% while MDT declined by more than -5%.

Other notable stocks that appreciated by at least 50% in 2021 include PLD, LOW, WFC, HD, XOM and COST. Other notable laggards that declined by at least -5% in 2021 include UBER and BA.

Ticker	Name	Sector	Mkt Cap - 12/31/20	2021 Return	Ticker	Name	Sector	Mkt Cap - 12/31/20	2021 Return
AAPL	APPLE INC.	Technology	2252647	34.6%	UPS	UNITED PARCEL SERVICE	Industrials	145430	30.0%
MSFT	MICROSOFT CORPORATION	Technology	1683942	52.5%	UNP	UNION PACIFIC CORP	Industrials	140555	23.3%
AMZN	AMAZON.COM, INC.	Discretionary	1634979	2.4%	BMJ	BRISTOL-MYERS SQUIBB CO	Health Care	140188	2.9%
GOOGL	ALPHABET INC	Communication	1187806	65.3%	LIN	LINDE PLC	Materials	138305	33.4%
FB	META PLATFORMS INC	Communication	778506	23.1%	AMGN	AMGEN INC.	Health Care	134158	0.9%
TSLA	TESLA INC	Discretionary	668975	49.8%	CHTR	CHARTER COMMUNICATIONS	Communication	132227	-1.4%
BRKB	BERKSHIRE HATHAWAY INC.	Financials	543672	29.0%	PM	PHILIP MORRIS INTL	Staples	128929	20.8%
V	VISA INCORPORATION	Technology	431336	-0.3%	C	CITIGROUP INC.	Financials	128374	1.0%
JNJ	JOHNSON & JOHNSON	Health Care	414250	11.4%	SBUX	STARBUCKS CORPORATION	Discretionary	125520	11.2%
WMT	WALMART INC	Staples	408089	2.0%	WFC	WELLS FARGO & COMPANY	Financials	124719	61.1%
JPM	JPMORGAN CHASE & CO.	Financials	387335	27.7%	BA	BOEING CO	Industrials	120840	-6.0%
MA	MASTERCARD, INC.	Technology	356226	1.2%	LOW	LOWE'S COMPANIES INC.	Discretionary	120704	63.3%
PG	PROCTER & GAMBLE CO	Staples	345025	20.5%	IBM	INTL BUSINESS MACHINES	Technology	112166	16.8%
UNH	UNITEDHEALTH GROUP INC	Health Care	332795	45.2%	AMD	ADVANCED MICRO DEVICES	Technology	110235	56.9%
NVDA	NVIDIA CORPORATION	Technology	323242	125.5%	BLK	BLACKROCK, INC	Financials	110032	29.4%
DIS	WALT DISNEY CO	Communication	322682	-14.5%	RTX	RAYTHEON TECHNOLOGIES	Industrials	108603	23.3%
HD	HOME DEPOT INC	Discretionary	285807	59.5%	MS	MORGAN STANLEY	Financials	108034	46.6%
PYPL	PAYPAL HOLDINGS INC	Technology	274482	-19.5%	NOW	SERVICENOW INC	Technology	107389	17.9%
BAC	BANK OF AMERICA CORP	Financials	262531	49.6%	MMM	3M COMPANY	Industrials	100823	4.9%
VZ	VERIZON COMMUNICATIONS	Communication	243113	-7.5%	AMT	AMERICAN TOWER CORP	Real Estate	99703	32.9%
ADBE	ADOBE INC	Technology	239917	13.4%	INTU	INTUIT INC.	Technology	99422	70.3%
CMCSA	COMCAST CORPORATION	Communication	239747	-2.2%	LMT	LOCKHEED MARTIN CORP	Industrials	99318	3.2%
NFLX	NETFLIX INC	Communication	238892	11.4%	CAT	CATERPILLAR INC.	Industrials	98884	16.0%
KO	COCA-COLA CO	Staples	235647	11.4%	SQ	SQUARE INC	Technology	97436	-25.8%
NKE	NIKE INC.	Discretionary	221401	18.7%	AXP	AMERICAN EXPRESS CO	Financials	97333	36.9%
MRK	MERCK & CO., INC.	Health Care	206934	1.8%	ZM	ZOOM VIDEO COMM.	Technology	96455	-45.5%
PEP	PEPSICO INC.	Staples	205099	20.5%	ISRG	INTUITIVE SURGICAL, INC.	Health Care	96127	31.8%
T	AT&T INC.	Communication	204916	-8.1%	EL	ESTEE LAUDER COMPANIES	Staples	95968	40.0%
PFE	PFIZER INC.	Health Care	204553	66.7%	GE	GENERAL ELECTRIC CO	Industrials	94607	9.7%
INTC	INTEL CORPORATION	Technology	204162	6.0%	SYK	STRYKER CORPORATION	Health Care	92084	10.2%
CRM	SALESFORCE.COM, INC.	Technology	203392	14.2%	BKNG	BOOKING HOLDINGS INC	Discretionary	91216	7.7%
ABT	ABBOTT LABORATORIES	Health Care	194056	30.5%	GS	GOLDMAN SACHS GROUP INC	Financials	90735	47.6%
ORCL	ORACLE CORPORATION	Technology	190965	36.9%	UBER	UBER TECHNOLOGIES INC	Industrials	89802	-17.8%
CSCO	CISCO SYSTEMS INC	Technology	189606	45.8%	CVS	CVS HEALTH CORP	Health Care	89405	54.9%
ABBV	ABBVIE INC	Health Care	189151	32.4%	TGT	TARGET CORPORATION	Discretionary	88398	32.9%
TMO	THERMO FISHER SCIENTIFIC	Health Care	184605	43.5%	FIS	FIDELITY NATIONAL INFO	Technology	87705	-21.9%
AVGO	BROADCOM INC	Technology	177111	56.4%	DE	DEERE & COMPANY	Industrials	84320	28.9%
XOM	EXXON MOBIL CORP	Energy	174278	57.6%	MU	MICRON TECHNOLOGY, INC.	Technology	83675	24.2%
QCOM	QUALCOMM INCORPORATED	Technology	172297	22.3%	MDLZ	MONDELEZ INTERNATIONAL	Staples	83603	15.9%
TMUS	T-MOBILE US INC	Communication	167276	-14.0%	TJX	TJX COMPANIES INC	Discretionary	81991	12.8%
COST	COSTCO WHOLESALE CORP	Staples	166256	51.8%	ANTM	ANTHEM INC	Health Care	80094	46.1%
ACN	ACCENTURE PLC	Technology	165788	60.7%	SPGI	S&P GLOBAL INC	Financials	79092	44.7%
LLY	ELI LILLY AND COMPANY	Health Care	161494	66.1%	AMAT	APPLIED MATERIALS, INC.	Technology	78878	83.6%
MCD	MCDONALD'S CORP	Discretionary	159884	27.8%	ZTS	ZOETIS INC	Health Care	78653	48.3%
DHR	DANAHER CORPORATION	Health Care	157786	48.6%	CI	CIGNA CORP	Health Care	78273	12.3%
CVX	CHEVRON CORPORATION	Energy	157695	46.3%	FISV	FISERV, INC.	Technology	76320	-8.8%
MDT	MEDTRONIC PLC	Health Care	157617	-9.8%	MO	ALTRIA GROUP, INC.	Staples	76195	24.3%
NEE	NEXTERA ENERGY INC	Utilities	151214	23.4%	ADP	AUTOMATIC DATA PROCESS	Technology	75731	42.6%
TXN	TEXAS INSTRUMENTS INC	Technology	150612	17.5%	PLD	PROLOGIS INC	Real Estate	73645	72.3%
HON	HONEYWELL INTERNATIONAL	Industrials	149252	-0.3%	CL	COLGATE-PALMOLIVE CO.	Staples	73297	2.1%

Applied Finance Research: Top 100 US Stocks by 12/31/20 Market Cap: AFG Data as of 12/31/21. 2021 Returns are 12/30/20 to 12/31/21.

2021 Q4 Return Trends	Market Weight			Equal Weight			Company Analysis		
Sector	9/30-11/8	11/8-12/31	Q4	9/30-11/8	11/8-12/31	Q4	Mkt Cap (\$B)	Biggest Contributors	% Due to Top 5
Communication	4.0%	-4.6%	-0.7%	3.8%	-12.2%	-9.1%	5064	GOOGL (8.4%), DIS (-8.4%), CMCSA(-9.6%), TMUS(-9.2%), CHTR(-10.4%)	na
Discretionary	13.7%	-3.7%	9.5%	8.9%	-7.1%	1.1%	6099	TSLA (36.3%), HD (26.9%), LOW (27.9%), NKE (15.0%), F (47.4%)	81.2%
Staples	5.7%	5.7%	11.8%	5.8%	1.3%	7.1%	2759	PG (17.7%), COST (26.5%), PEP (16.3%), KO (13.7%), EL (23.6%)	62.4%
Energy	12.5%	-5.9%	5.9%	13.1%	-14.9%	-4.0%	1261	CVX (17.0%), XOM (5.5%), COP (7.5%), EOG (13.8%), DVN (26.5%)	89.5%
Financials	8.3%	-3.1%	5.0%	10.5%	-3.5%	6.5%	5766	BRKB (9.5%), SCHW (15.7%), BAC (5.3%), C (-13.3%), CME (20.3%)	32.8%
Health Care	4.7%	2.3%	7.1%	4.1%	-12.9%	-9.3%	6319	UNH (28.9%), PFE (38.5%), MRNA (-34.0%), ABBV (27.0%), LLY (19.9%)	54.0%
Industrials	10.2%	-1.8%	8.3%	12.8%	-5.4%	6.6%	4227	UNP (29.2%), UPS (18.3%), CSX (26.8%), NSC (24.9%), ITW (20.0%)	32.1%
Technology	12.3%	0.9%	13.3%	11.1%	-6.0%	4.2%	12861	AAPL (25.7%), MSFT (19.5%), NVDA(42.0%), PYPL(-27.5%), AVGO(38.1%)	71.5%
Materials	12.1%	1.4%	13.6%	11.4%	-2.5%	8.6%	1296	LIN (18.5%), SHW (26.1%), FCX (28.5%), APD (19.4%), ECL (12.7%)	44.9%
Real Estate	8.0%	6.1%	14.6%	8.3%	2.0%	10.6%	1547	PLD (34.8%), CCI (21.3%), PSA (26.8%), AMT (10.8%), SPG (24.3%)	37.8%
Utilities	4.4%	8.2%	13.0%	5.4%	6.0%	11.6%	1075	NEE (19.4%), EXC (20.3%), SO (11.8%), DUK (8.5%), EIX (24.3%)	42.1%
All Sectors	9.3%	-0.4%	8.9%	8.9%	-6.4%	1.9%	48275	AAPL (25.7%), MSFT (19.5%), TSLA (36.3%),NVDA(42.0%), GOOGL(8.4%)	38.7%

Applied Finance Research: Russell 3000 Sector Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 9/30/21 & 11/8/21

US Markets, based on cap-weighted returns of Russell 3000 constituents as of 9/30/21, returned 8.9% in Q4. US stocks appreciated by 9.3% through early November before declining -0.4% by the end of 2021. Equal-weighted gains kept pace with cap-weighted returns through 11/8, then underperformed cap-weighted returns by 6.0% through the end of the year.

All GICs sectors appreciated through 11/8, then nearly half declined from that point forward. In aggregate, all sectors (ex-Communication) appreciated over the course of 2021 Q4, led by Real Estate, Materials, Technology and Utilities while Communication, Financials and Energy lagged. The tables below highlight top and bottom performing industries on a market-cap weighted basis. Top performing industries appreciated more than 16.0%, while worst performing industries declined by at least -1.0% over the previous quarter.

2021 Q4 Industry Return Trends		Q4 Returns		Mkt Cap (\$B)		Biggest Contributors	
Sector	Industry	Market	Equal	Mkt Cap (\$B)			
Discretionary	Automobile Manu	34.1%	6.0%	917	TSLA (36.3%), F (47.4%), GM (11.2%), THO (-14.8%), WKHS (-43.0%)		
Discretionary	Homebuilding	26.7%	28.9%	137	DHI (29.4%), LEN (24.3%), NVR (23.3%), PHM (24.8%), BLD (34.7%)		
Discretionary	Home Improve Retail	26.5%	1.3%	503	HD (26.9%), LOW (27.9%), FND (7.6%), GRWG (-47.1%), LL (-8.6%)		
Discretionary	Distributors	21.7%	2.1%	51	POOL (30.5%), LKQ (19.8%), GPC (16.4%), GNLN (-59.3%), FNKO (3.2%)		
Health Care	Managed Health Care	26.2%	9.1%	575	UNH (28.9%), ANTM (24.7%), CNC (32.2%), HUM (19.4%), MOH (17.2%)		
Industrials	Railroads	25.9%	22.3%	279	UNP (29.2%), CSX (26.8%), NSC (24.9%), KSU (8.5%)		
Industrials	Building Products	19.0%	17.6%	299	JCI (20.0%), TT (17.4%), BLDR (65.7%), AOS (41.1%), TREX (32.5%)		
Industrials	Air Freight/Logistics	18.3%	18.7%	259	UPS (18.3%), FDX (18.3%), CHRW (24.4%), EXPD (13.3%), FWRD (46.1%)		
Industrials	Trading Comp/Dist	16.1%	16.3%	154	FAST (24.7%), GWW (32.3%), WSO (19.1%), SITE (21.5%), URI (-5.3%)		
Materials	Constrx Materials	25.1%	18.8%	55	MLM (29.1%), VMC (22.9%), EXP (27.1%), SUM (25.6%), USLM (6.9%)		
Materials	Copper	20.6%	20.1%	91	FCX (28.5%), SCCO (11.8%)		
Materials	Dvsfd Chem	19.4%	18.6%	25	EMN (20.8%), HUN (18.6%), CC (16.4%)		
Materials	Industrial Gases	18.7%	18.9%	208	LIN (18.5%), APD (19.4%)		
Real Estate	Industrial REITs	32.4%	25.8%	164	PLD (34.8%), DRE (37.8%), REXR (43.4%), EGP (37.4%), FR (27.6%)		
Real Estate	Specialized REITs	16.9%	15.7%	558	CCI (21.3%), PSA (26.8%), AMT (10.8%), DLR (23.3%), EXR (35.8%)		
Real Estate	Residential REITs	16.1%	20.1%	227	MAA (23.5%), AVB (15.5%), INVH (18.8%), EQR (12.6%), CPT (21.7%)		
Staples	Personal Products	22.2%	11.6%	135	EL (23.6%), COTY (33.6%), IPAR (43.4%), NUS (26.4%), EPC (26.4%)		
Technology	Semiconductors	26.6%	21.1%	1899	NVDA (42.0%), AVGO (38.1%), QCOM (42.3%), AMD (39.8%), MU (31.4%)		
Technology	Tech Hdw/Stg/Periph	24.8%	7.0%	2551	AAPL (25.7%), HPQ (38.6%), STX (37.8%), DELL (6.6%), WDC (15.5%)		
Technology	Semiconductor Equip	24.7%	23.7%	349	AMAT (22.4%), LRCX (26.6%), KLAC (28.9%), TER (49.9%), ENPH (22.0%)		
Technology	Communications Equip	20.9%	15.0%	378	CSCO (17.2%), ANET (67.3%), MSI (17.3%), CIEN (49.9%), FIVV (23.1%)		
Technology	IT Cons/Other Serv	17.4%	8.9%	465	ACN (30.0%), CTSH (19.9%), EPAM (17.2%), IBM (2.1%), IT (10.0%)		
Utilities	Indpt Pwr Prod/Energy Trd	17.2%	20.4%	29	VST (34.1%), CWEN.A (19.9%), AES (7.1%)		

