EYE ON THE MARKET • SPECIAL EDITION

Active Management and QE-Distorted Markets

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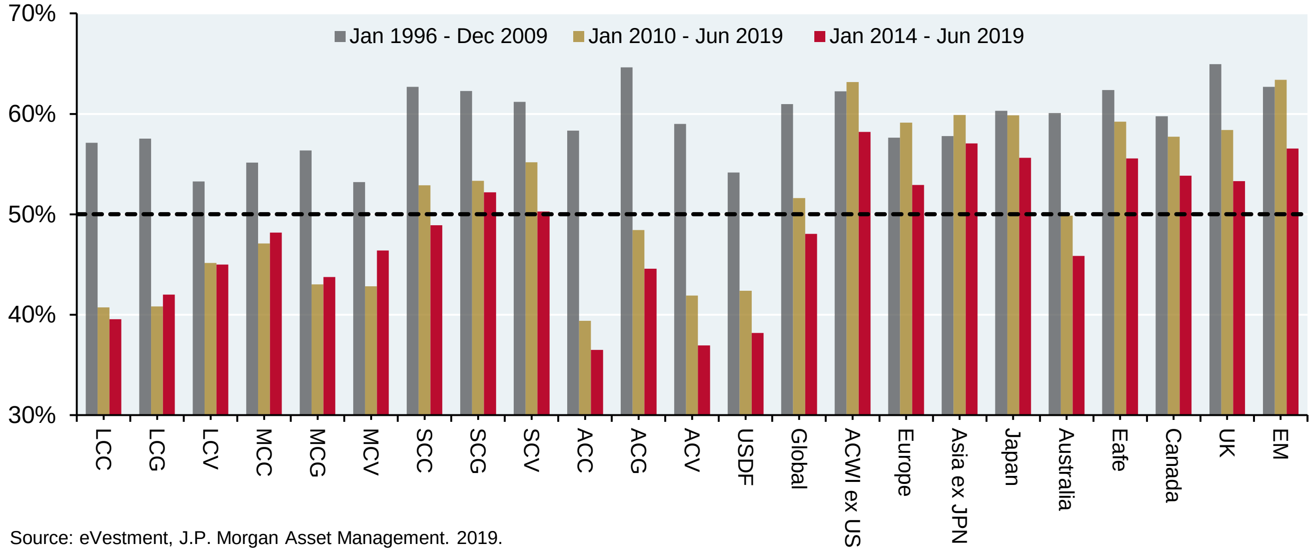
Active equity management and QE-distorted markets

How are active equity managers doing at a time of distorted markets? We analyzed 6,700 institutional[1] equity managers across 23 style categories. The performance database used for the analysis includes all managers reporting returns at any time since 1996. The chart below shows the percentage of managers that outperformed over the time frames indicated. As with our 2014 analysis, outperformance was better for non-US categories. Outperformance in 2014-2019 was also almost always weaker than in 2010-2014. Even so, a large number of equity categories still show more than 50% of managers outperforming net of fees, despite the enormous market distortions introduced by central bank quantitative easing programs.

Active equity manager outperformance trends

% of managers outperforming respective ETF, 1 year basis using monthly data



Source: eVestment, J.P. Morgan Asset Management. 2019.

Here's a rough grading of manager outperformance by style category since 2014:

Grade A: manager outperformance average above 50%

- SCG, SCV, ACWI ex-US, Europe, Asia ex-Japan, Japan, EAFE, Canada, UK, EM (p.5-6)

Grade B: manager outperformance average from 45%-50%

- MCC, MCV, SCC, Global, Australia (p.7)

Grade C: manager outperformance average below 45%

- LCC, LCG, LCV, MCG, ACC, ACG, ACV, USDF (p.8)

Methodology. Managers were assessed vs their respective stated benchmarks, rather than against a single benchmark for the entire style category. In addition to measuring performance vs stated benchmarks, we also analyzed performance vs the ETF which tracks the manager's stated benchmark. When ETFs weren't available, we derived pro forma ETFs by subtracting average market ETF fees from stated benchmark returns. The performance database provided gross of fee returns; we derived fee levels from US Mutual Fund I Share Class fees for purposes of computing net of fee returns. See pages 13-17 for more details on methodology, ETFs, fees, etc.

[1] "**Institutional**" refers to equity managers that primarily service institutional investors (pension plans, endowments, foundations, insurance companies and sovereign wealth funds), and also service individuals with access to investment vehicles with institutional pricing. See page 16 for more information on fee levels used in the analysis.

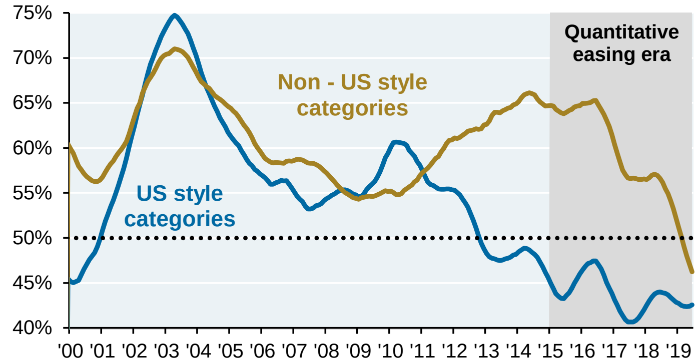
Manager performance and Central Bank distortions

Any discussion on industry performance needs to start with the unorthodox changes in market conditions resulting from central bank quantitative easing: negative real policy rates across the developed world, $14 trillion of European and Japanese government bonds with negative yields, a collapse in risk premia across asset classes and a number of other distortions. Before getting into the details, start with the first two charts below. **Note how the rise in negative yielding government bonds coincided with a deterioration in equity manager outperformance in both US and non-US style categories**. The length of the current economic cycle may also partially explain the decline in manager outperformance; the US expansion is now the longest on record, and as shown in the bottom chart, many active managers tend to perform better in "down" markets.

Negative yielding debt as % of investment grade debt
Ratio - Negative yielding debt index/Global aggregate index

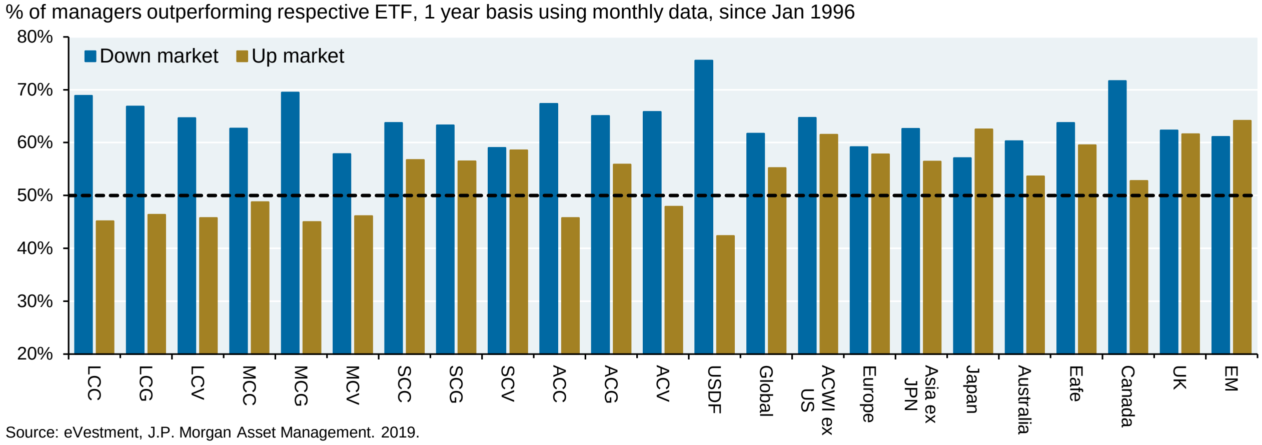
Source: Bloomberg. August 2019.

1 year manager outperformance, 3 year rolling average
% of managers outperforming ETF, equal weighted across styles



Source: eVestment, J.P.Morgan Asset Management. 2019.

Managers generally outperform more in down markets
% of managers outperforming respective ETF, 1 year basis using monthly data, since Jan 1996



Source: eVestment, J.P. Morgan Asset Management. 2019.

