

Global Portfolio Strategy November 2016

November 1, 2016

When Global Stocks Change their Volatility Stripes: Does It Matter?

Unstable Volatility

- One of the most striking relationships in the global markets is that between stable stocks and volatile ones. The low-growth, low-rate environment has pushed investors towards bond-like stocks to an unprecedented degree. Once again, this relationship is essentially a byproduct of the market's focus on bond-like strategies: in the non-U.S. developed world there's a very large overlap between the cohort of stocks with low price volatility and the bond-proxy cohort.
- The price volatility of stocks isn't invariant however; stocks can and do change their stripes. The turnover of stocks in the lowest-quintile of price volatility is above 50% and the most-volatile stocks tend to move out at a similar pace. We developed a framework to predict changes in volatility utilizing work we did in the U.S. market.
- The performance of low-volatility issues since early-2009 has been linked to their bond-proxy characteristics. About half of them have performance that's closely-linked to Treasury bond returns. Other strategies popularized in the low-rate environment, such as those emphasizing the stability of fundamentals or high dividend yields also have higher-than-benchmark representations in the cohort of low price volatility. The same bet has been made in many different guises.

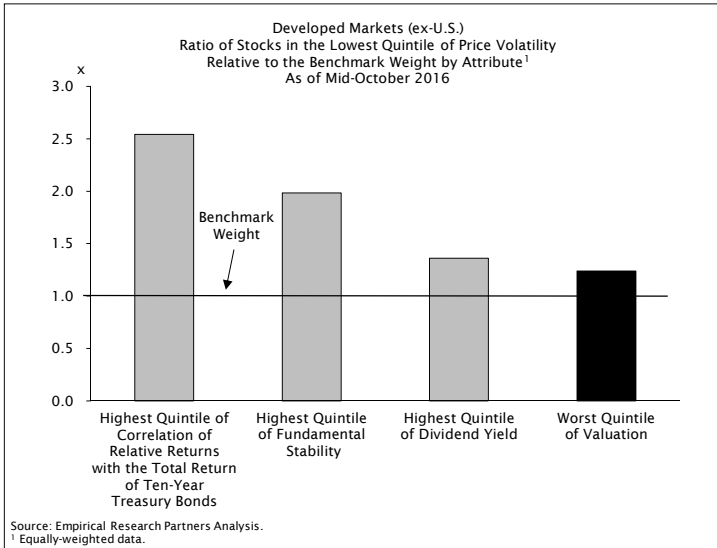
Predicting Unpredictability: Forecasting Stock-Level Volatility

- There are a number of telltale signs that foreshadow an increase in price volatility among stocks where it's been low. Those include fundamentals that are more volatile than the stock, spending lots of money in pursuit of rapid expansion and negative price and earnings trends. Other indicators that carry some weight are our high arbitrage risk framework, that captures the controversy of a stock, and its rank in our Failure Model.
- Stocks in the lowest-quintile of price volatility that are predicted to have higher volatility in the future have historically underperformed the market by only (75) basis points per year, but given the valuation of the bond-proxies the downside could be larger this time. Meanwhile, those predicted to have lower volatility have outperformed by +2.5 points per year.
- Appendix 1 on page 11 screens for stocks in the lowest-quintile of price volatility that are predicted to have even lower volatility in the future. Appendix 2 on page 12 has the other side: low-volatility stocks at risk of leaving that coveted space.
- At the other extreme, for the highest-quintile of price volatility, we find that the approach is more fruitful. The issues with the biggest expected increases in price volatility have underperformed by (4) percentage points per year. The model we use here is similar to that described above, but here price and earnings trends count more.
- Appendix 3 on page 13 presents a red flag list of high price volatility stocks at risk of even higher volatility in the future.
- The model is also effective in identifying stocks with stable fundamentals that could see rising share price volatility ahead. As we'd expect, the bulk of the fundamentally-stable stocks also have low share price volatility in the here-and-now, but that doesn't mean they'll always have that character. We find that the model is useful in predicting future returns among the stable stocks too. Appendix 4 on page 14 looks for low price volatility stable stocks at risk of a big increase in volatility over the coming year that are also priced at rich valuation multiples.

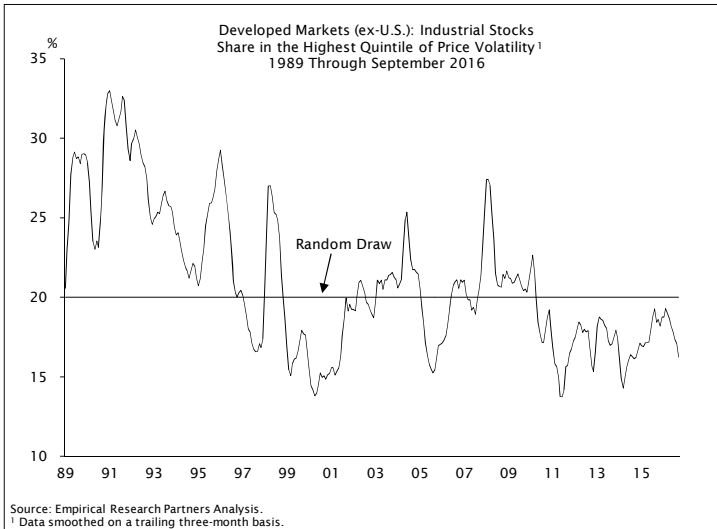
Sungsoo Yang (212) 803-7925 Nicole Price (212) 803-7935 Yi Liu (212) 803-7942 Iwona Scanzillo (212) 803-7915

Conclusions in Brief

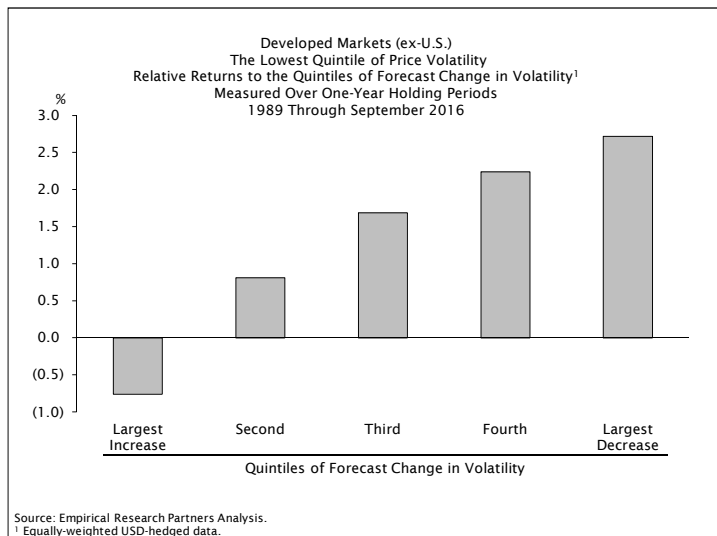
- There're a lot of bond-like stocks in the low-volatility cohort:



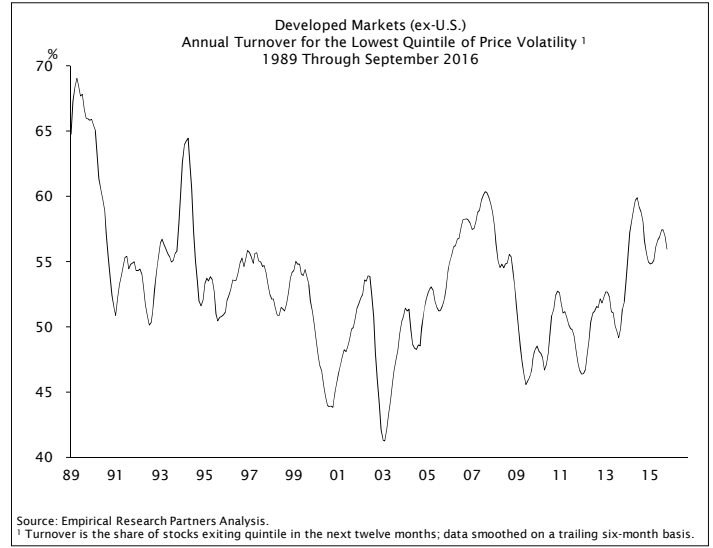
- There're also some noticeable long-term trends at the sector level:



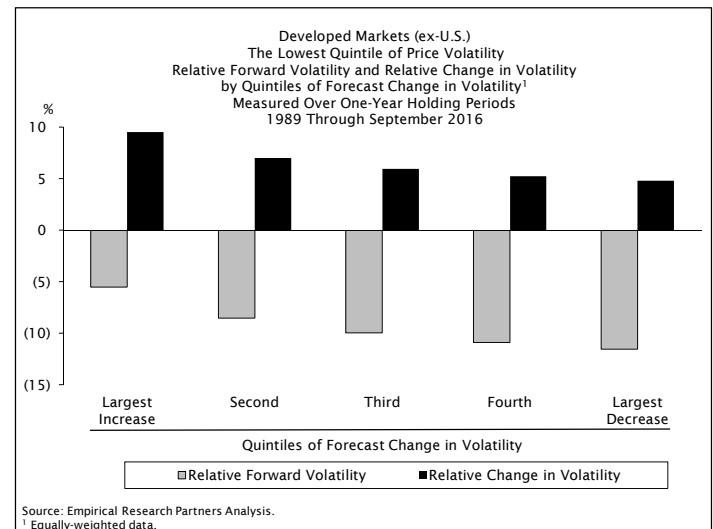
- And works well in predicting returns for low-volatility stocks with changing volatility...