2021 Q4 Industry Return Trends		Q4 Returns		Mkt Cap (\$B)		Biggest Contributors	
Sector	Industry	Market	Equal	Mkt Cap (\$B)			
Communication	Broadcasting	-12.6%	-13.7%	82	VIAC (-23.0%), FOXA (-8.0%), DISCA (-7.3%), AMCX (-26.1%), SBGI (-15.9%)		
Communication	Inter Home Ent	-10.6%	-13.7%	142	ATVI (-14.0%), PLTK (-37.4%), EA (-7.2%), TTWO (15.4%), ZNGA (-15.0%)		
Communication	Wireless Telecom Serv	-9.1%	-9.4%	168	TMUS (-9.2%), GOGO (-21.8%), SHEN (-19.1%), TDS (4.2%), USM (-1.2%)		
Communication	Cable & Satellite	-9.0%	-5.8%	507	CMCSA (-9.6%), CHTR (-10.4%), DISH (-25.4%), ATUS (-21.9%), LBRDA (-4.4%)		
Communication	Movies/Ent	-4.9%	-10.9%	722	DIS (-8.4%), ROKU (-27.2%), LYV (31.3%), AMC (-28.5%), NFLX (-1.3%)		
Communication	Integrated Telecom Serv	-4.7%	-4.2%	421	T (-7.2%), VZ (-2.7%), CNSL (-18.6%), ATNI (-14.4%), IDT (5.3%)		
Communication	Advertising	-2.8%	-8.9%	46	MGNI (-37.5%), CDLX (-21.3%), IPG (3.0%), TTGT (16.1%), OMC (2.1%)		
Communication	Alternative Carriers	-2.6%	-6.3%	34	GSAT (-30.5%), BAND (-20.5%), LUMN (3.2%), LILA (-10.8%), IRDM (3.6%)		
Discretionary	Education Services	-17.7%	-9.5%	43	CHGG (-54.9%), TWOU (-40.2%), COUR (-22.8%), LAUR (27.9%), BFAM (-9.7%)		
Discretionary	Casinos & Gaming	-13.0%	-9.1%	180	DKNG (-43.0%), CZR (-16.7%), PENN (-28.4%), SGMS (-19.5%), MGM (4.0%)		
Discretionary	Homefurnishing Retail	-12.7%	-13.3%	33	RH (-19.6%), WSM (-4.3%), SNBR (-18.1%), BBBY (-15.6%), AAN (-10.1%)		
Discretionary	Leisure Products	-11.6%	-2.1%	93	PTON (-58.9%), HAS (14.9%), MAT (16.2%), SWIM (52.6%), HAYW (17.9%)		
Discretionary	Consumer Electronics	-10.8%	-9.2%	37	GRMN (-12.0%), SONO (-7.9%), GPRO (10.1%), UEIC (-17.3%), VUZI (-17.1%)		
Discretionary	Computer/Elect Retail	-7.7%	-7.4%	44	GME (-15.4%), BBY (-3.2%), RCII (-13.9%), CONN (3.0%)		
Financials	Consumer Finance	-6.4%	0.4%	377	UPST (-52.2%), COF (-10.1%), AXP (-2.1%), DFS (-5.5%), CACC (17.5%)		
Financials	Thrfts/Mortgage Fin	-2.6%	5.0%	112	RKT (-12.7%), UWMC (-13.6%), WD (33.4%), PFSI (14.5%), RDN (-6.4%)		
Health Care	Health Care Tech	-4.9%	-7.9%	144	CERN (32.1%), TDOC (-27.6%), VEEV (-11.3%), SDGR (-36.3%), OMCL (21.6%)		
Health Care	Health Care Supplies	-3.6%	-6.4%	130	STAA (-29.0%), HAE (-24.9%), ALGN (-1.2%), MMSI (-13.2%), XRAY (-3.7%)		
Health Care	Biotechnology	-3.2%	-13.2%	1258	MRNA (-34.0%), ABBV (27.0%), VRTX (21.1%), AMGN (6.7%), BIIB (-15.2%)		
Industrials	Airlines	-11.5%	-12.7%	118	LUV (-16.7%), DAL (-8.3%), AAL (-12.5%), UAL (-8.0%), ALK (-11.1%)		
Real Estate	Real Estate Services	-5.3%	-2.4%	102	ZG (-29.8%), CBRE (11.5%), OPEN (-28.8%), RDFN (-23.4%), JLL (8.6%)		
Technology	Data Proc/Outsourced Serv	-7.3%	-9.7%	1675	PYPL (-27.5%), SQ (-32.7%), ADP (23.9%), MA (3.5%), V (-2.5%)		

Applied Finance Research: Russell 3000 Industry Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 9/30/21. Excludes industries with less than 20B in market cap

US Sector & Industry Analysis – 2021

2021 Q4 Return Trends	Market Weight			Equal Weight			Company Analysis		
	12/31-6/30	6/30-12/31	2021	12/31-6/30	6/30-12/31	2021	Mkt Cap (\$B)		% Due to Top 5
Sector								Biggest Contributors	
Communication	19.0%	0.0%	19.0%	47.7%	-11.0%	22.6%	4260	GOOGL (65.3%), FB (23.1%), DIS (-14.5%), NFLX (11.4%), TMUS (-14.0%)	112.9%
Discretionary	11.9%	9.4%	22.4%	37.5%	-3.9%	31.4%	5367	TSLA (49.8%), HD (59.5%), LOW (63.3%), F (137.5%), MCD (27.8%)	56.0%
Staples	5.6%	10.6%	16.9%	13.7%	3.9%	18.3%	2701	COST (51.8%), PG (20.5%), PEP (20.5%), EL (40.0%), KO (11.4%)	58.0%
Energy	46.9%	4.5%	53.5%	63.1%	-2.3%	61.1%	854	XOM (57.6%), CVX (46.3%), COP (86.7%), EOG (88.7%), MPC (61.0%)	55.4%
Financials	24.7%	7.5%	34.1%	23.7%	9.3%	36.0%	4501	BRKB (29.0%), BAC (49.6%), JPM (27.7%), WFC (61.1%), MS (46.6%)	34.0%
Health Care	11.2%	8.4%	20.6%	12.7%	-15.4%	-4.1%	5604	UNH (45.2%), PFE (66.7%), LLY (66.1%), TMO (43.5%), DHR (48.6%)	47.7%
Industrials	15.8%	4.0%	20.4%	21.4%	3.5%	26.7%	3794	UPS (30.0%), UNP (23.3%), JCI (77.5%), RTX (23.3%), DE (28.9%)	19.7%
Technology	12.8%	15.1%	29.8%	13.3%	3.6%	18.1%	11121	MSFT (52.5%), AAPL (34.6%), NVDA (125.5%), ACN(60.7%), AVGO(56.4%)	68.4%
Materials	15.0%	9.4%	25.9%	24.1%	6.1%	31.6%	1172	LIN (33.4%), SHW (44.9%), FCX (61.4%), NUE (118.4%), MLM (56.1%)	42.3%
Real Estate	20.7%	14.8%	38.6%	22.2%	12.1%	37.3%	1281	PLD (72.3%), AMT (32.9%), PSA (66.6%), SPG (95.8%), CCI (35.1%)	32.6%
Utilities	2.4%	14.1%	16.8%	6.5%	9.0%	15.7%	1053	NEE (23.4%), EXC (41.4%), DUK (19.1%), SO (16.3%), FE (41.8%)	47.0%
All Sectors	15.0%	9.3%	25.6%	22.9%	0.3%	23.4%	41708	MSFT(52.5%), AAPL(34.6%), GOOGL(65.3%),NVDA(125.5%),TSLA(49.8%)	29.8%

Applied Finance Research: Russell 3000 Sector Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 12/31/20 & 6/30/20

We can also review 2021 fully year returns in a similar format to Q4 data on the previous page. In the first half of 2021, all sectors appreciated and equal weight performance (22.9%) outperformed cap weight (15.0%) by 7.9%. In the second half of 2021, cap weight continued to appreciate by 9.3% while equal weight returns were flat. Top performing industries appreciated more than 40.0%, while worst performing industries returned less than 9.0% over the course of 2021.

2021 Industry Return Trends		2021 Returns			Company Analysis	
Sector	Industry	Market	Equal	Mkt Cap (\$B)	Biggest Contributors	
Communication	Inter Media Svcs	43.5%	7.9%	2126	GOOGL (65.3%), FB (23.1%), PINS (-44.8%), TWTR (-20.2%), MTCH (-12.5%)	
Discretionary	Home Improve Retail	59.3%	10.2%	419	HD (59.5%), LOW (63.3%), FND (40.0%), GRWG (-67.6%), LL (-44.5%)	
Discretionary	Distributors	53.5%	40.7%	43	POOL (53.0%), LKQ (71.1%), GPC (43.4%), CORE (54.2%), FNKO (81.1%)	
Discretionary	Automobile Manu	52.5%	31.6%	773	TSLA (49.8%), F (137.5%), GM (40.8%), WKHS (-78.0%), THO (13.3%)	
Discretionary	Specialty Stores	52.2%	47.1%	87	BBWI (133.7%), TSCO (71.6%), ULTA (43.6%), DKS (116.4%), SIG (220.7%)	
Discretionary	Homebuilding	52.0%	56.4%	116	DHI (58.7%), LEN (54.0%), NVR (44.8%), PHM (34.0%), TOL (68.4%)	
Discretionary	Automotive Retail	40.2%	44.5%	162	AZO (76.8%), ORLY (56.0%), AAP (54.7%), KMX (37.9%), AN (67.4%)	
Energy	Oil/Gas Expl/Prod	84.6%	107.5%	198	COP (86.7%), EOG (88.7%), PXD (66.2%), DVN (196.1%), CLR (177.9%)	
Energy	Integrated Oil & Gas	53.0%	57.2%	348	XOM (57.6%), CVX (46.3%), OXY (67.7%)	
Energy	Oil/Gas Strg/Trans	44.8%	27.4%	108	OKE (64.8%), LNG (69.5%), WMB (38.4%), KMI (23.9%), TRGP (100.2%)	
Financials	Inv Bank/Brokerage	49.4%	41.4%	333	MS (46.6%), GS (47.6%), SCHW (60.2%), RJF (59.5%), LPLA (54.6%)	
Financials	Multi-line Insurance	48.8%	38.3%	75	AIG (53.9%), HIG (44.3%), AFG (94.8%), ANAT (101.0%), AIZ (16.5%)	
Financials	Regional Banks	40.3%	42.7%	607	PNC (38.2%), TFC (26.1%), SIVB (74.9%), FITB (62.4%), FRC (41.2%)	
Health Care	Managed Health Care	40.6%	28.4%	526	UNH (45.2%), ANTM (46.1%), CNC (37.3%), HUM (13.8%), MOH (49.6%)	
Industrials	Building Products	45.6%	36.2%	240	JCI (77.5%), CARR (45.3%), TT (41.0%), TREX (61.3%), AOS (59.1%)	
Industrials	Constrx/Engineering	45.3%	34.5%	63	PWR (59.5%), ACM (55.5%), WSC (76.3%), EME (39.9%), MTZ (35.3%)	
Materials	Steel	68.4%	65.4%	53	NUE (118.4%), STLD (71.4%), RS (37.8%), CLF (49.0%), CMC (79.8%)	
Materials	Constrx Materials	52.1%	57.0%	46	MLM (56.1%), VMC (41.1%), EXP (65.1%), SUM (99.9%), USCR (84.6%)	
Real Estate	Industrial REITs	62.6%	52.1%	133	PLD (72.3%), DRE (67.8%), REXR (67.8%), EGP (68.4%), FR (60.3%)	
Real Estate	Residential REITs	58.5%	67.3%	161	AVB (62.1%), EQR (57.3%), MAA (85.8%), INVH (55.6%), CPT (83.1%)	
Real Estate	Retail REITs	51.9%	49.9%	128	SPG (95.8%), REG (71.4%), O (24.1%), BPYU (28.8%), KIM (69.5%)	
Staples	Food Retail	40.9%	34.8%	48	KR (45.4%), ACI (75.1%), SFM (47.7%), GO (-28.0%), IMKTA (104.8%)	
Technology	Semiconductor Equip	53.5%	50.2%	294	AMAT (83.6%), LRCX (53.7%), KLAC (68.0%), TER (36.8%), ENTG (44.6%)	
Technology	Semiconductors	49.9%	45.9%	1574	NVDA (125.5%), AVGO (56.4%), AMD (56.9%), QCOM (22.3%), MRVL (84.6%)	
Technology	Systems Software	46.2%	20.5%	2260	MSFT (52.5%), ORCL (36.9%), FTNT (142.0%), PANW (56.7%), NOW (17.9%)	
Technology	Communications Equip	46.0%	25.3%	320	CSCO (45.8%), ANET (97.9%), MSI (61.9%), JNPR (63.4%), FIVV (39.1%)	
Technology	Tech Dist	43.8%	30.7%	40	CDW (56.9%), ARW (38.0%), SNX (41.5%), NSIT (40.1%), AVT (20.2%)	
Technology	IT Cons/Other Serv	41.6%	42.9%	394	ACN (60.7%), IBM (16.8%), EPAM (86.5%), IT (108.7%), CTSH (9.6%)	

2021 Industry Return Trends		2021 Returns			Company Analysis	
Sector	Industry	Market	Equal	Mkt Cap (\$B)	Biggest Contributors	
Communication	Inter Home Ent	-20.4%	-17.1%	149	ATVI (-28.0%), ZNGA (-35.2%), TTWO (-14.5%), EA (-7.7%), GLUU (0.0%)	
Communication	Wireless Telecom Serv	-13.0%	4.8%	176	TMUS (-14.0%), GOGO (40.5%), TDS (12.1%), SHEN (-6.1%), USM (2.7%)	
Communication	Integrated Telecom Serv	-7.5%	40.6%	451	VZ (-7.5%), T (-8.1%), IDT (257.3%), CNSL (53.0%), OOMA (41.9%)	
Communication	Movies/Ent	-4.2%	62.9%	704	DIZ (-14.5%), NFLX (11.4%), SPOT (-25.6%), ROKU (-31.3%), LYV (62.9%)	
Communication	Cable & Satellite	-3.6%	4.0%	496	ATUS (-57.3%), CMCSA (-2.2%), CABO (-20.4%), LSXMA (17.7%), CHTR (-1.4%)	
Communication	Broadcasting	1.7%	16.8%	72	FOXA (23.0%), VIAC (-17.2%), DISCA (-21.8%), NXST (40.9%), TGNA (35.6%)	
Discretionary	Leisure Products	-25.1%	9.9%	94	PTON (-76.4%), BC (33.8%), HAS (11.9%), MAT (23.6%), YETI (21.0%)	
Discretionary	Education Services	-22.8%	15.4%	42	CHGG (-66.0%), BFAM (-27.2%), HMHC (383.4%), LAUR (49.3%), TWOU (-49.8%)	
Discretionary	Casinos & Gaming	0.1%	31.9%	131	LVS (-36.8%), MGM (42.5%), PENN (-40.0%), CZR (25.9%), RRR (133.5%)	
Discretionary	Internet Retail	2.5%	-8.3%	1746	AMZN (2.4%), EBAY (33.8%), ETSY (23.1%), SFX (67.8%), GRUB (-52.9%)	
Financials	Thrfts/Mortgage Fin	3.1%	28.3%	102	RKT (-27.6%), WD (67.0%), NYCB (22.6%), AX (49.0%), COOP (34.1%)	
Financials	Reinsurance	9.0%	6.2%	40	RE (19.8%), ESGR (20.8%), Y (10.6%), RNR (3.0%), RGA (-3.2%)	
Health Care	Health Care Tech	-1.8%	5.4%	125	TDOC (-54.1%), CERN (19.7%), SDGR (-56.0%), OMCL (50.3%), VEEV (-6.2%)	
Health Care	Biotechnology	5.4%	-16.3%	1141	ABBV (32.4%), MRNA (143.1%), GILD (30.0%), REGN (30.7%), EXAS (-41.3%)	
Health Care	Health Care Supplies	8.4%	-7.1%	114	ALGN (23.0%), HAE (-55.3%), COO (15.3%), QDEL (-24.9%), LINTH (114.2%)	
Industrials	Airlines	-1.9%	-1.5%	96	LUV (-8.1%), AAL (13.9%), DAL (-2.8%), SAVE (-10.6%), CPA (7.0%)	
Industrials	Industrial Conglomerates	5.4%	20.8%	391	GE (9.7%), ROP (14.7%), MMM (4.9%), RAVN (74.8%), HON (-0.3%)	
Materials	Gold	3.7%	-22.6%	58	NEM (7.4%), CDE (-51.3%), GORO (-45.3%), CMCL (-23.9%), RGLD (0.0%)	
Real Estate	Real Estate Services	7.9%	32.3%	80	ZG (-54.2%), CBRE (73.0%), JLL (81.5%), RDFS (-44.1%), NMRK (157.3%)	
Staples	Brewers	-25.2%	-22.6%	22	SAM (-49.2%), TAP (4.1%)	
Staples	Distillers/Vintners	6.4%	30.7%	81	STZ (16.1%), BFB (-6.0%), MGPI (81.9%)	
Technology	Data Proc/Outsourced Serv	-5.6%	2.6%	1645	PYPL (-19.5%), ADP (42.6%), SQ (-25.8%), GPN (-36.9%), FIS (-21.9%)	
Technology	Inter Svcs & Infras	5.1%	-5.1%	212	NET (73.0%), TWLO (-22.2%), MDB (47.4%), FSLY (-59.4%), VRSN (17.3%)	
Technology	Application Software	9.0%	3.2%	1664	INTU (70.3%), ZM (-45.5%), TEAM (63.0%), ADBE (13.4%), CRM (14.2%)	

Applied Finance Research: Russell 3000 Industry Analysis: AFG Data as of 12/31/21. Market Cap and Market Weight data based on Market Cap data as of 12/31/20. Excludes industries with less than 20B in market cap

AFG & Friends Favorite Stocks for 2022

Over the last several weeks of 2021, AFG invited our clients to help contribute to an annual tradition: AFG & Friends Favorite Stocks. Thanks to submissions from AFG clients and team members, we have generated a list of 50 unique stocks that we would like to share with you as a source of investment ideas for 2022. In addition to this, participants helped AFG meet its goal and raise \$5,000 for charity! A full list of the 2022 buy ideas can be downloaded from the following links:

