Empirical Research Partners

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Portfolio Strategy February 2018

Inflation-itis: Catching? Demographics and Risk Premia, Industrial Commodities: Exploiting Free Cash Flow

Ready, Fire, Aim

- Stronger growth in hourly earnings prompted an indiscriminate sell-off in the equity market as investors became worried that inflationary forces are building, the Fed is behind the curve, and that multiples are too high. Those concerns aren't crazy but the timing is odd as the turning point didn't occur last Friday, but almost two years ago when the recovery began to boost the fortunes of those in the bottom 80% of the income distribution. That rebooted the cycle and since then underlying inflation has been gradually firming, as those with the highest marginal propensity to spend have finally enjoyed real income growth. The early-cycle stocks led and the bond surrogates broke down in the reborn expansion.

- The risk from here is that pent-up demand is being unleashed as Millennials, who are at the age of marriage, become employed and benefit from a tight labor market. That could conceivably lead to a pick-up in inflation after a long, dry spell. While possible, at this point we don't see betting on that conjecture. The linkage between wage growth and inflation is weak and has been non-existent in the competitive environment of the Bretton Woods II era. Inflation has been around +2% for more than two decades with a standard deviation of less than ± 50 basis points. Moreover, the system is less rate sensitive than it's been in the past, because the consumer has borrowed little money, with the bulk of it at fixed rates. The economy is still awash in free cash flow and market pricing still embodies some skepticism about the sustainability of it.

- We've been overweight banks, investment banks and money managers and very underexposed to the bond surrogates. For that to work out the cycle has to evolve gradually. Given all the moving pieces that go into the inflation numbers that still looks to be the best bet. The sell-off didn't really alter the opportunity set and our valuation spreads sit 4/10th of a deviation below average, a typical mid-cycle reading, and our regime indicator is neutral. Playing defense still looks like an expensive proposition. Other portfolio themes include autos and auto parts, aerospace, chemicals, biotech, HMOs, casinos and hotels. We're still overweight in an eclectic group of tech stocks. Appendix 1 on page 16 presents our large-cap core portfolio.

Demographics and Risk Premia

- People 55 and older control 75% of household financial assets, +15 percentage points more than that demographic did 20 years ago. The appetite for risk taking falls until one reaches retirement age and flattens out thereafter. The attitudes towards an asset class have to do with the experience one has had in it. Rich, older people, who had record equity exposures in 2007, sold stock near the bottom, bought bonds and have continued to do so since.

- We don't think the facts support the notion that there will be a great retail rotation into equities in the wake of bond losses. Having enjoyed a smooth ride in bond funds it will take an awful lot to create disillusionment. Also, the effective duration of those funds is only 4½ years, two years less than that of the market itself. Boomers are prone to affairs of the heart and they're not close to abandoning this one.

Free Cash Flow Dynamics and the Industrial Commodities

- The performance of the free cash flow anomaly has held up in part because there's been a structural decline in capital intensity. The track record is particularly good in the industrial commodities sector, where changes in capital spending carry great weight. Appendix 2 on page 17 ranks the chemical and metals stocks, focusing on the relationship between their net expenditures and gross cash flow.

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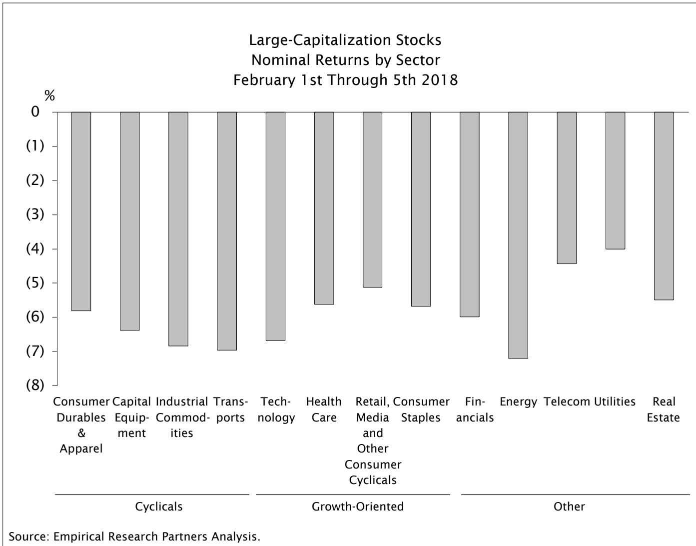
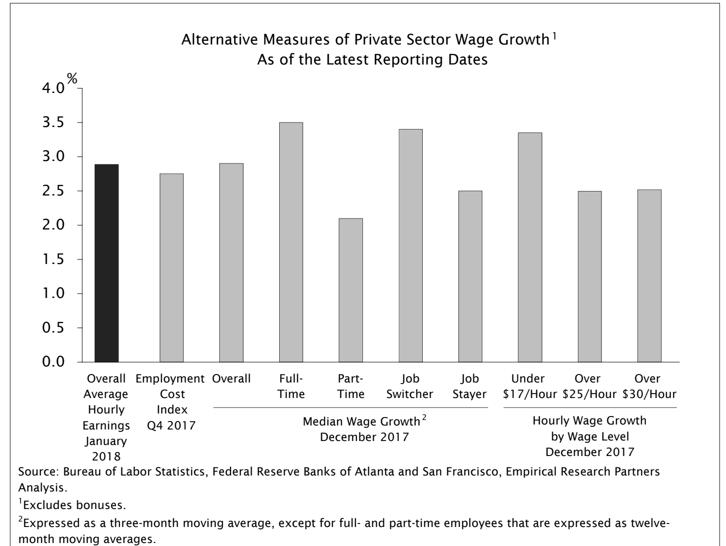
Conclusions in Brief

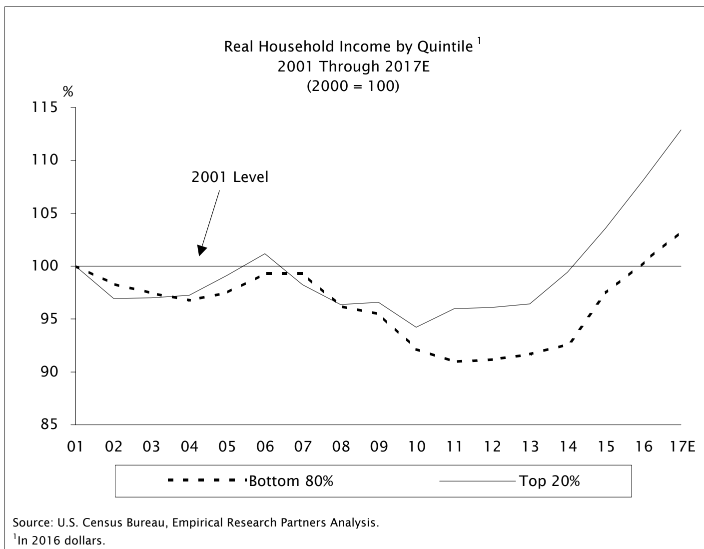
- They sold everything…



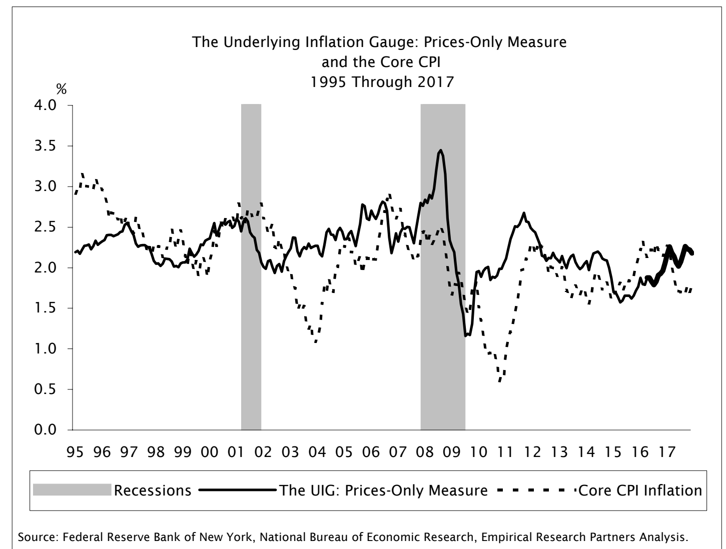
- …Based on an unexceptional wage growth number:



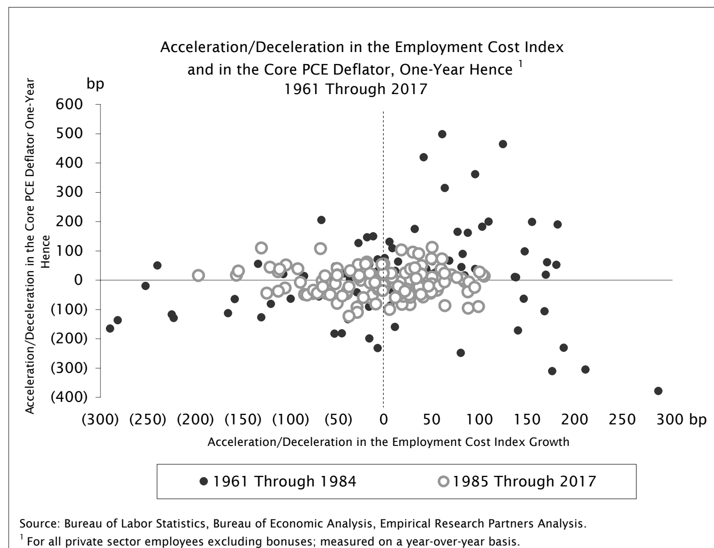
- The cycle turned almost two years ago…



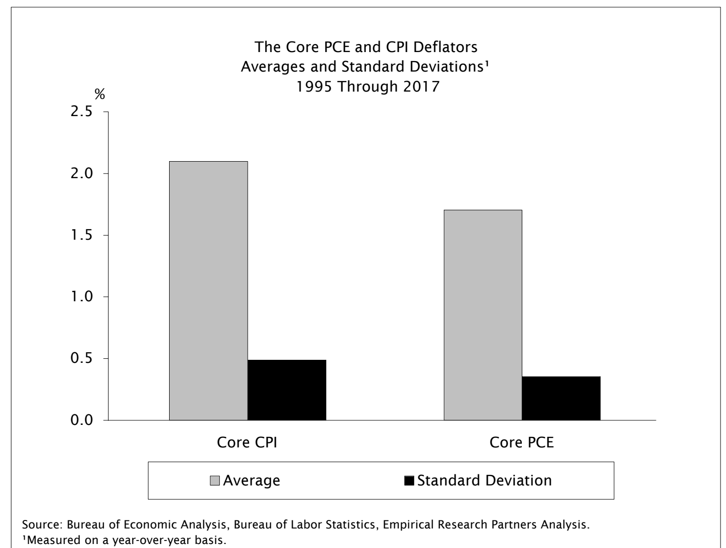
- …And that's when the trend in inflation began to firm:



- Wage growth and inflation are loosely related...



- …And betting on an inflation shock isn't a high odds bet:

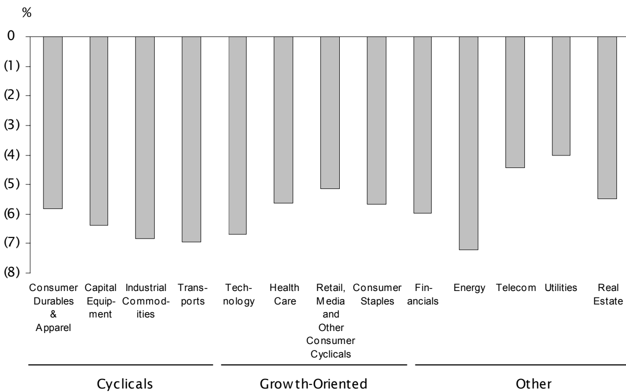


Inflation-itis: Catching?