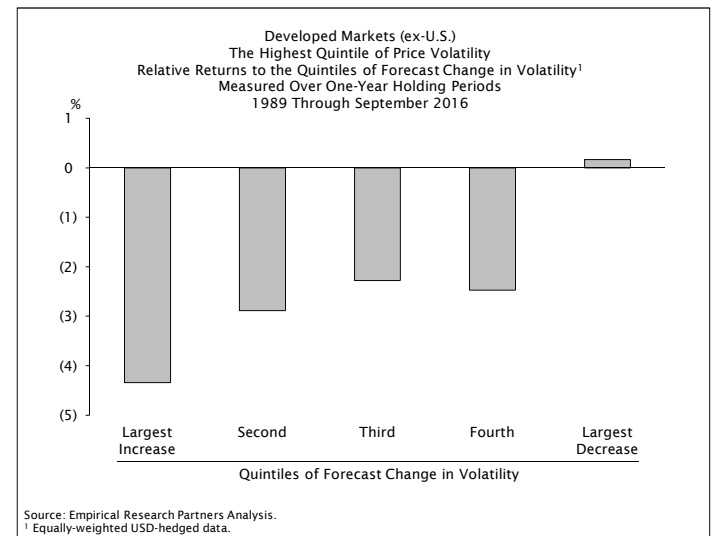
- The price volatility of stocks isn't invariant, they can and do change their volatility stripes:



- Our volatility forecasting model for non-U.S. stocks is quite effective:



- ...And for high-volatility stocks too:



When Global Stocks Change their Volatility Stripes: Does It Matter?

Yet Again: A Bond-Proxy Strategy

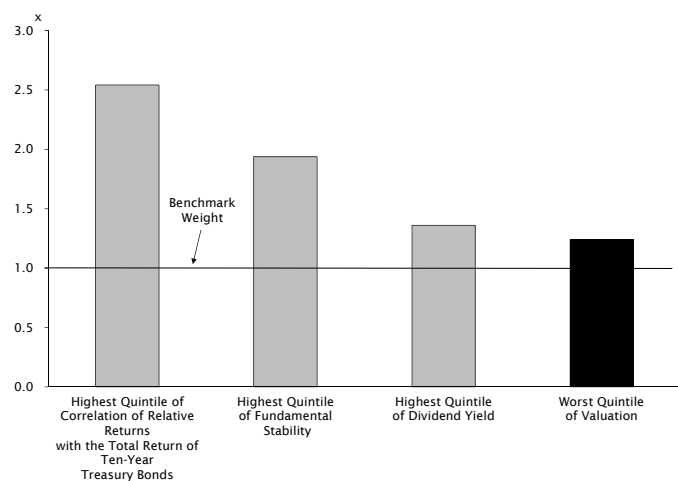
As we've highlighted in the past, one of the most striking relationships in the global markets is that between stable stocks and volatile ones. The two have been performing as almost perfect mirror images of one another as the low-growth, low-rate environment has pushed investors towards bond-like stocks offering low volatility. The most stable issues have consistently outperformed since 2009, although since July they've had a turn in fate.

Once again, this relationship is essentially a byproduct of the market's focus on bond-like strategies. The sterling performance of stocks with low price volatility since early-2009 has been linked to their bond-proxy characteristics. Exhibit 1 shows that in the non-U.S. developed world there's a very large intersection between the cohort of stocks with low price volatility and the bond-proxy cohort. About half the stocks in the lowest-quintile of volatility are also in the highest-quintile of correlation with Treasury bond returns. A similar exercise in the U.S. produces similar results (see Exhibit 2).

Exhibit 1 also shows an overlap between low price volatility stocks and those deemed most fundamentally-stable by our stability framework. Other strategies whose returns are linked to the low-rate environment, such as high dividend yield, also have higher than benchmark representations in the low price volatility cohort.

We've repeatedly highlighted that, after being consistently rewarded by the markets for a long period of time, the valuations of the bond-proxies have become increasingly stretched. Low-volatility stocks are no exception and are now overrepresented in the worst-quintile of our valuation framework.

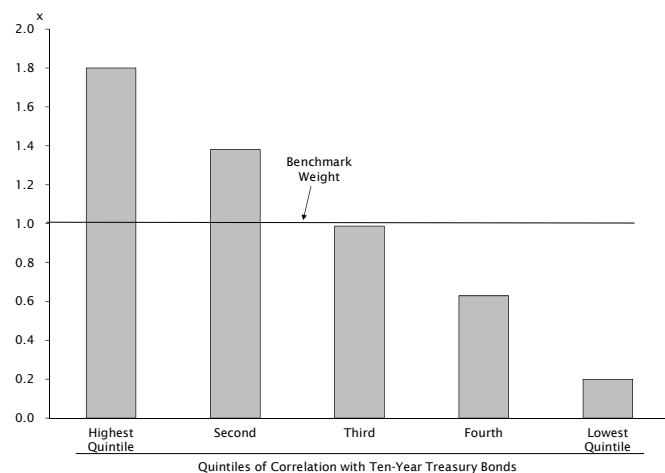
Exhibit 1: Developed Markets (ex-U.S.)
Ratio of Stocks in the Lowest Quintile of Price Volatility Relative to the Benchmark Weight by Attribute¹
As of Mid-October 2016



Source: Empirical Research Partners Analysis.

¹ Equally-weighted data.

Exhibit 2: U.S. Large-Capitalization Stocks
Ratio of Stocks in the Lowest Quintile of Price Volatility by Quintile of Correlation of Relative Returns with the Total Return of Ten-Year Treasury Bonds Relative to the Benchmark Weight¹
As of Mid-October 2016



Source: Empirical Research Partners Analysis.

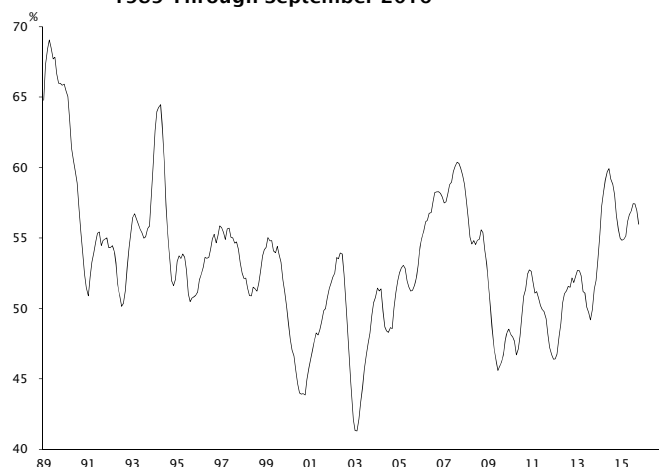
¹ Equally-weighted data.

Unstable Volatility

Exhibit 3 shows that the annual turnover of the stocks in the lowest quintile of price volatility has been broadly stable since the end of the 1980s and the probability of a stock staying in the lowest quintile is less than 50%. Looking at the other end of the spectrum, the most volatile stocks tend to exit that quintile at a broadly similar pace (see Exhibit 4). So the price volatility of stocks isn't invariant, they can and do change their stripes.

We repeat the exercise using our fundamental stability score described in Exhibit 5. It weighs the stability of ROEs and earnings along with financial leverage and beta. We find that compared to the price volatility cut, the rotation of the fundamentally-derived stable cohort is much lower, with only about a quarter of the stocks exiting each year (see Exhibit 6). Market price volatility is thus more changeable than our stability framework that captures a more fundamental dimension.

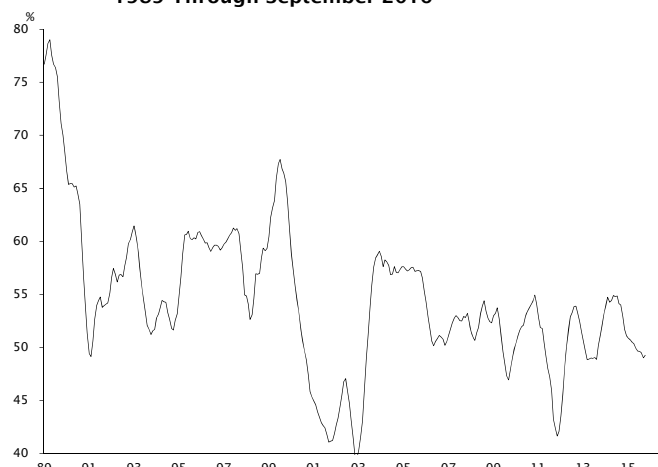
**Exhibit 3: Developed Markets (ex-U.S.)
Annual Turnover for the Lowest Quintile of
Price Volatility¹
1989 Through September 2016**



Source: Empirical Research Partners Analysis.

¹ Turnover is the share of stocks exiting quintile in the next twelve months; data smoothed on a trailing six-month basis.

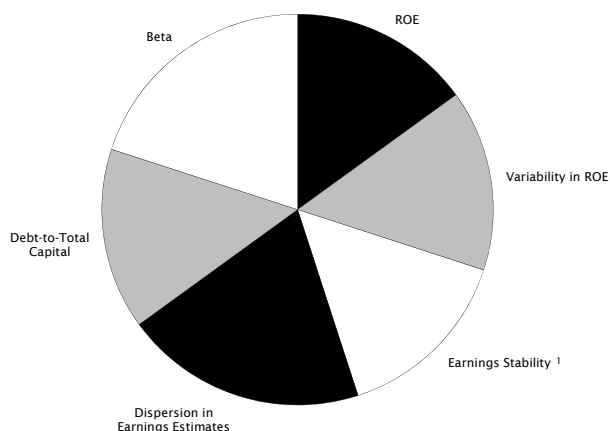
**Exhibit 4: Developed Markets (ex-U.S.)
Annual Turnover for the Highest Quintile of
Price Volatility¹
1989 Through September 2016**



Source: Empirical Research Partners Analysis.

¹ Turnover is the share of stocks exiting quintile in the next twelve months; data smoothed on a trailing six-month basis.