[AFG & Friends 2022 Stock Picks](#) | [Company Notes](#)

Ticker	Company Name	Sectors	MKT Cap	Company Grade
FB*	Meta Platforms Inc	Communication Services	961,798	B
JP:7974	Nintendo Co Ltd	Communication Services	57,358	B
ATVI	Activision Blizzard Inc	Communication Services	52,559	C
DISCA*	Discovery Inc	Communication Services	12,372	B
BABA	Alibaba Group Holding Ltd	Consumer Discretionary	333,595	D
PHM	Pultegroup, Inc	Consumer Discretionary	14,444	A
ONON	On Holding Ag	Consumer Discretionary	11,784	D
ASO	Academy Sports And Outdoors Inc	Consumer Discretionary	3,766	A
WBA	Walgreens Boots Alliance Inc	Consumer Staples	44,991	A
COP	ConocoPhillips	Energy	95,334	D
PBR	Petroleo Brasileiro Sa Petrobras	Energy	71,678	A
APA	APA Corp	Energy	10,229	A
EQT	EQT Corporation	Energy	8,326	A
CNX	CNX Resources Corp	Energy	2,976	A
WFC	Wells Fargo & Company	Financials	192,252	B
ITUB	Itau Unibanco Holding S.A.	Financials	36,577	B
DFS	Discover Financial Services	Financials	34,142	A
CBOE	CBOE Global Markets Inc	Financials	13,785	B
LNC	Lincoln National Corporation	Financials	12,755	D
JEF	Jefferies Financial Group Inc	Financials	9,574	A
MTG	MGIC Investment Corporation	Financials	4,729	A
FHI	Federated Hermes Inc	Financials	3,660	C
APLD	Applied Blockchain, Inc.	Financials	1	na
CVS	CVS Health Corp	Health Care	136,961	A
AMGN	Amgen Inc.	Health Care	127,956	A
GILD	Gilead Sciences, Inc.	Health Care	92,067	A
REGN*	Regeneron Pharmaceuticals Inc	Health Care	69,730	A
BIIB	Biogen Inc	Health Care	35,256	A
DGX	Quest Diagnostics Incorporated	Health Care	21,075	A
EXEL	Exelixis, Inc.	Health Care	5,893	B
CVET	Covetrus Inc	Health Care	2,755	B
MCRB	Seres Therapeutics Inc	Health Care	785	B
CLLS	Collectis SA	Health Care	375	na
LUV	Southwest Airlines Co.	Industrials	25,287	F
KNX	Knight-Swift Transportation	Industrials	10,085	A
MAXR	Maxar Technologies Inc	Industrials	2,159	A
MSFT	Microsoft Corporation	Information Technology	2,551,350	C
TXN	Texas Instruments Incorporated	Information Technology	174,904	A
FISV*	Fiserv, Inc.	Information Technology	68,983	A
FIS	Fidelity National Information Services	Information Technology	66,984	C
NXPI	NXP Semiconductors NV	Information Technology	60,885	A
GPN	Global Payments Inc.	Information Technology	39,536	B
UCTT	Ultra Clean Holdings, Inc.	Information Technology	2,546	A
CLBT	Cellebrite DI Ltd.	Information Technology	1,485	na
VALE	Vale S.A	Materials	71,539	C
ALB	Albemarle Corporation	Materials	27,413	F
FMC	FMC Corporation	Materials	13,865	C
BERY	Berry Global Group Inc	Materials	9,938	A
SVC	Service Properties Trust	Real Estate	1,478	A
SRE	Sempra Energy	Utilities	42,035	A

Report Data as of 12/31/2021

*Indicates stock was recommended in multiple submissions

We also would like to recognize the submissions for the top picks for 2021. Thank you for your participation!

Ticker	Company Name	Total Return	Price Close (12/31/20)	Price Close (12/10/21)	Market Cap (12/31/20)	Div Yield (12/31/20)	Submitted by:
MRO	MARATHON OIL CORPORATION	146.7%	6.67	16.22	5269	0.00%	Dhaval Sanghavi, Applied Finance
AFG	AMERICAN FINANCIAL GROUP INC.	92.9%	87.62	138.02	7646	2.28%	Ken Dery, Kenneth A. Dery & Associates
ACI	ALBERTSONS COMPANIES INC	78.1%	17.58	30.70	8422	0.00%	Ian Browning, Peddock Capital Advisors LLC
MIK	MICHAELS COMPANIES INC	68.9%	13.01	21.97	1920	0.00%	James Stechschulte, Thor Investment Management
LKQ	LKQ CORPORATION	65.2%	35.24	57.97	10725	0.00%	Dan Obrycki, Applied Finance
EQT	EQT CORPORATION	64.1%	12.71	20.86	3245	0.00%	Dan Obrycki, Applied Finance
ORLY	O'REILLY AUTOMOTIVE INC.	50.8%	452.57	682.37	33161	0.00%	Derek Bergen, Applied Finance
CVS	CVS HEALTH CORP	48.4%	68.30	98.86	89405	2.93%	Dan Obrycki, Applied Finance
FCX	FREEPORT-MCMORAN INC	48.4%	26.02	38.37	37807	0.00%	Dhaval Sanghavi, Applied Finance
GHL	GREENHILL & COMPANY INC	47.9%	12.14	17.73	230	1.65%	Tim Call, The Capital Management Corp

Report Data as of 12/10/2021

	1 Month	3 Month	6 Month	YTD	1 Year	3 Year	5 Year	10 Year	All-Time Annualized	All-Time Cumulative
AFG 50	7.0%	9.5%	9.9%	29.7%	29.7%	26.3%	18.2%	17.9%	11.7%	596.4%
SPDR S&P 500 (SPY)	4.6%	11.1%	11.7%	28.7%	28.7%	26.0%	18.4%	16.5%	10.6%	488.5%
Spread (6/10/04-12/31/21)	2.4%	-1.6%	-1.8%	1.0%	1.0%	0.3%	-0.2%	1.4%	1.1%	107.9%

Information Ratio: 0.27 | Sharpe: 0.78

Performance Summary	Portfolio	Benchmark	Spread
Cumulative	596.4%	488.5%	107.9%
Annual	11.7%	10.6%	1.1%
2004	11.8%	7.4%	4.4%
2005	9.4%	4.8%	4.6%
2006	17.7%	15.9%	1.9%
2007	-1.0%	5.1%	-6.1%
2008	-34.0%	-36.8%	2.8%
2009	30.1%	26.4%	3.7%
2010	14.5%	15.1%	-0.5%
2011	-4.2%	1.9%	-6.1%
2012	21.8%	16.0%	5.8%
2013	38.2%	32.3%	5.9%
2014	19.9%	13.5%	6.5%
2015	-1.2%	1.3%	-2.5%
2016	13.0%	12.0%	1.0%
2017	25.7%	21.7%	4.0%
2018	-9.0%	-4.6%	-4.4%
2019	34.4%	31.2%	3.2%
2020	15.5%	18.4%	-2.9%
2021	29.8%	28.8%	1.0%

Sector Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Energy	10.8%	8.0%	2.8%	2.6%	0.0%	0.1%
Materials	20.0%	15.1%	4.9%	2.4%	0.0%	0.1%
Industrials	5.8%	8.9%	-3.0%	7.9%	0.0%	-0.2%
Cons. Disc.	12.0%	12.8%	-0.8%	12.9%	0.0%	-0.1%
Cons. Stpls.	11.7%	12.6%	-0.9%	6.4%	0.0%	-0.1%
Health Care	15.0%	11.0%	4.0%	12.8%	0.0%	0.5%
Financials	1.2%	4.7%	-3.5%	11.5%	0.0%	-0.4%
Info Tech	13.6%	16.5%	-2.9%	26.8%	0.0%	-0.8%
Communic.	-0.9%	0.2%	-1.1%	12.0%	0.0%	-0.1%
Utilities	9.1%	12.9%	-3.8%	2.3%	0.0%	-0.1%
Real Estate	6.5%	17.6%	-11.1%	2.5%	0.0%	-0.3%
Total	9.5%	11.1%	-1.6%	100.0%		

Size Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Large (6B+)	9.5%	10.8%	-1.4%	100.0%	-2.0%	-1.4%
Mid (2-6B)	0.0%	0.5%	-0.5%	0.0%	2.0%	0.0%
Total	9.5%	11.1%	-1.6%	100.0%		

Style Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Value	10.2%	6.3%	3.9%	25.2%	20.8%	1.0%
Growth	8.9%	12.4%	-3.5%	74.8%	-20.8%	-2.6%
Total	9.5%	11.1%	-1.6%	100.0%		



AFG 50: A 50 stock, sector-neutral portfolio selecting stocks from the S&P 500 and benchmarked against the S&P 500. Buy and sell decisions are completely driven by comprehensive due diligence provided by AFG's analyst team.

In 2021 Q4, strategy performance trends in the AFG 50 strategy included the following:

- Stock selection on a sector basis was strongest in Health Care and Materials and weakest in Information Technology, Financials and Real Estate.
- Active sector weights did not impact relative performance in a meaningful way. Overall sector allocation effect impacts were 0.00%.
- Stock selection on a size basis was weakest in Large (6B+). Stock selection on a size basis did not deliver positive relative returns against any size tiers this period.
- Active size weights reflected weighting towards Mid (2-6B) stocks away from Large (6B+) stocks. Overall size allocation effect impacts were -0.20%. Allocation effects were negative in Mid (2-6B).
- Stock selection on a style basis was strongest in Value and weakest in Growth.
- Active style weights reflected weighting towards Value stocks away from Growth stocks. Overall style allocation effect impacts were -1.27%. Allocation effects were negative in Value and Growth.

**Benchmark Sector Weights & Returns are based on market cap contribution of S&P 500 constituents as of 9/30/2021. Value & Growth style partitions are formed by market cap weighting the bottom half (Value) and top half (Growth) of MV/IC within each sector.*

Top Performers: 2021 Q4	Ticker	Sector	Total Return
Hp Inc	HPQ	Info Tech	38.6%
Pfizer Inc.	PFE	Health Care	38.5%
Union Pacific Corporation	UNP	Industrials	29.2%
Kla Corp	KLAC	Info Tech	28.9%
Lowe'S Companies Inc.	LOW	Cons. Disc.	27.9%

Bottom Performers: 2021 Q4	Ticker	Sector	Total Return
Alaska Air Group Incorporated	ALK	Industrials	-11.1%
Capital One Financial Corporat	COF	Financials	-10.1%
Walt Disney Co	DIS	Communic.	-8.4%
Allstate Corp	ALL	Financials	-6.9%
Fiserv, Inc.	FISV	Info Tech	-4.3%

Strategy performance displays USD total returns from 6/10/04 to 12/31/21. 2021 Q4 Partition analysis displays USD total returns from 9/30/21 to 12/31/21.

	1 Month	3 Month	6 Month	YTD	1 Year	3 Year	5 Year	10 Year	All-Time Annualized	All-Time Cumulative
AFG High Dividend	6.6%	9.4%	8.5%	27.9%	27.9%	17.5%	14.7%		14.0%	257.8%
Russell 1000 Value Index	6.3%	7.8%	6.9%	25.2%	25.2%	17.6%	11.2%		12.5%	215.2%
Spread (4/11/12-12/31/21)	0.3%	1.6%	1.6%	2.7%	2.7%	-0.1%	3.5%		1.5%	42.6%

Information Ratio: 0.39 | Sharpe: 1.00

Performance Summary	Portfolio	Benchmark	Spread
Cumulative	257.8%	215.2%	42.6%
Annual	14.0%	12.5%	1.5%
2012	6.0%	9.4%	-3.5%
2013	31.8%	32.5%	-0.8%
2014	13.6%	13.5%	0.2%
2015	0.0%	-3.8%	3.8%
2016	13.7%	17.3%	-3.6%
2017	21.1%	13.7%	7.5%
2018	0.8%	-8.3%	9.1%
2019	24.9%	26.5%	-1.6%
2020	1.6%	2.8%	-1.2%
2021	27.9%	25.2%	2.7%

Sector Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Energy	17.0%	7.7%	9.3%	3.9%	-1.0%	0.4%
Materials	-0.5%	13.1%	-13.6%	3.3%	-0.6%	-0.5%
Industrials	13.8%	8.3%	5.5%	11.8%	-3.4%	0.7%
Cons. Disc.	7.7%	6.4%	1.3%	5.9%	7.8%	0.1%
Cons. Stpls.	6.0%	11.8%	-5.8%	8.8%	-3.3%	-0.5%
Health Care	16.2%	11.2%	5.0%	15.9%	1.2%	0.8%
Financials	4.2%	5.2%	-0.9%	18.1%	6.3%	-0.2%
Info Tech	15.9%	8.0%	8.0%	12.3%	-0.7%	1.0%
Communic.	-2.7%	0.5%	-3.2%	12.6%	-9.8%	-0.4%
Utilities	8.1%	13.1%	-4.9%	3.6%	5.0%	-0.2%
Real Estate	1.1%	16.5%	-15.4%	4.0%	-1.6%	-0.6%
Total	9.4%	7.8%	1.6%	100.0%		

Size Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Large (6B+)	9.4%	8.2%	1.2%	97.5%	2.5%	1.2%
Mid (2-6B)	0.0%	0.8%	-0.8%	2.5%	-2.5%	na
Total	9.4%	7.8%	1.6%	100.0%		

AFG High Dividend: A 35 stock portfolio selecting high dividend yield stocks from the Russell 1000 and benchmarked against the Russell 1000 Value. Buy and sell decisions reflect dividend analysis and capital appreciation characteristics, offering diversification across all sectors but no sector-weight mandate to mirror the broader benchmark or high-income peer group.

In 2021 Q4, strategy performance trends in the AFG High Dividend strategy included the following:

- Stock selection on a sector basis was strongest in Information Technology, Health Care and Industrials and weakest in Real Estate, Consumer Staples and Materials.
- Active sector weights reflected weighting towards Consumer Discretionary, Financials and Utilities away from Communication Services, Industrials and Consumer Staples. Overall sector allocation effect impacts were 0.43%. Allocation effects were positive in Communication Services and Utilities and negative in Financials, Real Estate and Consumer Staples.
- Stock selection on a size basis was strongest in Large (6B+) . Stock selection on a size basis did not deliver negative relative returns against any size tiers this period.
- Active size weights reflected weighting towards Large (6B+) stocks away from Mid (2-6B) stocks. Overall size allocation effect impacts were 0.18%. Allocation effects were positive in Mid (2-6B).

**Benchmark Sector Weights & Returns are based on market cap contribution of Russell 1000 Value constituents as of 9/30/2021.*



Top Performers: 2021 Q4	Ticker	Sector	Total Return
Pfizer Inc.	PFE	Health Care	38.5%
Accenture Plc	ACN	Info Tech	30.0%
Norfolk Southern Corporation	NSC	Industrials	24.9%
Eli Lilly And Company	LLY	Health Care	19.9%
Abbott Laboratories	ABT	Health Care	19.6%

Bottom Performers: 2021 Q4	Ticker	Sector	Total Return
Jpmorgan Chase & Co.	JPM	Financials	-2.7%
Intel Corporation	INTC	Info Tech	-2.7%
Verizon Communications	VZ	Communic.	-2.7%
Lyondellbasell Industries Nv	LYB	Materials	-0.5%
Unilever Plc	UL	Cons. Stpls.	0.1%

Strategy performance displays USD total returns from 4/11/12 to 12/31/21. 2021 Q4 Partition analysis displays USD total returns from 9/30/21 to 12/31/21.