Anything New?

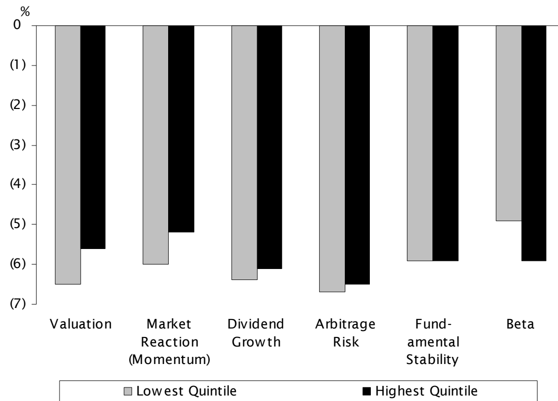
The January jobs report prompted a panic as investors became worried that inflationary forces are building, the Fed is behind the curve, and as a result of that, the risk to the status quo is greater than they had thought and multiples are too high. The sell-off occurred across the entire equity market with almost no discrimination among sectors (see Exhibit 1). Factors didn't matter either (see Exhibit 2). In an era when performance claims emphasize downside protection the impetus is to sell first and ask questions later, and that's what happened once again.

Exhibit 1: Large-Capitalization Stocks Nominal Returns by Sector February 1st Through 5th 2018



Source: Empirical Research Partners Analysis.

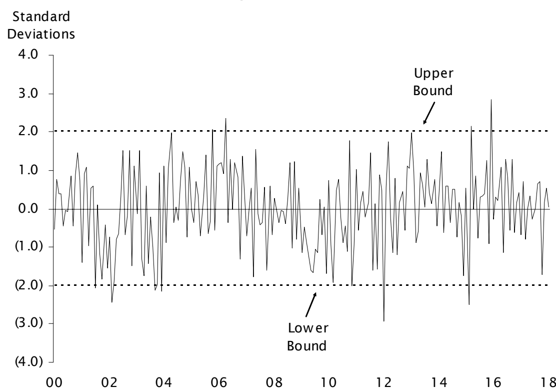
Exhibit 2: Large-Capitalization Stocks Nominal Returns by Factor February 1st Through 5th 2018



Source: Empirical Research Partners Analysis.

Ironically, the growth rate in average hourly earnings, the number that spooked the market, wasn't really surprising. The +2.8% year-over-year increase was well within the bounds of what we would have guessed based on a simple statistical extrapolation of the prior data (see Exhibit 3). Essentially what happened was that series finally caught up with the other measures of wage growth (see Exhibit 4). The acceleration has been led by those at the lower-end of the labor market, where the tightness has been most acute. As usual, the upward momentum has come from people that switched jobs and traded up. Staid baby boomers, that don't change jobs very often, had been holding that series back. Their wages, that comprise a little less than a quarter of the base of labor compensation, bottomed about three quarters ago and thereafter the labor market tightened by enough to lift all boats (see Exhibit 5). The weakness in that older demographic had been offsetting strength in the similarly-sized millennial cohort, and that's no longer the case. The volatile components of consumer spending also took a turn to the positive as higher commodity prices flowed through to consumption (see Exhibit 6).

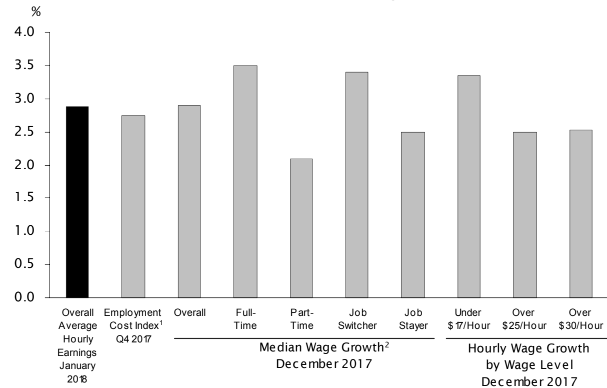
Exhibit 3: Growth in the Hourly Earnings of Private Employees Standardized Unexpected Changes[1] 2000 Through January 2018



Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Based on the first-order autoregressive models over the past five years. Measured on a year-over-year basis.

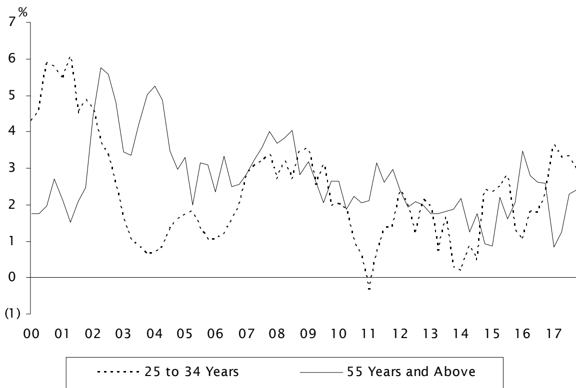
Exhibit 4: Alternative Measures of Private-Sector Wage Growth As of the Latest Reporting Dates



Source: Bureau of Labor Statistics, Federal Reserve Banks of Atlanta and San Francisco, Empirical Research Partners Analysis.

[1]Excludes bonuses.
[2]Expressed as a three-month moving average, except for full- and part-time employees that are expressed as twelve-month moving averages.

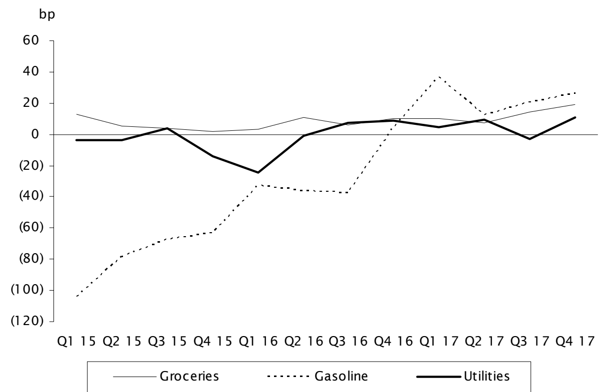
Exhibit 5: Median Earnings[1]
Year-over-Year Growth Rates
Ages 25-34 and 55 Years and Above
2000 Through 2017



Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Smoothed on a trailing four-quarter basis.

Exhibit 6: The Volatile Components of Consumption
Contribution to the Growth Rate
of Personal Consumption Expenditures
2015 Through 2017



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

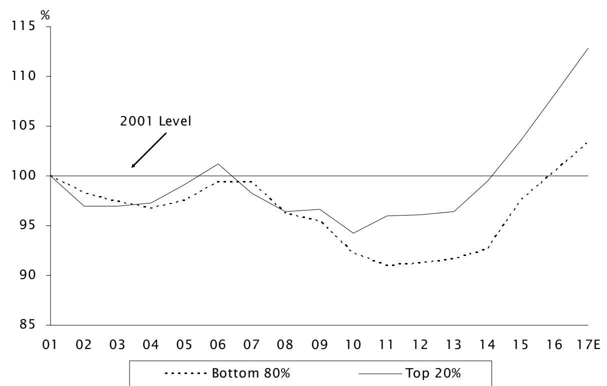
The Turning Point in the Economy Was Almost Two Years Ago

The turning point in the post-Crisis recovery didn't happen last Friday, it occurred in April of 2016. At that point the slack in the labor market had been sufficiently cleared to begin to invoke accelerator effects in parts of the system. As the share of people forced to work part-time fell to what turned out to be the inflection point, wages at the low-end took off (see Exhibit 7). The good times finally trickled down to the bottom 80% of the income distribution, that accounts for just over 60% of spending (see Exhibit 8). We see the effects of that broadening in the home ownership rate, where the turn has been more pronounced in the bottom-half of the distribution (see Exhibit 9).

Exhibit 7: Working Part-Time for Economic Reasons
as a Share of the Labor Force[1]
and Wage Growth for Low-Skill Service Positions
2003 Through January 2018

Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.
[1]Working part-time data smoothed on a trailing three-month basis.

Exhibit 8: Real Household Income by Quintile[1]
2001 Through 2017E
(2001 = 100)



Source: U.S. Census Bureau, Empirical Research Partners Analysis.

[1]In 2016 dollars.

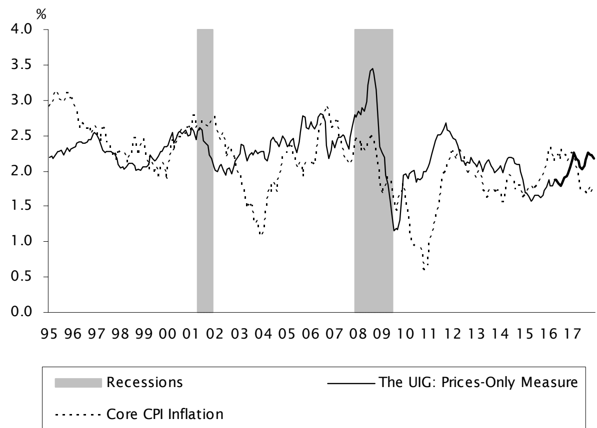
The broadening out of the recovery also engendered strength in the cyclical components of inflation. The Federal Reserve Bank of New York maintains an Underlying Inflation Gauge that's designed to express the primary trend in inflation. The prices-only measure applies dynamic factor models to 223 price series to separate the signals from the noise. As shown in Exhibit 10 the primary trend recovered even as the core CPI showed weakness, held back by a series of negative shocks, with the health care sector behind some of them. Once again it looks like the true turning point occurred long ago.

The equity market has responded rationally to the change in the facts. With the consumer finally on firmer footing early-cycle stocks have led, while the bond surrogates trailed (see Exhibit 11). The bond surrogates, that had temporarily become their own asset class, suffered defections, and the correlations among them broke down (see Exhibit 12). An economic recovery with normalization in inflation is a good thing for stocks. The market is worried about is a change in the slope of inflation, that would shock both the system and the central bank. That concern isn't crazy.

Exhibit 9: Homeownership Rate by Family Income 2010 Through 2017

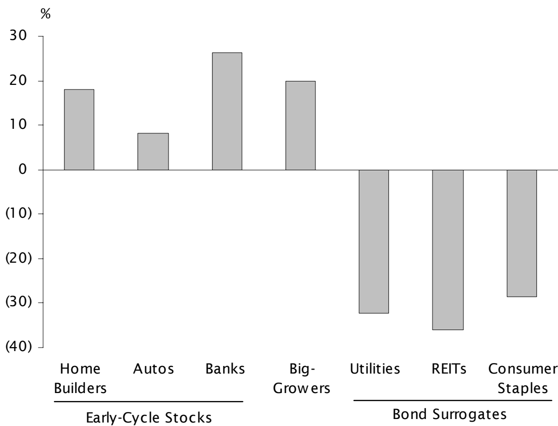
Source: U.S. Census Bureau, Empirical Research Partners Analysis.

Exhibit 10: The Underlying Inflation Gauge: Prices-Only Measure and the Core CPI 1995 Through 2017



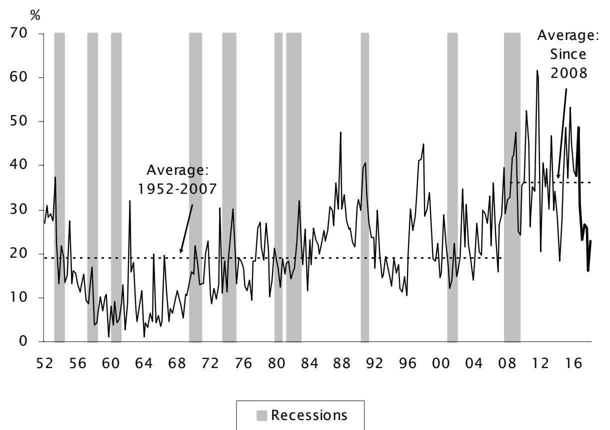
Source: Federal Reserve Bank of New York, National Bureau of Economic Research, Empirical Research Partners Analysis.