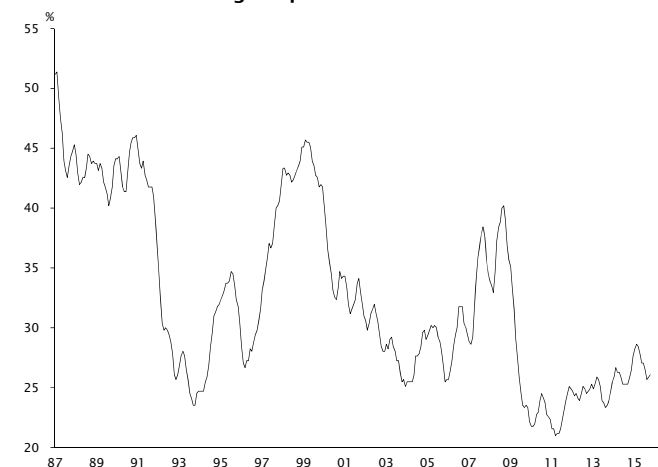
**Exhibit 5: Fundamental Stability Score
Factor Composition
2016**



Source: Empirical Research Partners Analysis.

¹ Computed over the trailing 12 quarters.

**Exhibit 6: Developed Markets (ex-U.S.)
Annual Turnover for Fundamentally-Stable Stocks¹
1987 Through September 2016**



Source: Empirical Research Partners Analysis.

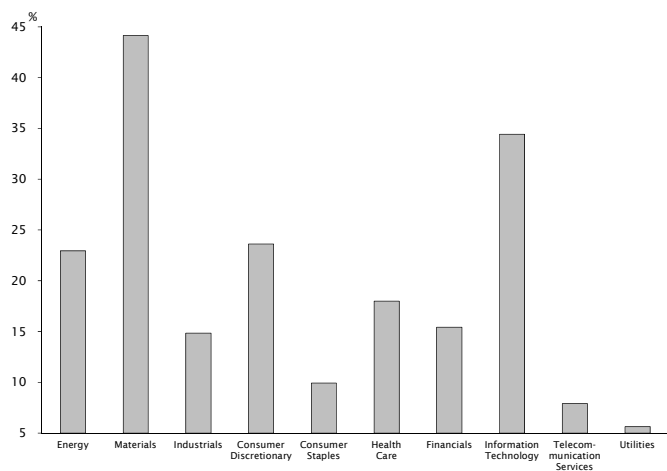
¹ Turnover is the share of stocks exiting the most stable quintile in the next twelve months; data smoothed on a trailing six-month basis.

Changing Sectors, Stable Regions

In the non-U.S. developed world the sectors with a high number of issues in the top-quintile of volatility are, unsurprisingly, industrial commodities and technology (see Exhibit 7). At the other extreme, those with a large proportion of low-volatility stocks are telecom, utilities and consumer staples (see Exhibit 8). This is largely consistent with our fundamental stability framework that produces a similar paradigm as shown by the black bars in the exhibit.

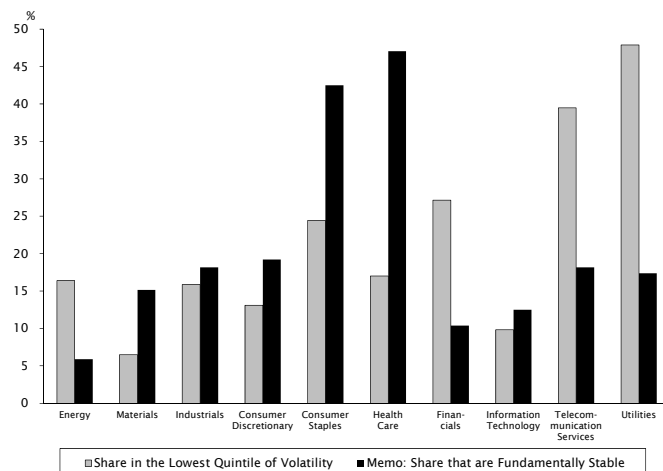
The historical trends are noteworthy and the share of stocks with high price volatility in each sector has varied over time. The industrial commodity sector is one example of a major swing with the volatility of the stocks increasing during the commodity bull market of the 2000s and remaining elevated during the reversal that followed (see Exhibit 9). Industrial stocks trended the other way, they've gradually migrated out of the most volatile cohort (see Exhibit 10). We view their behavior as another consequence of our Bretton Woods II thesis; with an increasingly capital-light model, companies have stabilized their free cash flow margins and have lost part of the cyclicality in their earnings, becoming more stable than before.

**Exhibit 7: Developed Markets (ex-U.S.)
Share of Stocks in the Highest Quintile of
Price Volatility by Sector
As of End-September 2016**



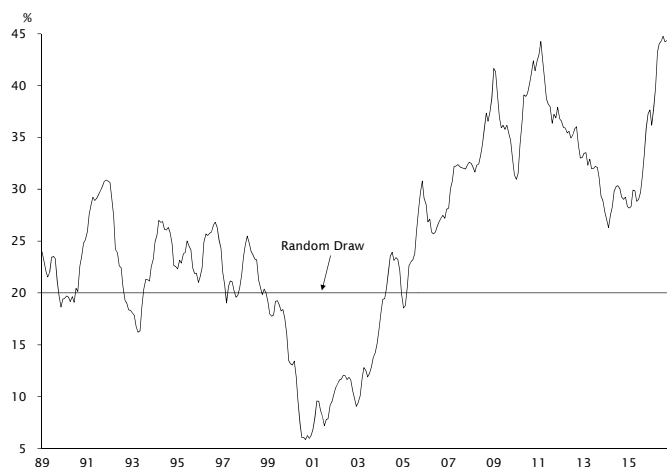
Source: Empirical Research Partners Analysis.

**Exhibit 8: Developed Markets (ex-U.S.)
Share of Stocks in the Lowest Quintile of
Price Volatility by Sector
As of End-September 2016**



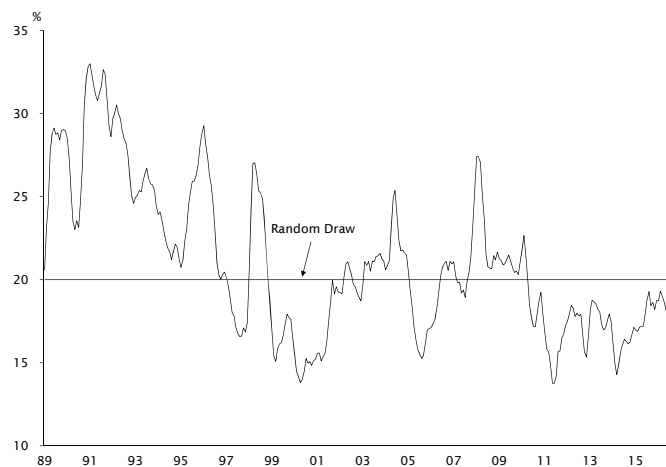
Source: Empirical Research Partners Analysis.

**Exhibit 9: Developed Markets (ex-U.S.): Materials Stocks
Share in the Highest Quintile of Price Volatility'
1989 Through September 2016**



Source: Empirical Research Partners Analysis.

**Exhibit 10: Developed Markets (ex-U.S.): Industrial Stocks
Share in the Highest Quintile of Price Volatility'
1989 Through September 2016**

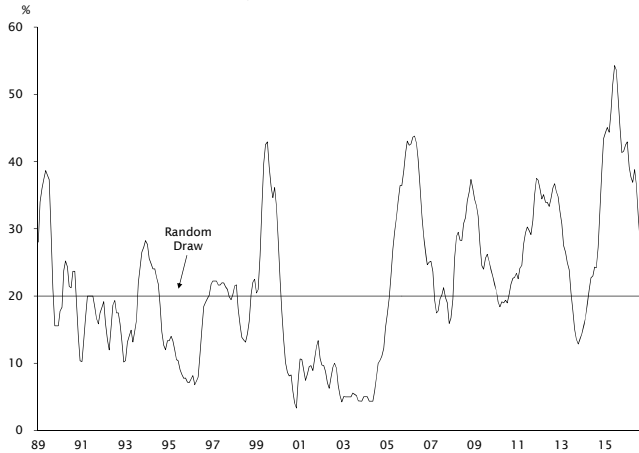


Source: Empirical Research Partners Analysis.

The price volatility among energy stocks is also interesting on two counts. First, the decline in oil prices has clearly had an impact on the stress in the sector, with half of the stocks in the sector moving to the top-quintile of volatility around the middle of last year (see Exhibit 11). Second, in contrast to the U.S. where the proportion of energy stocks in the highest quintile of volatility remains elevated at 48%, in the non-U.S. developed markets the proportion has declined recently to 26%. This owes much to the different sector compositions: the non-U.S. market is dominated by big integrateds while in the U.S. there are a lot more volatile E&Ps. It's worth highlighting that the financial sector doesn't typically provide many volatile stocks; the recent jump in the number of volatile banks is essentially a function of those in Continental Europe and Japan migrating to that cohort (see Exhibit 12).