	1 Month	3 Month	6 Month	YTD	1 Year	3 Year	5 Year	10 Year	All-Time Annualized	All-Time Cumulative
Strategic Valuation	6.5%	12.5%	13.5%	34.8%	34.8%	30.6%	23.0%	19.7%	14.7%	2332.0%
SPDR S&P 500 (SPY)	4.6%	11.1%	11.7%	28.7%	28.7%	26.0%	18.4%	16.5%	8.8%	611.3%
Spread (9/30/98-12/31/21)	1.9%	1.5%	1.8%	6.1%	6.1%	4.7%	4.7%	3.2%	5.9%	1720.7%

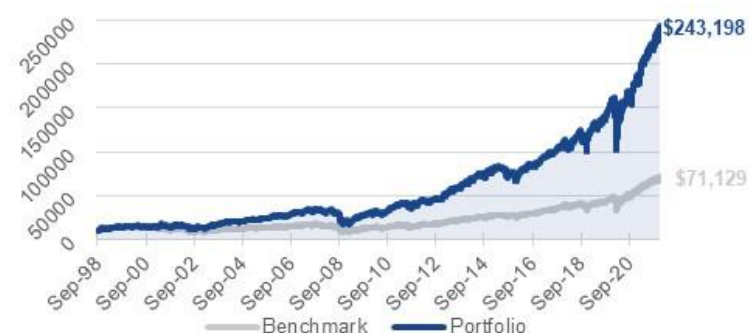
Information Ratio: 0.95 | Sharpe: 0.89

Performance Summary	Portfolio	Benchmark	Spread
Cumulative	2332.0%	611.3%	1720.7%
Annual	14.7%	8.8%	5.9%
1998	21.6%	21.6%	0.0%
1999	26.2%	20.4%	5.8%
2000	-6.8%	-9.7%	2.9%
2001	13.6%	-11.8%	25.3%
2002	-17.8%	-21.6%	3.8%
2003	42.0%	28.2%	13.8%
2004	20.1%	10.7%	9.4%
2005	12.3%	4.8%	7.4%
2006	19.3%	15.9%	3.4%
2007	12.1%	5.1%	7.0%
2008	-40.0%	-36.8%	-3.2%
2009	47.3%	26.4%	20.9%
2010	22.3%	15.1%	7.3%
2011	9.2%	1.9%	7.3%
2012	16.2%	16.0%	0.2%
2013	41.2%	32.3%	8.9%
2014	19.0%	13.5%	5.5%
2015	-4.5%	1.3%	-5.7%
2016	14.8%	12.0%	2.8%
2017	25.0%	21.7%	3.3%
2018	1.2%	-4.6%	5.8%
2019	42.6%	31.2%	11.4%
2020	16.0%	18.4%	-2.4%
2021	34.8%	28.8%	6.1%

Sector Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Energy	14.4%	8.0%	6.4%	2.6%	0.0%	0.2%
Materials	25.7%	15.1%	10.6%	2.4%	0.0%	0.3%
Industrials	11.4%	8.9%	2.6%	7.9%	0.0%	0.2%
Cons. Disc.	17.9%	12.8%	5.1%	12.9%	0.0%	0.7%
Cons. Stpls.	10.1%	12.6%	-2.5%	6.4%	0.0%	-0.2%
Health Care	8.5%	11.0%	-2.5%	12.8%	0.0%	-0.3%
Financials	7.4%	4.7%	2.7%	11.5%	0.0%	0.3%
Info Tech	21.3%	16.5%	4.8%	26.8%	0.0%	1.3%
Communic.	-6.4%	0.2%	-6.6%	12.0%	0.0%	-0.8%
Utilities	9.8%	12.9%	-3.1%	2.3%	0.0%	-0.1%
Real Estate	24.3%	17.6%	6.7%	2.5%	0.0%	0.2%
Total	12.5%	11.1%	1.5%	100.0%		

Size Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Large (6B+)	13.5%	10.8%	2.6%	100.0%	0.0%	2.6%
Mid (2-6B)	0.0%	0.5%	-0.5%	0.0%	0.0%	na
Total	12.5%	11.1%	1.5%	100.0%		

Style Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Value	14.1%	6.3%	7.8%	25.2%	-5.2%	2.0%
Growth	13.3%	12.4%	0.9%	74.8%	5.2%	0.7%
Total	12.5%	11.1%	1.5%	100.0%		



Strategic Valuation: A 30-60 stock, sector-neutral portfolio selecting stocks from the S&P 500 and benchmarked against the S&P 500. This strategy is tailored to exploit the Valuation/Cheapness gap created when the application of cheapness measures reflect a misrepresentation of valuation that can be exploited by more robust estimates of intrinsic value.

In 2021 Q4, strategy performance trends in the Strategic Valuation portfolio included the following:

- Stock selection on a sector basis was strongest in Information Technology, Consumer Discretionary and Financials and weakest in Communication Services, Health Care and Consumer Staples.
- Active sector weights did not impact relative performance in a meaningful way. Overall sector allocation effect impacts were 0.00%.
- Stock selection on a style basis was strongest in Value and Growth. Stock selection on a style basis did not deliver negative relative returns against any style categories this period.
- Active style weights reflected weighting towards Growth stocks away from Value stocks. Overall style allocation effect impacts were 0.32%. Allocation effects were positive in Value.

**Benchmark Sector Weights & Returns are based on market cap contribution of S&P 500 constituents as of 9/30/2021. Value & Growth style partitions are formed by market cap weighting the bottom half (Value) and top half (Growth) of MV/IC within each sector.*

Top Performers: 2021 Q4	Ticker	Sector	Total Return
Qualcomm Incorporated	QCOM	Info Tech	42.3%
Broadcom Inc	AVGO	Info Tech	38.1%
Union Pacific Corporation	UNP	Industrials	29.2%
Kla Corp	KLAC	Info Tech	28.9%
Freeport-Mcmoran Inc	FCX	Materials	28.5%

Bottom Performers: 2021 Q4	Ticker	Sector	Total Return
Match Group Inc	MTCH	Communic.	-15.8%
Generac Holdings Inc	GNRC	Industrials	-13.9%
Verizon Communications	VZ	Communic.	-2.7%
Texas Instruments Inc	TXN	Info Tech	-1.3%
Facebook Incorporation	FB	Communic.	-0.9%

Strategy performance displays USD total returns from 9/30/98 to 12/31/21. 2021 Q4 Partition analysis displays USD total returns from 9/30/21 to 12/31/21.

	1 Month	3 Month	6 Month	YTD	1 Year	3 Year	5 Year	10 Year	All-Time Annualized	All-Time Cumulative
AFG US Small/Mid Cap	5.2%	10.8%	10.4%	41.9%	41.9%	26.7%	16.2%	17.8%	15.9%	3007.7%
RUSSELL 2000 VALUE INDEX	4.1%	4.4%	1.2%	28.3%	28.3%	18.0%	9.1%	12.0%	9.8%	771.5%
Spread (9/30/98-12/31/21)	1.1%	6.4%	9.1%	13.6%	13.6%	8.8%	7.1%	5.7%	6.2%	2236.2%

Information Ratio: 0.78 | Sharpe: 0.81

Performance Summary	Portfolio	Benchmark	Spread
Cumulative	3007.7%	771.6%	2236.2%
Annual	15.9%	9.8%	6.2%
1998	17.1%	9.1%	8.0%
1999	10.4%	-1.5%	11.9%
2000	18.8%	22.8%	-4.1%
2001	32.9%	14.0%	18.9%
2002	-7.1%	-11.4%	4.3%
2003	72.0%	46.0%	26.0%
2004	27.8%	22.3%	5.5%
2005	12.6%	4.7%	7.9%
2006	16.3%	23.5%	-7.1%
2007	-5.7%	-9.8%	4.1%
2008	-35.1%	-28.9%	-6.2%
2009	35.1%	20.6%	14.5%
2010	34.1%	24.5%	9.6%
2011	0.0%	-5.5%	5.5%
2012	27.7%	18.1%	9.7%
2013	56.2%	34.5%	21.7%
2014	10.4%	4.2%	6.2%
2015	-8.6%	-7.5%	-1.1%
2016	20.7%	31.7%	-11.1%
2017	19.8%	7.8%	11.9%
2018	-13.3%	-12.9%	-0.4%
2019	26.9%	22.4%	4.5%
2020	13.1%	4.6%	8.5%
2021	41.9%	28.3%	13.6%

Sector Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Energy	7.4%	-6.5%	13.9%	5.6%	0.0%	0.8%
Materials	12.3%	6.0%	6.2%	4.4%	0.0%	0.3%
Industrials	24.1%	9.6%	14.5%	15.2%	0.0%	2.2%
Cons. Disc.	4.2%	3.7%	0.6%	9.4%	0.0%	0.1%
Cons. Stpls.	8.2%	9.5%	-1.3%	3.5%	0.0%	0.0%
Health Care	8.7%	-9.1%	17.8%	13.8%	0.0%	2.5%
Financials	10.6%	5.3%	5.3%	22.1%	0.0%	1.2%
Info Tech	14.8%	2.4%	12.4%	9.1%	0.0%	1.1%
Communic.	-10.0%	-10.2%	0.1%	4.4%	0.0%	0.0%
Utilities	21.0%	12.6%	8.4%	3.6%	0.0%	0.3%
Real Estate	5.7%	10.0%	-4.3%	9.0%	0.0%	-0.4%
Total	10.8%	4.4%	6.4%	100.0%		

Size Analysis: 2021 Q4	Portfolio	Benchmark	Spread	Benchmark Weight	Active Weight	Selection Effect
Large (6B+)	27.5%	3.0%	24.5%	7.7%	0.1%	1.9%
Mid (2-6B)	10.9%	3.9%	7.0%	53.7%	1.0%	3.8%
Small (0.5-2B)	7.7%	2.5%	5.2%	33.5%	4.1%	1.7%
Micro (0-0.5B)	0.0%	-2.5%	2.5%	5.1%	-5.1%	na
Total	10.8%	4.4%	6.4%	100.0%		

AFG US Small/Mid Cap: A 75-150 stock, sector-neutral portfolio selecting stocks from the Russell 2000 and benchmarked against the Russell 2000 Value Index. This strategy is designed to form a diversified portfolio of stocks with attractive Applied Finance valuation and multifactor grade characteristics.

In 2021 Q4, strategy performance trends in the AFG US Small/Mid Cap included the following:

- Stock selection on a sector basis was strongest in Health Care, Industrials and Financials and weakest in Real Estate.
- Active sector weights did not impact relative performance in a meaningful way. Overall sector allocation effect impacts were 0.00%.
- Stock selection on a size basis was strongest in Mid (2-6B) and Large (6B+) . Stock selection on a size basis did not deliver negative relative returns against any size tiers this period.
- Active size weights reflected weighting towards Small (0.5-2B) stocks away from Micro (0-0.5B) stocks. Overall size allocation effect impacts were 0.27%. Allocation effects were positive in Micro (0-0.5B).

**Benchmark Sector Weights & Returns are based on market cap contribution of Russell 2000 Value constituents as of 9/30/2021.*



Top Performers: 2021 Q4	Ticker	Sector	Total Return
Avis Budget Group, Inc.	CAR	Industrials	78.0%
Builders Firstsource, Inc.	BLDR	Industrials	65.7%
Synaptics Incorporated	SYNA	Info Tech	61.1%
Customers Bancorp Inc	CUBI	Financials	52.0%
Owens & Minor, Incorporated	OMI	Health Care	39.0%

Bottom Performers: 2021 Q4	Ticker	Sector	Total Return
Amc Networks Inc	AMCX	Communic.	-26.1%
Adtalem Global Education Inc	ATGE	Cons. Disc.	-21.8%
Scientific Games Corp	SGMS	Cons. Disc.	-19.5%
Corsair Gaming Inc	CRSR	Info Tech	-18.6%
Rev Group Inc	REVG	Industrials	-17.3%

Strategy performance displays USD total returns from 9/30/98 to 12/31/21. 2021 Q4 Partition analysis displays USD total returns from 9/30/21 to 12/31/21.