Exhibit 11: Early-Cycle Stocks, Big Growers and the Bond Surrogates Capitalization-Weighted Relative Returns April 2016 Through Early-February 2018



Source: Empirical Research Partners Analysis.

Exhibit 12: Large-Capitalization Stocks Stocks Most Correlated with the Bond Market[1] Daily Return Correlations Expressed as Quarterly Averages 1952 Through Early-February 2018



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

[1]The bond surrogates are the 10% of the market with relative returns that are most correlated with the performance of ten-year Treasury Bonds.

Inflation: On the Ready

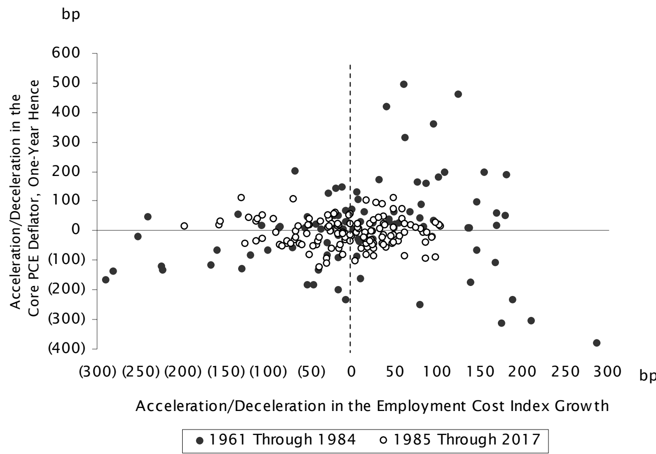
The market is apprehensive that after a long slumber animal spirits have awoken, with Millennials, now of the age of marriage and employed, leading the charge. It's possible that both wage growth and inflation could break out to the upside, causing a major rethink of the assumptions underpinning multiples. To position for that scenario we have to think it's not only possible, but probable. The evidence doesn't support that point of view.

The linkage between wage growth and inflation has always been tenuous and in the Bretton Woods II era of globalization that's been truer than ever. That's apparent in Exhibit 13, that relates changes in the Employment Cost Index to those in the PCE deflator. The black dots represent the 1961-1984 data points, while the white ones are the later observations. Even though it's logical to expect causality we can't see it. We repeated the exercise, restricting the sample to episodes with a +50 basis point or greater acceleration in labor costs, the recent state of affairs, and once again ended up with a muddle (see Exhibit 14).

Inflation is notoriously hard to predict because the headline numbers contain so many moving pieces that are buffeted by disparate forces. That's seen in Exhibit 15, that examines the behavior of select categories contained in the core CPI. What was weak in the middle part of last year showed strength by the end of it, even as new pockets of

weaknesses emerged. On balance there's been firming, and the weakness in the dollar, and the surge in the income of the bottom 80% of the distribution, would lead us to expect some more of the same (see Exhibit 16).

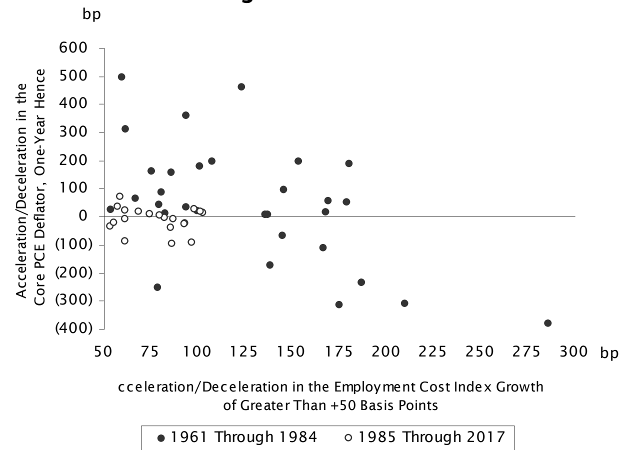
Exhibit 13: Acceleration/Deceleration in the Employment Cost Index and in the Core PCE Deflator, One-Year Hence[1]
1961 Through 2017



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Empirical Research Partners Analysis.

[1]For all private sector employees excluding bonuses; measured on a year-over-year basis.

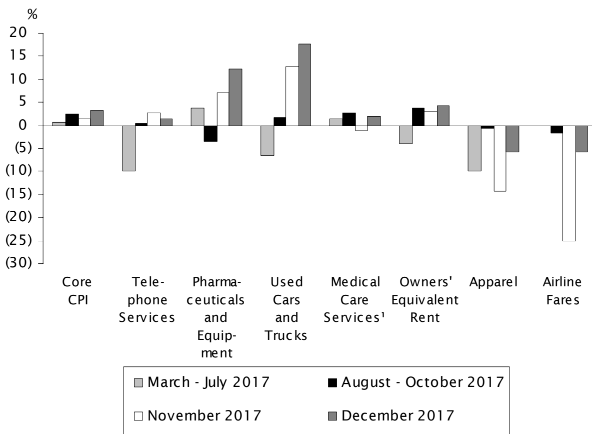
Exhibit 14: Acceleration/Deceleration in the Employment Cost Index of Greater Than +50 Basis Points and Acceleration/Deceleration in the Core PCE Deflator, One-Year Hence[1]
1961 Through 2017



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Empirical Research Partners Analysis.

[1]For all private sector employees excluding bonuses; measured on a year-over-year basis.

Exhibit 15: The Core CPI and Select Components Annualized Month-over-Month Changes
March Through December 2017



Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Hospitals, HMOs and physicians.

Exhibit 16: Price of U.S. Manufactured Good Imports and the Trade-Weighted Dollar
Year-over-Year Changes
2007 Through January 2018

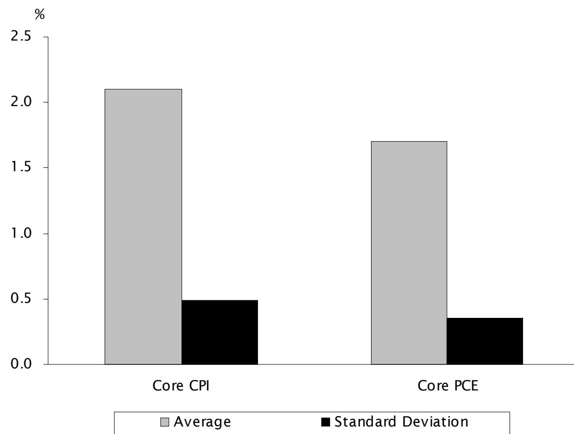
Source: Bureau of Labor Statistics, Federal Reserve Board, Empirical Research Partners Analysis.

Where We Stand: Reactive, Not Preemptive

Storytelling is a big part of the investment business and sometimes we have to act based on tall tales, usually because we're being paid to do so. While there are inflation threats that we can point to, they aren't so real that we should be positioned in anticipation of a structural break. In the last 22 years the core CPI has averaged a +2.1% annual increase with a standard deviation of ± 49 basis points (see Exhibit 17). The numbers for the core PCE deflator are +1.7% and ± 35 basis points. Current inflation expectations are broadly consistent with those facts (see Exhibit 18).

While it's possible that the price umbrella that's come from globalization is about to be raised, the burden of proof is still on the advocate of the view. We will delve into that debate in detail in some forthcoming research.

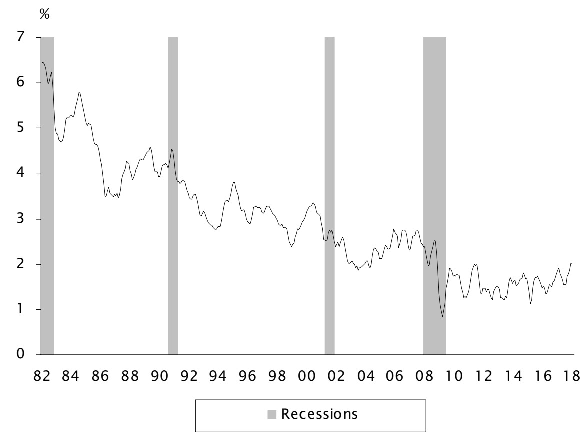
Exhibit 17: The Core PCE and CPI Deflators Averages and Standard Deviations[1] 1995 Through 2017



Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Measured on a year-over-year basis.

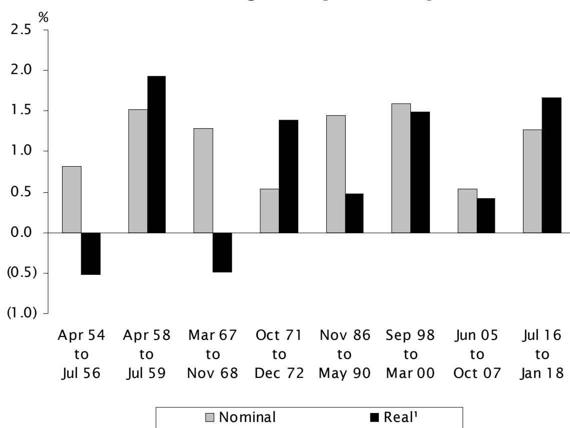
Exhibit 18: Two-Year-Forward Inflation Expectations 1982 Through Mid-January 2018



Source: Federal Reserve Bank of Cleveland, Bureau of Labor Statistics.

The rise in bond yields, measured in nominal or real terms, looks a lot like what happened in earlier run-ups to some major market tops (see Exhibit 19). What's different this time is that rates started at an exceptionally low level, and even after the increase are still low (see Exhibit 20). On top of that, there's good reason to think that the system is less rate sensitive than before. The consumer borrowed relatively little money in the post-Crisis years and the vast bulk of it was at fixed rates (see Exhibit 21). Higher rates bite when homes are traded, and we're starting with a modest turnover rate (see Exhibit 22).

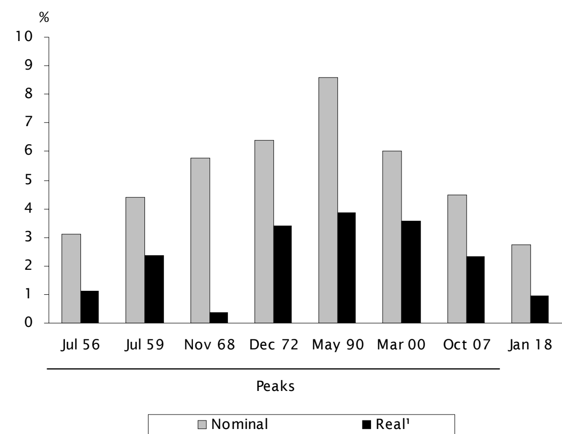
Exhibit 19: Change in Nominal and Real Ten-Year Treasury Bond Yields From Yield Troughs to Market Peaks Select Rising Rate Periods 1952 Through Early-February 2018



Source: Federal Reserve Board, Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Deflated using core CPI Inflation, prior to 1957 overall CPI is used.

Exhibit 20: Nominal and Real Ten-Year Treasury Bond Yields At Market Peaks Following Periods of Rising Rates 1952 Through Early-February 2018



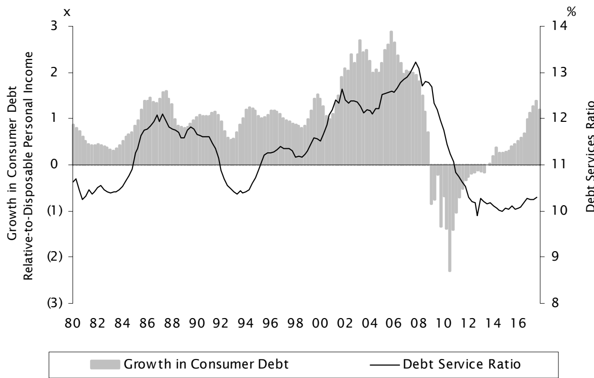
Source: Federal Reserve Board, Bureau of Labor Statistics, Empirical Research Partners Analysis.