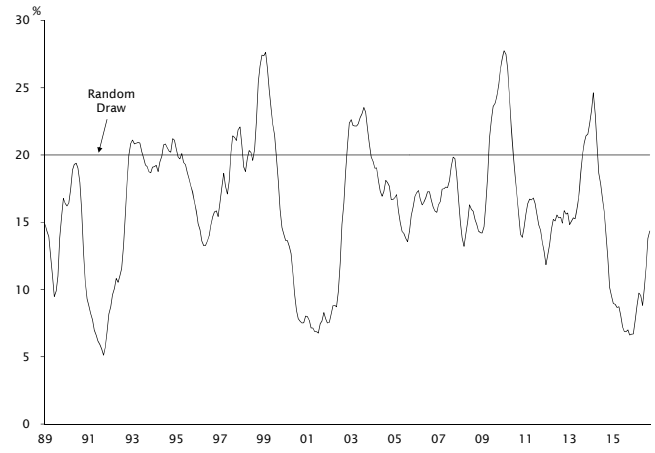
Finally, the regional mix shows that volatile stocks are overrepresented in Japan while the country is largely underrepresented among the least-volatile quintile (see Exhibits 13 and 14). This is a result of the recent swing in the Yen, but it's also due to the exposure of Japanese stocks to Chinese worries. However this isn't at odds with the historical pattern, on average the number of Japanese stocks found in the top-quintile of volatility tends to be 20% more than suggested by the benchmark (see Exhibit 15). The opposite is true in Continental Europe and the U.K. where stocks in the top-quintile of price volatility are typically underrepresented (see Exhibit 16).

**Exhibit 11: Developed Markets (ex-U.S.): Energy Stocks
Share in the Highest Quintile of Price Volatility'
1989 Through September 2016**



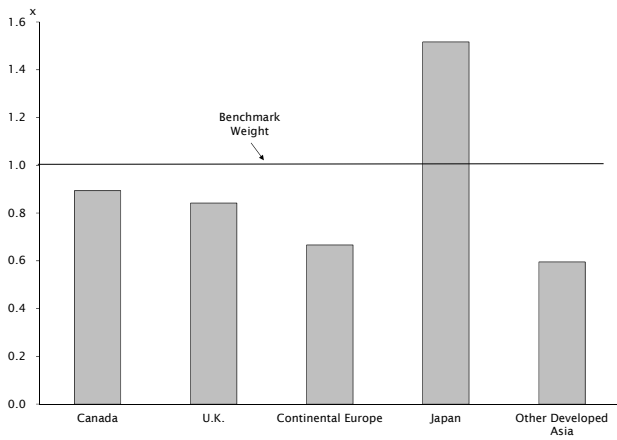
Source: Empirical Research Partners Analysis.
¹ Data smoothed on a trailing three-month basis.

**Exhibit 12: Developed Markets (ex-U.S.): Financial Stocks
Share in the Highest Quintile of Price Volatility'
1989 Through September 2016**



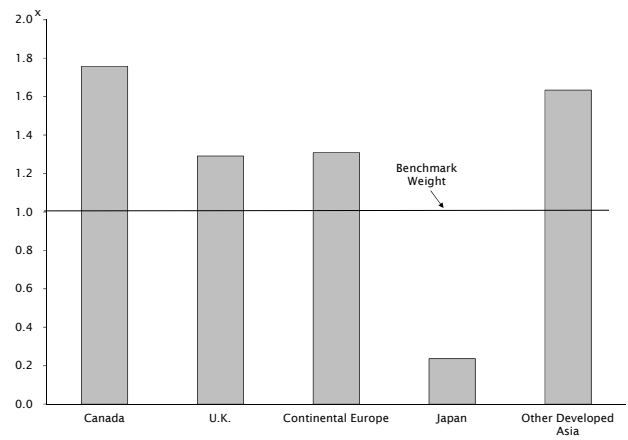
Source: Empirical Research Partners Analysis.
¹ Data smoothed on a trailing three-month basis.

**Exhibit 13: Developed Markets (ex-U.S.)
Ratio of Stocks in the Highest Quintile of
Price Volatility
Relative to the Benchmark Weight by Region'
As of Mid-October 2016**



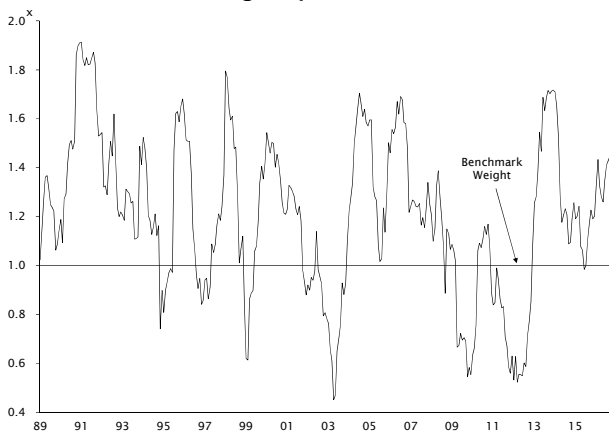
Source: Empirical Research Partners Analysis.
¹ Equally-weighted data.

**Exhibit 14: Developed Markets (ex-U.S.)
Ratio of Stocks in the Lowest Quintile of
Price Volatility
Relative to the Benchmark Weight by Region'
As of Mid-October 2016**



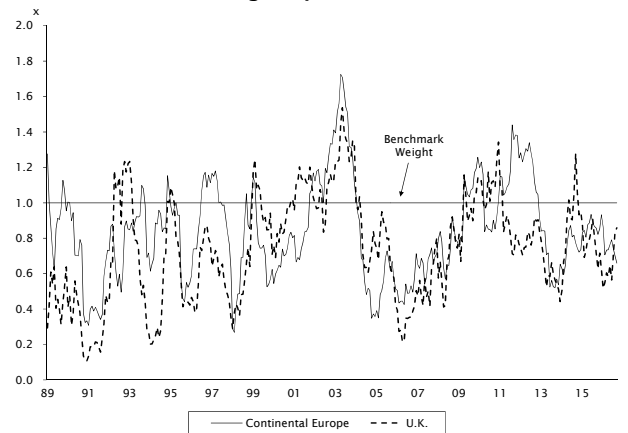
Source: Empirical Research Partners Analysis.
¹ Equally-weighted data.

**Exhibit 15: Japan
Ratio of Stocks in the Highest Quintile of
Price Volatility
Relative to the Benchmark Weight'
1989 Through September 2016**



Source: Empirical Research Partners Analysis.
¹ Equally-weighted data.

**Exhibit 16: Pan-Europe
Ratio of Stocks in the Highest Quintile of
Price Volatility
Relative to the Benchmark Weight'
1989 Through September 2016**



Source: Empirical Research Partners Analysis.
¹ Equally-weighted data.

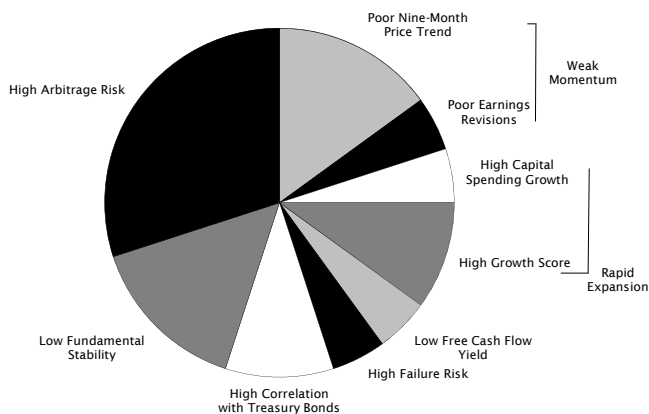
Predicting Unpredictability: Forecasting Stock-Level Volatility

Can we predict which stocks might undergo a volatility transformation? In short, yes. Among low-volatility stocks there are a number of telltale signs that foreshadow a future increase in volatility (see Exhibit 17).¹ For starters, having low fundamental stability – which we define as inconsistent past earnings growth and ROE, uncertain future earnings, high beta, and lots of leverage – is a warning flag. It’s also bad if price and earnings trends are negative and if the company is spending lots of money trying to grow rapidly. In the current setting a high correlation with U.S. Treasury bond returns should probably be seen as another cautionary sign. Other indicators include high arbitrage risk, a metric that captures the degree of controversy in a stock, and a high probability of underperformance, as assessed by our Failure Model.

We originally developed our volatility forecasting model for U.S. stocks and it turns out to be quite effective outside the U.S. too.² The black bars in Exhibit 18 show the average increase in volatility in the following 12 months for a low-volatility stock, contingent on the prediction of the model. For example, the left-most black bar shows that low volatility stocks in the highest quintile of our volatility prediction model on average see their annualized volatility increase by +10 percentage points in the following year.

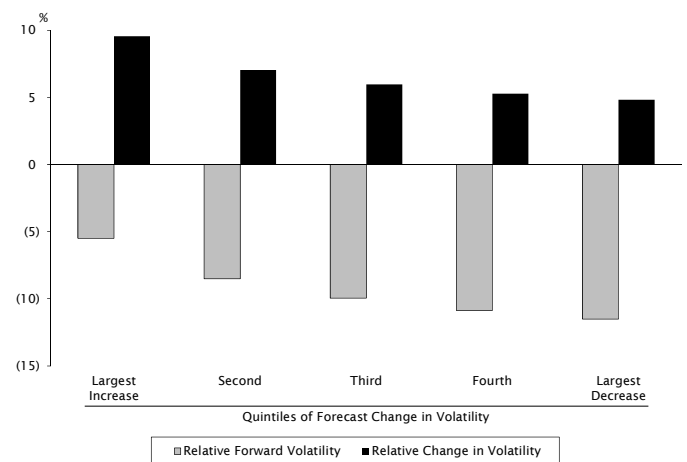
Note that volatility tends to mean revert over time, meaning stocks in the lowest quintile of volatility are likely to see their volatility increase in the next year; that’s why all the black bars are positive. The grey bars show the average level of year-ahead volatility vis-à-vis the market; those bars are all negative because notwithstanding the mean reversion effect, low volatility stocks tend to continue to have below-market volatility in the future.

**Exhibit 17: Developed Markets (ex-U.S.)
The Lowest Quintile of Price Volatility
Factors That Foretell an Increase in Year-Ahead Volatility
As of Mid-October 2016**



Source: Empirical Research Partners Analysis.