	AFG Company Grade 2021 Q4	Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	1.9%	-3.3%	1.2%	2.3%	3.5%	5.0%	-5.2%	-0.7%	0.4%	1.6%	3.1%	6649	1204	1292	1305	1392	1454
	North America	3.6%	-4.3%	2.4%	5.2%	6.4%	8.6%	-7.9%	-1.2%	1.5%	2.8%	5.0%	2574	527	481	486	528	551
	Europe	3.5%	-0.1%	2.3%	4.4%	4.8%	4.5%	-3.5%	-1.1%	0.9%	1.3%	1.1%	1668	248	286	303	368	462
	Asia	-1.3%	-4.2%	-1.0%	-1.6%	-0.9%	0.9%	-2.9%	0.3%	-0.3%	0.5%	2.2%	2330	419	509	500	477	424
	AFG US Database	3.6%	-4.6%	2.3%	5.4%	6.5%	8.6%	-8.2%	-1.2%	1.8%	2.9%	5.1%	2295	479	419	436	472	488
GICs Sector Analysis	Communication Services	-7.5%	-12.6%	-9.9%	-2.8%	-6.8%	-4.5%	-5.1%	-2.4%	4.7%	0.7%	3.0%	88	22	15	15	16	18
	Consumer Discretionary	1.4%	-12.5%	-4.3%	2.7%	3.5%	10.0%	-13.8%	-5.6%	1.4%	2.2%	8.7%	291	53	33	53	58	93
	Consumer Staples	5.6%	-3.4%	14.2%	5.2%	10.3%	8.3%	-9.1%	8.6%	-0.5%	4.6%	2.6%	92	23	15	16	17	19
	Energy	-0.1%	-0.8%	2.3%	-2.6%	2.1%	-3.3%	-0.7%	2.4%	-2.5%	2.2%	-3.2%	118	17	29	23	28	20
	Financials	5.5%	3.4%	6.9%	5.6%	5.1%	6.8%	-2.1%	1.3%	0.0%	-0.5%	1.3%	377	57	58	80	103	78
	Health Care	-4.4%	-13.2%	-6.9%	-7.4%	0.8%	6.1%	-8.9%	-2.5%	-3.0%	5.1%	10.5%	331	80	62	55	60	74
	Industrials	7.9%	0.0%	6.2%	10.7%	12.2%	14.3%	-7.9%	-1.8%	2.7%	4.3%	6.4%	322	69	80	65	58	48
	Information Technology	3.8%	-7.9%	1.1%	13.6%	12.3%	12.0%	-11.6%	-2.7%	9.8%	8.6%	8.2%	343	104	66	50	53	69
	Materials	10.3%	13.3%	7.7%	9.1%	6.2%	12.2%	3.0%	-2.6%	-1.2%	-4.1%	1.9%	106	26	23	17	13	25
	Real Estate	10.7%	8.8%	9.8%	13.1%	10.5%	10.2%	-2.0%	-0.9%	2.4%	-0.3%	-0.6%	157	18	19	42	46	31
	Utilities	12.2%	3.0%	10.8%	13.7%	15.0%	14.9%	-9.2%	-1.5%	1.4%	2.8%	2.7%	67	7	15	18	16	9
Size/Style	Large (6000M+ USD)	6.2%	-1.2%	4.2%	8.8%	8.4%	9.2%	-7.4%	-2.0%	2.6%	2.2%	3.0%	875	154	148	183	189	200
	Mid (2000M-6000M)	2.3%	-6.5%	3.1%	4.0%	6.5%	7.8%	-8.8%	0.8%	1.7%	4.2%	5.5%	695	171	137	133	122	131
	Small (500M-2000M)	1.6%	-5.9%	-0.3%	1.7%	4.3%	8.6%	-7.5%	-1.9%	0.1%	2.6%	7.0%	725	154	133	120	160	156
	Micro (0-500M)	-7.6%	-13.1%	-9.9%	-9.1%	-3.6%	4.7%	-5.5%	-2.2%	-1.5%	4.0%	12.3%	604	170	133	107	102	91
	Value (< Median MVIC)	4.8%	2.1%	3.1%	3.1%	4.2%	8.3%	-2.8%	-1.7%	-1.7%	-0.6%	3.5%	1011	137	165	158	232	317
	Growth (>= Median MVIC)	2.5%	-7.3%	1.7%	6.6%	8.6%	9.2%	-9.8%	-0.8%	4.1%	6.1%	6.6%	1284	342	253	278	239	170
Indices	Russell 1000 ® Index	6.0%	-1.1%	4.3%	8.7%	8.5%	8.5%	-7.0%	-1.6%	2.7%	2.5%	2.5%	978	180	164	199	209	224
	Russell 2000 ® Index	1.8%	-5.4%	0.7%	1.4%	5.2%	8.6%	-7.2%	-1.1%	-0.4%	3.4%	6.8%	1515	335	296	277	296	310
	S&P 500 ® Index	9.2%	5.7%	9.3%	11.2%	8.3%	10.1%	-3.5%	0.1%	1.9%	-1.0%	0.9%	498	57	87	110	123	121
	ADR Universe	-4.4%	-10.8%	-6.2%	-3.2%	1.3%	-2.7%	-6.3%	-1.8%	1.3%	5.7%	1.8%	633	131	122	120	126	132
	AFG International Database	1.0%	-2.4%	0.5%	0.9%	2.0%	3.2%	-3.4%	-0.5%	-0.1%	1.0%	2.2%	4353	725	873	868	920	966
Country Analysis	Canada	4.1%	-0.4%	3.1%	3.2%	5.9%	8.4%	-4.5%	-1.0%	-0.9%	1.8%	4.3%	278	47	62	49	56	63
	Austria	3.1%	1.9%	7.2%	2.9%	1.9%	1.2%	-1.3%	4.1%	-0.2%	-1.2%	-1.9%	30	5	7	6	4	7
	Belgium	2.9%	3.3%	-0.8%	-0.7%	3.8%	5.4%	0.4%	-3.7%	-3.6%	0.9%	2.5%	54	14	9	5	10	15
	Denmark	5.4%	5.6%	4.8%	0.7%	6.7%	8.2%	0.2%	-0.6%	-4.7%	1.3%	2.8%	47	8	10	8	9	11
	Finland	4.3%	-1.0%	9.6%	5.5%	3.7%	3.4%	-5.2%	5.4%	1.3%	-0.5%	-0.9%	56	6	8	9	17	15
	France	4.8%	1.9%	2.7%	8.4%	7.7%	3.3%	-3.0%	-2.1%	3.6%	2.9%	-1.5%	183	23	27	35	36	60
	Germany	2.3%	0.0%	3.5%	-1.7%	1.9%	4.7%	-2.3%	1.3%	-3.9%	-0.4%	2.5%	208	28	28	43	45	64
	Greece	0.5%	6.6%	0.5%	12.7%	4.2%	-5.1%	6.2%	0.1%	12.3%	3.7%	-5.5%	25	2	6	4	3	10
	Ireland	3.0%	-1.2%	-9.4%	11.0%	9.5%	-1.1%	-4.2%	-12.3%	8.0%	6.6%	-4.1%	21	2	3	5	4	7
	Italy	4.3%	9.3%	3.1%	7.2%	2.7%	0.0%	5.0%	-1.2%	2.9%	-1.6%	-4.3%	109	19	22	20	22	23
	Luxembourg	-1.5%	2.8%	0.9%	-1.4%	5.0%	-3.0%	4.3%	2.5%	0.1%	6.6%	-1.5%	15	1	2	1	2	7
	Netherlands	1.1%	-4.5%	-1.4%	0.5%	3.2%	6.6%	-5.6%	-2.5%	-0.6%	2.1%	5.5%	69	9	15	10	18	15
	Norway	7.0%	0.8%	12.1%	12.8%	4.7%	11.7%	-6.2%	5.1%	5.8%	-2.3%	4.7%	70	26	16	8	12	7
	Spain	0.2%	-2.6%	4.2%	3.7%	-2.1%	1.3%	-2.7%	4.0%	3.5%	-2.3%	1.1%	68	13	12	9	14	19
	Sweden	11.9%	-4.0%	11.0%	13.2%	14.1%	15.1%	-16.0%	-0.9%	1.3%	2.2%	3.2%	174	18	23	40	43	49
	Switzerland	3.5%	-2.1%	1.7%	6.3%	5.8%	2.6%	-5.5%	-1.8%	2.8%	2.3%	-0.9%	128	10	24	23	34	37
	United Kingdom	0.2%	-3.9%	-3.3%	-0.7%	1.6%	4.2%	-4.0%	-3.5%	-0.9%	1.5%	4.0%	407	63	69	71	91	111
	Australia	3.2%	2.7%	3.3%	4.0%	2.8%	3.4%	-0.5%	0.1%	0.7%	-0.4%	0.2%	248	54	55	57	49	31
	Hong Kong	-4.6%	-5.5%	-5.6%	-2.0%	-2.7%	-7.2%	-0.9%	-0.9%	2.6%	1.9%	-2.6%	378	105	86	78	59	49
	Japan	-4.5%	-8.2%	-5.0%	-4.9%	-3.7%	-1.8%	-3.7%	-0.5%	-0.4%	0.8%	2.7%	961	137	211	218	209	186
	New Zealand	-2.9%	-2.1%	-5.4%	-1.1%	-4.1%	-0.9%	0.8%	-2.5%	1.8%	-1.3%	2.0%	42	8	9	8	10	7
	Singapore	1.0%	-2.1%	-0.9%	2.4%	3.1%	0.8%	-3.1%	-1.9%	1.4%	2.1%	-0.1%	83	10	15	23	16	17
	South Korea	-2.2%	-4.7%	3.8%	-3.9%	-3.8%	-3.1%	-2.5%	6.0%	-1.6%	-1.6%	-0.9%	307	77	66	57	53	54
	Taiwan	10.2%	8.7%	10.7%	8.0%	8.2%	13.8%	-1.5%	0.6%	-2.2%	-2.0%	3.6%	308	25	66	57	80	78
	South Africa	7.5%	10.1%	9.7%	6.8%	10.6%	0.9%	2.7%	2.3%	-0.6%	3.1%	-6.6%	76	10	15	15	19	16
GICs Sector Analysis	Communication Services	-0.3%	-1.0%	3.3%	-1.2%	-1.9%	-1.4%	-0.7%	3.6%	-0.9%	-1.6%	-1.1%	232	43	44	50	49	45
	Consumer Discretionary	-1.6%	-7.8%	-3.1%	-1.0%	2.4%	1.8%	-6.2%	-1.4%	0.6%	4.1%	3.4%	570	110	129	114	107	109
	Consumer Staples	-2.7%	-3.7%	-5.2%	-3.9%	-0.6%	-0.2%	-1.0%	-2.5%	-1.3%	2.1%	2.5%	290	49	62	59	67	53
	Energy	-1.2%	-5.4%	-0.6%	4.6%	-7.7%	2.5%	-4.2%	0.6%	5.9%	-6.4%	3.7%	130	22	25	27	24	30
	Financials	1.7%	0.5%	1.2%	1.4%	3.6%	1.7%	-1.2%	-0.5%	-0.2%	1.9%	0.1%	456	72	108	87	77	111
	Health Care	-4.6%	-8.6%	-8.1%	-7.9%	-2.7%	-0.2%	-4.0%	-3.5%	-3.3%	2.0%	4.4%	338	40	54	63	82	97
	Industrials	0.7%	-2.6%	0.0%	2.0%	1.0%	2.4%	-3.4%	-0.7%	1.3%	0.3%	1.6%	824	137	152	169	179	185
	Information Technology	7.2%	-6.4%	5.6%	7.2%	9.3%	12.5%	-13.7%	-1.6%	-0.1%	2.1%	5.3%	568	64	103	111	138	151
	Materials	3.2%	3.8%	6.0%	3.3%	2.3%	1.3%	0.6%	2.8%	0.1%	-0.9%	-1.9%	405	54	80	85	95	89
	Real Estate	1.6%	2.4%	1.5%	0.0%	1.9%	2.3%	0.8%	-0.2%	-1.7%	0.3%	0.6%	402	96	87	75	74	68
	Utilities	4.3%	4.8%	3.9%	-0.3%	5.3%	6.0%	0.5%	-0.3%	-4.6%	1.1%	1.7%	135	33	26	24	25	26
Size/Style	Large (6000M+ USD)	2.0%	-2.9%	1.1%	2.1%	4.9%	2.6%	-4.9%	-0.9%	0.1%	2.9%	0.6%	1087	154	198	207	246	280
	Mid (2000M-6000M)	0.1%	-2.2%	-0.2%	-0.5%	1.5%	1.7%	-2.3%	-0.3%	-0.6%	1.3%	1.6%	1141	208	234	236	235	227
	Small (500M-2000M)	1.0%	-2.4%	0.6%	0.9%	0.8%	4.2%	-3.3%	-0.3%	0.0%	-0.2%	3.3%	2125	362	441	424	439	458
	Micro (0-500M)	0.1%	-4.5%	-2.5%	0.6%	3.1%	4.1%	-4.6%	-2.7%	0.5%	3.0%	4.0%	3492	703	704	696	678	710
	Value (< Median MVIC)	0.9%	-1.1%	0.7%	0.3%	0.7%	2.4%	-2.0%	-0.2%	-0.6%	-0.2%	1.5%	2000	253	364	369	438	574
	Growth (>= Median MVIC)	1.1%	-3.2%	0.4%	1.2%	3.2%	4.2%	-4.2%	-0.6%	0.2%	2.1%	3.2%	2353	471	508	499	482	392

Applied Finance Research: Company Grade [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

Percent to Target – 2021 Q4

	Percent to Target - Current 2021 Q4	Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	1.8%	-3.4%	2.5%	3.1%	3.3%	3.3%	-5.2%	0.7%	1.3%	1.5%	1.5%	6751	1274	1468	1441	1323	1244
	North America	3.5%	-4.0%	4.6%	5.5%	6.4%	8.3%	-7.6%	1.1%	2.0%	2.9%	4.8%	2619	616	625	558	441	377
	Europe	3.3%	-0.1%	4.2%	5.0%	4.3%	2.4%	-3.4%	0.9%	1.7%	1.0%	-0.9%	1692	295	396	377	328	294
	Asia	-1.3%	-5.1%	-2.1%	-1.2%	0.0%	0.2%	-3.8%	-0.8%	0.1%	1.3%	1.5%	2363	355	430	482	532	562
	AFG US Database	3.4%	-4.1%	4.9%	5.8%	6.4%	7.5%	-7.6%	1.4%	2.4%	3.0%	4.1%	2340	575	556	492	374	342
GICs Sector Analysis	Communication Services	-7.4%	-12.0%	-6.2%	-2.0%	-3.9%	-6.4%	-4.7%	1.1%	5.4%	3.4%	1.0%	91	29	15	10	16	20
	Consumer Discretionary	1.5%	-9.2%	2.1%	1.5%	3.0%	11.0%	-10.6%	0.6%	0.1%	1.5%	9.5%	301	66	55	65	48	66
	Consumer Staples	5.0%	-7.3%	11.7%	9.6%	10.7%	5.8%	-12.3%	6.7%	4.6%	5.7%	0.8%	94	26	19	18	20	10
	Energy	0.3%	2.3%	-1.4%	2.6%	1.7%	-5.9%	1.9%	-1.7%	2.3%	1.4%	-6.2%	119	23	33	31	15	16
	Financials	5.4%	6.0%	5.7%	5.2%	3.6%	7.4%	0.6%	0.3%	-0.2%	-1.8%	2.0%	378	63	104	100	65	45
	Health Care	-4.5%	-16.6%	-4.1%	-4.7%	-0.9%	7.8%	-12.2%	0.3%	-0.3%	3.5%	12.2%	339	78	73	65	61	61
	Industrials	7.7%	-1.8%	9.0%	10.2%	13.6%	10.7%	-9.5%	1.3%	2.5%	5.9%	3.0%	328	69	93	79	45	40
	Information Technology	3.4%	-8.5%	7.4%	12.2%	17.7%	6.9%	-12.0%	3.9%	8.8%	14.3%	3.5%	353	129	69	43	52	58
	Materials	10.1%	7.3%	9.3%	13.1%	6.6%	22.4%	-2.8%	-0.8%	3.0%	-3.5%	12.3%	108	27	32	30	14	5
	Real Estate	10.8%	13.6%	10.1%	9.8%	5.4%	8.1%	2.8%	-0.7%	-0.9%	-5.4%	-2.7%	159	59	46	24	17	12
	Utilities	12.2%	-2.7%	11.4%	13.5%	11.3%	19.7%	-14.9%	-0.8%	1.2%	-0.9%	7.5%	67	4	13	25	18	6
Size/Style	Large (6000M+ USD)	6.2%	-0.2%	7.2%	8.0%	8.9%	9.1%	-6.3%	1.0%	1.8%	2.8%	2.9%	882	205	199	179	153	144
	Mid (2000M-6000M)	1.9%	-6.3%	2.2%	7.5%	4.6%	6.3%	-8.1%	0.4%	5.6%	2.8%	4.5%	711	198	171	145	101	95
	Small (500M-2000M)	1.8%	-6.3%	4.8%	2.1%	4.5%	6.4%	-8.1%	3.1%	0.3%	2.8%	4.7%	746	171	185	168	119	102
	Micro (0-500M)	-7.5%	-16.5%	-10.0%	-2.3%	0.9%	0.5%	-8.9%	-2.5%	5.2%	8.4%	8.0%	621	197	118	128	112	65
	Value (< Median MVIC)	4.8%	-2.9%	3.9%	5.0%	5.6%	7.3%	-7.6%	-0.9%	0.3%	0.9%	2.6%	1022	92	161	282	251	234
	Growth (≥ Median MVIC)	2.4%	-4.5%	5.4%	6.8%	7.9%	7.9%	-6.9%	3.0%	4.4%	5.6%	5.6%	1318	482	394	210	123	108
Indices	Russell 1000 ® Index	6.0%	0.6%	5.8%	8.1%	8.3%	7.7%	-5.4%	-0.1%	2.1%	2.4%	1.7%	982	203	221	212	178	167
	Russell 2000 ® Index	1.8%	-5.8%	3.6%	3.5%	5.7%	6.2%	-7.7%	1.8%	1.7%	3.9%	4.3%	1543	383	376	328	248	205
	S&P 500 ® Index	9.2%	7.5%	9.4%	9.9%	8.7%	10.6%	-1.7%	0.1%	0.7%	-0.6%	1.4%	498	69	117	118	105	87
	ADR Universe	-4.5%	-12.6%	-4.4%	1.4%	-0.6%	-4.0%	-8.2%	0.1%	5.9%	3.9%	0.5%	644	136	110	106	116	175
	AFG International Database	1.0%	-2.8%	1.1%	1.6%	2.2%	1.7%	-3.7%	0.1%	0.7%	1.2%	0.8%	4411	699	912	949	948	902
Country Analysis	Canada	4.1%	-2.6%	2.1%	3.2%	6.0%	15.4%	-6.7%	-2.0%	-0.9%	2.0%	11.3%	279	41	69	65	67	34
	Austria	3.1%	3.8%	2.2%	5.3%	-0.3%	9.5%	0.6%	-0.9%	2.2%	-3.4%	6.4%	30	5	6	9	6	2
	Belgium	2.9%	6.6%	-0.1%	9.0%	3.0%	0.4%	3.7%	-3.0%	6.0%	0.1%	-2.5%	54	8	12	8	15	9
	Denmark	6.2%	4.6%	6.1%	7.3%	7.0%	6.7%	-1.6%	-0.2%	1.1%	0.7%	0.5%	48	11	13	7	9	6
	Finland	4.4%	-1.7%	7.3%	4.2%	6.9%	1.6%	-6.1%	2.8%	-0.2%	2.4%	-2.8%	57	7	14	14	12	9
	France	4.8%	0.8%	8.9%	7.3%	3.6%	4.0%	-4.0%	4.1%	2.5%	-1.2%	-0.8%	184	32	25	48	43	33
	Germany	1.8%	-6.6%	1.6%	4.2%	7.9%	-1.3%	-8.4%	-0.2%	2.4%	6.1%	-3.1%	212	27	55	46	43	40
	Greece	0.5%	10.3%	8.9%	5.2%	4.2%	-8.0%	9.8%	8.4%	4.8%	3.7%	-8.5%	25	3	2	6	4	9
	Ireland	3.0%	-0.6%	6.2%	10.6%	-7.4%	8.8%	-3.6%	3.2%	7.6%	-10.3%	5.9%	21	2	5	5	5	3
	Italy	4.4%	6.3%	10.3%	0.8%	2.6%	-0.1%	1.9%	5.9%	-3.7%	-1.8%	-4.5%	110	25	24	26	19	16
	Luxembourg	-1.5%	-7.2%	2.2%	-9.6%	-12.5%	2.8%	-5.6%	3.7%	-8.0%	-10.9%	4.4%	15	2	3	2	2	5
	Netherlands	0.9%	-5.2%	2.3%	4.9%	-4.7%	7.3%	-6.1%	1.5%	4.1%	-5.6%	6.4%	71	16	12	18	11	12
	Norway	5.6%	2.1%	5.9%	13.7%	10.3%	8.6%	-3.4%	0.4%	8.1%	4.7%	3.0%	73	29	26	7	5	6
	Spain	0.3%	-2.6%	2.2%	5.2%	4.5%	-7.2%	-2.9%	1.9%	4.9%	4.2%	-7.4%	70	12	16	11	16	14
	Sweden	11.5%	7.6%	13.2%	14.3%	12.9%	9.3%	-4.0%	1.7%	2.8%	1.4%	-2.2%	179	27	48	38	31	33
	Switzerland	3.5%	2.4%	2.9%	2.7%	5.3%	4.4%	-1.1%	-0.7%	-0.8%	1.8%	0.9%	128	15	29	36	27	19
	United Kingdom	0.1%	-3.7%	-0.8%	1.2%	1.7%	2.3%	-3.8%	-1.0%	1.1%	1.5%	2.1%	411	70	100	91	75	74
	Australia	3.6%	3.2%	4.3%	-0.5%	5.3%	6.6%	-0.3%	0.8%	-4.1%	1.7%	3.0%	253	58	77	46	45	27
	Hong Kong	-4.6%	-7.6%	-8.5%	-3.6%	-2.3%	-2.9%	-3.0%	-3.9%	1.0%	2.3%	1.7%	387	79	64	61	73	109
	Japan	-4.6%	-11.0%	-5.8%	-4.2%	-3.1%	-2.6%	-6.4%	-1.3%	0.3%	1.5%	2.0%	972	127	150	196	227	271
	New Zealand	-2.9%	-15.9%	-1.7%	-2.5%	-0.3%	-11.9%	-13.0%	1.2%	0.4%	2.6%	-9.1%	42	2	12	10	15	2
	Singapore	0.9%	-2.4%	-2.0%	0.9%	4.3%	-2.5%	-3.2%	-2.9%	0.1%	3.5%	-3.3%	85	8	7	27	27	15
	South Korea	-2.0%	-4.5%	-0.2%	-3.4%	-1.9%	-1.4%	-2.5%	1.8%	-1.3%	0.2%	0.6%	314	62	67	61	66	56
	Taiwan	10.2%	24.0%	5.9%	9.4%	8.0%	12.6%	13.9%	-4.2%	-0.8%	-2.2%	2.5%	308	17	52	79	78	80
	South Africa	7.5%	-1.6%	6.4%	3.5%	9.6%	18.5%	-9.1%	-1.0%	-4.0%	2.1%	11.0%	76	7	15	23	21	10
GICs Sector Analysis	Communication Services	-0.2%	-6.9%	4.8%	-0.8%	-0.6%	-0.4%	-6.7%	5.0%	-0.6%	-0.4%	-0.2%	235	35	52	55	44	47
	Consumer Discretionary	-1.8%	-9.1%	-3.8%	1.1%	1.7%	0.8%	-7.3%	-2.1%	2.9%	3.4%	2.6%	578	102	127	123	116	109
	Consumer Staples	-2.9%	-3.2%	-1.1%	-4.3%	-4.0%	-1.6%	-0.3%	1.7%	-1.4%	-1.1%	1.3%	293	48	66	70	57	51
	Energy	-1.5%	0.2%	-5.3%	-1.4%	0.3%	0.5%	1.7%	-3.8%	0.1%	1.8%	2.0%	131	17	31	30	37	15
	Financials	1.7%	1.7%	0.2%	1.1%	3.0%	1.6%	0.1%	-1.5%	-0.5%	1.4%	0.0%	461	85	73	67	103	132
	Health Care	-4.8%	-8.0%	-8.5%	-4.8%	-4.3%	-0.6%	-3.3%	-3.7%	0.0%	0.5%	4.2%	346	26	71	87	84	78
	Industrials	0.7%	-1.0%	2.0%	2.1%	0.4%	-0.1%	-1.7%	1.2%	1.4%	-0.4%	-0.8%	835	155	167	173	180	158
	Information Technology	7.2%	-8.7%	8.2%	10.0%	10.7%	9.7%	-15.9%	1.0%	2.8%	3.5%	2.5%	580	75	111	132	123	137
	Materials	3.2%	5.0%	2.5%	0.9%	3.3%	5.2%	1.8%	-0.7%	-2.3%	0.0%	2.0%	410	61	93	92	91	72
	Real Estate	1.6%	-1.0%	5.0%	3.0%	4.2%	-4.9%	-2.5%	3.4%	1.4%	2.7%	-6.5%	405	55	88	95	88	77
	Utilities	4.3%	1.1%	7.3%	4.9%	6.5%	2.6%	-3.1%	3.0%	0.7%	2.2%	-1.6%	135	38	29	22	23	23
Size/Style	Large (6000M+ USD)	1.9%	-2.1%	1.8%	3.1%	3.2%	2.5%	-4.0%	-0.1%	1.2%	1.3%	0.6%	1093	162	238	239	221	231
	Mid (2000M-6000M)	0.1%	-1.8%	0.7%	0.2%	1.2%	-0.6%	-1.8%	0.6%	0.1%	1.2%	-0.6%	1151	198	247	270	234	200
	Small (500M-2000M)	1.0%	-3.7%	0.9%	1.8%	2.2%	2.4%	-4.6%	-0.1%	0.8%	1.2%	1.4%	2166	338	425	438	493	470
	Micro (0-500M)	0.1%	-5.3%	-1.5%	0.4%	3.4%	2.6%	-5.4%	-1.6%	0.3%	3.3%	2.5%	3581	709	628	648	767	827
	Value (< Median MVIC)	0.9%	-3.0%	-0.6%	0.9%	1.7%	1.7%	-4.0%	-1.6%	0.0%	0.7%	0.8%	2014	154	219	393	559	689
	Growth (≥ Median MVIC)	0.9%	-2.7%	1.6%	2.1%	2.8%	1.7%	-3.7%	0.7%	1.2%	1.9%	0.8%	2397	545	693	556	389	212