[1]Deflated using core CPI Inflation, prior to 1957 overall CPI is used.

The equity market continues to offer the power of compounding as free cash flow margins are 8½% in a setting of sub-3% bond yields (see Exhibit 23). The associated free cash flow yields are 4.15%, or +138 basis points above the Bond's yield (see Exhibit 24). While that gap won't save us if there's an inflation shock, it suggests barring that, there's still some fuel in the tank.

The opportunity set in the market hasn't changed because the sell-off was exceptionally broad based. Our valuation spreads sit 4/10th of a deviation below their mean, a reading that reflects the market's belief that we're in the midst of an expansion of indeterminate length (see Exhibit 25). Our regime indicator is in a neutral stance (see Exhibit 26). Appendix 1 on page 16 presents our large-cap core portfolio. We're betting that any rise in inflation will be glacial, lifting the financials while weighing on the bond surrogates. Other themes are autos and auto parts, aerospace, chemicals, biotech, HMOs, casinos and hotels. We're still overweighted in an eclectic group of tech stocks.

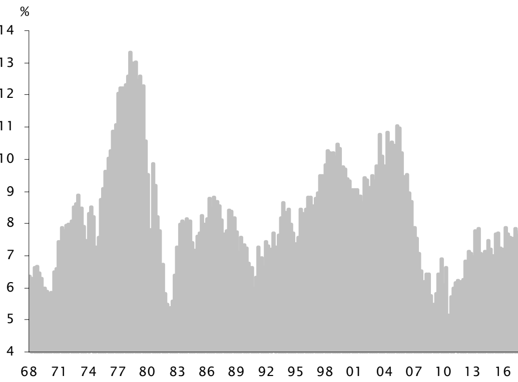
Exhibit 21: The U.S. Consumer Ratio of Dollar Growth in Debt Relative-to-Disposable Personal Income[1] and the Debt Service Ratio 1980 Through 2017



Source: Federal Reserve Board, U.S. Department of Commerce, Empirical Research Partners Analysis.

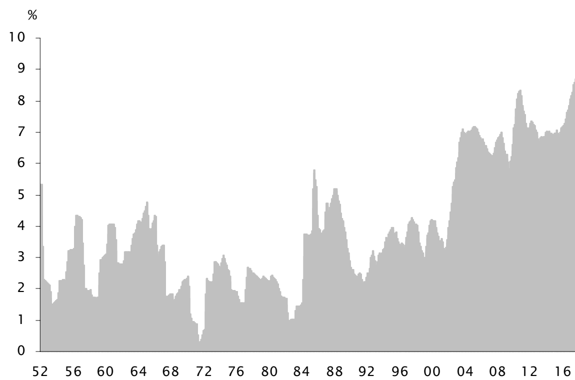
[1]Measured on a year-over-year basis and smoothed on a trailing one-year basis.

Exhibit 22: The Home Turnover Rate 1968 Through 2017



Source: National Association of Realtors, Census Bureau, Empirical Research Partners Analysis.

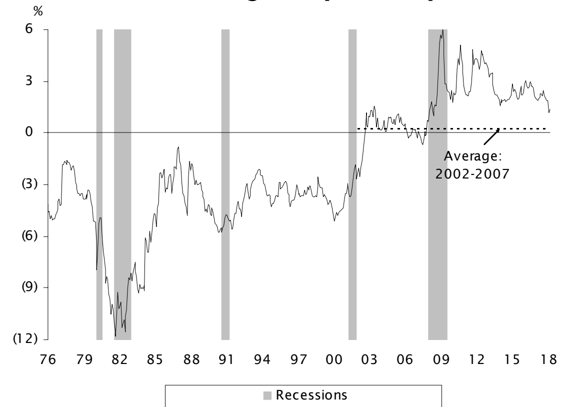
Exhibit 23: Large-Capitalization Stocks[1] Free Cash Flow Margins 1952 Through January 2018



Source: Corporate Reports, Empirical Research Partners Analysis.

[1]Excludes financials, utilities and REITS; based on trailing four-quarter data smoothed on a trailing three-month basis.

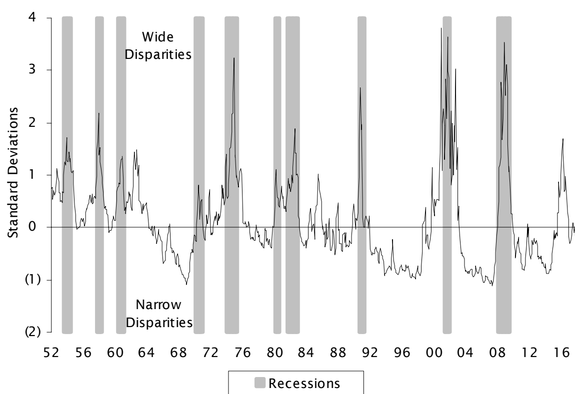
Exhibit 24: Large-Capitalization Stocks[1] Free Cash Flow Yield Less That of the Ten-Year Treasury Bond 1976 Through Early-February 2018



Source: Federal Reserve Board, Corporate Reports, Empirical Research Partners Analysis, National Bureau of Economic Research.

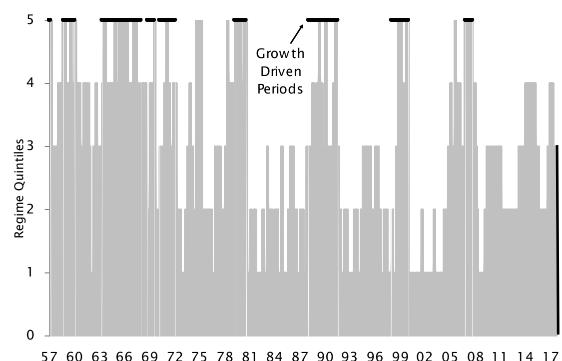
[1]Excludes financial, utilities and REITS; capitalization-weighted data.

Exhibit 25: U.S. Valuation Spreads Expected Return of the Top Quintile Compared to the Average 1952 Through Early-February 2018



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

Exhibit 26: The U.S. Equity Market Regime Indicator Quintiles (5=Growth-Driven Dynamic; 1=Valuation-Driven Dynamic) 1957 Through Early-February 2018



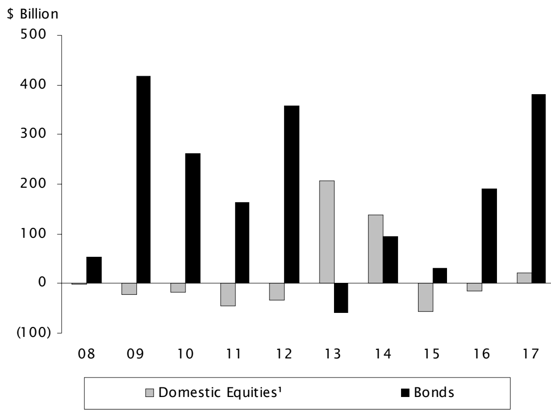
Source: Empirical Research Partners Analysis.

Demographics and Risk Premia: Joined at the Hip

Baby Boomers in Control

A question near and dear to our hearts is how demographics influence risk taking and the risk premia of different asset classes. We know a couple of things for sure. Since the financial crisis retail investors have poured unprecedented sums into bond funds while demonstrating indifference to equities (see Exhibit 27). Their basis in the bond products was set at historically low interest rates, in fact the lowest levels seen in more than 700 years (see Exhibits 28 and 29). Those provocative starting points didn't undermine their enthusiasm. Retail investor's interest in the bond market has coincided with a collapse in the term premium (see Exhibit 30). At the same time the relationship between the yields of that market and those offered by equities changed in a material way (see Exhibit 31). Just as that from the Great Depression lingered into the 1950s and early-1960s, the footprint of the financial crisis has stayed with us for almost a decade.

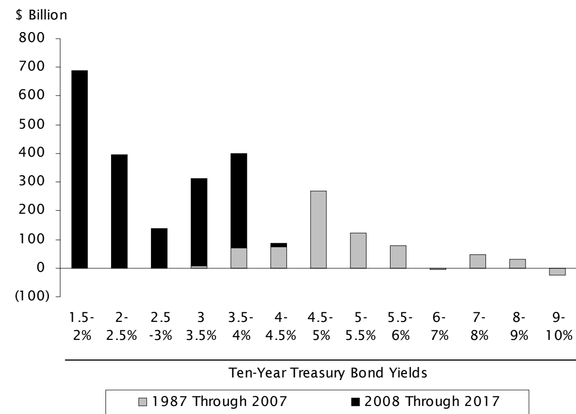
Exhibit 27: Domestic Equity and Bond Mutual Funds and ETFs Annual Net Flows 2008 Through 2017



Source: Investment Company Institute.

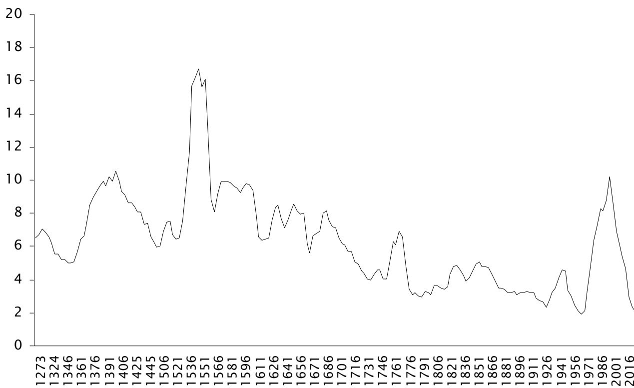
[1]Excluding variable annuities.

Exhibit 28: Bond Mutual Funds and ETFs Net Flows by the Level of Ten-Year Treasury Bond Yields at the Date of Inflows 1987 Through 2017



Source: Investment Company Institute, Federal Reserve Board, Empirical Research Partners Analysis.

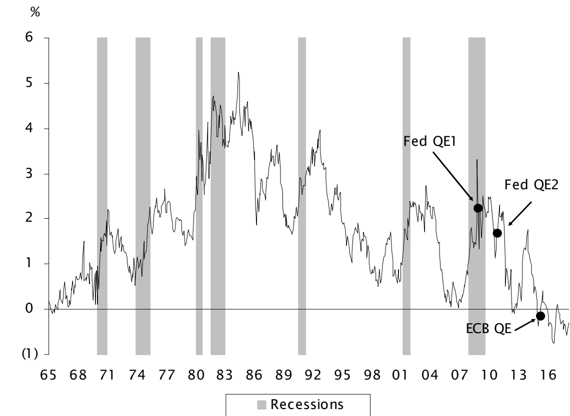
Exhibit 29: Nominal Government Bond Rates[1] 8-Year Moving Averages 1273 Through 2016



Source: Paul Schmelzing, 2017. "Eight Centuries of the Risk-Free Rate: Bond Market Reversals from the Venetians to the 'VaR Shock'," Bank of England, Staff Working Paper No. 686.

[1]Excluding variable annuities.