**Exhibit 18: Developed Markets (ex-U.S.)
The Lowest Quintile of Price Volatility
Relative Forward Volatility and Relative
Change in Volatility
by Quintiles of Forecast Change in Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**



Source: Empirical Research Partners Analysis.

¹ Equally-weighted data.

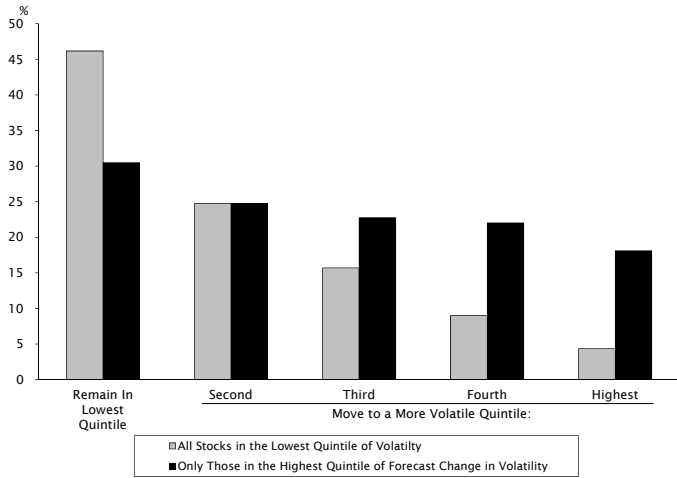
Another way to assess the efficacy of the model is to look at the probability of a low-volatility stock moving into a higher volatility quintile in the ensuing 12 months (see Exhibit 19). In this chart the grey bars show the unconditional probability of a low volatility stock moving quintiles in the next year. In fact the most likely outcome is to stay in the lowest quintile, with a probability of about 45%. Meanwhile less than 5% of low-volatility stocks actually move all the way to the highest quintile over the course of a year. The black bars show the odds when we deploy our volatility forecasting model: it cuts the probability of staying in the highest quintile by (15) percentage points and increases the odds of moving to the highest three quintiles of volatility by a similar amount.

¹ Stock Selection: Research and Results September 2016. “Predicting Stock-Level Volatility: High Vol Today, Low Vol Tomorrow?”

² Stock Selection: Research and Results October 2016. “Can a Zebra Change its Stripes? Volatility Changes and Stock Performance.”

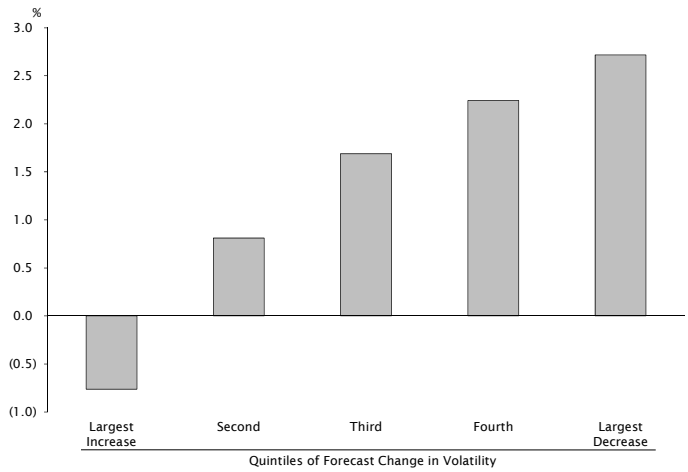
But what about future stock *returns*? Among low volatility stocks, those we expect to experience further declines in volatility outperform over the next year, to the tune of about +2.5 percentage points (see Exhibit 20). On the other hand, low-volatility issues that are predicted to have higher volatility in the future lag, by only about (75) basis points on average. The downside could be greater, however, given the valuation of the bond-proxy issues today.

**Exhibit 19: Developed Markets (ex-U.S.)
The Lowest Quintile of Price Volatility
Probability of Moving to Another Quintile in Following Year
1989 Through Mid-October 2016**



Source: Empirical Research Partners Analysis.

**Exhibit 20: Developed Markets (ex-U.S.)
The Lowest Quintile of Price Volatility
Relative Returns to the Quintiles of Forecast
Change in Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**

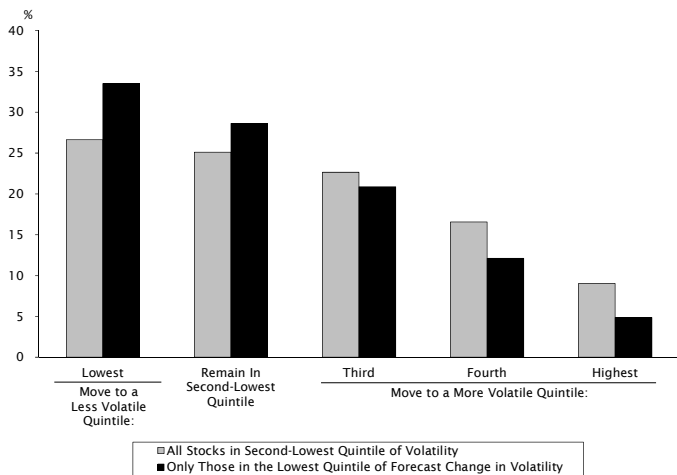


Source: Empirical Research Partners Analysis.
¹ Equally-weighted USD-hedged data.

We also found our model works quite well in predicting future volatility and returns for stocks with *moderately*-low volatility, which we define as those in the second-lowest quintile of volatility (see Exhibits 21 and 22). The reason is the volatility distribution is highly skewed (see Exhibit 23). Stocks in the lowest- and second-lowest quintiles of volatility tend to have quite similar volatility, so the artificial delineation into the lowest and second-lowest quintile doesn't matter that much, all the stocks have pretty similar volatilities.

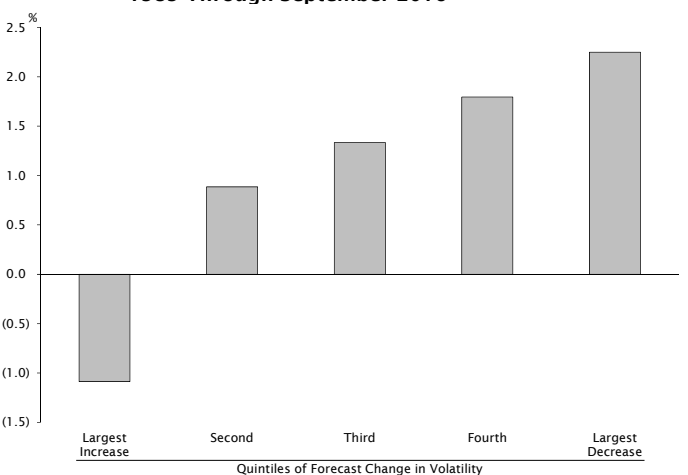
Appendix 1 on page 11 screens for stocks in the lowest quintile of volatility that are predicted to have even lower volatility in the future. On average stocks of this ilk have outperformed by about +2.5 percentage points per year. Appendix 2 on page 12 has the other side: low volatility stocks at risk of higher volatility in the future.

**Exhibit 21: Developed Markets (ex-U.S.)
The Second-Lowest Quintile of Price Volatility
Probability of Moving to Another Quintile in Following Year
1989 Through Mid-October 2016**



Source: Empirical Research Partners Analysis.

**Exhibit 22: Developed Markets (ex-U.S.)
The Second-Lowest Quintile of Price Volatility
Relative Returns to the Quintiles of Forecast
Change in Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**

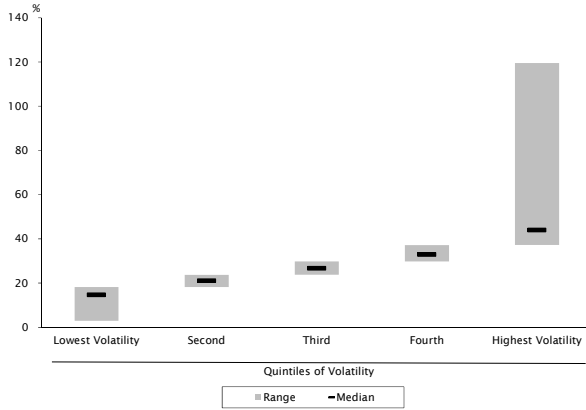


Source: Empirical Research Partners Analysis.
¹ Equally-weighted USD-hedged data.

You Take the High Road, I'll Take the Low Road

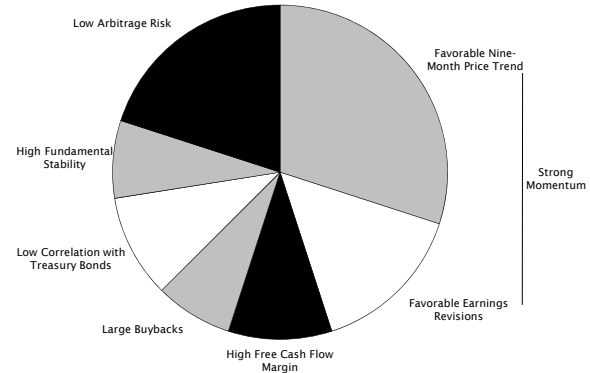
At the other extreme, the highest quintile of volatility is the odd one out; in that bucket there's a big spread in volatilities and lots of outlier-situation stocks feature. That asymmetry means the same model that we use for low volatility stocks is less effective among high volatility stocks. Instead, a variation on the model yields better results (see Exhibit 24). A number of the factors are similar between the two models, but among high volatility stocks there's a bigger emphasis on price and earnings trends; if a stock's volatility is high because it had a big jump *up* in share price that's good, but if the volatility is rising on a crashing price that's really bad.

