Empirical Research Partners
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Stock Selection: Research and Results October 2018

Top-Line Growers: The Free Cash Flow Imperative, Rankings: More 1s the Better, Modeling MLPs: Our Record

Top-Line Growers and Free Cash Flow Production

- Large-cap growth stocks with strong top-line growth, and today that means in the high-20s or better, have performed best when they're free cash flow generators and their margins put them into the top-two quintiles of their universe. In fact over the long run only the Big Growers with that virtue that've outperformed the benchmark, as the compounding of free cash flow makes them formidable. Net margins don't convey the same information as those based on free cash flow.
- The Big Top-Line Growers now have free cash flow margins in the high-teens. That means that free cash flow production has become a larger component of the valuation of those stocks. Appendix 1 on page 14 presents the growth stocks with the best top-line trajectories, sorted by their free cash flow margins.

Rankings: More 1s the Better

- Clients sometimes ask about how to interpret the ranking reports produced by our models. What they want to know is: Are all top-quintile stocks created equal, or does they way they reach that point influence their expected returns? The answer is that the path does matter and the greater coincidence of 1 ranks the higher the expected return. Stocks with 1s on all three of our fundamental super factors – valuation, capital deployment and earnings quality – have outperformed the market by about twice as much as other top-quintile issues. If a 1 on market reaction, our measure of investor sentiment, is added into the mix, the odds of success improve further, but four of a kind is a rare hand.
- Generally any combination of two 1s is better than a single one, although the best duo at any point in time has depended on the mood of the equity market. Of note, strong earnings quality that's been recognized by investors, as evidenced by a top-quintile market reaction score, has been a winner in all settings. Good capital deployment together with a top market reaction rank has also generated an enviable record. Low valuation plus strong capital deployment has been a good combo too. Exhibit 21 on page 8 presents stocks with winning combinations.

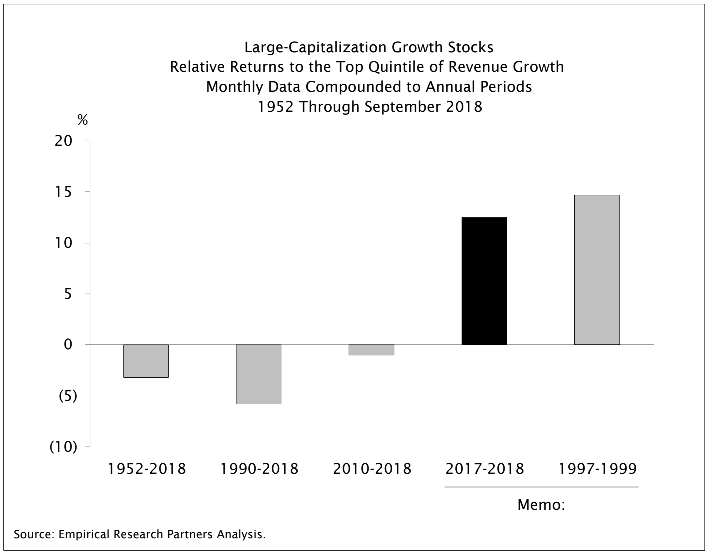
Modeling MLPs: Surprisingly, the Trend Has Been Your Friend

- Almost six years ago we launched a model to pick among energy-focused MLPs. Since then issues in its top quintile have outperformed the universe by almost +7 percentage points per annum, while those in the bottom one have lagged by nearly (6) points. The cap-weighted numbers are +5 and (5.5) points respectively. They matter because the universe is top heavy and the five-largest MLPs account for more than 40% of its capitalization.
- What's surprising is that the trend-following variables in the model, that look at price behavior and the breadth of analysts estimate revisions, have contributed mightily to its performance. That's consistently been the case, once again on both an equally- and cap-weighted basis. Some of that alpha might be attributable to the growing involvement of institutions in the asset class, and they now own almost half of it. MLPs with little or no profitability have been laggards. Like elsewhere in the energy sector, buying revenues at a low multiple has worked out. Exhibit 42 on page 13 presents MLPs with capitalizations of $2 billion or greater than rank in the top-three quintiles of our model.

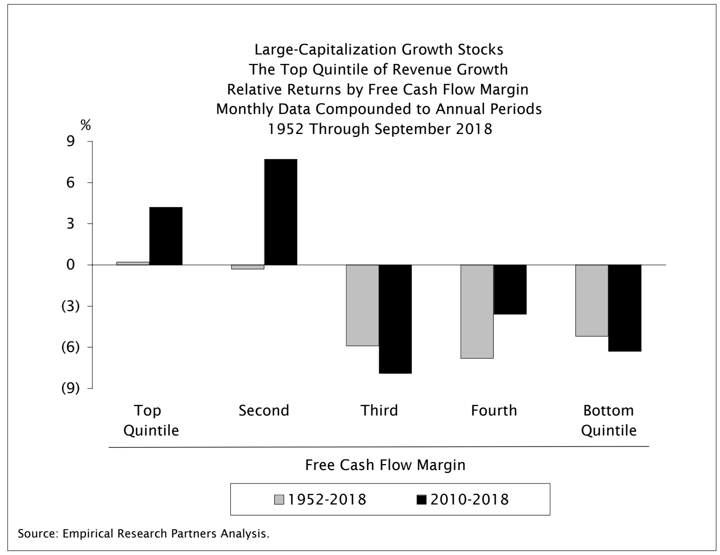
Nicole Price (212) 803-7935 Yi Liu (212) 803-7942 Yu Bai (212) 803-7919 Yuntao Ji (212) 803-7920 Longying Zhao (212) 803-7940 Janai Haynes (212) 803-8005

Conclusions in Brief

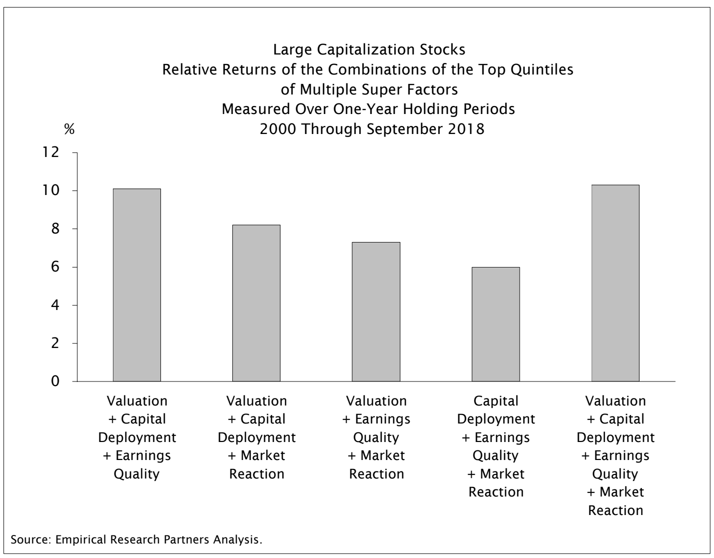
- In the world of growth stocks those with big top-line trajectories have led lately…



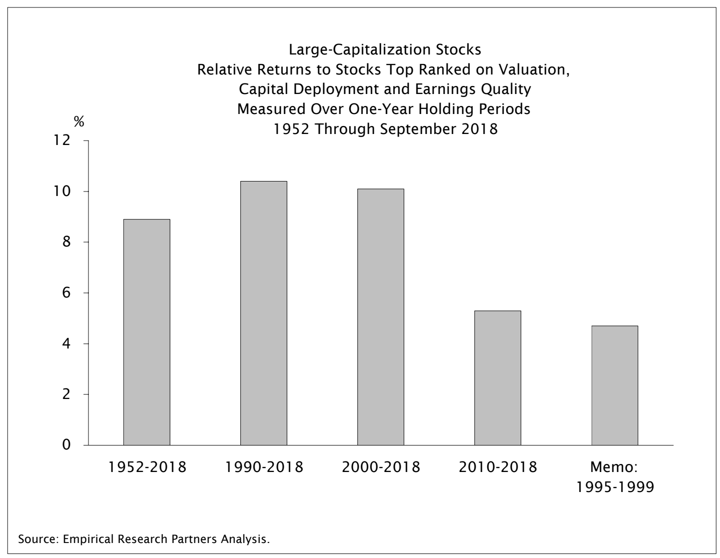
- ….And they perform best if they're free cash flow generators:



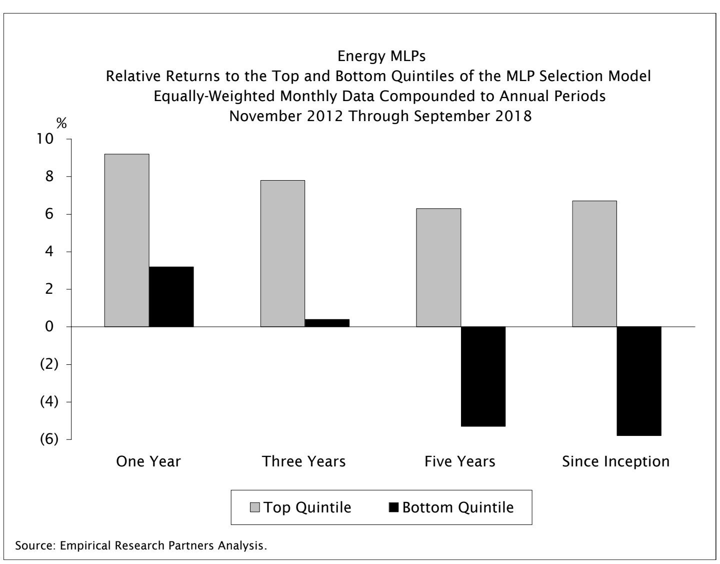
- In our ranking reports a series of 1s is a good thing…