A closer look at market distortions. As shown on the next page, challenges for active managers include highly concentrated markets (i.e., a small number of stocks generating a disproportionately high percentage of market returns); a rise in pairwise stock correlations compared to pre-crisis levels, which makes stock-picking harder since there's less differentiation in performance; a long period of growth stock outperformance in the US, Europe, Asia and Emerging Markets since 2010; substantial outperformance of "bond proxy"[2] stocks compared to the market, another by-product of low/negative interest rates; and perhaps the most anomalous result of all, a prolonged period of value underperformance which is unlike anything seen in the prior 70 years, a time when being a value oriented-investor paid significant dividends for active managers and for individual investors. This last chart is particularly important since this 70 year period of positive returns to value investing forms the basis for many active manager investment models

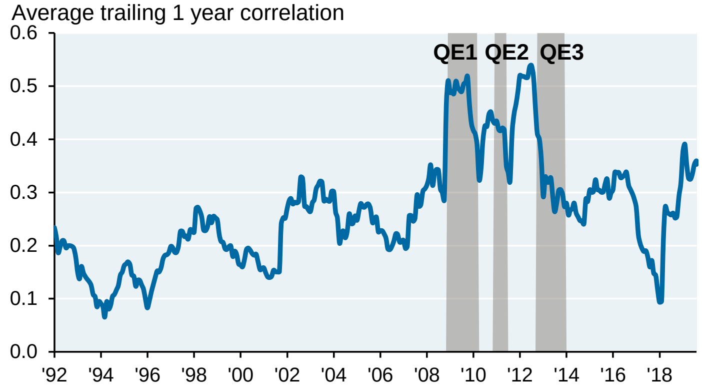
[2] **Bond proxy stocks** are defined as follows: the top decile stocks in the Russell 1000 large cap equity index with a combination of low beta to the equity market, high negative beta to interest rates (stock prices rise when rates fall), high dividend yield and high payout ratio.

and beliefs (see Appendix I for a discussion on possible catalysts for a value recovery that we're watching, as well as very early signs that it might already be underway). **Our finding that more than 50% of managers outperformed in so many categories since 2014 despite these distortions is a positive sign for the long term viability of active equity management**.

Contribution of top firms to overall US market return
% of market return, rolling 12-months

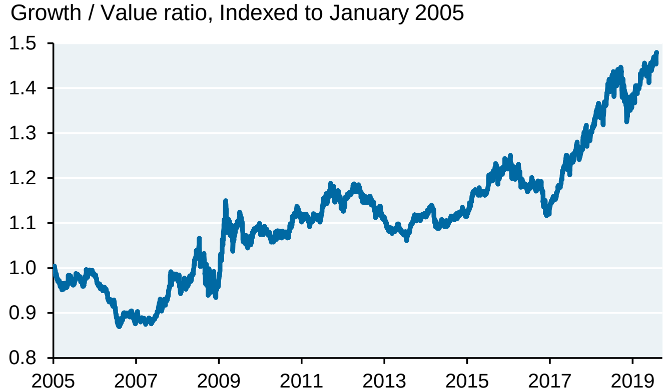
Source: J.P. Morgan Asset Management. August 2019. Data reflects periods of >= 10% annual market return.

Pairwise correlations in S&P 500 index
Average trailing 1 year correlation



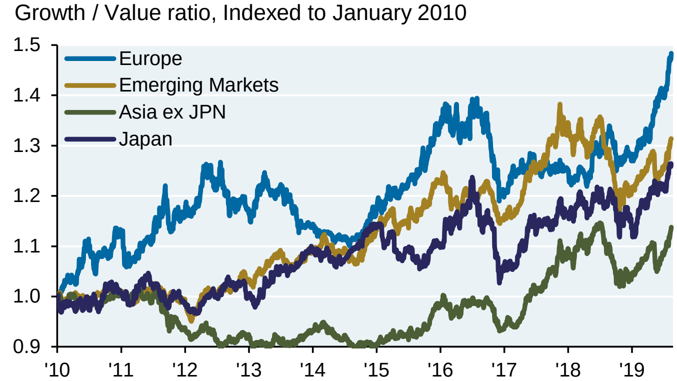
Source: J.P. Morgan Equity Research. August 2019.

US growth versus value cumulative net total return
Growth / Value ratio, Indexed to January 2005



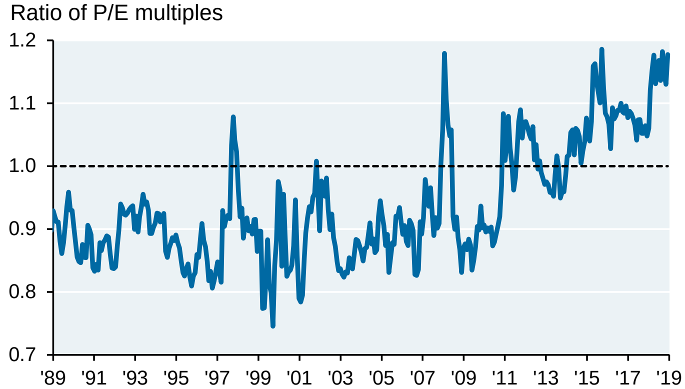
Source: Bloomberg. Indices: R1000 Growth and Value. August 12, 2019.

Growth versus value cumulative net total return
Growth / Value ratio, Indexed to January 2010



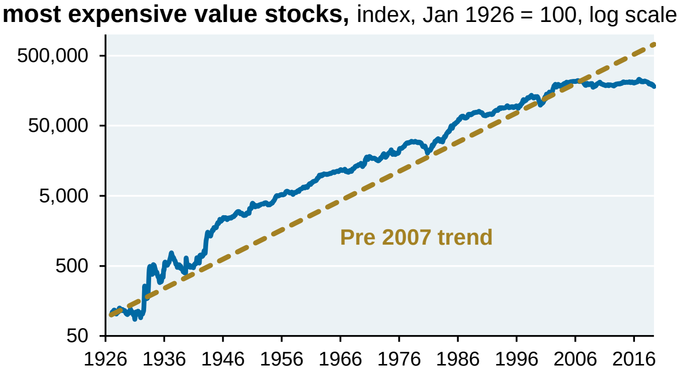
Source: Bloomberg. Indices: MSCI Growth and Value. August 12, 2019.

Bond proxy stock valuations vs Russell 1000 valuations
Ratio of P/E multiples



Source: J.P. Morgan Asset Management. August 2019. See footnote 2.

Cumulative excess return of cheapest value stocks over most expensive value stocks, index, Jan 1926 = 100, log scale



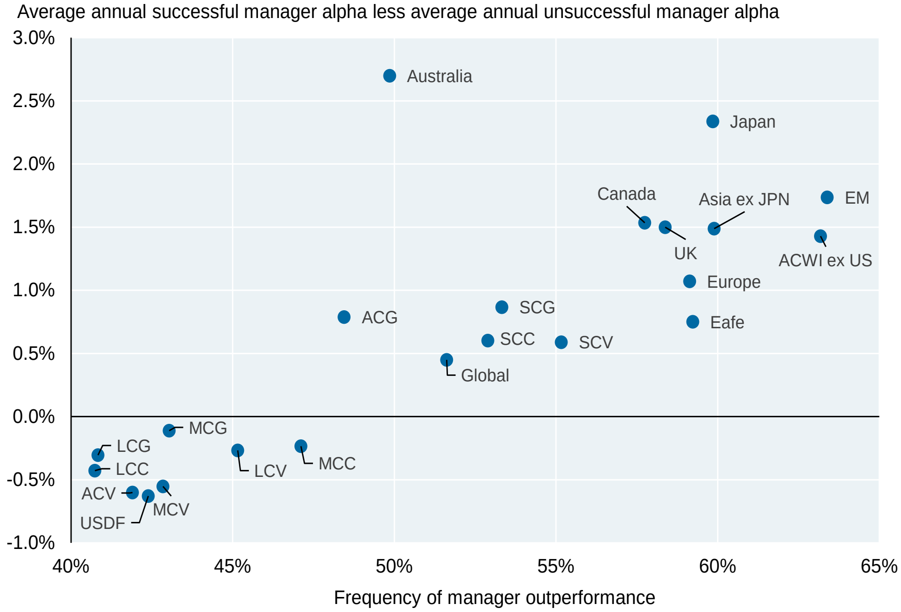
Source: French Data Library, J.P. Morgan Asset Management. Universe = NYSE, AMEX, Nasdaq. July 2019.