**Exhibit 23: Developed Markets (ex-U.S.)
Price Volatility by Quintile
As of Mid-October 2016**



Source: Empirical Research Partners Analysis.

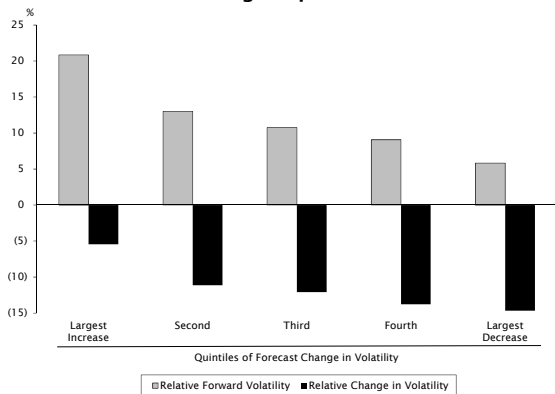
**Exhibit 24: Developed Markets (ex-U.S.)
The Highest Quintile of Price Volatility
Factors That Foretell a Decline in Year-Ahead
Volatility
As of Mid-October 2016**



Source: Empirical Research Partners Analysis.

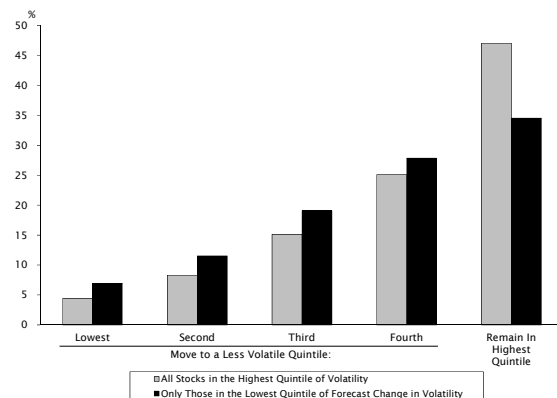
By design the model does a good job of predicting future changes in volatility for these highest-volatility issues (see Exhibit 25). On average a high volatility stock in the lowest quintile of forecast change in volatility can expect to see its annualized volatility decline by (15) percentage points over the following year. The model also cuts the odds of a high volatility stock remaining in the highest quintile of volatility a year later from almost 50% down to 35%(see Exhibit 26).

**Exhibit 25: Developed Markets (ex-U.S.)
The Highest Quintile of Price Volatility
Relative Forward Volatility and Relative Change in Volatility
by Quintiles of Forecast Change in Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**



Source: Empirical Research Partners Analysis.
¹ Equally-weighted data.

**Exhibit 26: Developed Markets (ex-U.S.)
The Highest Quintile of Price Volatility
Probability of Moving to Another Quintile in
Following Year
1989 Through Mid-October 2016**



Source: Empirical Research Partners Analysis.

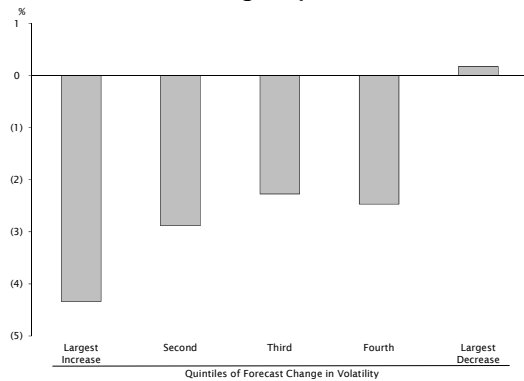
Our model also predicts future returns among high volatility stocks and the direction is the same as for low volatility stocks, i.e., a predicted increase in volatility is negative for future returns (see Exhibit 27). On average high volatility stocks that are expected to have even greater volatility in the future underperform the market by over (4) percentage points in the next 12 months. Appendix 3 on page 13 presents a red flag list of high volatility stocks at risk of even higher volatility in the future.

Stable to a Fault?

We turn back our attention to the cohort of stocks that score well in our fundamental stability approach, a list of about 80 large-cap names with the most-stable fundamentals. As we'd expect, the bulk of those issues also have low share price volatility, in fact around 60% of the group is drawn from the lowest-two quintiles of price volatility (see Exhibit 28). Given that, we took a look at whether the model presented in Exhibit 17 is useful in predicting future returns among the stable stocks. Exhibit 29 shows the results, which are similar to what we found across all low-volatility stocks. On average stable stocks with the largest predicted decline in price volatility have bested their stable peers by about +75 basis points over the next 12 months, and more significantly, those with the largest expected increase in price volatility have lagged by almost (250) basis points. As we pointed out in our previous research on the topic, valuation is also an important factor when sifting among the stable issues (see Exhibit 30).³

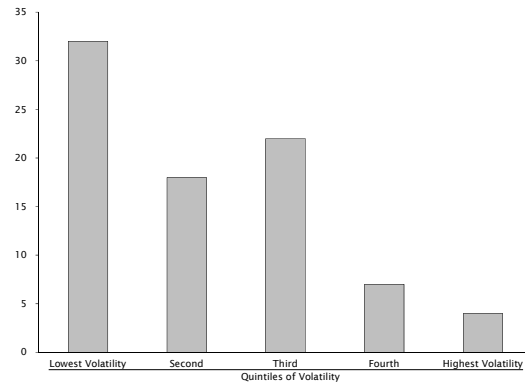
Appendix 4 on page 14 combines the two ideas, i.e., we look for stable stocks in the lowest two quintiles of price volatility over the past year and sort them on a composite score made up of our model's forecast change in price volatility over the next year and the score from our valuation framework. Stocks at the top of the screen have the furthest to fall if investors decide the increasing volatility of these stocks defeats the purpose of paying up for their erstwhile promise of sanctuary.

**Exhibit 27: Developed Markets (ex-U.S.)
The Highest Quintile of Price Volatility
Relative Returns to the Quintiles of
Forecast Change in Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**



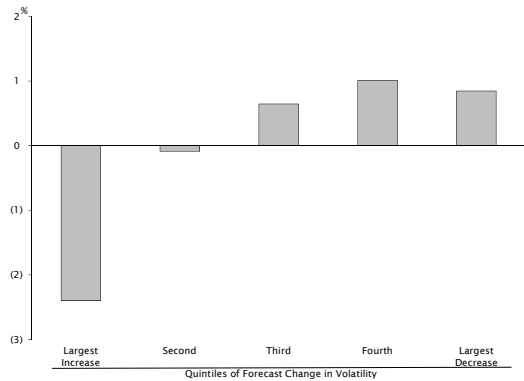
Source: Empirical Research Partners Analysis.
¹ Equally-weighted USD-hedged data.

**Exhibit 28: Developed Markets (ex-U.S.)
Number of Fundamentally-Stable Stocks
by Quintile of Price Volatility
As of Mid-October 2016**



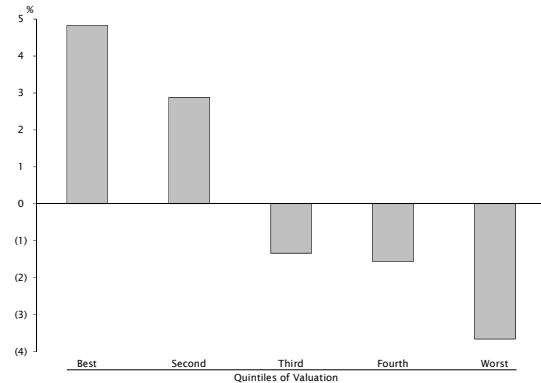
Source: Empirical Research Partners Analysis.

**Exhibit 29: Developed Markets (ex-U.S.):
Fundamentally-Stable Stocks
Relative Returns to the Quintiles of Forecast Change
in Price Volatility¹
Measured Over One-Year Holding Periods
1989 Through September 2016**



Source: Empirical Research Partners Analysis.
¹ Equally-weighted USD-hedged returns relative to all stable stocks.

**Exhibit 30: Developed Markets (ex-U.S.):
Fundamentally-Stable Stocks
Relative Returns by Quintile of Valuation¹
Measured Over One-Year Holding Periods
1987 Through Early-October 2016**



Source: Empirical Research Partners Analysis.
¹ Equally-weighted USD-hedged returns. Stocks are ranked across the large-cap universe, returns are relative to all stable stocks.

³ Global Portfolio Strategy October 2016. "A Great Equity Rotation? If Rates Move Up."