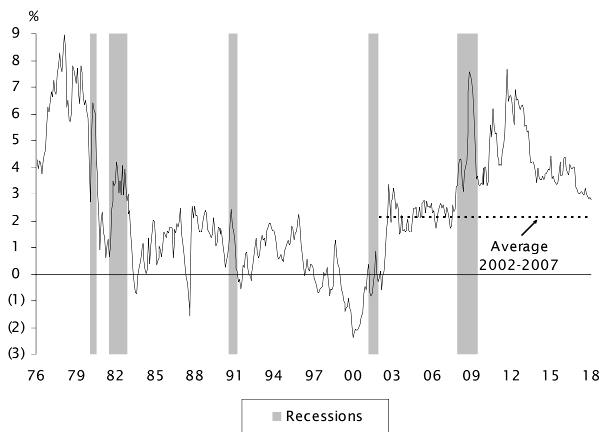
Exhibit 30: Ten-Year Treasury Bond Term Premium 1965 Through Early-February 2018



Source: Adrian, T., Crump R. K., and Emanuel Moench, 2008. "Pricing the Term Structure with Linear Regressions," National Bureau of Economic Research.

It's entirely possible that some of what we've witnessed in the past decade is attributable to aging, and, given that, the ups and downs of the markets will have a smaller effect on behavior than we might otherwise expect. After all, the money is concentrated in the older (and richer) demographics; Exhibit 32 depicts the share of assets under the direct control of households led by someone 55 and older. Up until 2004 that demographic accounted for 60% of the pie and now that number is over 75%. The skewing by age is greater in the equity categories than in the fixed income ones (see Exhibits 33 and 34).

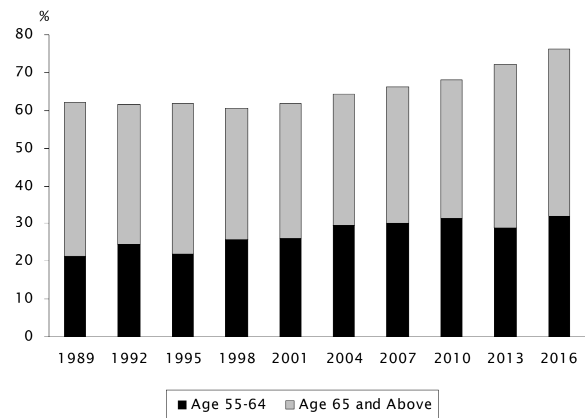
Exhibit 31: Large-Capitalization Stocks[1] *Forward* Earnings Yield Less That of the Ten-Year Treasury Bond 1976 Through January 2018



Source: Federal Reserve Board, Corporate Reports, Empirical Research Partners Analysis, National Bureau of Economic Research.

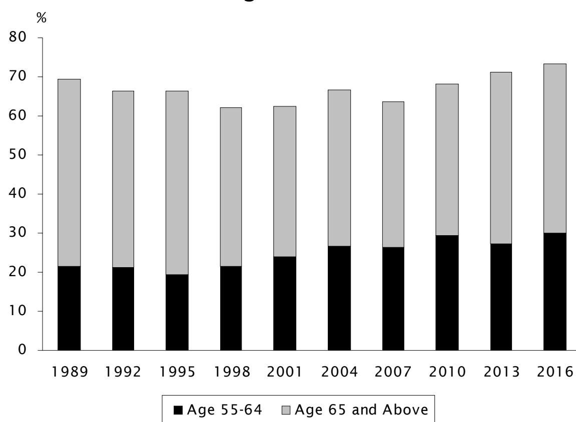
[1]Capitalization-weighted data.

Exhibit 32: Households: Age 55 and Above Share of Discretionary Financial Assets 1989 Through 2016



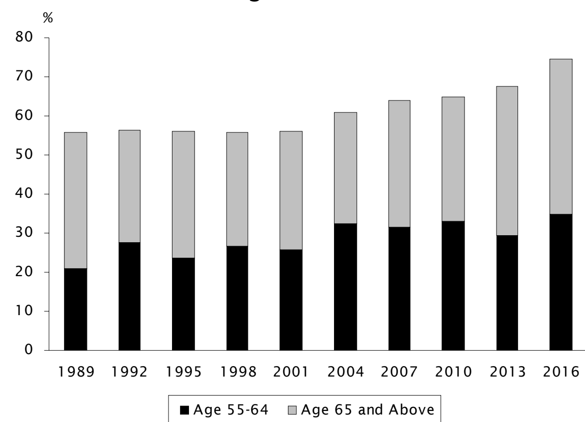
Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

Exhibit 33: Households: Age 55 and Above Share of Fixed Income and Liquid Assets 1989 Through 2016



Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

Exhibit 34: Households: Age 55 and Above Share of Equity Assets 1989 Through 2016



Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

Risk Taking: Age Versus Experiences

It may be that the willingness to take risk is largely a function of age, or, it could have more to do with one's experience in the asset class. We read an interesting paper that assessed how risk-taking attitudes change by age.[1] The authors drew upon data from a Dutch survey, conducted annually since 1993, to estimate how the willingness to take risk varies with age. The survey included six questions on that topic and the responses were graded on a seven-point scale, from 'totally disagree' (one point) to 'totally agree' (seven points). They had about 35,000 observations in the 18-year span they studied. The average participant stayed in the study for just over three years. What they found is illustrated, in normalized form, in Exhibit 35. There was a nearly linear decline in risk tolerance from early-adulthood until retirement, that flattened out thereafter. Of course the Dutch could behave differently than Americans.

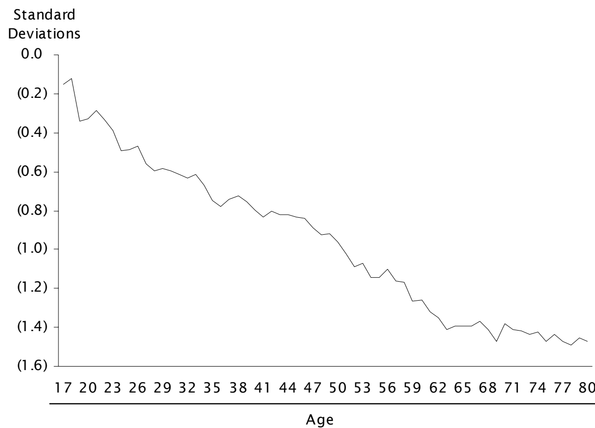
A second study used data from the Federal Reserve Board's Survey of Consumer Finances to look at how a person's experience in an asset class has influenced their willingness to take risk in it.[2] The authors found that the lifetime returns have had a significant effect on risk taking. Recent experiences carry the most weight, but those that date to

[1]Dohmen, T., Falk, A., Golsteyn, B., Huffman, D. and Uwe Sunde, 2017. "Risk Attitudes Across the Life Course," Working Paper.

[2]Malmendier, U. & Stefan Nagel, 2011. "Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?" *The Quarterly Journal of Economics,* Vol. 126(1), pp. 373-416.

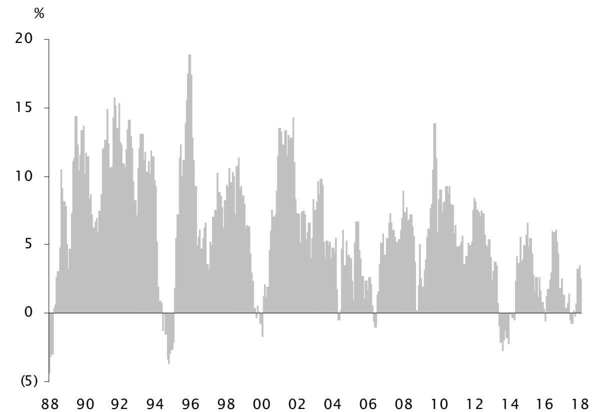
an early age influence behavior as well. Living through a bull market or two makes one more sanguine about the asset class. That insight seems especially relevant to today's bond investors (see Exhibit 36).

Exhibit 35: Changes in Risk Appetite by Age 1993 Through 2011



Source: Dohmen, T., Falk, A., Golsteyn, B., Huffman, D. and Uwe Sunde, 2017. "Risk Attitudes Across the Life Course," Working Paper, DNB Household Survey.

Exhibit 36: Vanguard Total Bond Market Index Fund Trailing Twelve-Month Nominal Returns 1988 Through Early-January 2018

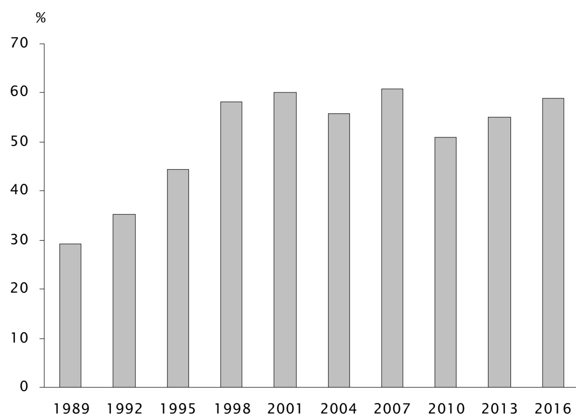


Source: Bloomberg L.P.

The Starting Point Matters Too

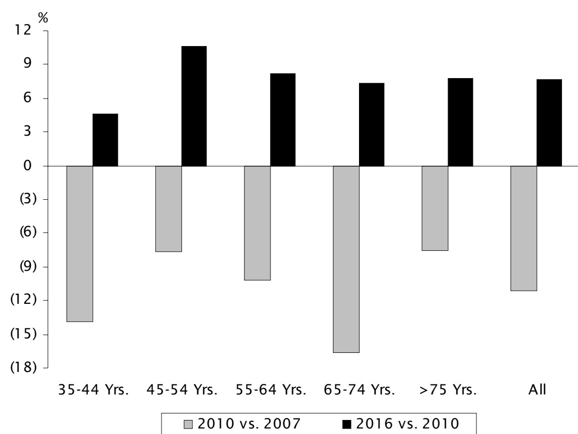
Baby Boomers and their immediate predecessors, the Silent Generation, enjoyed a great run in the stock market and that's reflected in the mix of assets they hold. As shown in Exhibit 37, in 2007 equities comprised 61% of the discretionary financial asset pool, more than double the representation for those in the same age bracket back in 1989. The share dipped to a little more than 50% in the aftermath of the Crisis and is now back to the record level seen a decade earlier. The equity share grew in part because the market went up and they never rebalanced.

Exhibit 37: U.S. Households Ages 55 and Older Equities as a Share of Discretionary Financial Assets 1989 Through 2016



Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

Exhibit 38: U.S. Millionaires Change in Equities as a Share of Discretionary Financial Assets By Age Group 2010 Versus 2007 and 2016 Versus 2010

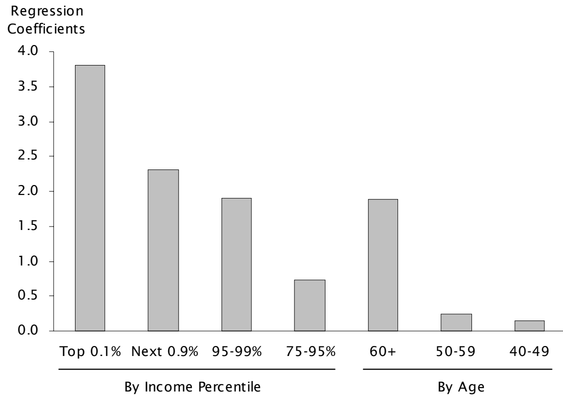


Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

Older, wealthy households, who've owned lots of equities, sold stock during 2008 and early-2009. We examine the changes in the equity allocations of millionaires by age group in Exhibit 38. From 2007 to 2010 the biggest decline occurred in the 65 to 74 age group. A group of academics looked into who sold in the bear market using tax return data. They found it was those at the very top of the income distribution who hit the panic button most vehemently when the VIX was spiking (see Exhibit 39). The 60 and over set was the most likely to have done so.