Frequency of outperformance vs magnitude of outperformance

Our primary industry performance measure in this analysis is the *frequency* of managers outperforming their benchmarks. However, we also looked at the *magnitude* of manager outperformance. To do this, we computed the average outperformance of successful managers, and subtracted the average underperformance of managers that trailed their benchmark in that same period. A net value of zero would mean that successful managers had positive alpha[3] that was exactly equal to the negative alpha of unsuccessful managers. Some key conclusions, using post-2010 data as a basis for analysis:

- There's a direct correlation between the *frequency* and *magnitude* of outperformance: more frequent outperformance was accompanied by higher net manager alpha. An example: 63% of ACWI ex-US managers outperformed since 2010; successful managers generated 4.6% average alpha; and unsuccessful managers underperformed by an average of 3.2%. **As a result, the chances of picking an outperforming ACWI ex-US manager were above 50%, and on top of that, the reward for picking a successful manager was higher than the penalty of picking an unsuccessful one.**
- The reverse was true for categories with outperformance frequency *below* 50%: underperforming managers lost alpha more than successful ones gained, which was the case with US large and mid cap.
- To conclude, **the magnitude of outperformance tended to amplify outperformance frequency results**. When active management was "working" for the majority of managers, the investor experience was even better than it looked since successful managers made more than unsuccessful ones lost; but when outperformance was scarce, manager alpha differentials made the active management choice even worse. **As shown, the performance boost from outperforming categories was significantly larger than the alpha drag from underperforming ones**.

Outperformance frequency vs outperformance magnitude, 2010 - 2019
Average annual successful manager alpha less average annual unsuccessful manager alpha



Source: eVestment, J.P. Morgan Asset Management. 2019. Outperformance frequency and magnitude computed on a one year rolling basis using monthly data

Magnitude of out/underperformance			
Style category	Avg pos alpha of successful managers	Avg neg alpha of unsuccessful managers	Net (successful - unsuccessful)
LCC	2.8%	-3.2%	-0.4%
LCG	3.2%	-3.5%	-0.3%
LCV	3.4%	-3.7%	-0.3%
MCC	3.8%	-4.0%	-0.2%
MCG	3.8%	-3.9%	-0.1%
MCV	3.7%	-4.2%	-0.6%
SCC	4.4%	-3.8%	0.6%
SCG	5.3%	-4.4%	0.9%
SCV	4.9%	-4.3%	0.6%
ACC	4.0%	-4.3%	-0.3%
ACG	5.9%	-5.1%	0.8%
ACV	4.5%	-5.1%	-0.6%
USDF	3.2%	-3.8%	-0.6%
Global	4.4%	-3.9%	0.4%
ACWI ex US	4.6%	-3.2%	1.4%
Europe	5.0%	-3.9%	1.1%
Asia ex JPN	5.5%	-4.0%	1.5%
Japan	5.4%	-3.1%	2.3%
Australia	6.1%	-3.4%	2.7%
Eafe	3.7%	-2.9%	0.8%
Canada	5.0%	-3.5%	1.5%
UK	5.2%	-3.7%	1.5%
EM	5.3%	-3.5%	1.7%

Source: eVestment, J.P. Morgan Asset Management 2019. Outperformance computed on a 1 year rolling basis using monthly data

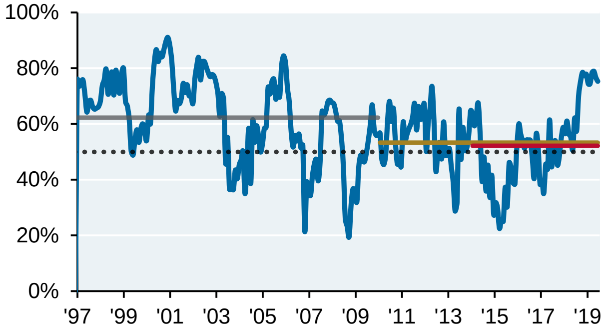
[3] Alpha is sometimes used to describe manager excess return given a level of market beta. However, for our purposes it simply indicates excess return of managers versus their respective benchmark or ETF.

Outperformance charts by style category

Grade A: post-2014 manager outperformance average at or above 50%

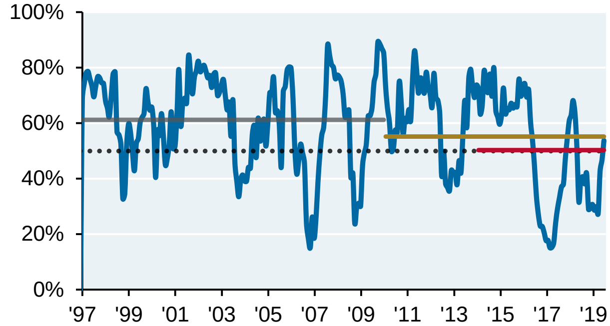
% of managers outperforming, rolling one year basis using monthly data
50%
January 1996 - December 2009
January 2010 - June 2019
January 2014 - June 2019

Small cap growth
% of managers outperforming respective ETF, rolling 1 year basis



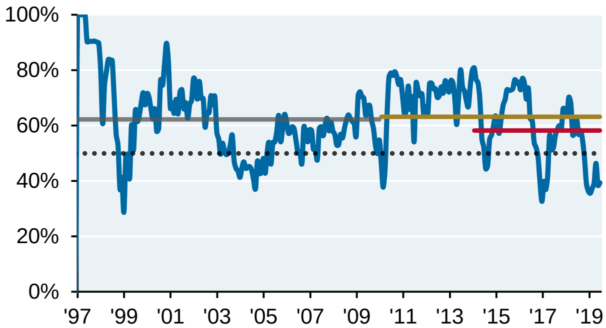
Source: eVestment, J.P. Morgan Asset Management. 2019.

Small cap value
% of managers outperforming respective ETF, rolling 1 year basis



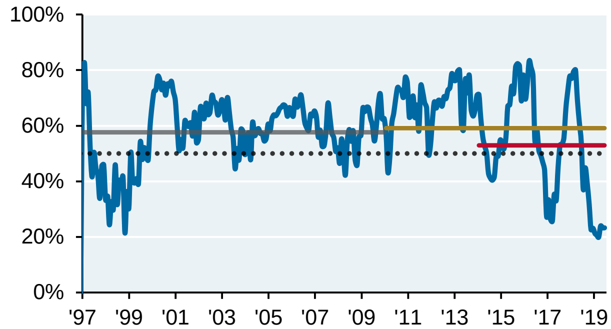
Source: eVestment, J.P. Morgan Asset Management. 2019.

ACWI ex-US
% of managers outperforming respective ETF, rolling 1 year basis



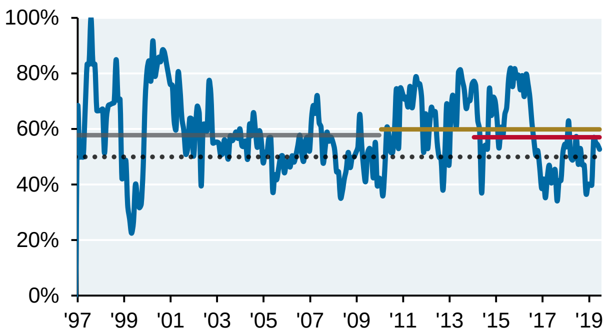
Source: eVestment, J.P. Morgan Asset Management. 2019.

Europe
% of managers outperforming respective ETF, rolling 1 year basis



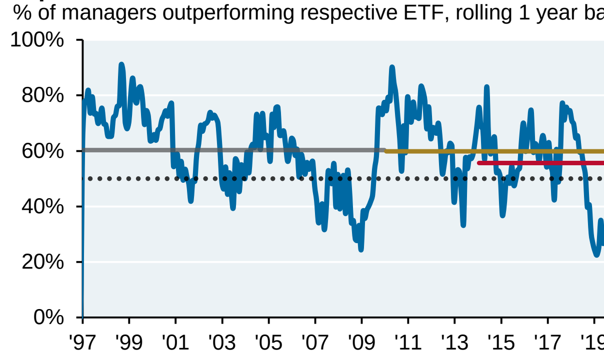
Source: eVestment, J.P. Morgan Asset Management. 2019.