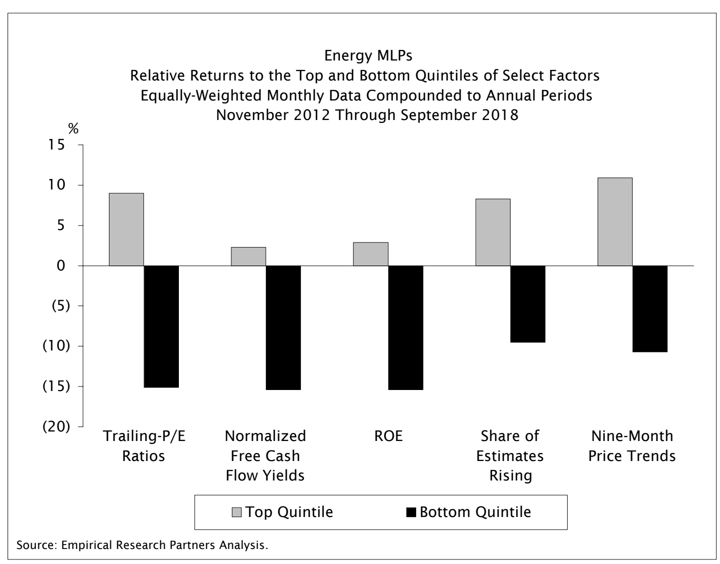
- …Particularly in the three fundamental categories:



- Our energy MLP selection model has done well…



- …As momentum strategies have been successful there:

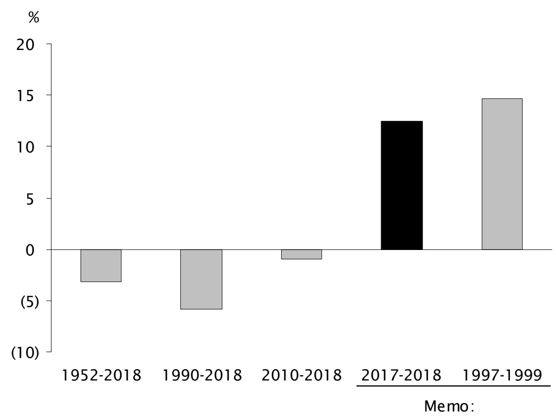


Big Top-Line Growers: The Free Cash Flow Imperative

All Growth Is Not Created Equal

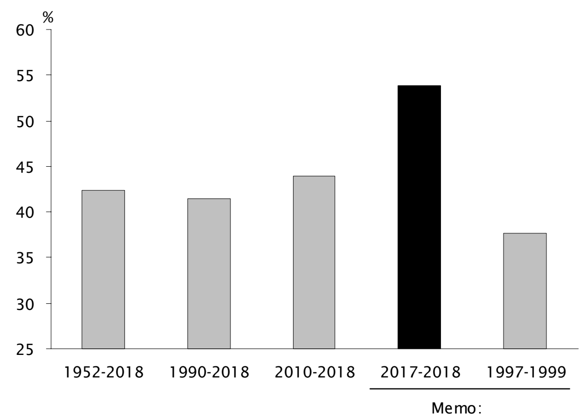
The last few years have been great ones for managers of large-cap growth stocks. Not only has the style been in favor, the leadership has included many issues with the best top-line growth rates. That's the natural habitat for many portfolio managers. As shown at the right in Exhibit 1, the latest run has been an impressive one for big top-line growers, that over the long run have trailed the benchmark. Their recent performance is unusual but not unprecedented, and the recent numbers resemble those put up in the late-1990s, that include a parabolic rise in 1999. What's been noteworthy is the win rate, and since the beginning of 2017 more than half of the revenue-growth elite have produced alpha, thirteen percentage points more than usual (see Exhibit 2).

Exhibit 1: Large-Capitalization Growth Stocks
Relative Returns to the Top Quintile of Revenue Growth
Monthly Data Compounded to Annual Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

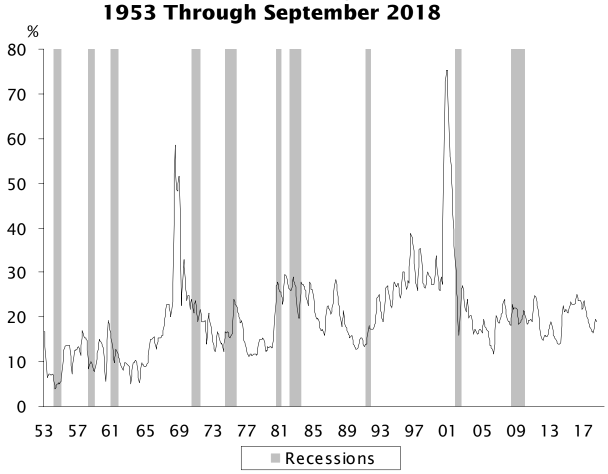
Exhibit 2: Large-Capitalization Growth Stocks
The Top Quintile of Revenue Growth
Share of Stocks Outperforming the Universe
1952 Through September 2018



Source: Empirical Research Partners Analysis.

The big top-line growers usually offer a substantial growth-rate advantage over the market, and the current one isn't exceptional. Exhibit 3 charts the differential between the growth rate needed to rank among the leadership relative to that for the S&P 500. What's helped boost this set of stocks is their free cash flow production, and just like in the rest of the market those margins are far above levels seen in the past (see Exhibit 4). Large amounts of cash flow are compounding at a rapid clip. We'll now examine how the growth rates and free cash flow have interacted.

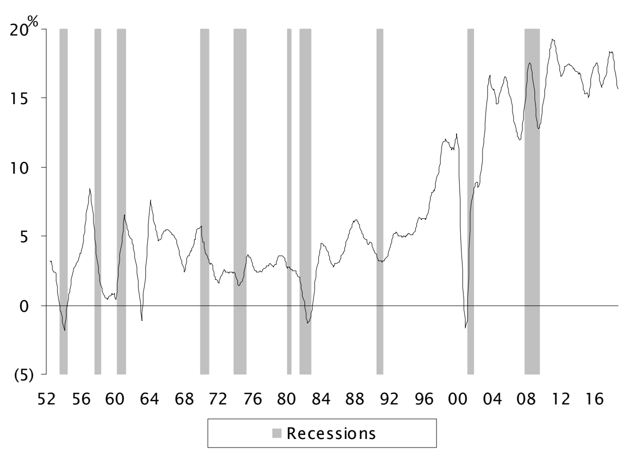
Exhibit 3: Large-Capitalization Growth Stocks
Minimum Revenue Growth Rate to Rank in the
Top Quintile Minus That of the S&P 500[1]
Measured on a Trailing Four-Quarter Basis
1953 Through September 2018



Source: National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Excludes financials; data smoothed on a trailing three-month basis.

Exhibit 4: Large-Capitalization Growth Stocks[1]
The Top Quintile of Revenue Growth
Free Cash Flow Margins
1952 Through September 2018

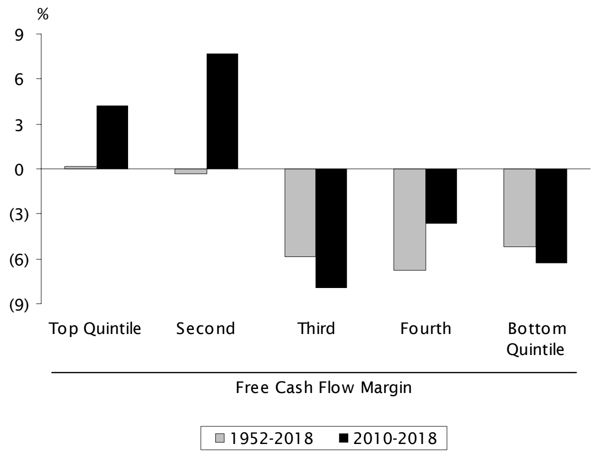


Source: National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Excludes financials; capitalization-weighted data smoothed on a trailing one-year basis.

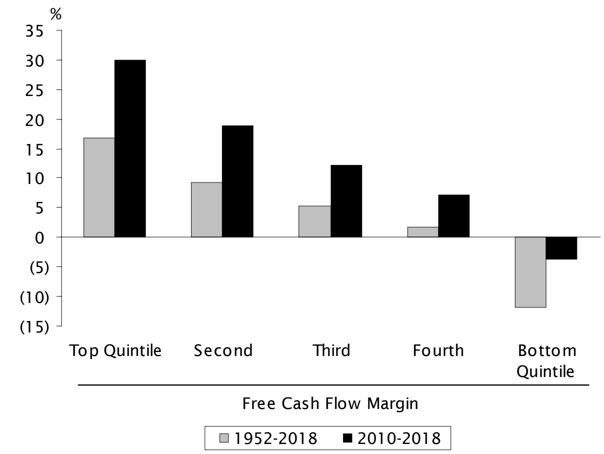
Large-cap growth stocks with top-quintile revenue growth rates are most likely to outperform when they also offer strong free cash flow production (see Exhibit 5). In this chart the grey bars represent their relative returns since 1952 and the black ones are the results since 2010. In this decade the level of the margins has told the tale and half the top-line growers with big free cash flow production have outperformed their benchmark, a strong win rate, by the standards of this group (see Exhibits 6 and 7).