Applied Finance Research: Percent to Target – Current [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21, Monthly Rebalancing, Average Returns

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

	EM Momentum 2021 Q4	Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	1.9%	-3.0%	2.3%	1.3%	3.4%	2.9%	-4.9%	0.4%	-0.6%	1.5%	1.1%	6729	883	1660	774	2203	1208
	North America	3.6%	-4.3%	5.0%	3.6%	6.4%	4.5%	-7.8%	1.4%	0.0%	2.8%	0.9%	2607	402	609	217	845	532
	Europe	3.4%	-2.7%	3.0%	3.4%	4.6%	5.1%	-6.0%	-0.4%	0.0%	1.3%	1.7%	1690	184	427	146	624	308
	Asia	-1.3%	-1.8%	-1.3%	-0.9%	-1.6%	0.1%	-0.5%	-0.1%	0.3%	-0.3%	1.4%	2355	286	599	398	715	356
	AFG US Database	3.5%	-4.9%	4.9%	3.7%	6.6%	4.6%	-8.5%	1.3%	0.2%	3.0%	1.1%	2322	356	539	194	760	472
GICs Sector Analysis	Communication Services	-7.6%	-16.1%	-10.0%	4.1%	-3.9%	-6.5%	-8.5%	-2.4%	11.7%	3.7%	1.2%	90	12	24	9	27	15
	Consumer Discretionary	1.7%	-11.3%	4.1%	-10.1%	6.4%	5.8%	-12.9%	2.4%	-11.8%	4.7%	4.2%	297	50	63	17	96	69
	Consumer Staples	5.3%	-2.9%	9.7%	-7.0%	6.3%	5.6%	-8.2%	4.4%	-12.3%	1.0%	0.3%	94	12	30	4	32	13
	Energy	0.3%	-5.0%	0.2%	12.7%	1.0%	-1.5%	-5.4%	-0.1%	12.3%	0.7%	-1.9%	119	16	26	8	32	36
	Financials	5.5%	5.5%	6.1%	5.7%	5.7%	3.8%	0.0%	0.6%	0.3%	0.2%	-1.6%	378	44	62	28	130	113
	Health Care	-4.4%	-10.2%	-3.1%	-4.1%	-0.5%	0.2%	-5.8%	1.3%	0.4%	3.9%	4.6%	335	85	76	20	90	62
	Industrials	7.8%	0.1%	6.1%	11.9%	10.6%	7.8%	-7.7%	-1.7%	4.1%	2.8%	0.0%	326	36	95	29	123	42
	Information Technology	3.5%	-6.8%	6.2%	-3.1%	7.6%	11.4%	-10.3%	2.7%	-6.6%	4.1%	7.9%	347	66	73	38	112	55
	Materials	10.0%	13.4%	13.1%	3.9%	10.4%	7.0%	3.4%	3.1%	-6.1%	0.4%	-3.0%	108	11	34	7	29	25
	Real Estate	10.7%	5.8%	7.5%	9.9%	13.7%	10.4%	-4.9%	-3.2%	-0.8%	3.0%	-0.3%	158	16	26	17	61	36
Utilities	12.2%	37.1%	11.4%	12.7%	12.2%	17.9%	24.8%	-0.8%	0.5%	0.0%	5.7%	67	2	26	12	23	2	
Size/Style	Large (6000M+ USD)	6.2%	-2.8%	7.4%	3.9%	9.3%	4.7%	-9.0%	1.2%	-2.3%	3.1%	-1.5%	879	91	233	41	365	147
	Mid (2000M-6000M)	2.0%	-5.8%	3.2%	3.7%	4.9%	4.5%	-7.8%	1.2%	1.7%	2.8%	2.5%	703	124	162	55	215	146
	Small (500M-2000M)	1.7%	-5.9%	3.0%	3.1%	3.2%	4.4%	-7.7%	1.2%	1.3%	1.5%	2.6%	740	141	143	97	179	178
	Micro (0-500M)	-7.7%	-13.4%	-2.1%	-11.0%	1.2%	-5.7%	-5.7%	5.6%	-3.3%	8.9%	2.0%	615	160	79	136	77	161
	Value (< Median MVIC)	4.8%	0.7%	4.5%	8.6%	5.9%	3.8%	-4.1%	-0.3%	3.8%	1.1%	-1.0%	1018	108	259	94	345	211
	Growth (>= Median MVIC)	2.5%	-7.7%	5.2%	-0.6%	7.1%	5.0%	-10.2%	2.7%	-3.0%	4.6%	2.5%	1304	248	280	100	414	261
Indices	Russell 1000 ® Index	6.0%	-2.7%	6.1%	6.8%	8.0%	7.7%	-8.6%	0.2%	0.9%	2.1%	1.8%	982	112	273	44	397	154
	Russell 2000 ® Index	1.9%	-6.0%	3.5%	0.9%	5.2%	3.7%	-7.8%	1.6%	-0.9%	3.3%	1.9%	1539	295	303	173	396	371
	S&P 500 ® Index	9.2%	2.9%	9.5%	8.5%	10.2%	8.5%	-6.4%	0.3%	-0.7%	1.0%	-0.7%	498	34	152	19	231	61
	ADR Universe	-4.3%	-12.2%	-0.6%	-7.9%	3.8%	-6.3%	-7.9%	3.7%	-3.6%	8.1%	-2.1%	641	134	140	92	139	135
	AFG International Database	1.0%	-1.7%	0.9%	0.6%	1.6%	2.3%	-2.7%	-0.1%	-0.4%	0.6%	1.3%	4406	527	1120	580	1443	735
Country Analysis	Canada	4.1%	1.0%	5.7%	2.7%	4.6%	4.2%	-3.0%	1.6%	-1.3%	0.5%	0.1%	284	46	69	23	85	59
	Austria	3.1%	7.9%	1.2%	2.3%	3.7%	1.4%	4.8%	-1.9%	-0.8%	0.5%	-1.7%	30	1	5	3	10	9
	Belgium	2.9%	-5.2%	-3.9%	5.4%	7.6%	7.7%	-8.1%	-6.8%	2.5%	4.7%	4.8%	54	5	14	7	18	9
	Denmark	6.2%	7.2%	7.9%	1.8%	5.9%	4.6%	1.0%	1.6%	-4.4%	-0.3%	-1.6%	48	6	13	2	16	10
	Finland	4.3%	0.9%	6.1%	2.0%	6.3%	4.6%	-3.4%	1.8%	-2.3%	2.1%	0.3%	56	5	14	4	24	8
	France	4.8%	12.0%	0.6%	2.2%	4.4%	9.3%	7.2%	-4.2%	-2.7%	-0.4%	4.5%	183	12	43	14	79	34
	Germany	1.9%	-4.2%	2.2%	-2.4%	3.0%	4.6%	-6.1%	0.3%	-4.3%	1.1%	2.7%	211	21	53	16	83	36
	Greece	0.5%	0.3%	0.2%	9.5%	-1.5%	-3.2%	-0.2%	-0.3%	9.0%	-2.0%	-3.7%	25	3	5	3	6	6
	Ireland	3.0%	8.2%	7.8%	-0.1%	-1.2%	7.2%	5.2%	4.8%	-3.1%	-4.1%	4.2%	21	3	4	1	7	4
	Italy	4.4%	2.7%	5.5%	15.3%	3.2%	-0.2%	-1.7%	1.2%	10.9%	-1.2%	-4.6%	110	6	23	11	41	27
	Luxembourg	-1.5%	12.2%	-4.3%	20.0%	-9.9%	4.9%	13.7%	-2.8%	21.6%	-8.4%	6.5%	15	1	4	1	4	3
	Netherlands	0.7%	-5.3%	2.2%	-2.3%	3.4%	-4.6%	-6.0%	1.5%	-3.0%	2.7%	-5.3%	70	9	23	5	19	13
	Norway	5.9%	-4.5%	4.0%	6.1%	12.5%	8.7%	-10.5%	-2.0%	0.2%	6.6%	2.7%	72	13	15	6	18	18
	Spain	0.3%	-8.5%	0.3%	3.9%	3.7%	-4.6%	-8.8%	0.1%	3.7%	3.4%	-4.9%	70	11	20	5	23	10
	Sweden	12.0%	2.9%	14.8%	0.3%	10.8%	20.6%	-9.1%	2.8%	-11.8%	-1.2%	8.6%	177	24	45	12	62	32
	Switzerland	3.4%	-3.3%	4.3%	1.7%	5.3%	2.5%	-6.7%	0.9%	-1.7%	1.9%	-0.9%	129	8	33	16	48	23
	United Kingdom	0.2%	-8.5%	-1.5%	1.5%	2.8%	3.1%	-8.7%	-1.6%	1.3%	2.6%	3.0%	415	50	108	35	161	61
	Australia	3.6%	1.5%	5.2%	13.8%	4.0%	1.1%	-2.1%	1.6%	10.2%	0.4%	-2.5%	253	42	75	19	71	44
	Hong Kong	-4.6%	-8.1%	-3.1%	-2.8%	-5.8%	-3.9%	-3.5%	1.5%	1.8%	-1.1%	0.7%	383	69	111	62	89	51
	Japan	-4.5%	-9.9%	-5.4%	-3.6%	-4.3%	-1.9%	-5.4%	-0.9%	0.9%	0.3%	2.7%	970	61	224	186	359	138
	New Zealand	-2.9%	-8.5%	0.1%	-7.3%	0.2%	-5.3%	-5.6%	3.0%	-4.4%	3.1%	-2.4%	42	8	7	4	15	6
	Singapore	0.9%	-0.7%	0.3%	1.6%	0.3%	3.8%	-1.6%	-0.5%	0.8%	-0.6%	2.9%	85	17	18	21	15	12
	South Korea	-2.0%	7.0%	-4.9%	-2.2%	-1.1%	-3.2%	9.0%	-2.8%	-0.2%	1.0%	-1.2%	312	49	83	31	86	62
	Taiwan	10.2%	9.2%	10.4%	7.4%	10.2%	17.0%	-1.0%	0.2%	-2.8%	0.0%	6.8%	308	38	79	72	78	39
	South Africa	7.5%	20.2%	5.6%	7.8%	7.1%	2.4%	12.7%	-1.9%	0.3%	-0.3%	-5.0%	76	10	24	12	17	11
GICs Sector Analysis	Communication Services	-0.3%	-1.2%	1.5%	-1.3%	0.2%	-5.4%	-1.0%	1.8%	-1.0%	0.5%	-5.1%	233	26	74	16	86	29
	Consumer Discretionary	-1.8%	-7.8%	-1.1%	-4.5%	1.2%	-2.2%	-6.0%	0.6%	-2.7%	3.0%	-0.4%	575	75	184	64	183	67
	Consumer Staples	-2.9%	-4.7%	-4.0%	-3.7%	-1.8%	0.3%	-1.8%	-1.1%	-0.8%	1.0%	3.2%	292	26	101	38	103	22
	Energy	-1.5%	2.8%	-2.5%	-2.9%	-5.2%	-0.1%	4.3%	-1.0%	-1.3%	-3.6%	1.4%	131	15	24	10	30	50
	Financials	1.6%	-1.6%	2.1%	3.3%	0.7%	2.6%	-3.3%	0.5%	1.7%	-0.9%	1.0%	459	53	74	62	136	133
	Health Care	-4.5%	-7.3%	-4.6%	-5.1%	-1.1%	-6.6%	-2.7%	-0.1%	-0.6%	3.5%	-2.1%	342	60	89	45	94	54
	Industrials	0.7%	-3.2%	1.1%	-0.3%	1.3%	1.8%	-3.9%	0.4%	-1.0%	0.7%	1.1%	832	75	209	103	317	126
	Information Technology	7.3%	1.0%	5.8%	10.5%	7.1%	13.5%	-6.2%	-1.5%	3.3%	-0.2%	6.3%	577	74	137	74	197	93
	Materials	3.3%	10.8%	4.2%	-0.5%	0.8%	4.2%	7.5%	1.0%	-3.7%	-2.5%	1.0%	409	51	92	38	143	83
	Real Estate	1.6%	1.9%	0.0%	0.3%	1.7%	5.9%	0.3%	-1.6%	-1.3%	0.1%	4.2%	403	58	89	104	89	63
Utilities	4.3%	-5.2%	6.0%	5.5%	4.2%	-1.1%	-9.5%	1.7%	1.2%	-0.1%	-5.3%	135	8	41	18	58	9	
Size/Style	Large (6000M+ USD)	1.9%	-2.3%	1.7%	0.7%	3.0%	1.6%	-4.2%	-0.2%	-1.2%	1.1%	-0.3%	1092	89	317	44	465	176
	Mid (2000M-6000M)	0.1%	-2.2%	0.0%	-2.3%	1.1%	1.3%	-2.3%	-0.1%	-2.4%	1.0%	1.2%	1154	131	318	101	424	179
	Small (500M-2000M)	1.0%	-1.7%	0.9%	1.3%	0.9%	3.1%	-2.7%	-0.1%	0.3%	-0.1%	2.1%	2160	306	484	435	553	380
	Micro (0-500M)	0.0%	-1.8%	-1.6%	-0.3%	2.1%	2.9%	-1.8%	-1.6%	-0.3%	2.1%	2.9%	3596	538	458	1677	483	438
	Value (< Median MVIC)	1.0%	0.7%	1.6%	0.4%	0.6%	1.4%	-0.2%	0.6%	-0.6%	-0.3%	0.4%	2021	198	522	294	656	349
	Growth (>= Median MVIC)	1.0%	-3.3%	0.3%	0.8%	2.4%	3.0%	-4.2%	-0.7%	-0.2%	1.4%	2.0%	2385	328	598	286	787	385

Applied Finance Research: EM Momentum [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21, Monthly Rebalancing, Average Returns