Asia ex-Japan
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Japan
% of managers outperforming respective ETF, rolling 1 year basis

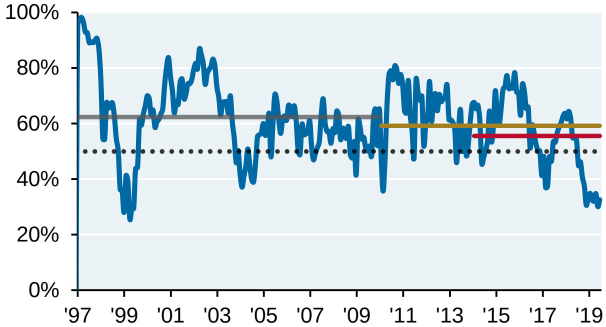


Source: eVestment, J.P. Morgan Asset Management. 2019.

Grade A (continued)

EAFE

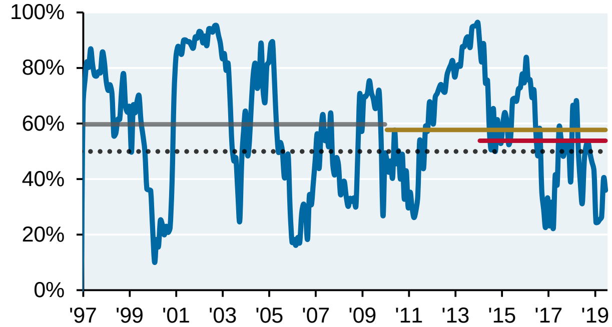
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Canada

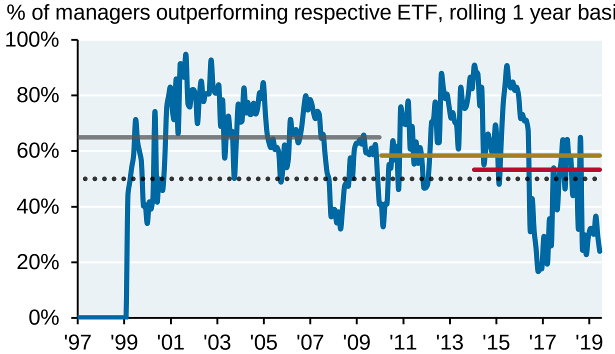
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

UK

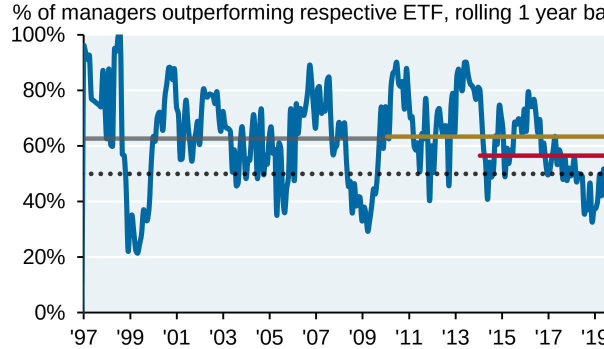
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Emerging Markets

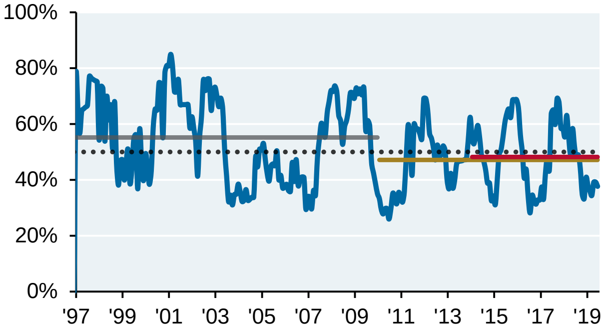
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

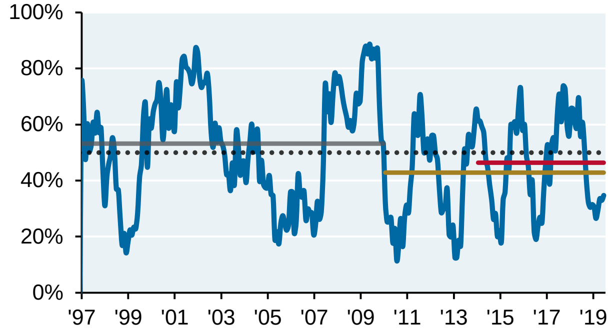
Grade B: post-2014 outperformance average from 45%-50%

Mid cap core
% of managers outperforming respective ETF, rolling 1 year basis



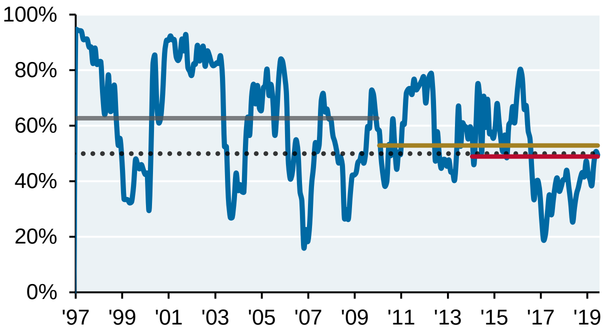
Source: eVestment, J.P. Morgan Asset Management. 2019.

Mid cap value
% of managers outperforming respective ETF, rolling 1 year basis



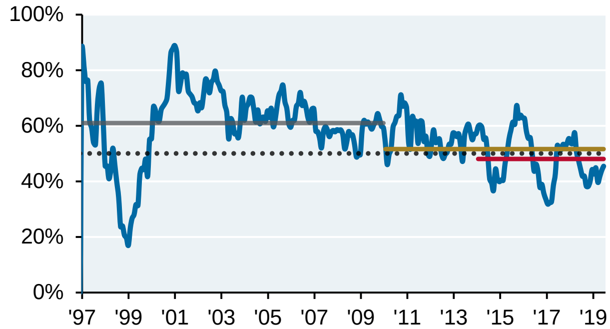
Source: eVestment, J.P. Morgan Asset Management. 2019.

Small cap core
% of managers outperforming respective ETF, rolling 1 year basis



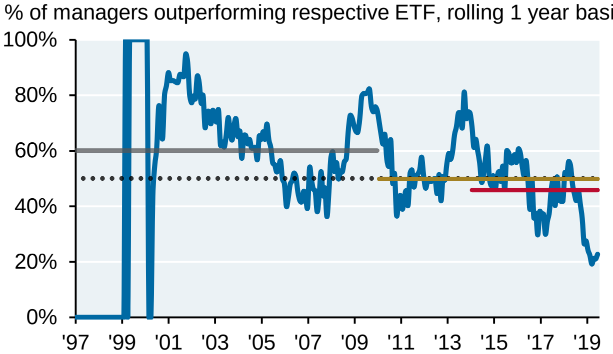
Source: eVestment, J.P. Morgan Asset Management. 2019.

Global
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Australia
% of managers outperforming respective ETF, rolling 1 year basis

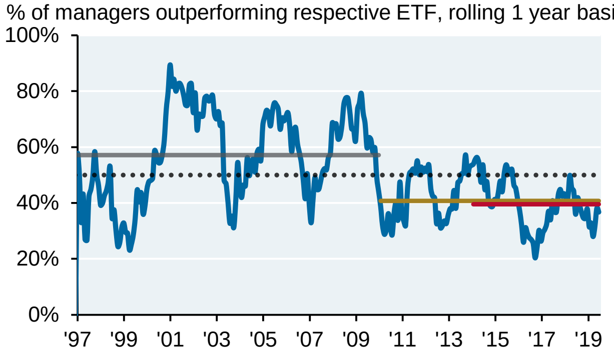


Source: eVestment, J.P. Morgan Asset Management. 2019.