Exhibit 5: Large-Capitalization Growth Stocks
The Top Quintile of Revenue Growth
Relative Returns by Free Cash Flow Margin
Monthly Data Compounded to Annual Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

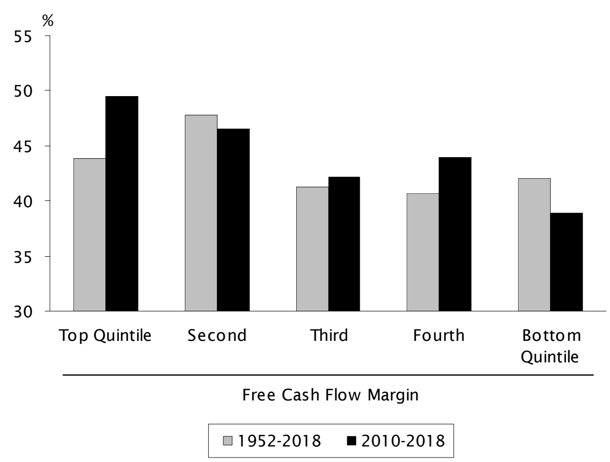
Exhibit 6: Large-Capitalization Growth Stocks[1]
The Top Quintile of Revenue Growth
Average Margins by Free Cash Flow Margin Quintile
1952 Through September 2018



Source: Empirical Research Partners Analysis.

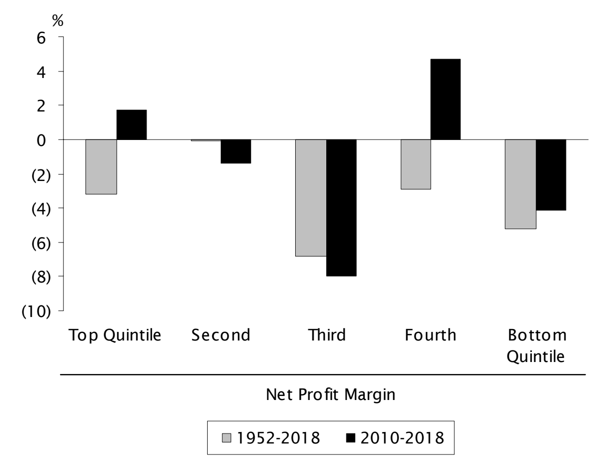
Free cash flow margins have mattered more than profit margins when picking among growth stocks. In fact, substituting net margins into the equation doesn't tell any story at all (see Exhibit 8).

Exhibit 7: Large-Capitalization Growth Stocks
The Top Quintile of Revenue Growth
Share of Stocks Outperforming by Free Cash Flow Margin
Monthly Data Compounded to Annual Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

Exhibit 8: Large-Capitalization Growth Stocks
The Top Quintile of Revenue Growth
Relative Returns by Net Profit Margin
Monthly Data Compounded to Annual Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

Conclusion: Good is Good

In equity investing sometimes bad is good, but that's not usually the case in the growth stock arena. There, we're rarely asked to call turning points, rather it's evidence about the sustainability of the status quo that counts. High free cash flow margins aren't seen as a vulnerability, signally the potential for regression to the mean, but instead tell us that the resources are there to self finance rapid growth and avoid dilution.

Appendix 1 on page 14 presents the growth stocks offering the best top-line trajectories sorted by their free cash flow margins.

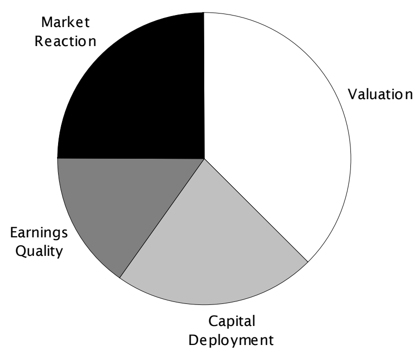
Ranking Reports: The More 1s Better?

Four Legs Make a Better Stool

In this research we describe how to interpret the ranking reports generated by our stock selection models. Specifically we address a question we receive quite frequently: Do stocks with top-quintile ranks on multiple super factors outperform those with the same overall rank but fewer 1s?

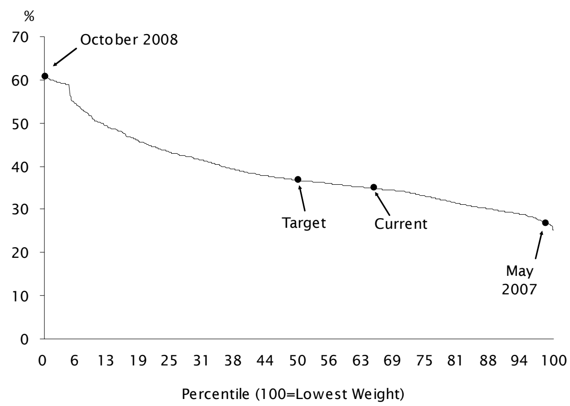
Our stock selection models consist of four building blocks. They assess what managements are doing with their capital (capital deployment and financing), the financial results those decisions are yielding (earnings quality), what investors are paying for them (valuation), and whether the crowd is becoming more or less excited about the prospects for the company (market reaction). Exhibit 9 presents the target weighting assigned to each of our super factors. While the building blocks have remained consistent over the years, the methodologies behind them have become considerably more sophisticated. This year a number of Big Data feeds were incorporated into our market reaction framework.

Exhibit 9: Large-Capitalization Stocks
Core Stock Selection Model
Super Factor Target Weights
As of September 2018



Source: Empirical Research Partners Analysis.

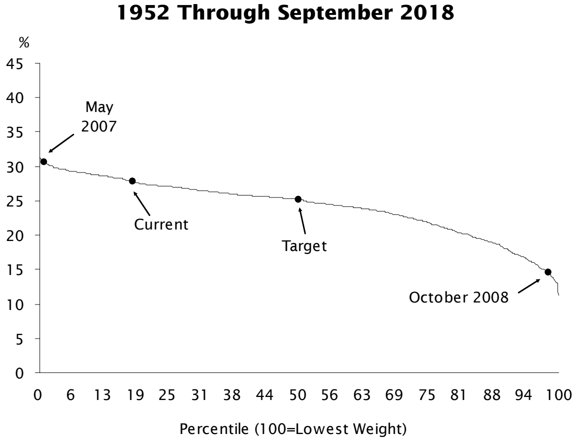
Exhibit 10: Large-Capitalization Stocks
The Core Model
Contribution of Valuation to the Expected Returns
Current versus History
1952 Through September 2018



Source: Empirical Research Partners Analysis.

In our models the way the building blocks get put together depends on an assessment of the opportunity set and the market's regime. For example, in the core model the weight accorded to valuation can vary from 25% to 60% of the expected return and currently it's at 35% (see Exhibit 10). Sometimes we're being paid to try to exploit misvaluation while at others we're not. The importance we attach to the opinions of others also varies, and they count more when there aren't provocative anomalies to be resolved, which is the situation at the moment (see Exhibit 11).

Exhibit 11: Large-Capitalization Stocks
The Core Model
Contribution of Market Reaction to the Expected Returns
Current versus History
1952 Through September 2018



Source: Empirical Research Partners Analysis.

Exhibit 12: Large-Capitalization Consumer Cyclical Stocks
Core Model Ranking
Sorted by Capitalization
As of Early-October 2018

			Quintile Ranks (1=Best; 5=Worst)					
			Super Factors					
Symbol	Company	Price	Valuation	Capital Deployment	Earnings Quality and Trend	Market Reaction	Core Model Rank	Market Capitalization ($ Billion)
NKE	NIKE INC	$84.46	5	2	1	1	1	$135.9
LOW	LOWE'S COMPANIES INC	114.07	2	1	1	2	1	92.5
TJX	TJX COMPANIES INC	112.23	4	2	1	1	1	70.4
TGT	TARGET CORP	88.47	1	4	3	1	1	46.6
ROST	ROSS STORES INC	98.58	4	1	1	2	1	36.9
ORLY	O'REILLY AUTOMOTIVE INC	345.78	3	3	1	1	1	28.0
BBY	BEST BUY CO INC	79.01	1	1	2	3	1	21.8
AZO	AUTOZONE INC	770.35	2	3	3	3	1	19.8
EXPE	EXPEDIA GROUP INC	130.32	1	1	2	3	1	19.5
KSS	KOHL'S CORP	76.05	1	1	1	1	1	12.7
AAP	ADVANCE AUTO PARTS INC	169.60	3	2	1	1	1	12.6
RL	RALPH LAUREN CORP	135.44	2	1	3	1	1	11.0
M	MACY'S INC	34.71	1	2	4	1	1	10.7
JWN	NORDSTROM INC	60.63	1	1	1	1	1	10.2

Source: Empirical Research Partners Analysis.

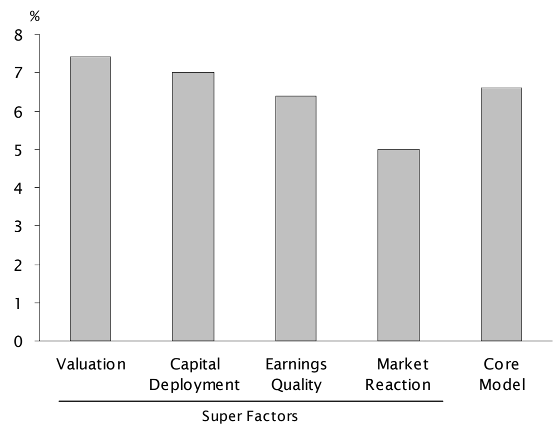
The results of the modeling process are displayed in reports like the one shown in Exhibit 12 (overleaf). At the far right it depicts the core model quintile rank for each stock. There are many paths to the top as apparent in the differences in the super factor scores for Nike and Target.