Appendix 1: Developed Markets (ex-U.S.): Large and Mid-Capitalization Stocks

**The Lowest Quintile of Volatility and the Lowest Quintile of Forecast Change in Volatility: Decrease in Volatility Expected
Sorted by Market Capitalization
As of Late-October 2016**

		Factors That Foretell a Decline in Volatility (1=Volatility Likely to Decline; 5=Volatility Likely to Increase)														
Symbol	Company	Price (Local)	Local Currency Code	Memo: Trailing Volatility (1=Lowest)	Funda- mental Stability (1=Highest)	Nine- Month Price Trend (1=Highest)	Three- Month Earnings Revisions (1=Highest)	Capital Spending Growth (1=Lowest)	Growth Score (1=Lowest)	Free Cash Flow Yield (1=Highest)	Failure Model (1=Best)	Correlation With Treasury Bonds (1=Lowest)	Arbitrage Risk (1=Lowest)	Forecast Change In Volatility (1=Largest Decline)	YTD Returns	Market Capitalization (\$ Million)
NESN VX	Nestle S.A.	72.10	CHF	1	1	3	3	2	3	3	4	3	1	1	0.0	\$226,374
NOVN VX	Novartis AG	72.55	CHF	1	2	4	3	1	4	2	5	2	1	1	(14.9)	192,037
9432 JP	Nippon Telegraph and Telephone Corporation	4,658.00	JPY	1	2	4	1	2	4	1	2	3	4	1	0.1	94,839
RY CT	Royal Bank of Canada	83.48	CAD	1	2	2	2	na	2	na	2	1	1	1	17.6	92,527
TD CT	Toronto-Dominion Bank	60.32	CAD	1	1	3	2	na	2	na	1	1	1	1	16.2	83,603
RB/ LN	Reckitt Benckiser Group plc	72.47	GBP	1	1	1	3	2	5	3	1	5	1	1	17.1	62,096
IMB LN	Imperial Brands PLC	39.20	GBP	1	4	2	2	1	1	1	2	5	1	1	11.0	46,353
DG FP	VINCI SA	67.48	EUR	1	4	2	4	4	2	1	3	2	1	1	14.9	43,624
BMO CT	Bank of Montreal	86.10	CAD	1	2	2	2	na	2	na	1	1	1	1	14.6	41,437
BCE CT	BCE Inc.	60.57	CAD	1	1	2	4	2	4	2	3	5	1	1	17.2	39,339
DANSKE DC	Danske Bank A/S	211.90	DKK	1	4	3	2	na	2	na	1	2	1	1	18.1	30,385
CPG LN	Compass Group Plc	14.70	GBP	1	2	1	2	4	3	3	2	5	2	1	27.5	29,850
CM CT	Canadian Imperial Bank of Commerce	100.52	CAD	1	1	2	1	na	2	na	1	1	1	1	14.5	29,610
SWEDA SS	Swedbank AB Class A	211.20	SEK	1	4	2	na	na	2	na	2	2	1	1	20.6	26,664
2 HK	CLP Holdings Limited	78.70	HKD	1	1	1	4	4	1	3	1	5	3	1	23.0	25,680
SEBA SS	Skandinaviska Enskilda Banken AB Class A	92.15	SEK	1	4	4	3	na	2	na	4	1	1	1	9.8	22,682
UOB SP	United Overseas Bank Ltd. (Singapore)	18.91	SGD	1	3	4	5	na	1	na	1	1	2	1	(0.4)	22,166
EXPN LN	Experian PLC	15.64	GBP	1	3	1	2	4	5	2	1	4	1	1	31.9	18,422
GIVN VX	Givaudan SA	1,930.00	CHF	1	2	2	2	1	4	3	3	2	2	1	8.5	17,994
SGSN VX	SGS SA	2,112.00	CHF	1	1	2	na	3	4	3	2	2	3	1	12.7	16,504
KNIN VX	Kuhne & Nagel International AG	135.00	CHF	1	1	3	3	4	4	3	4	1	1	1	1.2	16,282
ATLN VX	Actelion Ltd.	144.00	CHF	1	2	1	3	1	5	3	1	1	2	1	4.2	15,564
HAL NA	HAL Trust	180.40	EUR	1	3	2	1	na	2	na	1	3	1	1	13.8	15,395
WOS LN	Wolseley plc	44.13	GBP	1	4	1	2	2	3	2	4	3	2	1	18.9	13,705
PGHN SW	Partners Group Holding AG	502.50	CHF	1	1	1	1	na	2	na	1	1	5	1	42.2	13,575
AMC AT	Amcor Ltd	15.08	AUD	1	4	1	1	4	1	2	2	1	4	1	15.9	13,287
PPL CT	Pembina Pipeline Corporation	41.39	CAD	1	2	1	3	2	4	5	3	2	3	1	44.1	11,938
EMSN SW	EMS-CHEMIE HOLDING AG	502.00	CHF	1	1	1	3	3	5	3	3	1	3	1	16.5	11,863
WKL NA	Wolters Kluwer NV	35.60	EUR	1	3	1	3	4	4	2	2	4	1	1	16.3	11,656
JMT PL	Jerónimo Martins SGPS S.A.	15.94	EUR	1	2	1	3	1	3	2	1	3	3	1	33.2	11,087
BNZL LN	Bunzl plc	22.25	GBP	1	2	1	1	3	3	3	2	5	1	1	18.1	9,280
SOON VX	Sonova Holding AG	134.00	CHF	1	1	3	2	2	5	3	3	1	3	1	6.3	8,882
BVI FP	Bureau Veritas SA	17.53	EUR	1	3	3	4	3	3	2	4	2	1	1	(2.5)	8,423
FGR FP	Eiffage SA	68.09	EUR	1	5	1	4	5	1	1	1	2	2	1	16.1	7,271
ASX AT	ASX Limited	47.73	AUD	1	3	1	2	na	2	na	1	2	3	1	16.7	7,107
FCG NZ	Fonterra Co-operative Group Limited	5.92	NZD	1	3	3	2	5	1	1	1	2	3	1	5.5	6,794
SPSN SW	Swiss Prime Site AG	82.15	CHF	1	3	2	2	na	2	na	1	5	2	1	7.9	5,883
ORNBV FH	Orion Oyj Class B	37.20	EUR	1	1	2	2	2	4	3	3	3	1	1	24.4	5,693
SGX SP	Singapore Exchange Ltd.	7.24	SGD	1	1	4	3	na	1	na	2	2	1	1	(2.5)	5,576
BCVN SW	Banque Cantonale Vaudoise	622.00	CHF	1	1	3	4	na	2	na	2	2	3	1	2.3	5,393
RTO LN	Rentokil Initial plc	2.34	GBP	1	5	1	2	3	3	3	1	2	2	1	48.6	5,310
9533 JP	Toho Gas Co. Ltd.	977.00	JPY	1	4	2	4	3	2	1	2	4	5	1	27.3	5,066
PSPN SW	PSP Swiss Property AG	89.95	CHF	1	3	2	2	na	2	na	2	5	1	1	4.4	4,150
SATS SP	SATS Ltd	4.79	SGD	1	1	1	3	4	3	2	2	1	5	1	26.9	3,847
CAST SS	Castellum AB	125.40	SEK	1	4	1	1	na	2	na	1	5	2	1	21.6	3,816
CAE CT	CAE Inc.	18.61	CAD	1	2	1	2	4	2	2	2	3	3	1	22.8	3,766
EBRO SM	Ebro Foods SA	20.92	EUR	1	2	2	3	5	3	2	1	2	1	1	16.4	3,506
HUFVA SS	Hufvudstaden AB Class A	143.80	SEK	1	2	1	3	na	2	na	1	4	3	1	20.9	3,444
LUKN SW	Luzerner Kantonalbank AG	391.75	CHF	1	2	2	3	na	2	na	1	3	2	1	6.0	3,361
EMMN SW	Emmi AG	604.00	CHF	1	3	1	1	2	3	2	1	1	5	1	35.5	3,275
SIE SP	SIA Engineering Co. Ltd.	3.70	SGD	1	1	3	5	3	3	3	4	2	2	1	1.6	3,015
6370 JP	Kurita Water Industries Ltd.	2,484.00	JPY	1	2	5	3	5	3	3	2	1	3	1	(0.2)	2,798
6412 JP	Heiwa Corporation	2,406.00	JPY	1	4	4	5	4	3	1	1	1	4	1	10.6	2,328
6845 JP	Azbil Corporation	3,080.00	JPY	1	1	4	2	1	4	3	2	2	4	1	0.9	2,212
MBT CT	Manitoba Telecom Services Inc.	36.99	CAD	1	5	1	5	1	4	3	3	2	1	1	27.5	2,049
VMS SP	Venture Corporation Limited	9.34	SGD	1	1	1	2	5	3	1	1	4	4	1	21.4	1,900
GUOL SP	GuocoLand Limited	1.99	SGD	1	4	3	1	na	2	na	1	1	2	1	10.5	1,686
9075 JP	Fukuyama Transporting Co. Ltd.	592.00	JPY	1	1	4	2	4	2	5	1	3	3	1	0.0	1,594
8088 JP	Iwatani Corporation	624.00	JPY	1	4	5	na	5	1	1	2	2	4	1	0.9	1,492

Source: Empirical Research Partners Analysis.

Appendix 2: Developed Markets (ex-U.S.): Large and Mid-Capitalization Stocks

**The Lowest Quintile of Volatility and the Highest Quintile of Forecast Change in Volatility: Increase in Volatility Expected
Sorted by Market Capitalization
As of Late-October 2016**