Grade C: post-2014 outperformance average below 45%

Large cap core

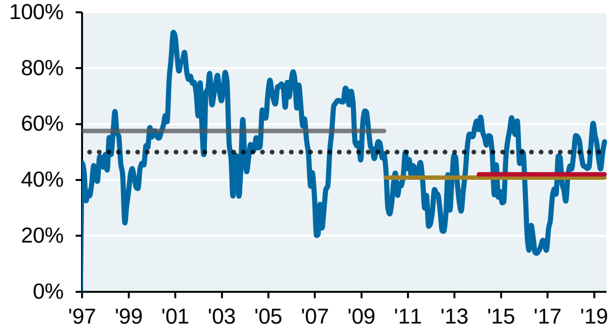
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Large cap growth

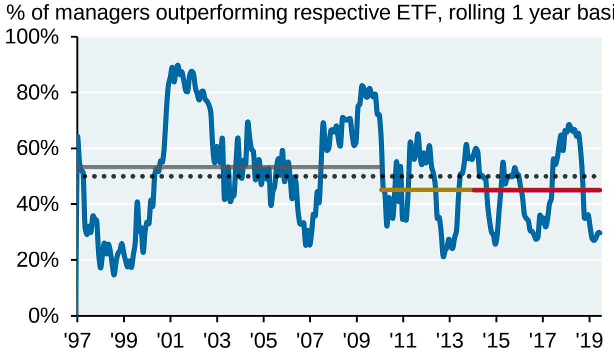
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Large cap value

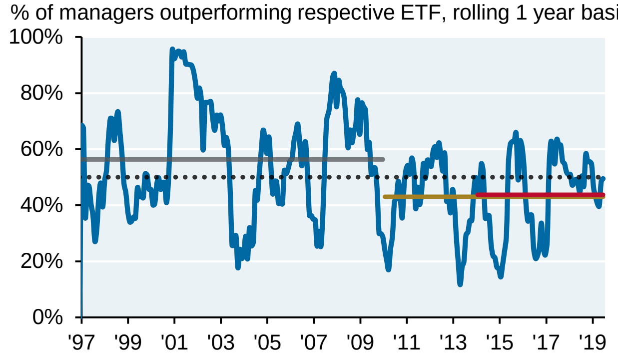
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

Mid cap growth

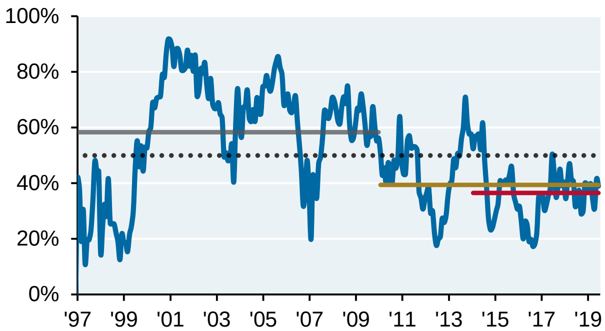
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

All cap core

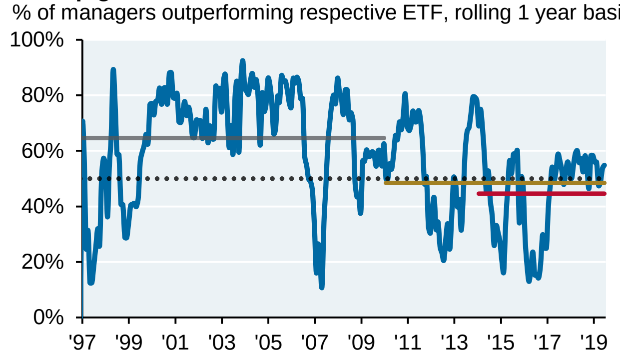
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

All cap growth

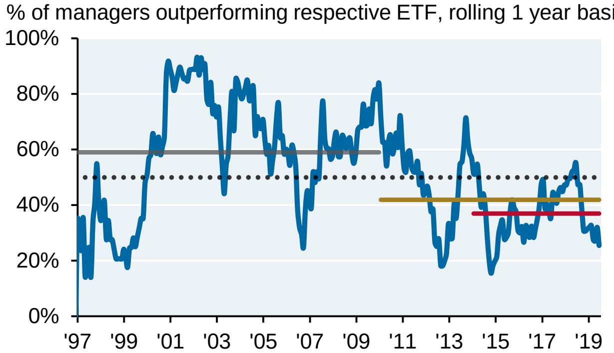
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

All cap value

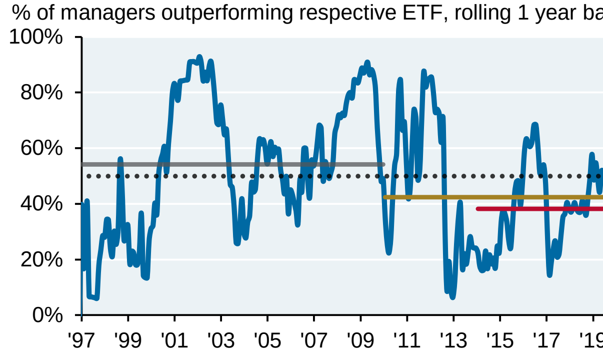
% of managers outperforming respective ETF, rolling 1 year basis



Source: eVestment, J.P. Morgan Asset Management. 2019.

US dividend focused

% of managers outperforming respective ETF, rolling 1 year basis

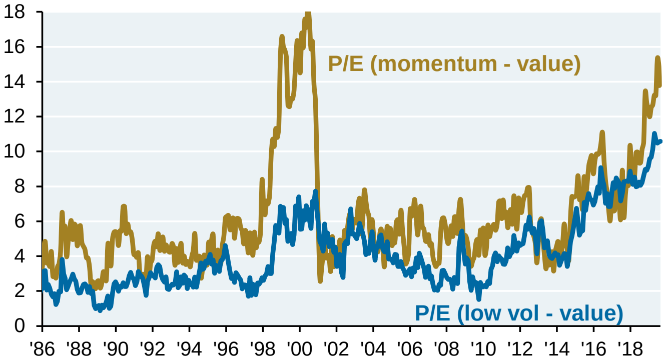


Source: eVestment, J.P. Morgan Asset Management. 2019.

Appendix I: Possible catalysts of a value recovery, and signs that it may already be underway

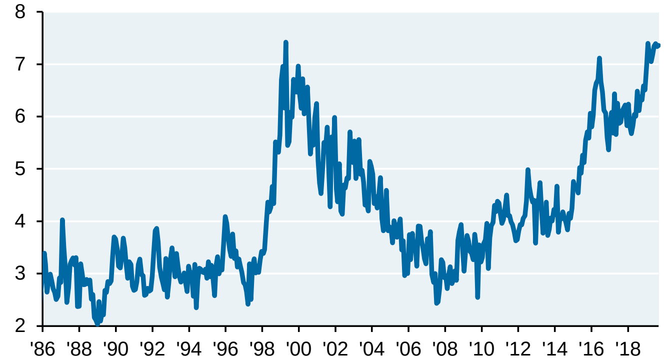
On page 3, we showed how value investing has suffered its worst stretch in over 70 years. Why and how might this change? Well, the first answer is always "exhaustion", in which the discount for value stocks simply becomes so great that investors that are underweight begin to reverse course. In doing so, they prompt other similarly positioned investors to do the same, and the process builds on itself. As shown below, the premiums investors are paying for momentum and low volatility relative to value are at historic highs, as is the discount applied to value stocks vs the broad market.

Premiums paid for momentum and low vol at historic highs, Forward P/E premium over value



Source: J.P. Morgan Global Equity Strategy and Quantitative Research. 2019.

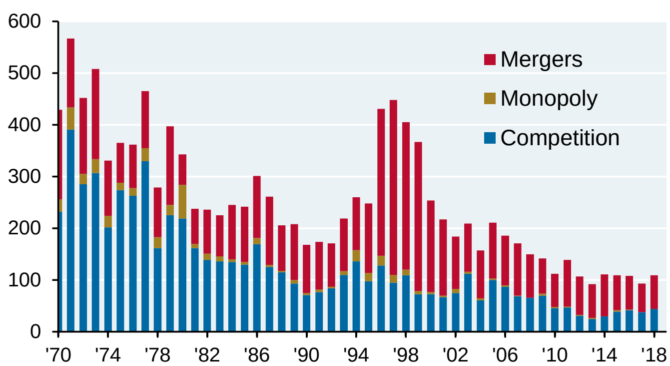
Broad market premium over value
Forward P/E premium, S&P 500 - value



Source: J.P. Morgan Global Equity Strategy and Quantitative Research. 2019.

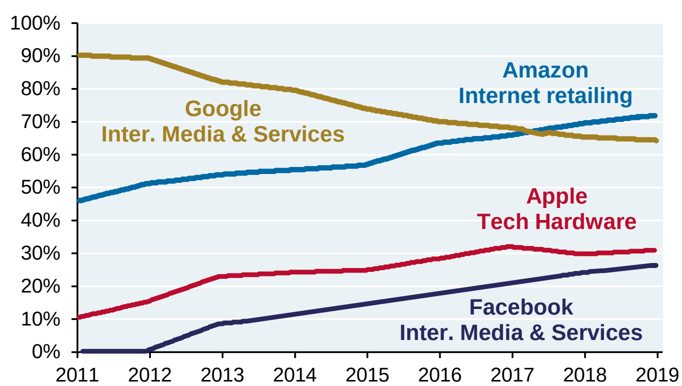
What could accelerate this process? First, we will look at a policy issue that may impede some of the best performing growth stocks. After a multi-decade **collapse in antitrust enforcement activity**, House Democrats have prioritized antitrust focus on consolidation of healthcare markets, and on monopolization of big tech platforms. While it is unlikely that any legislation will pass before the 2020 election, current DOJ investigations may slow the rate of new acquisitions that have been fueling tech earnings growth. In addition to anti-trust legislation, there are lingering privacy legislation proposals that could restrict the ease with which online platforms share data with advertisers, and also anti-trust investigations at the state level by a dozen Attorneys General. Many stocks that could be affected are among the best performers with respect to momentum and growth.