Clients ask: Does the way a stock gets to the top matter, and are some combinations better than others? We examined those questions using data since 1952 and here we present the results beginning in 2000. That choice of period does affect the conclusions somewhat as the span we chose includes the collapse of the momentum leadership of the late-1990s. At the end we'll touch upon the differences across different eras.

There are a Number of Winning Combinations

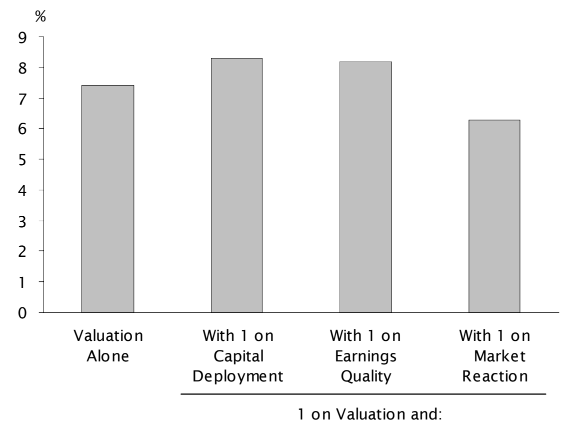
All of our super factors have added value in the last 19 years, with valuation the best of the lot (see Exhibit 13). Its advantage has to do with the starting point we've chosen, the peak of the New Economy era. The relative returns shown here and elsewhere are equally weighted and based on one-year holding periods.

**Exhibit 13: Large-Capitalization Stocks
Relative Returns of the Top Quintile
of Our Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018**



Source: Empirical Research Partners Analysis.

**Exhibit 14: Large-Capitalization Stocks
Best Quintile of Valuation
Relative Returns When Combined
With the Top Quintile of Other Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018**



Source: Empirical Research Partners Analysis.

Exhibit 14 looks at the performance of stocks that rank in the best quintile of valuation and those that also rank well on another super factor as well. Bringing a good capital deployment or earnings quality score to the fold has added around a hundred basis points to returns. Those combinations tell us that things are poised to get better or are already in the process of doing so. Top-quintile market reaction scores actually detracted from returns in the time frame we studied, largely a result of the collapse of the commodities boom of the 2000s. The odds of a value stock also being top rated on capital deployment exceed 50%, while on the other two criteria they're about one-in-four.

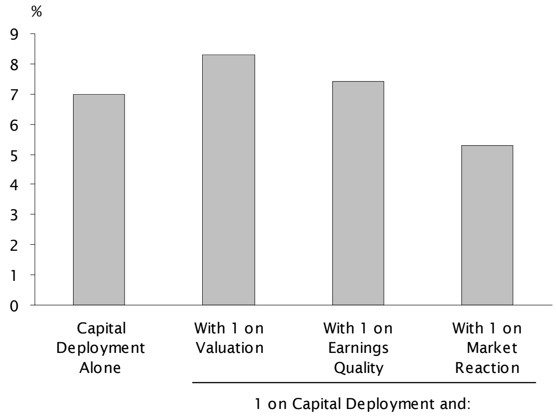
There's a synergy on having 1s on both capital deployment and earnings quality that's also in the ballpark of +50 to +100 basis points (see Exhibits 15 and 16). Somewhere between a third and half of the issues that are top ranked on one of those super factors will have the same status on the other.

When we start with momentum stocks, drawn from the top-quintile of market reaction, a good valuation score has been worth +130 basis points to the return in the next year (see Exhibit 17). The odds of that combination appearing are about four in ten.

Putting it all together, stocks that rank in the top quintile of all three fundamental components of our model – valuation, capital deployment and earnings quality – have outperformed by +10 percentage points per annum (see Exhibit 18). On average about 15 issues out of 750 large-cap issues will offer that combination, while only 3 or 4 will have ones across all four of our super factors.

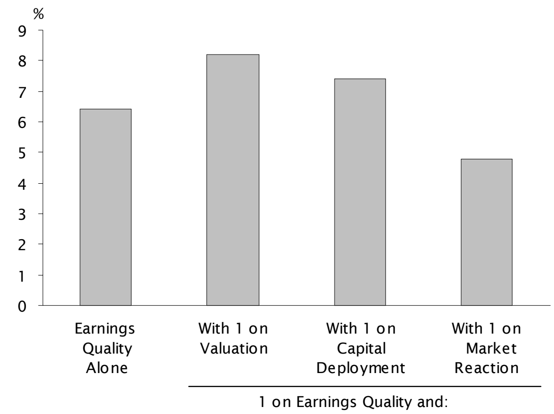
No matter what the era, the coincidence of low valuation and good capital deployment and earnings quality has turned out to be a winner (see Exhibit 19). The results in the 2010s have been weaker than those that came before, as low valuation hasn't been rewarded in the last five years. In that span the win rate has been in the low rather than the mid-50s (see Exhibit 20). As shown at the right, the precedent for this period was the New Economy years, 1995 through 1999.

Exhibit 15: Large-Capitalization Stocks
Best Quintile of Capital Deployment
Relative Returns When Combined
With the Top Quintile of Other Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018



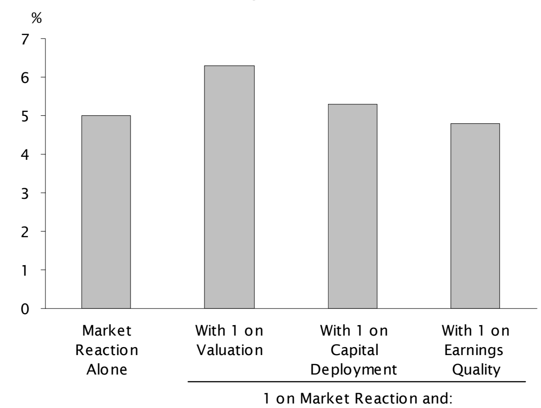
Source: Empirical Research Partners Analysis.

Exhibit 16: Large-Capitalization Stocks
Best Quintile of Earnings Quality
Relative Returns When Combined
With the Top Quintile of Other Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018



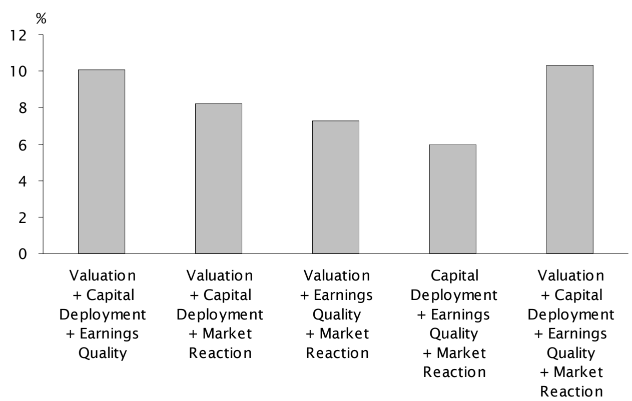
Source: Empirical Research Partners Analysis.

Exhibit 17: Large-Capitalization Stocks
Best Quintile of Market Reaction
Relative Returns When Combined
With the Top Quintile of Other Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018



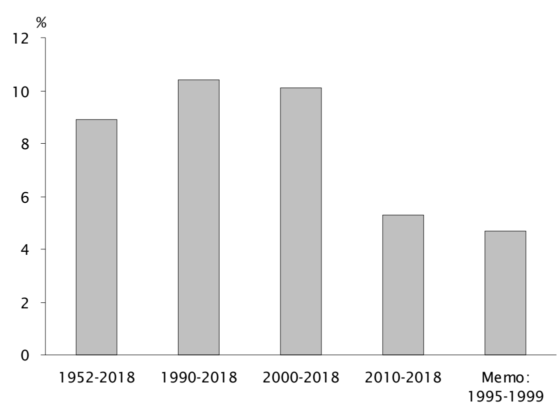
Source: Empirical Research Partners Analysis.

Exhibit 18: Large-Capitalization Stocks
Relative Returns of the Combinations of
the Top Quintiles of Multiple Super Factors
Measured Over One-Year Holding Periods
2000 Through September 2018



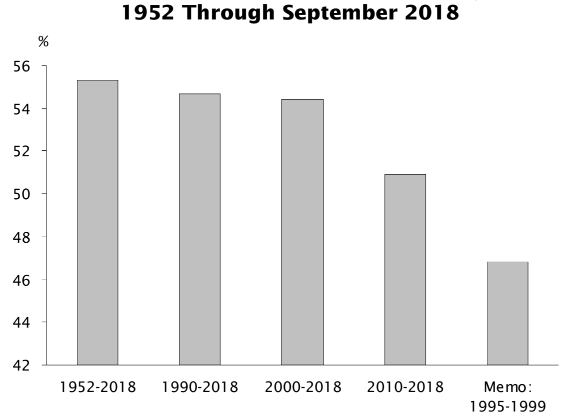
Source: Empirical Research Partners Analysis.

Exhibit 19: Large-Capitalization Stocks
Relative Returns to Stocks Top Ranked on Valuation,
Capital Deployment and Earnings Quality
Measured Over One-Year Holding Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

Exhibit 20: Large-Capitalization Stocks
Share of Stocks Top Ranked on Valuation,
Capital Deployment and Earnings Quality
Outperforming the Market
Measured Over One-Year Holding Periods
1952 Through September 2018



Source: Empirical Research Partners Analysis.