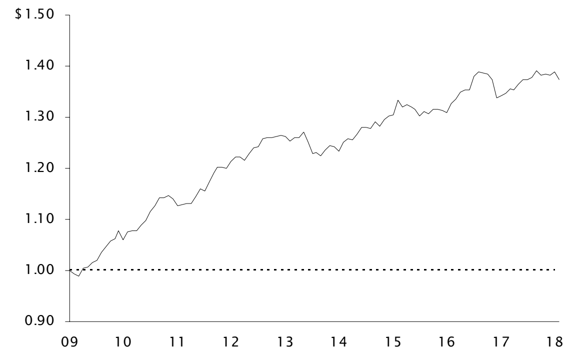
Before the financial Crisis hit wealthy boomers held a lot more equity exposure than their predecessors. They and their elders sold some stock near the bottom. Not surprisingly they've been reluctant to buy back in on the way up, although for the most part they've let their longstanding positions ride.

Exhibit 39: The Relationship Between Investor Selling and Changes in the VIX Depending on Percentile of Adjusted Gross Income Regression Coefficients by Income Level and Age Measured Over Ten-Day Windows 2008 and 2009



Source: Hoopes, J., Langetieg, P., Nagel, S., Reck, D., Slemrod, J. and Bryan Stuart, 2016. "Who Sold During the Crash of 2008-9? Evidence from Tax-Return Data on Daily Sales of Stocks," NBER Working Paper No. 22209.

Exhibit 40: Vanguard Total Bond Market Index Fund Growth of a Dollar 2009 Through January 2018



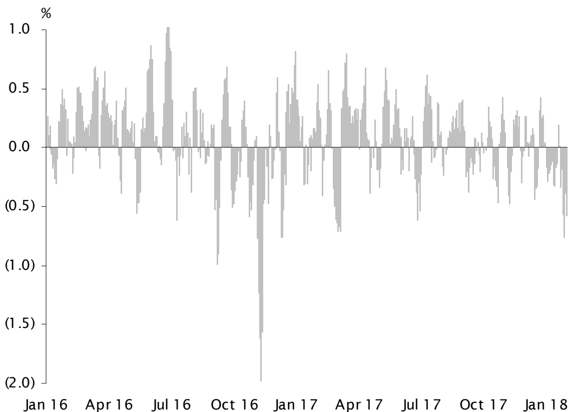
Source: Empirical Research Partners Analysis.

Conclusion: Demographics Have Played a Significant Role

The wealth of the older generations of Americans, that control three-quarters of all discretionary financial assets, is skewed toward those at the very top of the distribution. Those people have had a great life-long run in the stock market and by 2007 equities played an important role in their portfolios, in fact double that seen in those of earlier generations. They sold some stock near the bottom of the financial Crisis and thereafter turned their attention to bonds. Once again they've had a good run in that asset class that's thus far has been largely drama-free (see Exhibit 40). We think the combination of the older generation's still-high equity exposure, the fact they sold at the bottom, the smooth ride they've had in bond funds and their now more advanced ages makes them unlikely to abruptly change course. It will take a big change in the macro economy to push them in a different direction and they're at least initially likely to buy into any increases in yields. The effective duration of their bond holdings is about 4.5 years, or almost two years less than that for the entire bond market.

We examined flows into bond ETFs to see if the recent rise in rates has yet prompted a reaction by investors. Despite the erratic returns of recent years we don't see any sign of a run on the bond bank (see Exhibits 41 and 42). The boomers, who are prone to affairs of the heart, aren't close to giving up on this one. The advanced age of the base of most equity holders makes them loss averse and less likely to add to their considerable exposures.

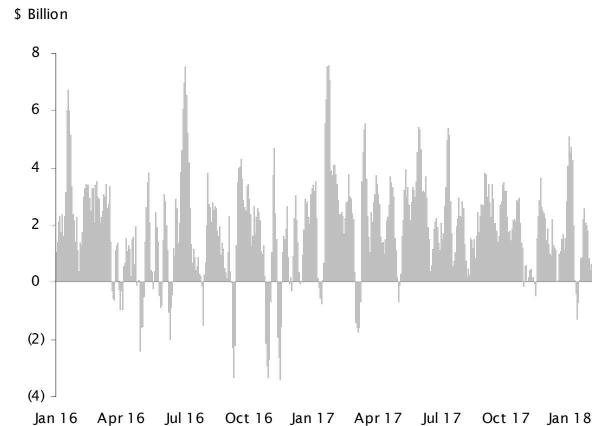
Exhibit 41: U.S.-Listed Bond ETFs[1] Weekly Nominal Returns[2] 2016 Through Early-February 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1]Includes bond ETFs with assets greater than $1 billion, currently 76 in number. Includes U.S.-listed ETFs with ex-U.S. constituents.
[2]Asset-weighted.

Exhibit 42: U.S.-Listed Bond ETFs[1] Weekly Net New Money Flows[2] 2016 Through Early-February 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

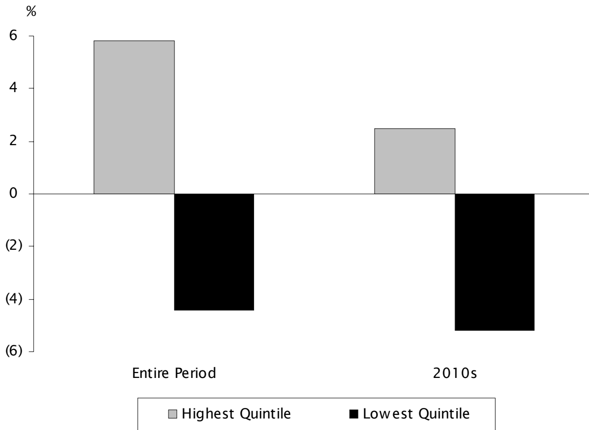
[1]Includes bond ETFs with assets greater than $1 billion, currently 76 in number. Includes U.S.-listed ETFs with ex-U.S. constituents.
[2]Computed over a trailing five-trading day period.

The Annals of Free Cash Flow: Exploiting Declines in Capital Intensity

A Different Era, Now 15 Years Long

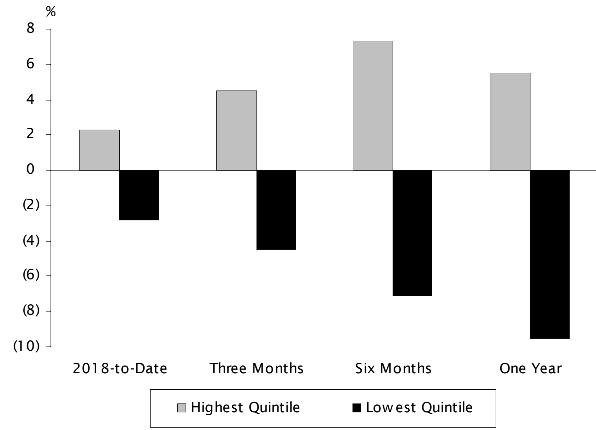
We've long been advocates of using free cash flow yield as a primary valuation tool and it features prominently in the construction of our quantitative models. It may be an oldie but it's remained a goodie. Exhibit 43 displays the relative returns of the highest and lowest quintiles of free cash flow-to-enterprise value, in the past 65 years and in the 2010s alone. Unlike most other anomalies this one has held up, including in the latest year when returns were quite good (see Exhibit 44).

Exhibit 43: Large-Capitalization Stocks
Relative Returns to the Highest and Lowest Quintiles of Free Cash Flow-to-Enterprise Value
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

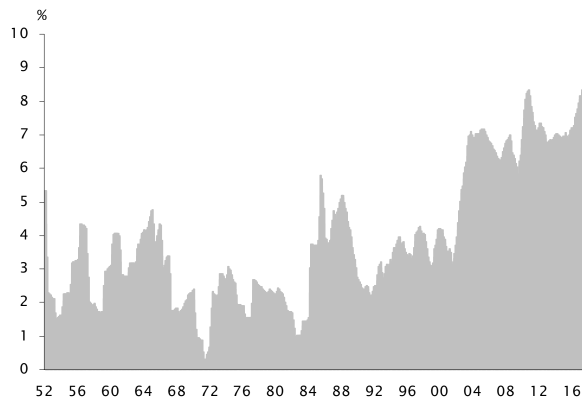
Exhibit 44: Large-Capitalization Stocks
Relative Returns to the Highest and Lowest Quintiles of Free Cash Flow-to-Enterprise Value
Monthly Data Compounded
Twelve Months Ending Early-February 2018



Source: Empirical Research Partners Analysis.

One reason why the anomaly hasn't disappeared is that free cash flow margins shot up 15 years ago and have never returned to earth, instead, they climbed ever higher (see Exhibit 45). Much of that margin expansion is attributable to a lesser draw on gross cash flow from capital expenditures and the rest from higher profit margins. It's the companies at the privileged end of the food chain that have driven that results, and Exhibit 46 presents the ratio of gross cash flow-to-*net* capital spending (i.e., the incremental over depreciation) for the market and the companies in the highest quintile. What's happened is that there's now a large segment of the market with minimal reinvestment needs, at least when that's defined to be physical capital. That change in the way the world works has proven to be exploitable, because it was long lasting, and it's paid to tilt away from companies that have to fund traditional investments to grow (see Exhibit 47). That's been doubly true in the last year or so (see Exhibit 48).

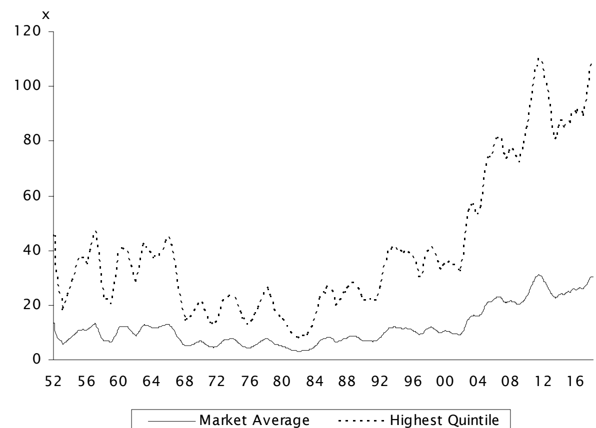
Exhibit 45: Large-Capitalization Stocks[1]
Free Cash Flow Margins
1952 Through January 2018



Source: Corporate Reports, Empirical Research Partners Analysis.

[1]Excludes financials, utilities and REITS; based on trailing four-quarter data smoothed on a trailing three-month basis.

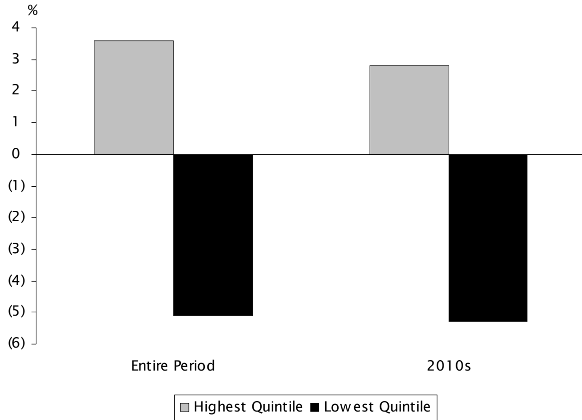
Exhibit 46: Large-Capitalization Stocks
Gross Cash Flow-to-Net Capital Spending Ratios[1]
Market Average and the Highest Quintile
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

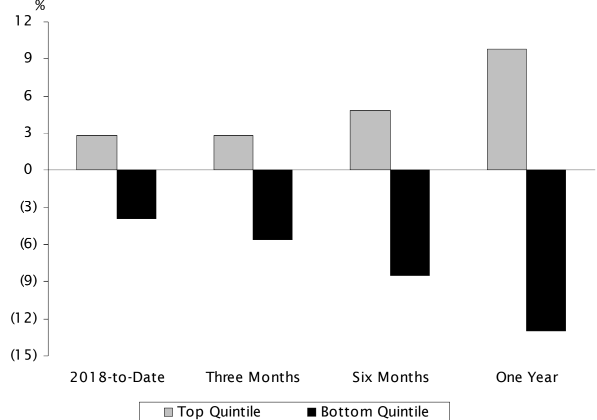
[1]Equally-weighted data smoothed on a trailing one-year basis.