Number of Department of Justice antitrust investigations initiated



Source: United States Department of Justice. 2018.

Technology companies' share of industry sales



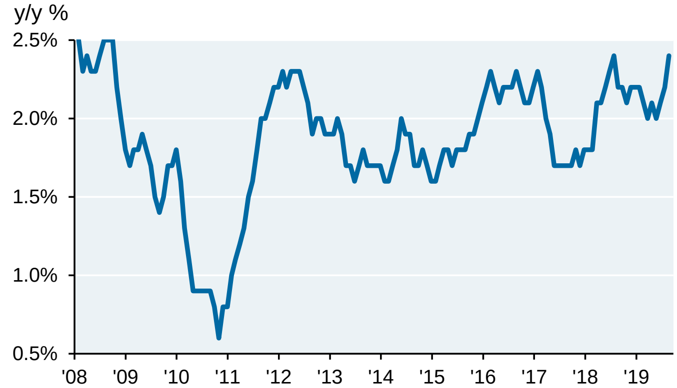
Source: Goldman Sachs. 2019.

Now, let's consider the enormous demand for another set of outperforming stocks: "bond proxies", given a backdrop of low and negative real interest rates. While there is little inflation on the horizon in Europe or Japan to force their central banks to **normalize monetary policy**, it is notable that (a) the US output gap now shows that spare capacity has been exhausted, and (b) US core CPI has been at or above 2% for over a year (wage inflation has been rising as well). While the Fed might still cut rates this year to avoid appreciation of the US dollar after more ECB easing, we see the "beginning of the end" of super-loose US monetary policy given the data below. If and when rates normalize, we expect to see value recover at the expense of over-bought bond proxy stocks.

US "output gap": a measure of spare capacity
%, Actual GDP relative to potential GDP

Source: Congressional Budget Office. Q1 2019.

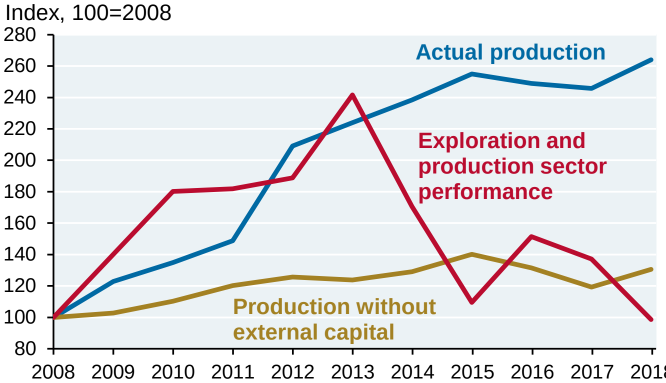
US core CPI
y/y %



Source: Bureau of Labor Statistics. August 2019.

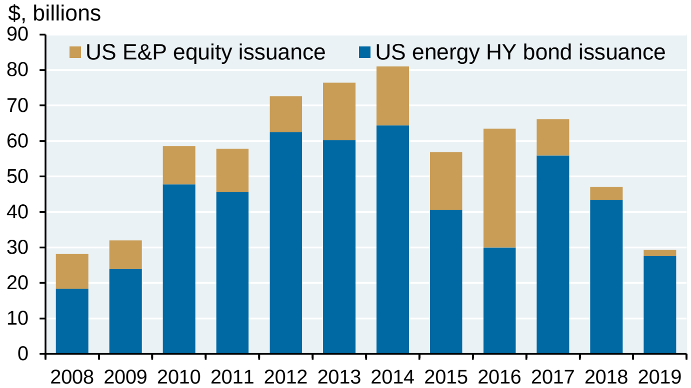
Now we will consider the two big value laggards: energy and financials. With respect to energy stocks, which have been among the worst laggards in the entire market, the problem is well-acknowledged: **the lack of capital discipline** which has resulted in investors piling into projects whose returns have been poor. As shown below (left), US production of oil and gas soared over the last decade (blue line) despite a decade of volatile investor returns which have now completely given back prior gains (red line). What's notable is that some analysts estimate that without the surge in capital provided to the energy industry, production would have been much lower (and prices/profitability presumably much higher). The good news: all the *bad* news is finally having an impact on capital discipline. Energy sector equity and debt issuance has been declining in the last few years, suggesting that a major shake-out and rationalization of the energy sector is now underway, paving the way for better returns in the future.

Oil and gas production with and without external capital
Index, 100=2008



Source: Kimmeridge Energy Management, Bloomberg. 2019.

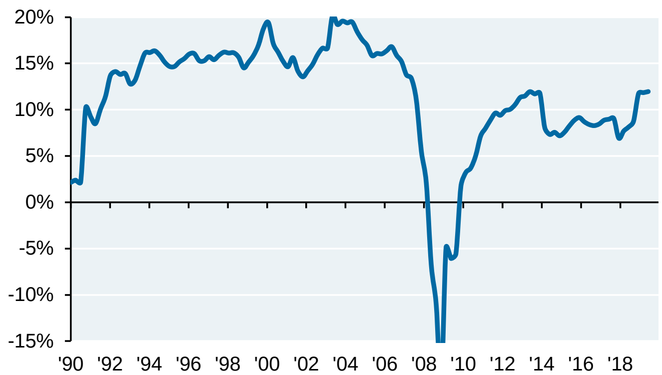
Energy sector capital raises
$, billions



Source: Bloomberg. 2019. 2019 data annualized for issuance through July.

On **banks**, catalysts for a meaningful sector recovery could include a modest steepening of the yield curve through rate normalization, and investors moving back to neutral sector weights on financials as part of any general narrowing of value discounts vs the market. However, we'd be surprised to see valuations reach their pre-crisis levels. Consumer and industrial loan demand is already pretty strong, and lower rates have already boosted housing. The (sorely needed) re-equitization of the banking sector after the financial crisis has reduced the sector's return on equity, and neither party in Washington appears poised to allow banks to reduce capital. M&A activity has also declined since pent-up demand for inter-state bank consolidation has already taken place, mostly during the 1990's and early 2000's. Currently, almost all banking consolidation is in the small- and mid-cap space ($1 bn-$20 bn in assets), and to make matters worse, bank acquirers over the last few years have usually underperformed the sector as a whole. As a result, while curve steepening and investor positioning may help, the catalysts that drove bank price-to-book ratios over 2.0x in the early 2000's are unlikely to repeat themselves.

S&P 500 banks return on common equity

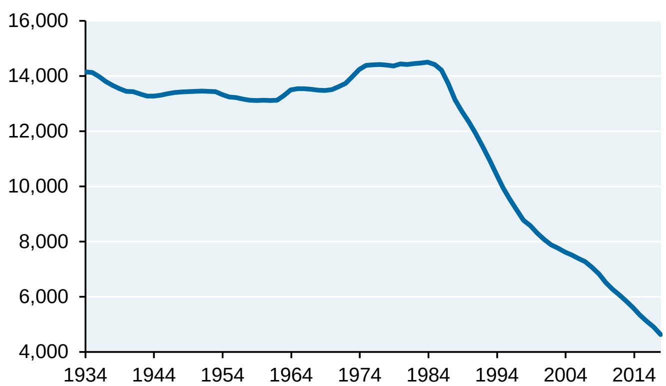


Source: Bloomberg. 2019.

S&P 500 banks price to book value

Source: Bloomberg. 2019.

Number of US commercial banks



Source: FDIC. 2019.