Conclusion: The More 1s the Better

In general our models have performed better than any of their super factors, so the focus first and foremost should be on the overall rank. The models have benefited from the engineering that goes into putting the disparate pieces together. That said, as a rule, the more 1s the better, and it's been particularly helpful if all the fundamental factors (i.e., valuation, capital deployment and earnings quality) point in a positive direction.

Exhibit 21 presents the stocks that offer a winning set of attributes. Four of them, shown at the top have 1s in all super factors. Over the long run the very-best returns have been generated by stocks with that combination and at the moment the stocks that meet that criterion are Marathon Petroleum, Kohl's, Nordstrom and AES Corp. That's about the usual number.

We also highlight other intersections of super factors that have good track records: 1s on all the fundamental ones, 1s on earnings quality and market reaction, 1s on capital deployment and market reaction, and finally value stocks with top-quintile market reaction scores.

Exhibit 21: Large-Capitalization Stocks
Top Quintile Model Ranks
Winning Combinations of Super Factor Ranks
Sorted by Capitalization Within Combination
As of End-September 2018

			Quintile Ranks (1=Best; 5=Worst)							
			Super Factors							
Symbol	Company	Price	Valuation	Capital Deployment	Earnings Quality	Market Reaction	Core Model Rank	Forward P/E-Ratio		Market Capitalization ($ Billion)
All 1s										
MPC	MARATHON PETROLEUM CORP	$79.97	1	1	1	1	1	13.4	x	$36.5
KSS	KOHL'S CORP	74.55	1	1	1	1	1	13.4		12.4
JWN	NORDSTROM INC	59.81	1	1	1	1	1	16.4		10.1
AES	AES CORP	14.00	1	1	1	1	1	11.3		9.3
Fundamental Super Factors All 1s										
E	ENI SPA	$37.66	1	1	1	3	1	12.9	x	$68.7
LRCX	LAM RESEARCH CORP	151.70	1	1	1	5	1	10.3		23.8
TEVA	TEVA PHARMACEUTICAL INDUSTRIES-ADR	21.54	1	1	1	4	1	7.7		22.3
OMC	OMNICOM GROUP	68.02	1	1	1	4	1	12.0		15.3
Earnings Quality and Market Reaction 1s										
AAPL	APPLE INC	$225.74	3	2	1	1	1	16.9	x	$1,093.2
NKE	NIKE INC	84.72	5	2	1	1	1	32.0		136.4
TJX	TJX COMPANIES INC	112.02	3	2	1	1	1	22.3		70.2
PANW	PALO ALTO NETWORKS INC	225.26	5	3	1	1	1	45.1		21.1
WCG	WELLCARE HEALTH PLANS INC	320.49	2	4	1	1	1	27.1		16.0
FTNT	FORTINET INC	92.27	4	1	1	1	1	51.8		15.6
BR	BROADRIDGE FINANCIAL SOLUTIONS	131.95	3	2	1	1	1	28.4		15.3
MOS	MOSAIC CO	32.48	2	5	1	1	1	18.0		12.5
AAP	ADVANCE AUTO PARTS INC	168.33	3	2	1	1	1	22.8		12.5
FFIV	F5 NETWORKS INC	199.42	3	2	1	1	1	19.4		12.1
NRG	NRG ENERGY INC	37.40	2	2	1	1	1	11.3		11.3
NBIX	NEUROCRINE BIOSCIENCES INC	122.95	5	5	1	1	1	NM		11.1
RHI	ROBERT HALF INTERNATIONAL INC	70.38	3	1	1	1	1	19.6		8.6
HLF	HERBALIFE NUTRITION LTD	54.55	2	1	1	1	1	18.2		8.6
KAR	KAR AUCTION SERVICES INC	59.69	2	2	1	1	1	19.2		8.0
Capital Deployment and Market Reaction 1s										
UNP	UNION PACIFIC CORP	$162.83	4	1	3	1	1	19.8	x	$120.4
COP	CONOCOPHILLIPS	77.40	3	1	4	1	1	16.5		89.9
SNE	SONY CORP	60.65	2	1	2	1	1	15.0		77.9
CSX	CSX CORP	74.05	4	1	2	1	1	19.5		63.6
NSC	NORFOLK SOUTHERN CORP	180.50	4	1	3	1	1	19.0		50.5
VLO	VALERO ENERGY CORP	113.75	2	1	3	1	1	14.3		48.7
HCA	HCA HEALTHCARE INC	139.12	2	1	3	1	1	14.6		48.2
HUM	HUMANA INC	338.52	3	1	3	1	1	22.1		46.6
UAL	UNITED CONTINENTAL HOLDINGS INC	89.06	1	1	2	1	1	10.0		24.3
NTAP	NETAPP INC	85.89	3	1	2	1	1	19.4		22.3
HES	HESS CORP	71.58	5	1	1	1	1	NM		21.5
MSCI	MSCI INC	177.41	5	1	na	1	1	31.9		15.8
HFC	HOLLYFRONTIER CORP	69.90	2	1	3	1	1	11.2		12.3
RL	RALPH LAUREN CORP	137.55	2	1	3	1	1	20.5		11.2
AZPN	ASPEN TECHNOLOGY INC	113.91	5	1	2	1	1	35.5		8.1
Valuation and Market Reaction Both 1s										
TGT	TARGET CORP	$88.21	1	4	3	1	1	16.2	x	$46.4
CTL	CENTURYLINK INC	21.20	1	5	3	1	1	19.0		22.9
M	MACY'S INC	34.73	1	2	4	1	1	8.8		10.7
ALSN	ALLISON TRANSMISSION HOLDINGS	52.01	1	4	2	1	1	11.5		6.8

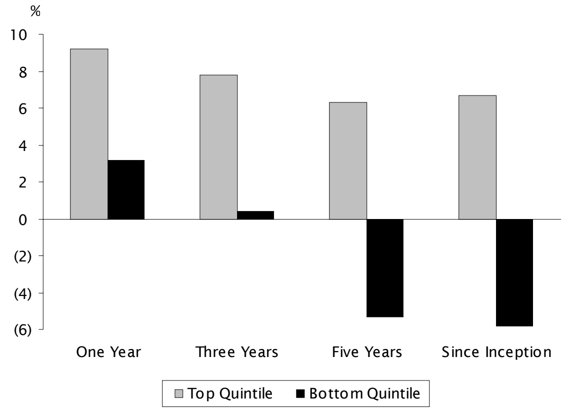
Source: Empirical Research Partners Analysis.

The Energy MLP Model: Surprisingly, the Trend Has Been Your Friend

Good Numbers from an Unexpected Source

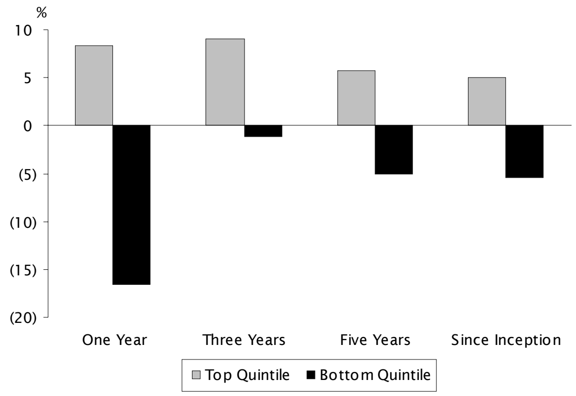
Almost six years ago we launched a model designed to pick from among a universe of energy MLPs. It's had a good record, when measured on either an equally- and cap-weighted basis (see Exhibits 22 and 23). The cap-weighted numbers are particularly important here because the five-largest MLPs account for more than 40% of the capitalization of the universe.

Exhibit 22: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of the MLP Selection Model
Equally-Weighted Monthly Data Compounded to Annual Periods
November 2012 Through September 2018



Source: Empirical Research Partners Analysis.

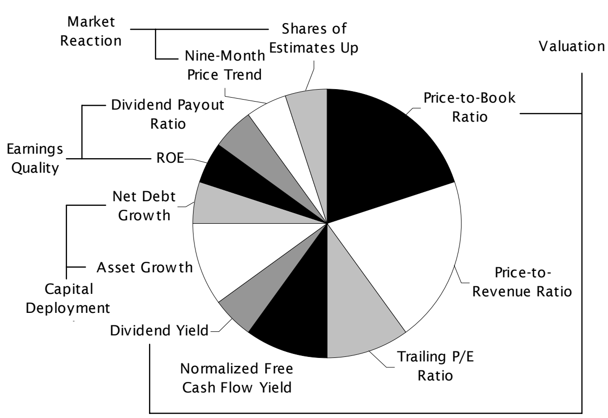
Exhibit 23: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of the MLP Selection Model
Cap-Weighted Monthly Data Compounded to Annual Periods
November 2012 Through September 2018



Source: Empirical Research Partners Analysis.

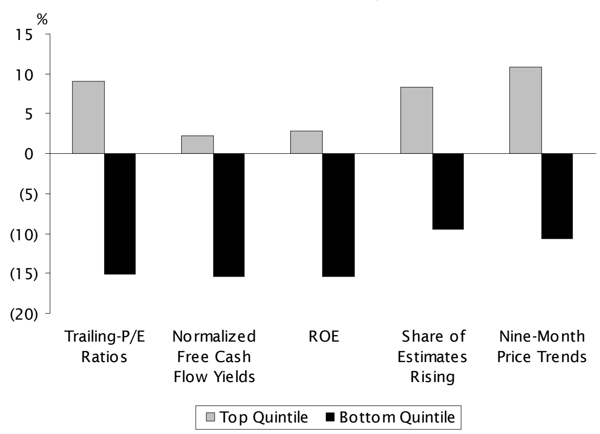
Our MLP Selection Model has a strong value flavor and two-thirds of it consists of valuation measures of one sort of another (see Exhibit 24). It was designed that way because it's tied to the energy sector, where supply has tended to be mean reverting and the price of admission has mattered. The rest of the model is made up of factors that assess capital deployment, earnings quality and the market and analysts' response to the fundamentals. Compared to most of our other models this one is simple, and there's no dynamic weighting of factors or consideration of regime.