Exhibit 47: Large-Capitalization Stocks
Relative Returns to the Ratio of Gross Cash Flow-to-Net Capital Spending
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



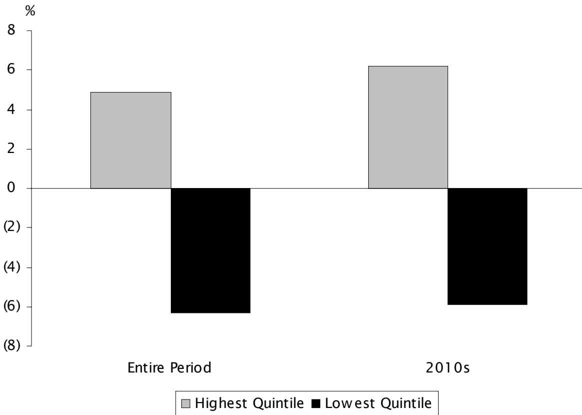
Source: Empirical Research Partners Analysis.

Exhibit 48: Large-Capitalization Stocks
Relative Returns to the Top and Bottom Quintiles of Gross Cash Flow-to-Net Capital Spending
Monthly Data Compounded
Twelve Months Ending Early-February 2018



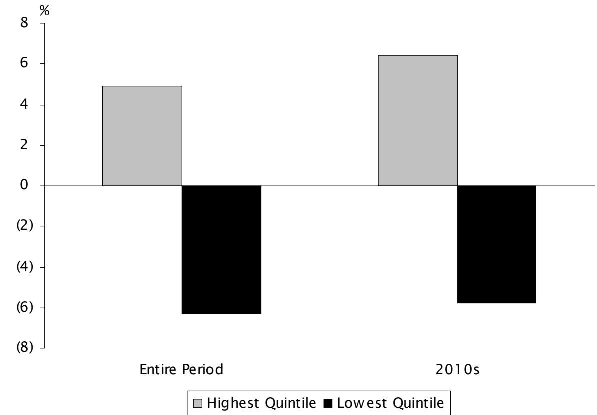
Source: Empirical Research Partners Analysis.

Exhibit 49: Large-Capitalization Industrial Commodity Stocks
Relative Returns to the Ratio of Gross Cash Flow-to-Net Capital Spending
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

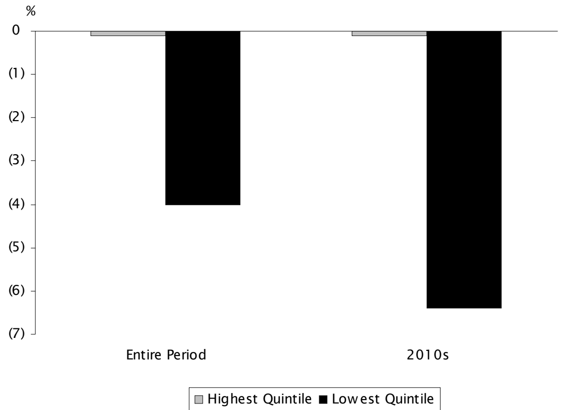
Exhibit 50: Chemical Stocks[1]
***Industry* Relative Returns to the Ratio of Gross Cash Flow-to-Net Capital Spending**
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

[1]Drawn from the largest 1,500 stock universe.

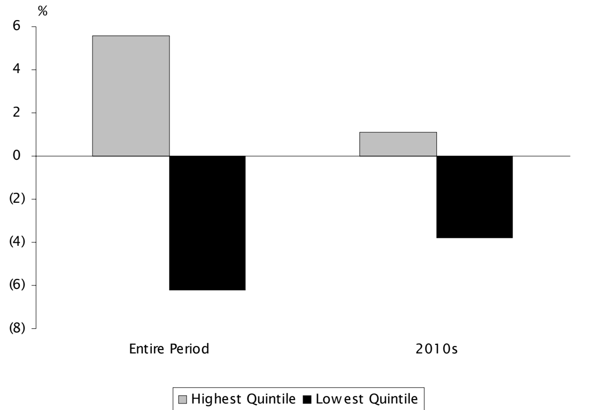
Exhibit 51: Mining and Metals Stocks[1]
***Industry* Relative Returns to the Ratio of Gross Cash Flow-to-Net Capital Spending**
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

[1]Drawn from the largest 1,500 stock universe.

Exhibit 52: Chemical Stocks[1]
***Industry* Relative Returns to the Ratio of Free Cash Flow-to-Enterprise Value**
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



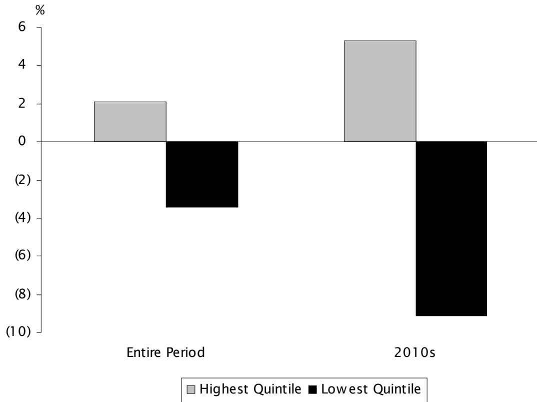
Source: Empirical Research Partners Analysis.

[1]Drawn from the largest 1,500 stock universe.

Capital Spending Has Always Mattered in Industrial Commodities

One place where capital spending has proven deterministic is in the industrial commodity sector (see Exhibit 49 overleaf). It's made up of chemicals, metals and mining, construction materials, papers and packaging. The bigger industries are chemicals and metals. In chemicals the draw on gross cash flow from net capital spending has long been important to stock performance, while in metals reinvestment has chronically proved to be a problem (see Exhibits 50 and 51 overleaf). In both cases free cash flow yields have led us in the right direction (see Exhibits 52 and 53). Exhibit 54 makes it obvious why chemicals are easier to model than metals. They usually generate free cash flow, at least on a pre-dividend basis, and their cycles have had more of a glacial character.

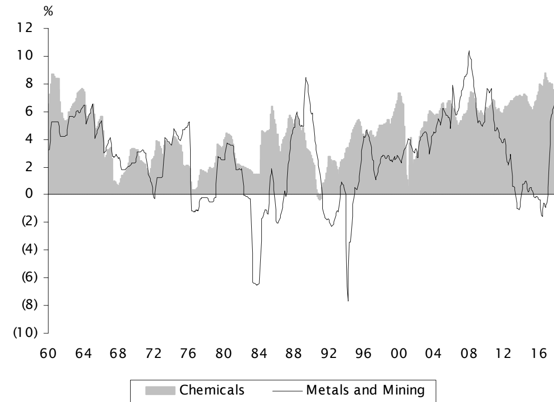
Exhibit 53 Mining and Metals Stocks[1]
***Industry* Relative Returns to the Ratio of Free Cash Flow-to-Enterprise Value**
Monthly Data Compounded and Annualized
1952 Through Early-February 2018



Source: Empirical Research Partners Analysis.

[1]Drawn from the largest 1,500 stock universe.

Exhibit 54: Large-Capitalization Chemicals and Metals and Mining Stocks
Pre-Dividend Free Cash Flow Margins[1]
1960 Through 2017



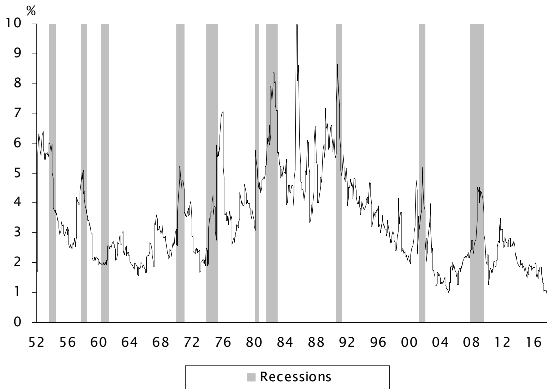
Source: Empirical Research Partners Analysis.

[1]Data smoothed on a trailing three-month basis.

Conclusion: Less Fuel in the Tank

The fact that free cash flow margins have continually risen has not been lost on investors, who've become less skeptical as the expansion has lumbered forward. Exhibit 55 depicts the yield advantage of the companies that make up the top quintile of margins. It was +3.5 percentage points in Fall of 2011 during the European debt crisis, +2 points two years ago and it's a point now. That's the lowest reading on record. Similarly the spread between the top-yielding companies and the average one is narrow (see Exhibit 56). When everything is priced the same our focus should be on growth. Even so, in this phase of the industrial commodities cycle we suspect it will be wise to pay attention to the free cash flow dynamics and Appendix 2 on page 17 ranks the chemicals and metals and mining stocks on those bases.

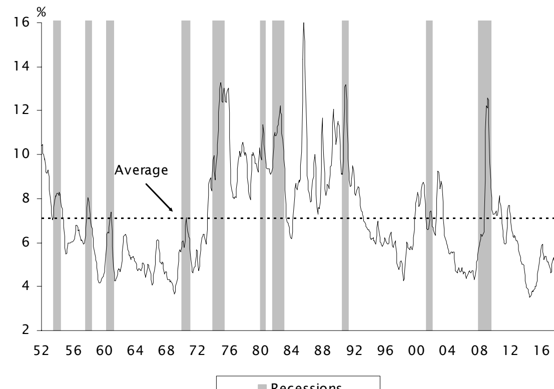
Exhibit 55: Large-Capitalization Stocks[1]
The Top Quintile of Free Cash Flow Margins
Relative Free Cash Flow Yields
1952 Through Early-February 2018



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

[1]Excludes financials, REITs and utilities.

Exhibit 56: Large-Capitalization Stocks
Spread of Free Cash Flow Yields[1]
Highest Quintile Compared to Average
1952 Through Early-February 2018



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

[1]Excludes financials, REITs and utilities, data smoothed on a trailing three-month basis.