US commercial banks

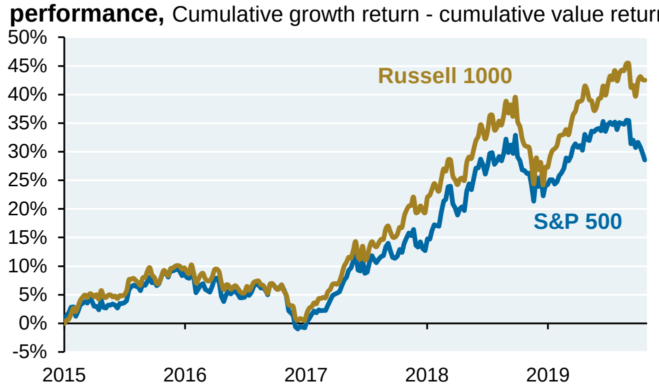
	Less than $100 mm	$100 mm to $1 bn	$1 bn to $10 bn	$10 bn to $250 bn	Greater than $250 bn
Number of banks	1,090	2,884	531	116	9
% of assets	0.38%	5.50%	8.17%	32.73%	53.23%
Return on assets	0.96	1.35	1.28	1.43	1.37
Return on equity	6.75	11.42	10.64	11.88	12.66

Source: FDIC. Q2 2019.

Early signs of a value recovery?

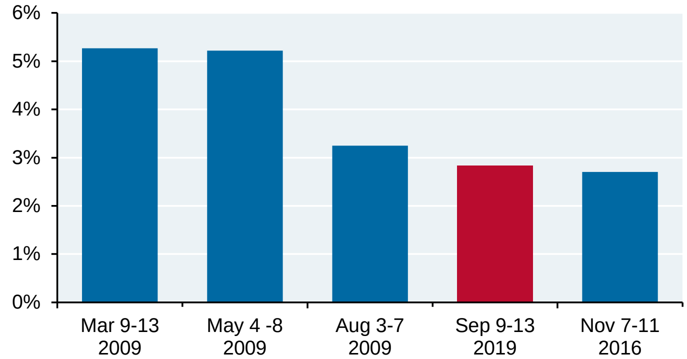
It may eventually reverse itself yet again, but some of the catalysts described above may already be starting to narrow the performance gap between growth and value. In mid-September of this year, value outperformed growth by the largest magnitude since 2009 within both the S&P 500 and Russell 1000 universes. In addition, Bloomberg's factor analysis showed the second largest return of value versus growth since 2009. We will continue to monitor this nascent value recovery, and whether it boosts manager outperformance in the months ahead (should it continue).

S&P 500 and R1000 growth versus value cumulative performance, Cumulative growth return - cumulative value return



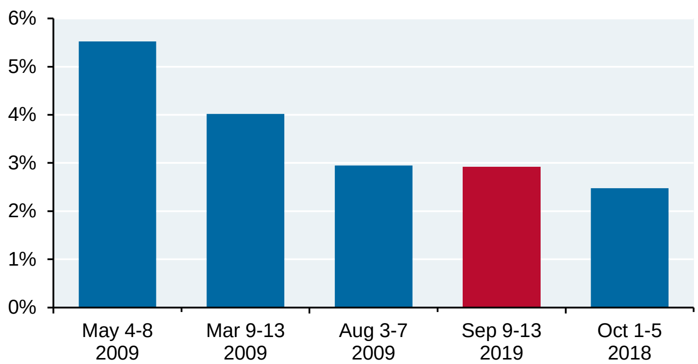
Source: Bloomberg. October 25, 2019.

Largest weekly S&P 500 value vs growth returns since 2009, Weekly value index return - growth index return



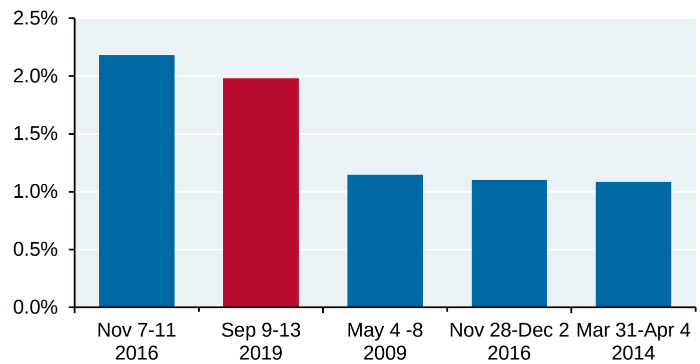
Source: Bloomberg. September 2019.

Largest weekly R1000 value vs growth returns since 2009, Weekly value index return - growth index return



Source: Bloomberg. September 2019.

Largest weekly value vs growth factor returns since 2009
Weekly value factor return - growth factor return



Source: Bloomberg. September 2019.

Appendix II: Methodology

- Most frequently used manager benchmarks by style category
- Assets under management, # of managers and benchmark/ETF availability
- Manager fee assumptions and sensitivity
- ETF tracking error by style category

Most frequently used manager benchmarks by style category

We assessed performance for each manager by comparing their returns to their stated preferred benchmark/ETF, rather than over-simplifying by using a single benchmark/ETF for each equity style category. The table below shows the top 3 most frequently used benchmarks by style category.

Top 3 benchmarks by style category

LCC	AUM	# managers
S&P 500	555,350	249
Russell 1000	142,297	89
S&P 500 (NTR)	9,481	4
LCG	**AUM**	**# managers**
Russell 1000 Growth	722,351	226
S&P 500	317,801	56
Russell 1000	50	2
LCV	**AUM**	**# managers**
Russell 1000 Value	996,494	274
S&P 500	174,348	69
Russell 1000	20,464	9
MCC	**AUM**	**# managers**
Russell MidCap	52,635	50
S&P 400	37,700	12
S&P 500	-	1
MCG	**AUM**	**# managers**
Russell MidCap Growth	217,722	99
S&P 400	39	3
Russell 3000 Growth	-	1
MCV	**AUM**	**# managers**
Russell MidCap Value	184,578	86
Russell MidCap	9,370	7
S&P 500	87	2
SCC	**AUM**	**# managers**
Russell 2000	179,285	184
S&P 600	82	3
Russell 2000 Value	105	2
SCG	**AUM**	**# managers**
Russell 2000 Growth	204,679	166
Russell 2000	4,048	7
Russell Microcap Growth	-	1
SCV	**AUM**	**# managers**
Russell 2000 Value	200,603	211
Russell 2000	11,333	25
Russell 2500 Value	876	2
ACC	**AUM**	**# managers**
Russell 3000	111,198	77
S&P 500	81,310	58
S&P 1500	2,488	9
ACG	**AUM**	**# managers**
Russell 3000 Growth	90,700	53
S&P 500	2,568	11
Russell 3000	4,391	8
ACV	**AUM**	**# managers**
Russell 3000 Value	63,597	60
S&P 500	17,278	33
Russell 3000	7,016	18

USDF	AUM	# managers
S&P 500	104,047	64
Russell 1000 Value	297,168	58
Russell 1000	43,930	10
Global	**AUM**	**# managers**
MSCI World-ND	849,671	303
MSCI ACWI-ND	578,008	270
MSCI ACWI-GD	333,020	105
ACWI ex US	**AUM**	**# managers**
MSCI ACWI ex-US-ND	328,300	142
MSCI ACWI ex-US-GD	187,305	49
MSCI ACWI ex-US Small Cap-ND	11,838	28
Europe	**AUM**	**# managers**
MSCI Europe-ND	155,048	120
MSCI EMU-ND	38,920	31
MSCI Europe-GD	113,707	30
Asia ex JPN	**AUM**	**# managers**
MSCI AC Asia ex-Japan-ND	60,804	54
MSCI AC Asia ex-Japan-GD	17,883	26
MSCI AC Asia ex-Japan Small Cap-ND	1,506	9
Japan	**AUM**	**# managers**
TOPIX	118,612	186
MSCI Japan-ND	19,103	18
Russell/Nomura Small Cap	5,179	17
Australia	**AUM**	**# managers**
S&P/ASX 300	36,716	68
S&P/ASX 200	57,554	51
S&P/ASX Small Ordinaries	6,002	33
EAFE	**AUM**	**# managers**
MSCI EAFE-ND	628,423	210
MSCI EAFE-GD	107,876	41
MSCI EAFE Small Cap-ND	40,443	39
Canada	**AUM**	**# managers**
S&P/TSX Composite	125,928	140
S&P/TSX Capped Composite	29,176	37
S&P/TSX Small Cap	5,420	15
UK	**AUM**	**# managers**
FTSE All Share	210,107	94
FTSE SmallCap ex-Investment Trust	1,911	5
Numis Small Companies ex-IT	3,643	3
EM	**AUM**	**# managers**
MSCI EM-ND	651,039	246
MSCI EM-GD	136,912	63
MSCI EM Small Cap-ND	27,203	46

Source: eVestment, J.P. Morgan Asset Management. 2019.