Exhibit 24: Energy MLPs
Make-Up of the MLP Selection Model
As of September 2018



Source: Empirical Research Partners Analysis.

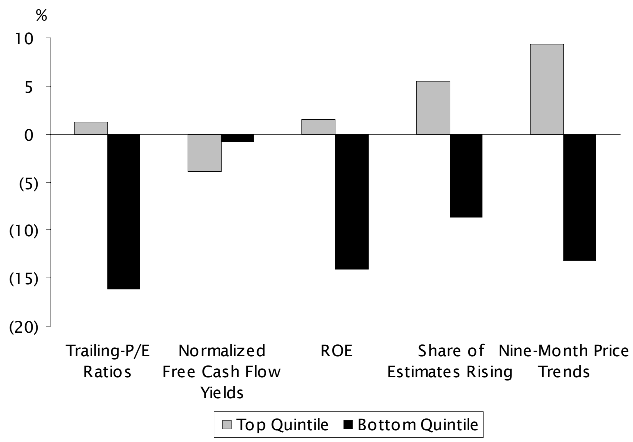
Exhibit 25: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Select Factors
Equally-Weighted Monthly Data Compounded to Annual Periods
November 2012 Through September 2018



Source: Empirical Research Partners Analysis.

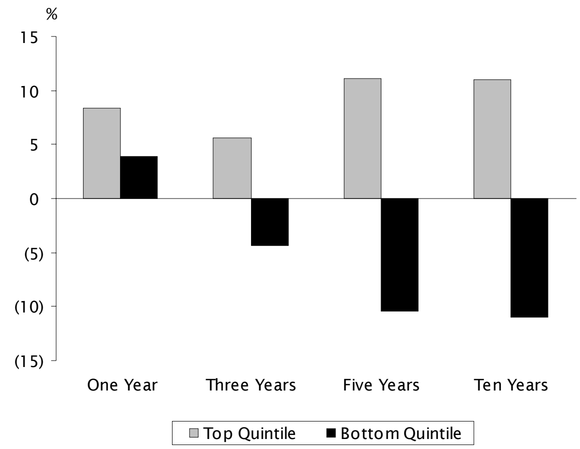
The way the model has generated alpha has been surprising. The two market reaction components – nine-month price trends and a measure of the breadth of upward analysts' estimates – have been critical to its performance. That was true on both equally- and cap-weighted bases (see Exhibits 25 and 26). Beyond that what's stood out is that not making money and selling at a high-P/E ratio has spelled trouble.

Exhibit 26: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Select Factors
Cap-Weighted Monthly Data Compounded to Annual Periods
November 2012 Through September 2018



Source: Empirical Research Partners Analysis.

Exhibit 27: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Nine-Month Stock Price Trends
Equally-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018

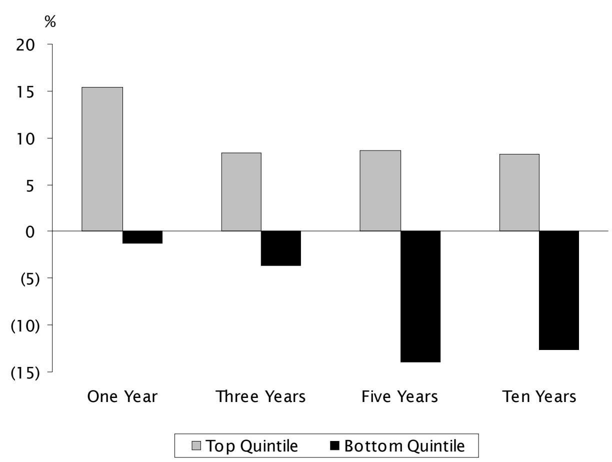


Source: Empirical Research Partners Analysis.

We reviewed the performance of price momentum for the past decade and found consistent alpha when measured on either an equally- or cap-weighted basis (see Exhibits 27 and 28). In fact, the relative returns from the price-trend variable were about fives times those earned within the energy sector as a whole (see Exhibit 29). The year-by-year data provides some insight as to what's gone on. From 2010 through 2015 there were stupendous returns to a momentum strategy on an equally-weighted basis as investors reached for yield in an environment of falling interest rates (see Exhibit 30). Thereafter it was the cap-weighted numbers that've held up best (see Exhibit 31).

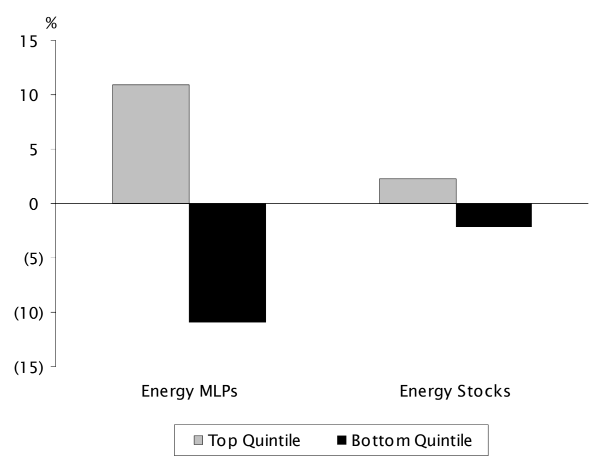
That performance coincided with a steady increase in institutional involvement in the asset class. Institutions went from holding about 30% of the capitalization at the beginning of this decade to nearly half of it today (see Exhibit 32). Exhibit 33 presents the institutional ownership of the ten-largest MLPs. In the cases where it's low, other public companies or private equity own stakes in the company.

Exhibit 28: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Nine-Month Stock Price Trends
Cap-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

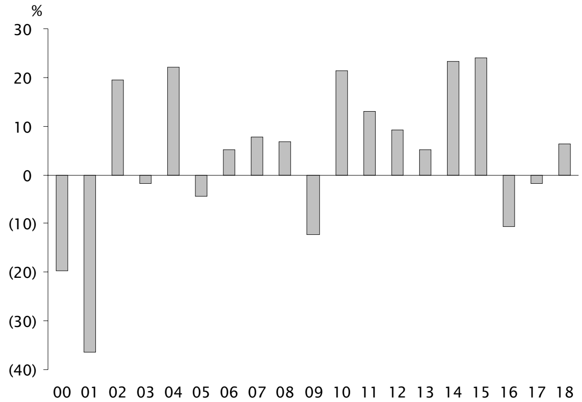
Exhibit 29: Energy MLPs
Sector **Relative Returns to the Top and Bottom Quintiles of Nine-Month Stock Price Trends**
Equally-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

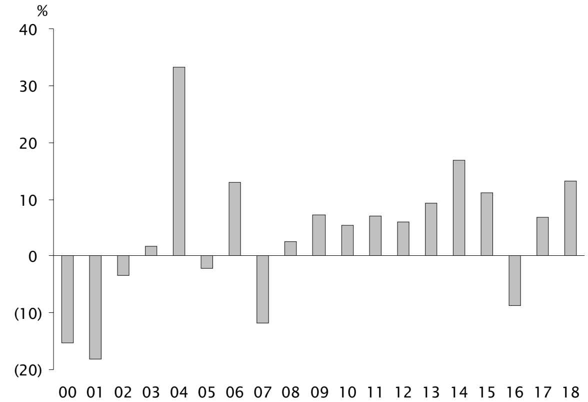
What's also noteworthy is that MLPs without any GAAP earnings, that typically populate the bottom quintile of P/E ratios, have fared poorly on both equally- and cap-weighted bases (see Exhibits 34 and 35). Given the focus on yields and dividend coverage ratios that's hardly surprising.

Exhibit 30: Energy MLPs
Relative Returns to the Top Quintile of Nine-Month Stock Price Trends
Equally-Weighted Monthly Data Compounded to Annual Periods
2000 Through September 2018



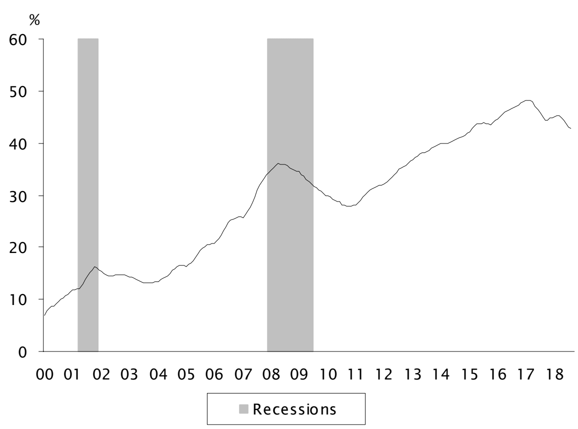
Source: Empirical Research Partners Analysis.