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

Price Momentum – 2021 Q4

	Price Momentum 2021 Q4	Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	2.4%	-3.2%	1.4%	3.6%	4.2%	4.5%	-5.5%	-1.0%	1.2%	1.8%	2.1%	6470	989	1331	1429	1425	1294
	North America	4.6%	-1.3%	4.3%	6.1%	5.3%	5.5%	-5.9%	-0.3%	1.5%	0.7%	0.8%	2470	255	407	565	640	602
	Europe	3.6%	-1.2%	3.1%	4.7%	4.6%	4.0%	-4.8%	-0.5%	1.1%	1.0%	0.4%	1636	164	308	385	406	372
	Asia	-1.1%	-4.5%	-1.3%	-0.4%	1.3%	2.6%	-3.4%	-0.3%	0.6%	2.3%	3.6%	2288	562	612	470	355	287
	AFG US Database	4.7%	-2.3%	4.4%	6.4%	5.6%	5.4%	-7.0%	-0.2%	1.7%	0.9%	0.7%	2191	219	372	508	565	526
GICs Sector Analysis	Communication Services	-7.3%	-16.7%	-3.5%	-6.3%	-9.5%	-7.8%	-9.5%	3.8%	1.0%	-2.3%	-0.6%	81	6	17	16	21	20
	Consumer Discretionary	3.5%	-8.2%	-0.4%	8.8%	3.6%	5.7%	-11.7%	-3.9%	5.3%	0.1%	2.2%	270	25	40	62	70	71
	Consumer Staples	7.0%	5.2%	4.1%	14.1%	4.5%	7.9%	-1.8%	-2.9%	7.1%	-2.5%	0.9%	89	11	17	15	23	21
	Energy	0.3%	-2.1%	6.4%	-4.0%	2.6%	-1.2%	-2.5%	6.1%	-4.3%	2.2%	-1.5%	118	7	21	28	30	31
	Financials	5.9%	4.3%	6.0%	7.4%	4.9%	7.0%	-1.6%	0.1%	1.5%	-1.0%	1.1%	370	35	58	78	101	97
	Health Care	-2.6%	-8.0%	-2.1%	-0.2%	-0.1%	-4.3%	-5.4%	0.5%	2.4%	2.5%	-1.7%	303	39	43	66	81	73
	Industrials	8.3%	-1.3%	8.4%	10.1%	9.6%	10.0%	-9.6%	0.1%	1.8%	1.3%	1.7%	316	31	63	81	84	56
	Information Technology	5.3%	-7.5%	1.4%	7.6%	11.3%	4.8%	-12.8%	-3.9%	2.3%	6.0%	-0.5%	313	36	54	78	77	67
	Materials	10.4%	9.4%	11.6%	7.1%	7.3%	15.2%	-0.9%	1.2%	-3.3%	-3.1%	4.8%	107	5	19	31	24	26
	Real Estate	11.1%	5.4%	8.6%	9.8%	11.6%	13.7%	-5.6%	-2.4%	-1.3%	0.5%	2.6%	156	13	20	30	36	56
Utilities	12.5%	14.0%	10.9%	14.2%	10.6%	15.5%	1.5%	-1.7%	1.6%	-2.0%	3.0%	66	8	18	18	16	4	
Size/Style	Large (6000M+ USD)	7.0%	-0.8%	7.3%	8.1%	9.0%	6.1%	-7.7%	0.3%	1.2%	2.0%	-0.9%	851	62	159	231	236	163
	Mid (2000M-6000M)	3.6%	-0.4%	3.0%	5.3%	3.6%	3.8%	-4.0%	-0.6%	1.7%	0.0%	0.2%	645	72	109	140	167	155
	Small (500M-2000M)	3.0%	-4.8%	1.6%	4.7%	2.8%	6.3%	-7.8%	-1.4%	1.7%	-0.2%	3.3%	695	85	103	136	161	208
	Micro (0-500M)	-7.1%	-15.6%	-5.8%	-1.6%	-2.8%	-5.2%	-8.6%	1.3%	5.5%	4.3%	1.9%	593	141	98	90	109	154
	Value (< Median MVIC)	5.1%	2.0%	3.2%	6.0%	5.5%	5.8%	-3.1%	-1.9%	0.9%	0.4%	0.7%	992	73	160	243	280	234
	Growth (>= Median MVIC)	4.3%	-4.7%	5.2%	6.6%	5.8%	5.3%	-9.1%	0.8%	2.3%	1.5%	1.0%	1199	145	211	265	284	292
Indices	Russell 1000 ® Index	6.5%	-0.5%	7.2%	7.2%	7.9%	6.6%	-7.0%	0.7%	0.8%	1.5%	0.1%	956	89	190	260	259	157
	Russell 2000 ® Index	2.8%	-3.1%	0.5%	4.6%	3.7%	4.3%	-5.8%	-2.2%	1.9%	0.9%	1.6%	1481	186	223	285	345	440
	S&P 500 ® Index	9.3%	10.0%	10.2%	8.9%	10.1%	7.9%	0.7%	1.0%	-0.4%	0.8%	-1.4%	497	27	102	153	148	66
	ADR Universe	-4.2%	-12.4%	-5.3%	-0.9%	2.0%	-1.4%	-8.2%	-1.1%	3.3%	6.1%	2.7%	622	151	102	128	106	134
	AFG International Database	1.2%	-3.1%	0.2%	2.1%	3.2%	3.7%	-4.3%	-1.0%	0.9%	2.0%	2.5%	4278	770	959	921	860	767
Country Analysis	Canada	4.1%	3.8%	2.6%	3.4%	3.3%	5.8%	-0.3%	-1.5%	-0.7%	-0.8%	1.7%	278	36	35	56	75	75
	Austria	3.1%	-2.7%	-4.9%	1.5%	4.5%	6.2%	-5.8%	-8.1%	-1.7%	1.4%	3.1%	30	1	3	8	11	6
	Belgium	2.9%	-4.0%	3.3%	8.7%	1.6%	5.7%	-6.9%	0.4%	5.8%	-1.3%	2.8%	54	10	13	14	8	8
	Denmark	5.4%	5.3%	1.1%	10.6%	6.3%	3.1%	-0.1%	-4.3%	5.2%	0.9%	-2.3%	47	5	9	10	14	8
	Finland	4.4%	0.7%	6.3%	2.2%	4.0%	7.0%	-3.7%	1.9%	-2.2%	-0.4%	2.6%	56	5	13	14	13	9
	France	5.1%	3.7%	2.3%	3.1%	7.2%	8.1%	-1.4%	-2.8%	-2.0%	2.1%	3.0%	180	18	35	47	47	32
	Germany	2.3%	-2.5%	-0.5%	3.9%	6.0%	3.4%	-4.8%	-2.8%	1.6%	3.7%	1.1%	202	26	45	45	42	43
	Greece	0.5%	-13.4%	6.4%	-0.8%	5.8%	-2.9%	-13.9%	6.0%	-1.3%	5.4%	-3.3%	25	2	5	3	5	10
	Ireland	3.0%	6.5%	8.0%	7.6%	6.0%	-5.1%	3.5%	5.0%	4.7%	3.0%	-8.0%	21	1	5	6	4	6
	Italy	4.4%	-4.9%	-1.8%	7.1%	7.1%	7.1%	-9.3%	-6.2%	2.7%	2.7%	2.7%	110	5	19	29	29	27
	Luxembourg	-1.5%	12.4%	-15.0%	-3.1%	4.1%	-1.4%	13.9%	-13.5%	-1.5%	5.6%	0.2%	15	1	2	3	3	5
	Netherlands	1.3%	-2.0%	1.5%	3.0%	3.4%	-2.5%	-3.3%	0.2%	1.7%	2.1%	-3.7%	67	9	9	16	18	13
	Norway	7.3%	-6.4%	3.4%	16.5%	4.5%	12.1%	-13.7%	-3.8%	9.3%	-2.8%	4.8%	68	7	7	13	21	18
	Spain	0.0%	2.1%	-0.8%	1.5%	1.6%	-5.0%	2.2%	-0.8%	1.5%	1.6%	-4.9%	67	8	18	18	15	7
	Sweden	12.0%	10.6%	10.0%	10.1%	10.2%	17.6%	-1.4%	-2.0%	-1.9%	-1.8%	5.6%	170	11	37	39	35	48
	Switzerland	3.5%	2.2%	4.6%	2.7%	6.5%	0.5%	-1.3%	1.1%	-0.8%	3.0%	-3.0%	128	20	27	33	26	21
	United Kingdom	0.5%	-7.5%	3.1%	1.5%	1.2%	-0.3%	-8.0%	2.5%	1.0%	0.7%	-0.8%	392	32	57	84	111	107
	Australia	3.5%	1.7%	4.4%	3.3%	2.8%	5.9%	-1.9%	0.8%	-0.2%	-0.8%	2.4%	243	36	46	65	56	39
	Hong Kong	-3.3%	-7.7%	1.2%	-1.0%	-3.3%	1.1%	-4.4%	4.6%	2.4%	0.1%	4.4%	347	142	74	50	41	40
	Japan	-4.5%	-5.9%	-4.5%	-3.7%	-1.5%	-3.9%	-1.4%	0.0%	0.8%	3.0%	0.6%	962	273	303	202	123	60
	New Zealand	-2.9%	-5.2%	-0.1%	-6.0%	-5.0%	0.3%	-2.3%	2.8%	-3.1%	-2.1%	3.2%	42	6	12	9	7	7
	Singapore	1.2%	-0.5%	1.8%	0.0%	-0.7%	5.0%	-1.7%	0.6%	-1.2%	-2.0%	3.8%	83	16	31	17	9	9
	South Korea	-1.9%	-1.7%	-4.7%	-4.7%	-0.4%	2.8%	0.2%	-2.8%	-2.8%	1.5%	4.6%	304	46	72	60	58	66
	Taiwan	9.8%	5.0%	7.2%	13.3%	13.2%	9.5%	-4.8%	-2.6%	3.5%	3.4%	-0.4%	305	40	72	65	61	65
	South Africa	7.6%	23.4%	10.5%	6.3%	7.0%	4.9%	15.8%	2.8%	-1.3%	-0.6%	-2.8%	75	6	4	9	22	32
GICs Sector Analysis	Communication Services	0.3%	-0.8%	1.0%	-1.4%	-1.0%	3.7%	-1.1%	0.7%	-1.6%	-1.3%	3.4%	222	31	54	53	45	38
	Consumer Discretionary	-1.5%	-6.0%	0.2%	-3.0%	1.4%	0.2%	-4.5%	1.8%	-1.5%	3.0%	1.8%	556	107	130	122	105	90
	Consumer Staples	-2.7%	-6.6%	-4.4%	-1.0%	-0.4%	-0.9%	-3.9%	-1.7%	1.7%	2.3%	1.8%	288	53	67	65	55	48
	Energy	-0.9%	-4.9%	-4.0%	-3.6%	1.2%	10.8%	-4.0%	-3.1%	-2.7%	2.1%	11.7%	127	27	28	26	21	22
	Financials	1.9%	-0.7%	0.5%	6.2%	1.5%	3.7%	-2.6%	-1.5%	4.3%	-0.4%	1.8%	449	119	103	87	69	70
	Health Care	-4.3%	-15.0%	-3.8%	-2.6%	-1.2%	-2.5%	-10.7%	0.5%	1.7%	3.1%	1.8%	329	43	74	74	73	63
	Industrials	0.7%	-2.1%	-0.8%	2.8%	1.9%	1.1%	-2.7%	-1.5%	2.1%	1.2%	0.5%	817	141	179	175	171	149
	Information Technology	7.6%	-4.4%	5.4%	9.7%	10.9%	12.1%	-12.0%	-2.2%	2.1%	3.3%	4.5%	557	77	113	116	126	123
	Materials	3.2%	9.7%	1.5%	2.2%	3.7%	1.0%	6.5%	-1.7%	-1.0%	0.5%	-2.2%	404	53	91	90	91	78
	Real Estate	2.2%	-5.0%	1.7%	2.8%	6.7%	8.0%	-7.2%	-0.6%	0.5%	4.5%	5.7%	392	83	92	87	75	53
Utilities	4.2%	-0.5%	2.3%	5.9%	4.9%	8.9%	-4.7%	-1.8%	1.7%	0.7%	4.8%	134	32	23	23	25	31	
Size/Style	Large (6000M+ USD)	2.2%	-1.1%	1.6%	2.9%	4.8%	1.6%	-3.3%	-0.6%	0.7%	2.6%	-0.6%	1065	149	259	298	227	130
	Mid (2000M-6000M)	0.1%	-5.0%	-2.3%	2.5%	2.3%	3.4%	-5.1%	-2.4%	2.3%	2.2%	3.2%	1126	209	252	247	217	199
	Small (500M-2000M)	1.3%	-2.9%	1.0%	1.2%	2.7%	4.5%	-4.2%	-0.3%	-0.1%	1.4%	3.2%	2087	411	447	375	415	438
	Micro (0-500M)	0.1%	-5.7%	2.0%	0.7%	1.9%	5.0%	-5.9%	1.9%	0.6%	1.7%	4.8%	3437	949	692	580	578	637
	Value (< Median MVIC)	1.0%	-1.1%	0.5%	1.5%	2.7%	1.5%	-2.1%	-0.5%	0.5%	1.7%	0.4%	1986	346	496	436	404	302
	Growth (>= Median MVIC)	1.3%	-4.8%	-0.2%	2.5%	3.6%	5.5%	-6.1%	-1.5%	1.1%	2.3%	4.1%	2292	423	463	484	455	465

Applied Finance Research: Price Momentum [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21, Monthly Rebalancing, Average Returns