Assets under management, # of managers and benchmark/ETF availability

The eVestment database includes all managers that reported returns at any time since 1996. The AUM below refers to the December 2018 AUM for managers currently reporting. The # of managers column refers to the number of managers that have ever reported since 1996, including legacy managers.

For ~75% of manager AUM, we were able to identify the ETF which corresponds to the manager's benchmark. Using ETFs rather than an index is a better way of capturing the real-life opportunity set of choices for investors, since ETFs incorporate both fees and tracking error. In some cases, managers have benchmarks that are "benchmark-agnostic", custom benchmark blends or "blank"; these managers were excluded from our analysis. Such exclusions represented 4% of all assets and 9% of all managers included in the eVestment database.

			By assets under management			By number of managers		
Style category	AUM (US$ mm)	Managers	ETF available	No ETF available	No benchmark available	ETF available	No ETF available	No benchmark available
Large Cap Core	765,687	379	92%	6%	2%	94%	4%	2%
Large Cap Growth	1,047,300	294	100%	0%	0%	98%	1%	2%
Large Cap Value	1,255,196	389	97%	3%	0%	96%	2%	2%
Mid Cap Core	92,326	67	98%	2%	0%	96%	1%	3%
Mid Cap Growth	222,985	107	100%	0%	0%	97%	3%	0%
Mid Cap Value	198,315	103	98%	2%	0%	97%	3%	0%
Small Cap Core	181,068	196	99%	1%	0%	97%	2%	2%
Small Cap Growth	231,214	176	90%	10%	0%	98%	2%	0%
Small Cap Value	213,251	242	99%	0%	0%	98%	1%	0%
All Cap Core	213,587	168	92%	6%	2%	86%	8%	6%
All Cap Growth	112,687	90	18%	82%	0%	31%	67%	2%
All Cap Value	92,990	132	30%	69%	1%	49%	48%	2%
U.S. Dividend Focused	541,804	182	86%	13%	1%	87%	8%	5%
Global	2,487,014	1290	66%	25%	9%	54%	32%	14%
ACWI ex US	713,971	320	55%	43%	1%	52%	45%	3%
Europe	624,849	559	38%	48%	15%	37%	34%	29%
Asia ex Japan	113,354	136	54%	44%	2%	40%	53%	7%
Japan	208,147	317	66%	24%	10%	65%	20%	15%
Australia	123,151	227	77%	16%	8%	52%	30%	18%
EAFE	1,050,088	428	68%	32%	0%	61%	37%	2%
Canada	191,165	246	84%	4%	12%	78%	9%	13%
United Kingdom	298,662	132	70%	23%	7%	71%	12%	17%
Emerging Markets	969,505	527	71%	26%	3%	51%	41%	9%
Aggregate	11,948,316	6707	76%	20%	4%	68%	23%	9%

Source: eVestment, J.P. Morgan Asset Management. 2019. AUM as of December 2018 for current managers only; the number of managers includes legacy managers no longer reporting.

We also excluded managers from the eVestment database that do not provide gross of fee performance (since we cannot vary fee levels), and managers that do not allow their performance data to be converted and reported in US dollar terms.

Manager fee assumptions

The eVestment database provides gross of fee return data for each manager. We used average Mutual Fund "I" Share Class fees within each style category, based on category designations assigned by Morningstar, and the managers tracked by them. The "I" share class refers to "Institutional" share classes that are made available to institutions, and also to individuals with access to them. In order to get a broader sense of fee levels applied to investors, we also included fees from managers who do not offer "I" Share Classes. In that case, we used the cheapest share class for that manager.

Exceptions. Morningstar does not analyse the following as unique, mutually exclusive categories: US Dividend Focused, ACWI ex US, UK, Canada and Australia. As a result, we made some assumptions regarding their fee levels. For two categories, we estimated fee levels based on categories with similar holdings: Large Cap Value fees were used as a proxy for US Dividend Focused fees, and EAFE fees as a proxy for ACWI ex US fees. For the UK, Canada and Australia, there were no categories with similar holdings, so we used Europe as a proxy for a non-US developed market.

Manager fees (in bps) by category

Style category	Average fee
Large Cap Core	67
Large Cap Growth	78
Large Cap Value	71
Mid Cap Core	78
Mid Cap Growth	93
Mid Cap Value	84
Small Cap Core	91
Small Cap Growth	101
Small Cap Value	97
All Cap Core	81
All Cap Growth	86
All Cap Value	108
U.S. Dividend Focused	71
Global	93
ACWI ex US	87
Europe	85
Asia ex Japan	106
Japan	92
Australia	85
EAFE	87
Canada	85
United Kingdom	85
Emerging Markets	112

Source: eVestment, Morningstar, J.P. Morgan Asset Management. 2019.

ETF tracking error by style category

Tracking error measures the degree to which two return series differ. It can be used to measure the deviation of returns between managers and their benchmarks, or between an ETF and the benchmark it tracks. The latter deviation results from differences in ETF constituent stocks when compared to its corresponding benchmark, and is computed in our analysis as the annualized standard deviation of monthly return differences. ETFs may not be able to hold 100% of a benchmark's constituents due to liquidity constraints. The table below shows the difficulty that some ETF creators have in tightly tracking benchmark performance. Some ETF tracking errors shown below are quite large, since they are not that different from the tracking error budgeted by active managers against their benchmarks in the pursuit of excess return.

ETF tracking error

Style category	AUM weighted average annualized tracking error	Top benchmarks for which ETF tracking errors were computed
Large Cap Core	0.58%	S&P 500, Russell 1000, MSCI USA-ND
Large Cap Growth	0.65%	Russell 1000 Growth, S&P 500, Russell 1000
Large Cap Value	0.57%	Russell 1000 Value, S&P 500, Russell 1000
Mid Cap Core	0.68%	Russell MidCap, S&P 400, S&P 500
Mid Cap Growth	0.51%	Russell MidCap Growth, S&P 400, Russell 2500
Mid Cap Value	0.47%	Russell MidCap Value, Russell MidCap, S&P 500
Small Cap Core	0.96%	Russell 2000, S&P 600, Russell 2000 Value
Small Cap Growth	0.91%	Russell 2000 Growth, Russell 2000
Small Cap Value	1.01%	Russell 2000 Value, Russell 2000, S&P 500
All Cap Core	0.62%	Russell 3000, S&P 500, Russell 1000
All Cap Growth	0.81%	S&P 500, Russell 3000, Russell 1000 Growth
All Cap Value	0.58%	S&P 500, Russell 3000, Russell 1000 Value
U.S. Dividend Focused	0.59%	S&P 500, Russell 1000 Value, Russell 1000
Global	2.02%	MSCI World-ND, MSCI ACWI-ND, MSCI World-GD
ACWI ex US	3.01%	MSCI ACWI ex-US-ND, MSCI EAFE-ND, MSCI EAFE Value-ND
Europe	5.09%	MSCI Europe-ND, MSCI EMU-ND, MSCI Europe Small Cap-ND
Asia ex Japan	4.93%	MSCI AC Asia ex-Japan-ND
Japan	2.39%	TOPIX, MSCI Japan-ND, S&P 500
Australia	1.80%	S&P/ASX 300, S&P/ASX 200
EAFE	2.98%	MSCI EAFE-ND, MSCI EAFE Small Cap-ND, MSCI EAFE Value-ND
Canada	1.75%	S&P/TSX Composite, S&P/TSX Capped Composite, S&P/TSX Small Cap
United Kingdom	1.39%	FTSE All Share
Emerging Markets	5.09%	MSCI EM-ND, MSCI Emerging Markets

Source: eVestment, J.P. Morgan Asset Management. 2019. Tracking errors were computed since the later of June 2004 and the inception of each ETF through June 2019.

Acronyms

AUM	Assets under management
ETF	Exchange traded fund
P/E	Price to earnings
QE	Quantitative easing
LCC	Large cap core
LCG	Large cap growth
LCV	Large cap value
MCC	Mid cap core
MCG	Mid cap growth
MCV	Mid cap value
SCC	Small cap core
SCG	Small cap growth
SCV	Small cap value
ACC	All cap core
ACG	All cap growth
ACV	All cap value
USDF	U.S. dividend focused
ACWI	All Country World Index
EAFE	Europe, Australasia, and Far East
UK	United Kingdom
EM	Emerging markets

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