Exhibit 31: Energy MLPs
Relative Returns to the Top Quintile of Nine-Month Stock Price Trends
Cap-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

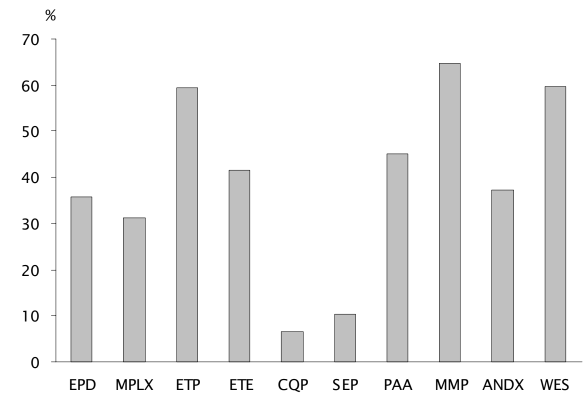
Exhibit 32: Energy MLPs
Institutional Ownership[1]
2000 Through August 2018



Source: FactSet Research Systems, National Bureau of Economic Research, Empirical Research Partners Analysis.

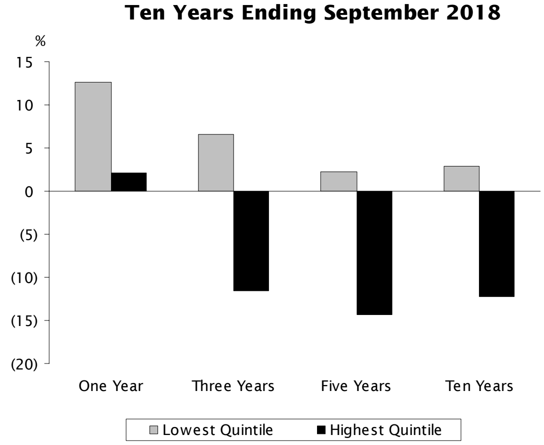
[1]Capitalization-weighted data smoothed on a trailing six-month basis.

Exhibit 33: Ten Largest Energy MLPs
Share of Capitalization Owned by Traditional Institutional Investors
As of Q2 2018



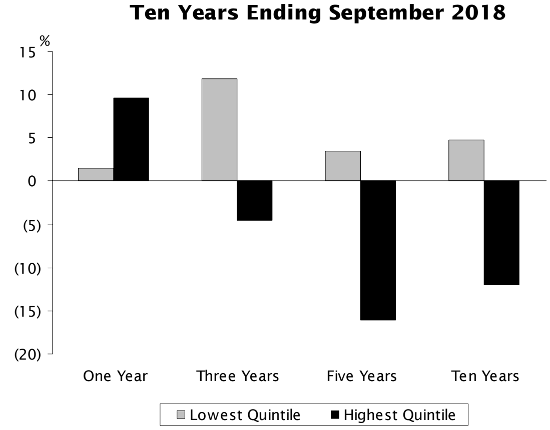
Source: Empirical Research Partners Analysis.

Exhibit 34: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Trailing-P/E Ratios
Equally-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

Exhibit 35: Energy MLPs
Relative Returns to the Top and Bottom Quintiles of Trailing-P/E Ratios
Cap-Weighted Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

Different Things to Different People

In the last decade energy MLPs have represented different things to different people. When interest rates were falling those securities were (temporarily) transformed into bond surrogates and the correlation of their relative returns with the performance of the bond market shot up (see Exhibit 36). That relationship faded when interest rates bottomed and the trajectory of oil prices was called into question by the shale glut. Thereafter they became oil price proxies and their correlation with the commodity reached its peak near the trough in oil prices a couple of years ago (see Exhibit 37). Now their profiles look like they did in the cycle of the 2000s.

Exhibit 36: Energy MLPs
Correlation of Relative Returns with Those of Treasury Bonds[1]
1988 Through Late-September 2018

Source: Bloomberg L.P., National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Correlation computed using trailing two years of capitalization-weighted monthly returns; data smoothed on a trailing three-month basis.

Exhibit 37: Energy MLPs
Correlation of Relative Returns with Those of Oil Prices[1]
1988 Through Late-September 2018

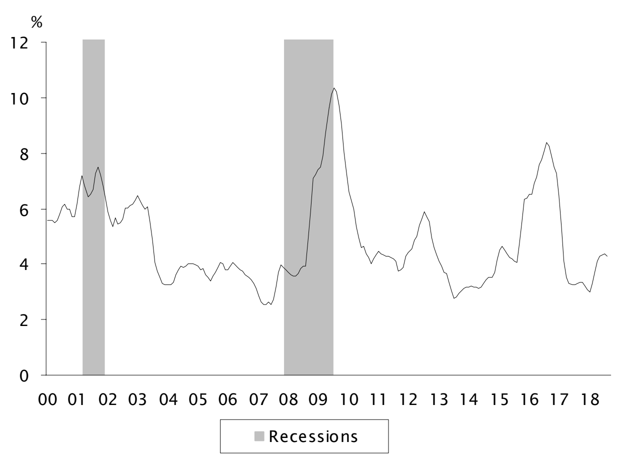
Source: Bloomberg L.P., National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Correlation computed using trailing two years of capitalization-weighted monthly returns; data smoothed on a trailing three-month basis.

The MLPs risk characteristics have changed too, coinciding with plunges in the commodity price. We see that in a chart of our downside risk indicator, that measures volatility on days in which the MLP underperforms (see Exhibit 38). That characteristic is now back to normal.

The latest round of price weakens transformed the valuation relationship between the MLPs and their cousins, the energy stocks. Exhibit 39 presents a comparison of the gross cash flow yields and MLPs have the advantage.

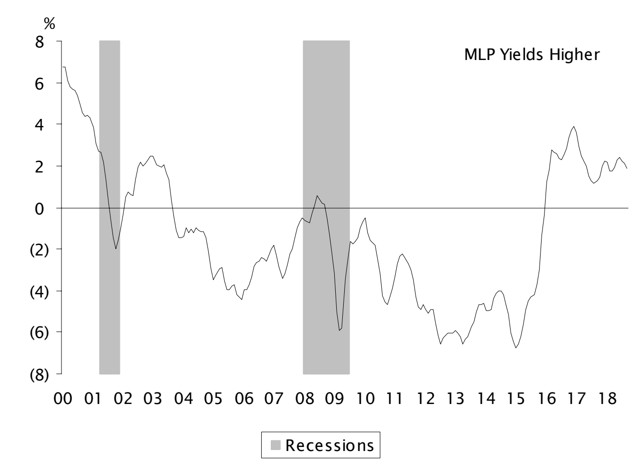
Exhibit 38: Energy MLPs
Downside Risk[1]
1988 Through Late-September 2018



Source: National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Capitalization-weighted data smoothed on a trailing three-month basis.

Exhibit 39: Energy
MLPs Relative to Common Equities
Differential in Gross Cash Flow Yields[1]
1988 Through Late-September 2018



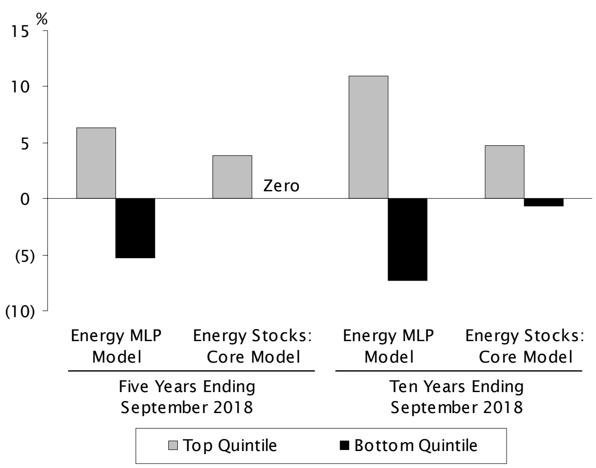
Source: National Bureau of Economic Research, Empirical Research Partners Analysis.

[1]Capitalization-weighted data smoothed on a trailing three-month basis.

Conclusion: Rising a Wave

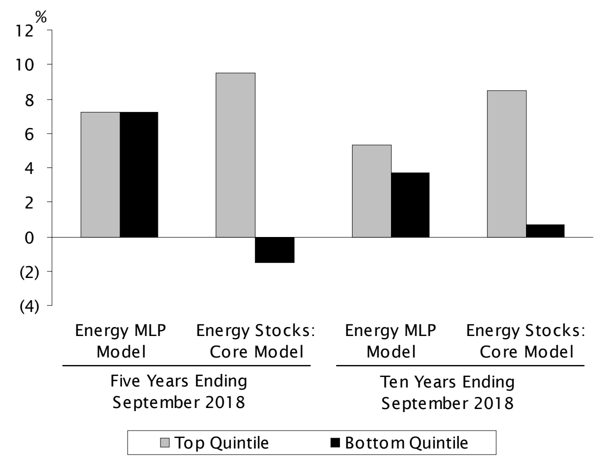
Thus far, energy MLPs have thus far proven to be fairly easy to model, certainly when compared to energy equities (see Exhibit 40). Momentum strategies have been very profitable and it's been wise to avoid companies losing money. One thing the MLPs and the traditional equities do have in common is that both should have been bought when they were out of favor, and issues priced to low price-to-sales ratios (see Exhibit 41). The idea that cost curves are deterministic in the energy business hasn't lost its relevance.

Exhibit 40: Energy MLPs and Large-Cap Equities
***Sector* Relative Returns to the Top and Bottom Quintiles of the Respective Models**
Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

Exhibit 41: Energy MLPs and Large-Cap Equities
***Sector* Relative Returns to the Top and Bottom Quintiles of Price-to-Sales Ratios**
Monthly Data Compounded to Annual Periods
Ten Years Ending September 2018



Source: Empirical Research Partners Analysis.