Appendix 1: The Large-Capitalization Core Portfolio Benchmarked to the S&P 500 As of Early-February 2018

Symbol	Company	Weight	Price at Inclusion	Price 02/06/18	S&P 500 Weight
CYCLICALS					
Consumer Durables and Apparel					
LEA	LEAR CORP	2.1 %	$109.51	$184.51	
FCAU	FIAT CHRYSLER AUTOMOBILES NV	1.3	7.96	22.81	
PHM	PULTEGROUP INC	1.1	24.36	30.16	
GM	GENERAL MOTORS CO	1.0	36.14	41.86	
SNE	SONY CORP	0.7	30.88	50.77	
		6.1 %			2.5 %
Capital Equipment					
BA	BOEING CO	2.6 %	$74.78	$340.91	
NOC	NORTHROP GRUMMAN CORP	1.4	62.51	327.50	
SPR	SPIRIT AEROSYSTEMS HOLDINGS	1.2	54.55	88.32	
HON	HONEYWELL INTERNATIONAL INC	1.1	27.16	151.40	
CBI	CHICAGO BRIDGE & IRON CO	0.2	22.51	19.21	
		6.4 %			6.9 %
Commercial Services					
MCO	MOODY'S CORP	1.3	$28.63	$157.94	
		1.3 %			0.8 %
Industrial Commodities					
LYB	LYONDELLBASELL INDUSTRIES NV	2.8	$74.81	$113.82	
FCX	FREEPORT-MCMORAN INC	1.1	15.71	18.74	
		3.9 %			2.7 %
Transports					
UAL	UNITED CONTINENTAL HOLDINGS INC	0.6 %	$22.38	$63.95	
		0.6 %			2.3 %
GROWTH-ORIENTED					
Technology					
MSFT	MICROSOFT CORP	4.7 %	$52.15	$91.33	
AAPL	APPLE INC	3.0	63.25	163.03	
TSM	TAIWAN SEMICONDUCTOR MFG CO	2.3	9.16	43.59	
XLNX	XILINX INC	2.1	35.08	68.99	
VRSN	VERISIGN INC	2.0	74.26	109.41	
ACN	ACCENTURE PLC	2.0	50.25	154.69	
FLEX	FLEX LTD	1.9	10.12	17.31	
TEL	TE CONNECTIVITY LTD	1.3	40.96	99.14	
FDC	FIRST DATA CORP	1.2	15.62	16.48	
EBAY	EBAY INC	1.2	24.57	42.79	
GLW	CORNING INC	1.1	20.51	29.80	
HPE	HEWLETT PACKARD ENTERPRISE	0.4	9.67	15.73	
HPQ	HP INC	0.3	14.98	21.43	
		23.4 %			20.8 %
Pharmaceuticals & Biotechnology					
JNJ	JOHNSON & JOHNSON	1.8 %	$50.87	$131.83	
AMGN	AMGEN INC	1.4	132.53	176.65	
ABBV	ABBVIE INC	1.1	88.86	111.20	
PFE	PFIZER INC	0.9	21.76	35.28	
GILD	GILEAD SCIENCES INC	0.9	97.21	80.38	
AGN	ALLERGAN PLC	0.6	229.32	168.33	
		6.8 %			8.1 %

Symbol	Company	Weight	Price at Inclusion	Price 02/06/18	S&P 500 Weight
GROWTH-ORIENTED (Cont.)					
Health Care Equipment and Services					
ANTM	ANTHEM INC	3.3 %	$75.58	$234.83	
UNH	UNITEDHEALTH GROUP INC	2.7	37.16	225.18	
SYK	STRYKER CORP	1.3	49.25	154.14	
HCA	HCA HOLDINGS INC	0.9	81.95	98.71	
CAH	CARDINAL HEALTH INC	0.8	35.27	65.44	
		9.0 %			5.1 %
Retail, Media and Other Consumer Cyclicals					
H	HYATT HOTELS CORP	3.2 %	$58.67	$78.24	
TJX	TJX COMPANIES INC	1.4	10.84	75.99	
COST	COSTCO WHOLESALE CORP	1.2	41.94	185.01	
WYN	WYNDHAM WORLDWIDE CORP	1.0	85.03	119.77	
LVS	LAS VEGAS SANDS CORP	1.0	62.27	74.11	
M	MACY'S INC	0.9	61.47	24.16	
		8.7 %			11.5 %
Consumer Staples					
PM	PHILIP MORRIS INTERNATIONAL	1.7 %	$42.16	$100.33	
PEP	PEPSICO INC	0.9	95.34	113.56	
		2.6 %			8.9 %
OTHER					
Financials					
C	CITIGROUP INC	4.1 %	$55.03	$74.82	
JPM	JPMORGAN CHASE & CO	4.1	46.90	112.11	
COF	CAPITAL ONE FINANCIAL CORP	3.9	66.87	98.44	
MS	MORGAN STANLEY	3.2	39.04	54.33	
PNC	PNC FINANCIAL SERVICES GROUP INC	2.6	66.75	154.29	
GS	GOLDMAN SACHS GROUP INC	1.9	120.49	258.70	
BAC	BANK OF AMERICA CORP	1.5	35.40	31.20	
CFG	CITIZENS FINANCIAL GROUP INC	1.3	26.77	44.60	
DFS	DISCOVER FINANCIAL SVCS INC	1.0	59.41	76.14	
LM	LEGG MASON INC	0.4	62.76	40.55	
		24.0 %			15.0 %
Energy					
COP	CONOCOPHILLIPS	2.6 %	$46.36	$55.94	
HES	HESS CORP	1.1	67.69	45.96	
OXY	OCCIDENTAL PETROLEUM CORP	1.1	91.75	71.22	
MPC	MARATHON PETROLEUM CORP	1.1	20.00	65.69	
NBL	NOBLE ENERGY INC	0.6	39.46	28.17	
APA	APACHE CORP	0.4	97.66	41.12	
MDR	MCDERMOTT INTL INC	0.2	17.28	8.13	
CHK	CHESAPEAKE ENERGY CORP	0.1	25.64	3.13	
		7.2 %			7.2 %
Telecommunication Services					
None					
		0.0 %			2.5 %
Utilities					
None					
		0.0 %			2.9 %
Real Estate					
None					
		0.0 %			2.8 %
TOTAL		100.0 %			100.0 %

Source: Empirical Research Partners Analysis.

Appendix 2: Chemicals, Metals and Mining
Key Factors Ranked within the Industrial Commodities Sector
Sorted by Gross Cash Flow-to-Net Capital Spending and Free Cash Flow-to-Enterprise Value
As of Early-February 2018

			Intra-Sectoral Quintile Ranks (1=Best; 5=Worst)						
Symbol	Company	Price	Gross Cash Flow -to-Net Capital Spending	Free Cash Flow-to-Enterprise Value	Core Model	Failure Model (1=Best; 10=Worst)	Forward P/E-Ratio		Market Capitalization ($ Million)
Chemicals									
WLK	WESTLAKE CHEMICAL CORP	$106.41	1	2	1	1	14.4	x	$13,738
HUN	HUNTSMAN CORP	32.46	1	2	2	3	12.6		7,791
GRA	GRACE (W R) & CO	72.03	1	2	4	8	19.5		4,881
POL	POLYONE CORP	42.88	1	3	2	4	16.9		3,465
PPG	PPG INDUSTRIES INC	115.61	1	3	2	6	17.5		29,420
FUL	FULLER (H. B.) CO	49.73	1	4	4	7	15.6		2,508
KWR	QUAKER CHEMICAL CORP	148.78	1	4	5	9	29.8		1,979
PAH	PLATFORM SPECIALTY PRODUCTS	10.75	2	1	3	4	11.0		3,086
APD	AIR PRODUCTS & CHEMICALS INC	162.84	2	1	4	4	22.3		35,652
VHI	VALHI INC	5.81	2	2	1	3	30.6		1,987
SMG	SCOTTS MIRACLE-GRO CO	90.48	2	2	4	8	19.2		5,257
PX	PRAXAIR INC	155.05	2	3	4	5	23.5		44,392
SXT	SENSIENT TECHNOLOGIES CORP	72.00	2	3	4	7	19.1		3,130
FOE	FERRO CORP	22.59	2	4	4	7	15.1		1,894
SHW	SHERWIN-WILLIAMS CO	403.13	2	4	4	9	21.1		37,698
VNTR	VENATOR MATERIALS PLC	21.02	2	5	5	10	8.0		2,234
LYB	LYONDELLBASELL INDUSTRIES NV	112.17	3	1	1	1	11.0		44,307
CBT	CABOT CORP	65.50	3	2	2	5	17.2		4,053
MTX	MINERALS TECHNOLOGIES INC	72.40	3	2	3	4	14.5		2,561
KRO	KRONOS WORLDWIDE INC	25.27	3	3	1	3	14.8		2,929
CC	CHEMOURS CO	49.22	3	3	3	6	9.8		9,114
NGVT	INGEVITY CORP	72.95	3	3	4	5	23.5		3,073
CE	CELANESE CORP	105.09	3	4	3	5	12.4		14,254
FMC	FMC CORP	85.72	3	4	4	8	15.9		11,509
BCPC	BALCHEM CORP -CL B	77.86	3	4	5	6	28.6		2,492
IFF	INTERNATIONAL FLAVORS & FRAGRANCES	146.13	3	4	5	9	23.1		11,541
ASH	ASHLAND GLOBAL HOLDINGS INC	73.87	3	5	4	9	23.3		4,597
DWDP	DOWDUPONT INC	70.89	3	5	5	9	17.2		165,882
MEOH	METHANEX CORP	59.85	4	1	1	1	11.9		5,029
ICL	ICL-ISRAEL CHEMICALS LTD	4.10	4	1	2	2	12.7		5,346
EMN	EASTMAN CHEMICAL CO	99.27	4	2	1	3	11.8		14,196
AXTA	AXALTA COATING SYSTEMS LTD	30.84	4	2	4	9	22.5		7,514
MON	MONSANTO CO	121.00	4	3	5	8	21.0		53,337
RPM	RPM INTERNATIONAL INC	50.99	4	4	4	7	16.3		6,816
ECL	ECOLAB INC	137.06	4	4	5	9	25.6		39,599
MOS	MOSAIC CO	26.04	4	5	3	7	20.8		10,031
GCP	GCP APPLIED TECHNOLOGIES INC	33.35	4	5	5	10	39.2		2,389
CF	CF INDUSTRIES HOLDINGS INC	39.91	5	1	1	2	92.8		9,309
OLN	OLIN CORP	36.06	5	2	2	4	15.0		6,000
TSE	TRINSEO SA	80.50	5	3	3	4	9.7		3,524
NEU	NEWMARKET CORP	392.53	5	4	5	9	18.0		4,653
ALB	ALBEMARLE CORP	105.51	5	5	5	10	20.6		11,658
VVV	VALVOLINE INC	24.15	5	5	5	10	19.7		4,902
PQG	PQ GROUP HOLDINGS INC	15.42	5	5	5	10	17.2		2,085
Metals & Mining									
WOR	WORTHINGTON INDUSTRIES	$45.58	1	1	2	2	13.7	x	$2,807
MT	ARCELORMITTAL	34.26	1	2	1	1	9.4		35,332
X	UNITED STATES STEEL CORP	34.58	1	3	1	3	10.5		6,050
RS	RELIANCE STEEL & ALUMINUM CO	85.03	1	3	2	3	13.4		6,200
CRS	CARPENTER TECHNOLOGY CORP	48.01	1	4	2	5	17.8		2,252
FCX	FREEPORT MCMORAN COPPER & GOLD	17.97	2	1	1	1	9.0		26,021
NEXA	NEXA RESOURCES SA	19.65	2	1	1	1	10.4		2,711
CMP	COMPASS MINERALS INTL INC	69.85	2	4	3	6	19.9		2,363
TECK	TECK RESOURCES LTD	28.33	3	1	1	1	8.1		16,422
ARNC	ARCONIC INC	29.11	3	5	3	7	19.3		14,011
HBM	HUDBAY MINERALS INC	8.25	4	1	1	1	11.3		2,157
CLF	CLEVELAND-CLIFFS INC	6.48	4	1	3	8	6.9		1,921
STLD	STEEL DYNAMICS INC	44.15	4	2	1	4	11.5		10,461
NUE	NUCOR CORP	64.24	4	4	3	7	13.2		20,423
SCCO	SOUTHERN COPPER CORP	47.40	4	5	3	5	17.4		36,642
AA	ALCOA CORP	49.09	5	1	1	2	14.3		9,092
WPM	WHEATON PRECIOUS METALS CORP	21.13	5	1	3	6	35.2		9,368
GSM	FERROGLOBE PLC	14.46	5	4	2	4	120.5		2,485
ATI	ALLEGHENY TECHNOLOGIES INC	26.34	5	5	3	8	19.8		3,316
CMC	COMMERCIAL METALS	23.42	5	5	4	7	16.2		2,732
PAAS	PAN AMERICAN SILVER CORP	15.91	5	5	4	8	20.5		2,448
TRQ	TURQUOISE HILL RESOURCES LTD	2.94	5	5	5	8	49.0		5,944

Source: Empirical Research Partners Analysis.