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

Earnings Quality – 2021 Q4

Earnings Quality 2021 Q4		Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	1.3%	-0.7%	2.4%	2.6%	2.1%	-0.6%	-2.0%	1.1%	1.3%	0.8%	-1.9%	5329	971	1087	1208	1131	930
	North America	2.5%	0.1%	4.7%	5.3%	3.9%	-2.0%	-2.4%	2.2%	2.8%	1.4%	-4.5%	1992	464	415	436	369	307
	Europe	3.1%	-0.9%	2.9%	5.4%	5.0%	1.6%	-4.0%	-0.1%	2.3%	2.0%	-1.5%	1312	170	175	233	357	375
	Asia	-1.2%	-1.7%	0.1%	-0.9%	-2.1%	-2.6%	-0.5%	1.3%	0.3%	-0.9%	-1.4%	1972	326	486	529	394	235
	AFG US Database	2.3%	-0.6%	5.0%	5.0%	4.3%	-2.5%	-3.0%	2.6%	2.7%	1.9%	-4.8%	1776	413	377	389	323	273
GICs Sector Analysis	Communication Services	-7.3%	-10.9%	-3.7%	-8.2%	-3.7%	-10.2%	-3.6%	3.6%	-0.9%	3.7%	-2.9%	90	22	15	21	19	11
	Consumer Discretionary	0.7%	-4.1%	5.8%	2.9%	3.8%	-1.2%	-4.8%	5.1%	2.2%	3.1%	-1.9%	283	65	46	58	52	61
	Consumer Staples	5.0%	-1.2%	8.5%	9.4%	1.6%	10.2%	-6.2%	3.5%	4.4%	-3.3%	5.2%	94	25	24	18	17	9
	Energy	0.3%	5.7%	-2.0%	1.8%	2.3%	-7.2%	5.4%	-2.3%	1.5%	2.0%	-7.5%	118	16	26	32	28	14
	Financials																	
	Health Care	-5.0%	-7.0%	-5.7%	-0.2%	-1.4%	-10.1%	-2.0%	-0.8%	4.8%	3.6%	-5.1%	329	85	68	59	61	55
	Industrials	7.6%	7.0%	10.2%	9.2%	7.2%	1.2%	-0.7%	2.5%	1.6%	-0.4%	-6.4%	322	76	78	75	54	38
	Information Technology	4.4%	0.1%	8.7%	6.0%	8.0%	-2.0%	-4.2%	4.3%	1.7%	3.6%	-6.4%	341	82	71	73	60	54
	Materials	10.1%	5.8%	12.8%	13.5%	14.4%	7.3%	-4.3%	2.7%	3.4%	4.3%	-2.8%	107	24	22	23	18	20
	Real Estate																	
Size/Style	Utilities	12.2%	16.3%	10.9%	11.2%	9.6%	15.8%	4.1%	-1.3%	-1.0%	-2.6%	3.6%	67	11	22	21	7	5
	Large (6000M+ USD)	5.4%	1.9%	8.4%	6.8%	7.0%	0.9%	-3.5%	3.0%	1.4%	1.6%	-4.5%	701	145	174	183	113	85
	Mid (2000M-6000M)	1.0%	-2.0%	7.7%	2.6%	1.6%	-6.9%	-3.0%	6.8%	1.6%	0.7%	-7.9%	536	138	108	112	105	71
	Small (500M-2000M)	-0.2%	-1.8%	-4.3%	4.4%	4.0%	-2.2%	-1.6%	-4.1%	4.6%	4.2%	-2.0%	538	129	94	93	104	117
	Micro (0-500M)	-12.6%	-13.5%	-10.0%	-7.1%	-9.8%	-17.4%	-0.9%	2.6%	5.6%	2.8%	-4.8%	447	128	73	63	68	114
	Value (< Median MVIC)	4.5%	3.9%	6.0%	4.6%	5.3%	2.1%	-0.6%	1.5%	0.1%	0.8%	-2.4%	785	131	148	202	183	119
Indices	Growth (≥ Median MVIC)	0.6%	-2.7%	4.3%	5.4%	2.7%	-6.0%	-3.3%	3.8%	4.8%	2.1%	-6.6%	991	281	228	187	139	154
	Russell 1000 ® Index	5.3%	2.3%	8.3%	5.9%	5.6%	2.7%	-3.0%	2.9%	0.6%	0.2%	-2.6%	765	157	186	204	136	81
	Russell 2000 ® Index	-0.1%	-1.9%	1.2%	3.7%	2.2%	-4.2%	-1.8%	1.2%	3.8%	2.2%	-4.2%	1145	299	215	216	202	212
	S&P 500 ® Index	9.1%	11.5%	9.1%	7.6%	9.9%	8.6%	2.4%	0.0%	-1.5%	0.8%	-0.5%	405	66	106	120	72	40
	ADR Universe	-4.6%	-7.5%	-2.3%	-1.6%	-1.7%	-9.0%	-2.9%	2.3%	3.0%	2.9%	-4.4%	546	145	136	105	72	87
	AFG International Database	0.8%	-0.7%	1.0%	1.5%	1.3%	0.1%	-1.5%	0.3%	0.7%	0.5%	-0.7%	3553	558	710	819	808	656
Country Analysis	Canada	3.5%	5.6%	1.8%	7.1%	0.8%	1.7%	2.1%	-1.8%	3.6%	-2.8%	-1.8%	215	51	37	46	46	33
	Austria	0.8%	3.0%	3.3%	-4.6%	5.1%	-3.9%	2.2%	2.4%	-5.4%	4.3%	-4.8%	21	3	1	1	7	8
	Belgium	0.6%	-12.7%	15.8%	2.9%	-2.3%	-0.1%	-13.3%	15.2%	2.3%	-2.9%	-0.6%	37	2	3	9	10	11
	Denmark	3.8%	-26.1%	10.5%	3.6%	3.1%	7.4%	-29.9%	6.7%	-0.3%	-0.8%	3.6%	38	1	3	7	17	8
	Finland	4.0%	2.7%	-0.6%	8.7%	3.1%	5.0%	-1.4%	-4.6%	4.7%	-0.9%	1.0%	49	6	6	8	13	14
	France	5.0%	8.4%	1.6%	7.2%	7.2%	2.1%	3.4%	-3.4%	2.1%	2.1%	-2.9%	154	9	18	27	50	49
	Germany	2.1%	3.8%	1.6%	0.9%	2.5%	1.9%	1.7%	-0.6%	-1.3%	0.3%	-0.3%	175	20	29	31	43	51
	Greece	-0.4%	1.1%	-1.1%	2.2%	-1.8%	-2.6%	1.5%	-0.7%	2.6%	-1.4%	-2.2%	21	1	3	6	5	4
	Ireland	2.2%	-10.5%	20.2%	7.6%	2.7%	2.9%	-12.8%	18.0%	5.3%	0.5%	0.6%	16	3	1	3	5	4
	Italy	4.9%	10.1%	5.4%	6.0%	5.0%	-1.7%	5.3%	0.5%	1.1%	0.2%	-6.5%	83	11	18	22	17	13
	Luxembourg	-2.6%	0.0%	16.1%	0.0%	-7.1%	-1.3%	0.0%	18.7%	0.0%	-4.5%	1.3%	14	0	1	0	6	7
	Netherlands	1.0%	-8.4%	-1.0%	7.7%	2.1%	4.9%	-9.5%	-2.1%	6.7%	1.1%	3.8%	56	11	6	5	8	24
	Norway	6.4%	4.6%	1.4%	-0.5%	18.0%	7.5%	-1.8%	-5.0%	-7.0%	11.6%	1.0%	56	13	6	12	11	13
	Spain	0.8%	2.1%	-12.9%	2.6%	3.7%	0.0%	1.3%	-13.7%	1.8%	2.8%	-0.8%	56	5	3	10	19	17
	Sweden	10.3%	-2.1%	14.2%	19.0%	13.6%	9.2%	-12.4%	3.8%	8.6%	3.3%	-1.2%	138	23	17	16	46	35
	Switzerland	3.9%	-7.6%	7.5%	10.0%	4.6%	-1.6%	-11.6%	3.5%	6.1%	0.7%	-5.5%	91	3	7	23	29	27
	United Kingdom	-0.4%	-5.1%	0.1%	3.2%	1.9%	-1.6%	-4.7%	0.5%	3.7%	2.3%	-1.2%	304	53	49	49	66	85
	Australia	4.9%	3.8%	8.9%	2.9%	3.3%	7.0%	-1.0%	4.0%	-2.0%	-1.6%	2.1%	178	42	30	39	35	30
	Hong Kong	-4.3%	-7.0%	-1.1%	-3.6%	-0.7%	-8.2%	-2.7%	3.2%	0.7%	3.5%	-3.9%	310	101	78	49	43	38
	Japan	-4.8%	-6.0%	-3.5%	-4.3%	-6.1%	-5.9%	-1.2%	1.3%	0.5%	-1.3%	-1.1%	838	80	224	273	174	86
New Zealand	-3.3%	-11.6%	-5.1%	-2.6%	2.9%	-7.5%	-8.3%	-1.8%	0.7%	6.2%	-4.2%	33	3	9	7	8	4	
Singapore	0.4%	-2.1%	2.6%	-4.2%	0.8%	4.0%	-2.4%	2.2%	-4.5%	0.4%	3.6%	45	6	5	7	18	8	
South Korea	-1.9%	-0.7%	2.9%	1.0%	-7.7%	-9.0%	1.3%	4.8%	3.0%	-5.8%	-7.1%	282	49	60	77	57	38	
Taiwan	10.4%	13.8%	7.6%	10.5%	10.0%	12.6%	3.4%	-2.7%	0.1%	-0.4%	2.3%	286	44	78	74	59	29	
South Africa	7.0%	5.7%	13.3%	12.8%	4.5%	-0.4%	-1.3%	6.3%	5.8%	-2.5%	-7.5%	52	10	10	9	10	12	
GICs Sector Analysis	Communication Services	-0.3%	-0.9%	2.2%	0.6%	-1.8%	-1.8%	-0.6%	2.5%	1.0%	-1.5%	-1.5%	232	46	44	58	50	33
	Consumer Discretionary	-1.6%	-7.7%	1.5%	-0.1%	-1.2%	-2.6%	-6.1%	3.1%	1.5%	0.4%	-0.9%	565	93	127	133	115	95
	Consumer Staples	-2.7%	-2.1%	-3.5%	-3.1%	-3.7%	-1.1%	0.6%	-0.8%	-0.4%	-1.0%	1.6%	290	45	57	65	64	58
	Energy	-1.2%	3.0%	-5.0%	2.5%	-1.2%	-6.4%	4.2%	-3.8%	3.7%	0.0%	-5.2%	130	32	21	24	26	26
	Financials																	
	Health Care	-4.7%	-13.2%	-6.1%	-1.1%	-2.2%	-7.6%	-8.4%	-1.3%	3.6%	2.5%	-2.8%	338	41	68	92	89	47
	Industrials	0.7%	-0.6%	1.4%	0.0%	1.9%	0.6%	-1.3%	0.6%	-0.7%	1.2%	-0.2%	813	123	147	188	188	165
	Information Technology	8.0%	6.6%	6.7%	10.6%	9.3%	5.4%	-1.4%	-1.4%	2.6%	1.3%	-2.6%	552	86	120	129	123	93
	Materials	3.1%	9.6%	2.6%	3.0%	0.2%	2.8%	6.5%	-0.5%	-0.1%	-2.9%	-0.3%	403	53	86	86	91	86
	Real Estate																	
Size/Style	Utilities	3.6%	1.2%	3.4%	0.5%	6.3%	4.2%	-2.4%	-0.2%	-3.0%	2.7%	0.6%	132	23	16	21	37	33
	Large (6000M+ USD)	2.0%	-2.0%	1.2%	2.4%	3.7%	2.5%	-4.0%	-0.8%	0.5%	1.8%	0.5%	853	110	162	221	203	155
	Mid (2000M-6000M)	-0.3%	-1.3%	-0.5%	-1.0%	1.1%	-0.6%	-1.0%	-0.1%	-0.6%	1.5%	-0.3%	911	135	186	210	215	163
	Small (500M-2000M)	0.8%	0.0%	1.7%	2.4%	0.1%	-0.6%	-0.8%	0.9%	1.6%	-0.7%	-1.4%	1788	312	360	387	390	338
	Micro (0-500M)	-0.2%	-2.3%	1.5%	0.8%	2.1%	-2.2%	-2.1%	1.7%	1.0%	2.3%	-2.0%	3164	662	599	514	625	763
	Value (< Median MVIC)	0.3%	1.1%	0.3%	0.0%	-0.4%	1.3%	0.8%	0.0%	-0.3%	-0.7%	0.9%	1608	164	311	402	425	305
Growth (≥ Median MVIC)	1.1%	-1.5%	1.7%	2.9%	3.1%	-0.9%	-2.7%	0.6%	1.8%	2.0%	-2.1%	1944	394	398	416	383	351	

Applied Finance Research: Earnings Quality [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21. Monthly Rebalancing, Average Returns

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

	Management Quality 2021 Q4	Returns						Return Spreads					Counts					
		Uni	F	D	C	B	A	F	D	C	B	A	Uni	F	D	C	B	A
	AFG Global Database	1.9%	-1.4%				3.4%	-3.3%				1.6%	6701	2160				4541
	North America	3.5%	-2.5%				6.3%	-6.1%				2.7%	2600	794				1805
	Europe	3.4%	2.2%				3.9%	-1.3%				0.4%	1685	422				1263
	Asia	-1.3%	-2.4%				-0.6%	-1.1%				0.7%	2339	918				1420
	AFG US Database	3.5%	-3.2%				6.5%	-6.7%				3.0%	2315	704				1610
GICs Sector Analysis	Communication Services	-7.3%	-9.6%				-5.5%	-2.3%				1.8%	89	37				51
	Consumer Discretionary	1.1%	-12.8%				4.4%	-13.8%				3.3%	294	55				239
	Consumer Staples	5.3%	-4.9%				8.8%	-10.2%				3.5%	92	22				70
	Energy	-0.1%	-7.6%				0.6%	-7.5%				0.7%	118	10				108
	Financials	5.5%	3.0%				6.2%	-2.4%				0.7%	377	84				293
	Health Care	-4.4%	-8.8%				0.4%	-4.3%				4.8%	335	175				160
	Industrials	7.8%	1.4%				10.6%	-6.4%				2.8%	324	97				227
	Information Technology	3.7%	-2.8%				8.6%	-6.5%				4.9%	349	149				200
	Materials	10.4%	10.6%				10.3%	0.1%				-0.1%	106	22				84
	Real Estate	10.7%	7.5%				11.3%	-3.2%				0.6%	158	23				134
	Utilities	12.2%	8.4%				14.7%	-3.8%				2.5%	67	26				41
Size/Style	Large (6000M+ USD)	6.1%	-0.6%				8.4%	-6.8%				2.3%	878	217				661
	Mid (2000M-6000M)	2.1%	-4.3%				5.8%	-6.4%				3.7%	703	252				451
	Small (500M-2000M)	1.7%	-4.4%				4.6%	-6.0%				2.9%	734	235				498
	Micro (0-500M)	-7.4%	-10.2%				-5.7%	-2.7%				1.8%	612	237				375
	Value (< Median MVIC)	4.8%	1.9%				6.1%	-2.9%				1.3%	1017	317				700
	Growth (>= Median MVIC)	2.4%	-7.3%				6.7%	-9.8%				4.3%	1297	386				910
Indices	Russell 1000 ® Index	6.0%	-0.9%				8.4%	-6.9%				2.4%	979	245				733
	Russell 2000 ® Index	1.8%	-2.8%				4.2%	-4.6%				2.4%	1519	519				999
	S&P 500 ® Index	9.2%	3.9%				10.3%	-5.3%				1.1%	498	84				414
	ADR Universe	-4.3%	-6.9%				-2.9%	-2.6%				1.4%	643	221				422
	AFG International Database	1.0%	-0.6%				1.8%	-1.6%				0.8%	4386	1455				2930
Country Analysis	Canada	4.0%	2.7%				4.7%	-1.3%				0.7%	285	90				195
	Austria	3.1%	7.7%				-2.6%	4.5%				-5.7%	30	15				14
	Belgium	2.9%	1.0%				3.9%	-1.9%				1.0%	54	20				34
	Denmark	5.4%	4.6%				5.9%	-0.9%				0.5%	47	13				34
	Finland	4.4%	6.3%				4.2%	1.9%				-0.3%	57	7				50
	France	4.8%	5.5%				4.5%	0.7%				-0.3%	184	51				132
	Germany	2.2%	3.0%				2.0%	0.8%				-0.2%	209	42				166
	Greece	0.5%	1.8%				0.1%	1.4%				-0.4%	25	6				19
	Ireland	3.0%	0.3%				3.5%	-2.6%				0.6%	21	4				17
	Italy	4.3%	4.6%				4.1%	0.2%				-0.2%	109	41				68
	Luxembourg	-1.5%	16.3%				-2.6%	17.9%				-1.1%	15	1				14
	Netherlands	1.3%	-3.3%				2.4%	-4.6%				1.2%	70	14				55
	Norway	6.7%	4.0%				9.2%	-2.7%				2.4%	71	32				39
	Spain	0.2%	3.3%				-1.2%	3.1%				-1.3%	68	22				46
	Sweden	11.8%	-0.6%				14.4%	-12.4%				2.7%	175	29				146
	Switzerland	3.4%	-1.3%				4.3%	-4.7%				0.9%	129	21				108
	United Kingdom	0.3%	-0.7%				0.6%	-1.0%				0.3%	416	99				317
	Australia	3.1%	3.0%				3.2%	-0.2%				0.1%	248	63				185
	Hong Kong	-4.5%	-2.6%				-6.6%	2.0%				-2.1%	382	196				185
	Japan	-4.5%	-5.0%				-4.1%	-0.5%				0.4%	963	409				554
New Zealand	-2.9%	-2.2%				-3.2%	0.7%				-0.4%	42	17				25	
Singapore	1.0%	1.7%				0.6%	0.7%				-0.4%	84	29				54	
South Korea	-2.1%	-2.9%				-1.5%	-0.8%				0.6%	311	143				168	
Taiwan	10.2%	9.8%				10.2%	-0.4%				0.0%	308	60				248	
South Africa	7.5%	10.6%				5.9%	3.1%				-1.5%	76	24				52	
GICs Sector Analysis	Communication Services	-0.2%	0.3%				-0.5%	0.5%				-0.4%	233	81				151
	Consumer Discretionary	-1.6%	-3.0%				-1.0%	-1.3%				0.6%	573	170				403
	Consumer Staples	-2.7%	-4.9%				-1.6%	-2.3%				1.1%	291	95				196
	Energy	-1.2%	-3.1%				-0.8%	-1.8%				0.5%	130	24				105
	Financials	1.7%	1.8%				1.6%	0.2%				-0.1%	459	153				305
	Health Care	-4.7%	-7.5%				-3.3%	-2.7%				1.5%	341	117				224
	Industrials	0.8%	-2.4%				2.2%	-3.2%				1.4%	827	255				571
	Information Technology	7.2%	2.8%				8.6%	-4.4%				1.4%	570	134				436
	Materials	3.1%	1.9%				3.7%	-1.2%				0.6%	406	131				274
	Real Estate	1.6%	2.3%				0.9%	0.7%				-0.7%	403	196				207
Utilities	4.3%	3.6%				5.3%	-0.7%				1.1%	135	89				46	
Size/Style	Large (6000M+ USD)	2.0%	-0.6%				2.9%	-2.6%				0.9%	1090	289				801
	Mid (2000M-6000M)	0.1%	-1.4%				1.0%	-1.5%				0.8%	1149	407				742
	Small (500M-2000M)	1.0%	-0.1%				1.5%	-1.1%				0.6%	2146	759				1387
	Micro (0-500M)	0.0%	-1.3%				0.8%	-1.4%				0.8%	3559	1309				2250
	Value (< Median MVIC)	0.9%	-0.1%				1.6%	-0.9%				0.7%	2014	892				1122
	Growth (>= Median MVIC)	1.1%	-1.4%				1.9%	-2.5%				0.8%	2372	563				1808

Applied Finance Research: Management Quality [Global Quintile By GICS Sector] from 9/30/21 to 12/31/21, Monthly Rebalancing, Average Returns

International Analysis | All Sectors | 500M+ USD*

United States Analysis | All Sectors | 500M+ USD*

*Size Tiers and US Indices include all firms that meet the market cap or index criteria.

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