The rising tide of institutional ownership has probably had something to do with the return dynamic we've seen in the world of MLPs. They've chased winners in yield-focused strategies. Exhibit 42 below presents a ranking of MLPs with capitalizations of $2 billion or greater in the top-three quintiles of our dedicated model. The trend-following variables are shown at the right.

Exhibit 42: Energy MLPs
MLP Model Report: Top Three Quintiles
Sorted by Model Rank, Nine-Month Price Trend and Market Capitalization
As of Late-September 2018

			Quintile Ranks (1=Best; 5=Worst)											
			Price-to:											
Symbol	Company	Price	Sales	Trailing Earnings	Normalized Free Cash Flow Yield	Dividend Yield	Dividend Payout Ratio (1=Lowest 5=Highest)	Asset Growth	Net Debt Growth	ROE	Nine-Month Price Trend	Share of Estimates Rising	MLP Model Rank	Market Capitalization ($ Million)
ETP	ENERGY TRANSFER PARTNERS -LP	$21.89	2	1	5	2	5	3	2	4	1	1	1	$25,532
CVRR	CVR REFINING LP	20.30	1	2	2	2	3	1	5	2	1	1	1	2,996
CEQP	CRESTWOOD EQUITY PARTNERS LP	35.80	1	5	2	4	1	1	2	5	1	3	1	2,565
DCP	DCP MIDSTREAM LP	38.74	1	4	1	3	1	2	1	4	2	3	1	5,552
SUN	SUNOCO LP	28.85	1	1	2	1	4	1	1	3	3	1	1	2,853
CQP	CHENIERE ENERGY PARTNERS LP	39.94	4	3	5	5	3	2	2	1	1	1	2	19,331
PAA	PLAINS ALL AMER PIPELNE -LP	23.94	1	3	4	5	2	2	1	4	1	2	2	17,370
ENLK	ENLINK MIDSTREAM PARTNERS LP	18.53	2	4	4	3	5	3	3	4	1	2	2	6,492
ETE	ENERGY TRANSFER EQUITY LP	17.15	1	1	5	4	4	3	2	1	2	3	2	19,863
ENBL	ENABLE MIDSTREAM PARTNERS LP	16.20	3	3	3	4	4	3	4	4	2	2	2	7,016
GEL	GENESIS ENERGY -LP	23.79	2	5	4	2	1	4	4	5	2	2	2	2,916
ARLP	ALLIANCE RESOURCE PTNRS -LP	20.20	2	1	1	2	2	3	1	2	2	3	2	2,654
DM	DOMINION ENRG MIDSTRM PRT LP	17.60	4	2	5	4	2	3	1	4	5	2	2	2,228
NS	NUSTAR ENERGY LP	27.03	2	3	3	2	4	3	2	4	3	4	3	2,893
SEP	SPECTRA ENERGY PARTNERS LP	35.90	4	2	4	3	5	1	3	4	4	3	3	17,408
PSXP	PHILLIPS 66 PARTNERS LP	50.35	5	1	4	5	3	4	4	2	4	1	3	6,189
BPL	BUCKEYE PARTNERS LP	35.34	2	2	3	1	4	3	3	4	5	3	3	5,421
TCP	TC PIPELINES LP	30.31	4	1	2	3	2	2	2	2	5	1	3	2,219

Source: Empirical Research Partners Analysis.

Appendix 1: Large-Capitalization Growth Stocks
Top Quintile of Top-Line Growth
Sorted by Free Cash Flow Margin and Growth Model Rank
As of End-September 2018

			Quintiles (1=Best, 5=Worst)								
Symbol	Company	Price	Free Cash Flow Margin	Capital Deployment and Financing	Earnings Quality and Trend	Market Reaction	Valuation	Growth Model Rank	Free Cash Flow Yield	Forward-P/E Ratio	Market Capitalization ($ Billion)
PANW	PALO ALTO NETWORKS INC	$225.26	1	3	1	1	5	1	2	45.1 x	$21.1
MU	MICRON TECHNOLOGY INC	45.23	1	3	2	4	1	1	1	4.3	52.5
ADI	ANALOG DEVICES	92.46	1	2	1	2	2	1	1	15.6	34.4
TEAM	ATLASSIAN CORP PLC	96.14	1	4	2	1	5	2	5	124.5	22.8
NKTR	NEKTAR THERAPEUTICS	60.96	1	1	1	3	2	2	1	40.5	10.5
NVDA	NVIDIA CORP	281.02	1	5	1	1	5	3	4	37.6	170.9
FB	FACEBOOK INC	164.46	1	4	3	5	1	4	3	21.9	475.5
SINA	SINA CORP	69.48	1	3	4	5	1	4	1	19.4	5.0
ANET	ARISTA NETWORKS INC	265.86	1	3	5	2	5	4	3	33.7	19.9
EXEL	EXELIXIS INC	17.72	1	5	3	5	5	4	2	17.2	5.3
BABA	ALIBABA GROUP HLDG	164.76	1	4	4	5	2	5	3	28.7	427.1
PAGS	PAGSEGURO DIGITAL LTD	27.67	1	4	4	5	5	5	5	30.7	9.0
NOW	SERVICENOW INC	195.63	2	4	1	1	5	1	5	74.1	34.8
LRCX	LAM RESEARCH CORP	151.70	2	1	2	5	1	1	1	10.3	23.8
BIDU	BAIDU INC	228.68	2	1	4	4	1	2	2	21.0	80.1
SPLK	SPLUNK INC	120.91	2	2	2	1	5	2	4	100.8	17.7
MTCH	MATCH GROUP INC	57.91	2	4	2	1	5	2	4	38.1	16.0
PAYC	PAYCOM SOFTWARE INC	155.41	2	5	1	1	5	2	5	54.8	9.1
ABMD	ABIOMED INC	449.75	2	5	3	1	5	3	5	98.4	20.2
PFPT	PROOFPOINT INC	106.33	2	5	3	4	5	4	4	77.5	5.5
ASML	ASML HOLDING NV	188.02	2	2	4	3	4	4	3	25.2	80.6
CGNX	COGNEX CORP	55.82	2	5	5	5	5	5	4	41.7	9.6
ALGN	ALIGN TECHNOLOGY INC	391.22	3	5	2	1	5	2	5	71.2	31.4
WDAY	WORKDAY INC	145.98	3	3	2	2	5	3	5	123.3	31.7
GRUB	GRUBHUB INC	138.62	3	5	5	1	5	3	5	66.1	12.5
SSNC	SS&C TECHNOLOGIES HLDGS INC	56.83	3	5	5	2	3	4	4	20.7	13.6
DXC	DXC TECHNOLOGY COMPANY	93.52	4	1	4	4	1	2	1	11.4	26.4
CLR	CONTINENTAL RESOURCES INC	68.28	4	4	3	2	2	2	5	20.4	25.7
LEN	LENNAR CORP	46.69	4	5	3	5	1	3	1	7.8	15.4
SHW	SHERWIN-WILLIAMS CO	455.21	4	2	4	2	3	3	2	22.2	42.5
IT	GARTNER INC	158.50	4	5	2	4	4	3	4	39.5	14.4
ANGI	ANGI HOMESERVICES INC	23.48	4	5	5	1	5	4	5	133.4	11.3
DXCM	DEXCOM INC	143.04	4	5	5	1	5	5	5	NM	12.6
NBIX	NEUROCRINE BIOSCIENCES INC	122.95	5	5	2	1	5	1	5	129.7	11.1
SGEN	SEATTLE GENETICS INC	77.12	5	5	5	1	5	2	5	NM	12.2
AMZN	AMAZON.COM INC	2,003.00	5	4	5	1	5	3	5	97.1	976.9
SQ	SQUARE INC	99.01	5	4	5	1	5	3	5	168.1	41.0
EVHC	ENVISION HEALTHCARE CORP	45.73	5	3	5	3	1	3	1	12.0	5.6
PE	PARSLEY ENERGY INC	29.25	5	5	3	2	2	3	5	16.5	9.6
NFLX	NETFLIX INC	374.13	5	4	5	1	5	4	5	111.3	162.9
EXAS	EXACT SCIENCES CORP	78.92	5	5	5	2	5	4	5	NM	9.7
LNG	CHENIERE ENERGY INC	69.49	5	4	4	2	4	4	5	27.9	24.9
EOG	EOG RESOURCES INC	127.57	5	3	4	2	3	4	5	20.8	73.9
FANG	DIAMONDBACK ENERGY INC	135.19	5	4	4	4	2	4	5	16.5	13.3
TSLA	TESLA INC	264.77	5	5	5	5	4	5	5	NM	45.2
W	WAYFAIR INC	147.67	5	5	5	2	5	5	5	NM	13.3
SHOP	SHOPIFY INC	164.46	5	5	5	3	5	5	5	NM	17.5
MELI	MERCADOLIBRE INC	340.47	5	4	5	5	5	5	5	NM	15.0
SNAP	SNAP INC	8.48	5	4	5	5	5	5	5	NM	10.8
NTNX	NUTANIX INC	42.72	5	5	5	3	5	5	5	NM	7.4
INCY	INCYTE CORP	69.08	5	4	5	5	5	5	5	78.0	14.7
BLUE	BLUEBIRD BIO INC	146.00	5	5	5	5	5	5	5	NM	7.9
CXO	CONCHO RESOURCES INC	152.75	5	5	5	4	4	5	5	30.6	30.6
PXD	PIONEER NATURAL RESOURCES CO	174.19	5	3	4	3	2	5	5	20.6	29.7
EQT	EQT CORP	44.23	5	5	5	5	1	5	5	19.1	11.7

Source: Empirical Research Partners Analysis.