		Factors That Foretell an Increase in Volatility (5=Volatility Likely to Increase; 1=Volatility Likely to Decline)													YTD Returns	Market Capitalization (\$ Million)
Symbol	Company	Price (Local)	Local Currency Code	Memo: Trailing Volatility (1=Lowest)	Fundamental Stability (5=Lowest)	Nine-Month Price Trend (5=Lowest)	Three-Month Earnings Revisions (5=Lowest)	Capital Spending Growth (5=Highest)	Growth Score (5=Highest)	Free Cash Flow Yield (5=Lowest)	Failure Model (5=Worst)	Correlation With Treasury Bonds (5=Highest)	Arbitrage Risk (5=Highest)	Forecast Change In Volatility (5=Largest Increase)		
VOD LN	Vodafone Group Plc	2.26	GBP	1	5	3	5	3	3	3	2	5	3	5	6.0 %	\$73,866
ENI IM	Eni S.p.A.	13.68	EUR	1	5	4	4	2	3	5	2	2	2	5	4.3	54,284
SU CT	Suncor Energy Inc.	39.00	CAD	1	5	3	1	3	1	5	4	2	3	5	13.0	48,327
HMB SS	Hennes & Mauritz AB Class B	254.70	SEK	1	1	5	5	5	5	4	5	3	4	5	(12.8)	46,990
CSL AT	CSL Limited	102.98	AUD	1	2	3	1	5	5	5	3	3	5	5	(1.7)	35,693
SAF FP	Safran SA	62.75	EUR	1	5	4	4	4	3	1	4	4	4	5	1.2	28,555
MFC CT	Manulife Financial Corporation	19.39	CAD	1	5	5	5	na	1	na	4	1	4	5	(3.1)	28,498
IMO CT	Imperial Oil Limited	43.90	CAD	1	5	5	5	1	1	5	4	1	4	5	(2.1)	27,863
TEL NO	Telenor ASA	139.80	NOK	1	5	4	4	4	4	1	4	4	4	5	(8.3)	24,940
WOW AT	Woolworths Ltd	25.25	AUD	1	5	4	2	2	1	5	4	3	5	5	6.0	24,934
EI FP	Essilor International SA	101.95	EUR	1	1	4	4	5	5	4	5	4	4	5	(9.1)	24,231
LUX IM	Luxottica Group S.p.A.	44.50	EUR	1	2	5	4	4	4	3	5	3	5	5	(25.7)	22,749
1038 HK	Cheung Kong Infrastructure Holdings Limited	63.90	HKD	1	3	4	4	3	5	3	5	5	4	5	(8.8)	21,966
AMS SM	Amadeus IT Group SA Class A	43.23	EUR	1	4	3	2	1	5	2	2	4	4	5	7.4	20,640
ATL IM	Atlantia S.p.A	22.78	EUR	1	5	4	4	5	4	1	4	4	2	5	(4.3)	20,148
SCAB SS	Svenska Cellulosa Aktiebolaget Class B	252.20	SEK	1	4	2	4	5	3	3	5	5	5	5	3.8	19,947
WPL AT	Woodside Petroleum Ltd	28.91	AUD	1	5	3	3	5	2	5	1	1	5	5	2.5	18,746
KPN NA	Royal KPN NV	2.94	EUR	1	5	5	2	4	3	1	5	2	4	5	(6.0)	13,509
AGU CT	Agrium Inc.	123.72	CAD	1	3	4	5	1	1	3	3	3	5	5	3.9	12,674
8830 JP	Sumitomo Realty & Development Co. Ltd.	2,739.50	JPY	1	5	5	4	na	1	na	5	1	5	5	(18.9)	12,472
VIE FP	Veolia Environnement SA	19.80	EUR	1	5	5	3	2	1	2	4	3	2	5	(6.0)	12,028
AGL AU	AGL Energy Limited	19.28	AUD	1	3	3	4	1	2	2	3	4	5	5	9.1	9,966
AM FP	Dassault Aviation SA	977.15	EUR	1	3	5	5	5	2	1	5	1	4	5	(13.5)	9,699
ADP FP	Aeroports de Paris SA	90.28	EUR	1	4	5	5	5	4	4	5	4	2	5	(14.2)	9,597
BOL FP	Bolloré SA	3.00	EUR	1	5	5	5	5	2	2	5	1	5	5	(28.8)	9,426
SY1 GY	Symrise AG	62.29	EUR	1	2	2	3	5	5	4	5	5	3	5	2.0	8,781
SIA SP	Singapore Airlines Ltd.	10.27	SGD	1	3	4	5	5	1	5	3	5	2	5	(6.1)	8,712
OTC CT	Open Text Corporation	84.78	CAD	1	4	1	1	na	5	na	1	4	5	5	26.9	7,716
669 HK	Techtronic Industries Co. Ltd.	29.85	HKD	1	1	4	5	4	5	4	4	2	5	5	(6.9)	7,051
WPG LN	Worldpay Group Plc	2.82	GBP	1	5	4	1	2	4	2	3	na	4	5	(8.5)	6,925
GKN LN	GKN plc	3.14	GBP	1	5	3	2	3	3	1	2	3	5	5	4.3	6,581
OCX CT	Onex Corporation	84.56	CAD	1	5	5	4	na	1	na	5	3	4	5	1.7	6,576
TNET BB	Telenet Group Holding NV	48.25	EUR	1	5	5	5	5	5	1	5	3	3	5	(3.6)	6,155
ALFA SS	Alfa Laval AB	127.20	SEK	1	4	5	2	4	2	1	5	3	5	5	(14.6)	5,945
RAA GY	RATIONAL AG	480.00	EUR	1	1	3	4	4	5	4	5	3	5	5	16.4	5,927
DLG LN	Direct Line Insurance Group Plc	3.51	GBP	1	4	4	1	na	1	na	5	1	5	5	(6.8)	5,893
COH AT	Cochlear Limited	127.85	AUD	1	2	1	1	4	5	5	2	3	5	5	35.7	5,583
2670 JP	ABC-MART INC.	6,490.00	JPY	1	1	4	3	5	5	4	4	1	5	5	(0.1)	5,366
ORP FP	Orpea SA	75.76	EUR	1	4	3	3	1	5	4	4	5	4	5	4.3	4,985
MEL NZ	Meridian Energy Limited	2.55	NZD	1	5	1	3	1	3	2	2	4	5	5	15.3	4,812
TTS AT	Tatts Group Limited	4.14	AUD	1	2	5	2	1	1	3	4	4	4	5	(3.3)	4,677
STH SP	StarHub Ltd	3.41	SGD	1	4	3	2	2	5	2	2	3	5	5	(5.2)	4,285
ALA CT	AltaGas Ltd.	34.37	CAD	1	4	2	3	5	5	5	5	3	4	5	16.1	4,196
CD SP	Comfortdelgro Corporation Limited	2.67	SGD	1	1	4	5	1	1	5	5	4	5	5	(10.2)	4,193
PUM GY	PUMA SE	230.90	EUR	1	3	2	3	3	3	5	4	2	5	5	16.4	3,782
FNTN GY	freenet AG	26.45	EUR	1	4	5	5	4	4	1	5	3	3	5	(10.5)	3,678
DOKA SW	dorma+kaba Holding AG	695.00	CHF	1	2	2	2	4	5	3	3	1	5	5	3.2	2,966
4544 JP	Miraca Holdings Inc.	5,060.00	JPY	1	3	5	1	1	3	1	2	1	5	5	(2.7)	2,836
AXIS SS	Axis AB	361.00	SEK	1	2	2	5	5	5	4	2	1	5	5	4.6	2,788
ORA AU	Orora Ltd.	2.99	AUD	1	4	1	1	3	5	2	1	4	5	5	35.5	2,719
AQN CT	Algonquin Power & Utilities Corp.	11.81	CAD	1	5	2	1	1	5	5	5	4	2	5	11.6	2,401
VIS SM	Viscofan S.A.	47.29	EUR	1	1	5	2	2	4	4	5	5	5	5	(14.4)	2,381
VCT NZ	Vector Limited	3.14	NZD	1	4	2	4	3	1	5	2	4	5	5	4.9	2,226
CAR AU	Carsales.Com Limited	11.70	AUD	1	1	2	1	5	5	3	3	3	5	5	1.5	2,174
LNK AU	Link Administration Holdings Ltd.	7.65	AUD	1	5	2	1	5	5	4	2	na	4	5	0.2	2,103
BVIC LN	Britvic plc	5.63	GBP	1	5	5	4	5	2	4	5	1	3	5	(22.2)	1,815
EVT AU	Event Hospitality & Entertainment Ltd.	14.54	AUD	1	2	5	4	5	5	5	4	na	3	5	(11.0)	1,786
HPL SP	Hotel Properties Limited	3.44	SGD	1	4	5	na	2	3	5	2	4	5	5	(8.7)	1,285
OUE SP	OUE Ltd.	1.71	SGD	1	5	5	4	1	4	5	4	3	4	5	(2.6)	1,110

Source: Empirical Research Partners Analysis.

Appendix 3: Developed Markets (ex-U.S.): Large and Mid-Capitalization Stocks

**The Highest Quintile of Volatility and the Highest Quintile of Forecast Change in Volatility: Increase in Volatility Expected
Sorted by Market Capitalization
As of Late-October 2016**

		Factors That Foretell an Increase in Volatility (5=Volatility Likely to Increase; 1=Volatility Likely to Decline)														
Symbol	Company	Price (Local)	Local Currency Code	Memo: Trailing Volatility (5=Highest)	Nine- Month Price Trend (5=Lowest)	Three- Month Earnings Revisions (5=Lowest)	Level Of Free Cash Flow Margin (5=Lowest)	Change In Shares Outstanding (5=Least Buybacks)	Correlation With Treasury Bonds (5=Highest)	Funda- mental Stability (5=Lowest)	Arbitrage Risk (5=Highest)	Forecast Change in Volatility (5=Largest Increase)	YTD Returns	Market Capitalization (\$ Million)		
RBS LN	Royal Bank of Scotland Group plc	1.92	GBP	5	5	4	na	5	1	5	3	5	(35.9) %	\$27,232		
UCG IM	UniCredit S.p.A.	2.30	EUR	5	5	4	na	5	1	5	5	5	(53.3)	15,119		
4528 JP	ONO Pharmaceutical Co. Ltd.	2,697.50	JPY	5	5	5	4	1	5	1	5	5	(37.1)	15,104		
SFR FP	SFR Group SA	25.00	EUR	5	5	5	5	2	5	5	3	5	(25.7)	11,936		
7261 JP	Mazda Motor Corp.	1,719.50	JPY	5	5	5	3	2	1	4	2	5	(31.0)	9,911		
7211 JP	Mitsubishi Motors Corporation	600.00	JPY	5	5	5	2	2	3	4	1	5	(43.1)	8,493		
CBK GY	Commerzbank AG	6.16	EUR	5	5	5	na	2	1	4	2	5	(33.0)	8,379		
ALKS US	Alkermes Plc	54.46	USD	5	4	2	5	5	4	5	2	5	(32.9)	8,198		
7272 JP	Yamaha Motor Co. Ltd.	2,269.00	JPY	5	4	5	4	4	3	3	3	5	(15.7)	7,563		
3659 JP	NEXON Co. Ltd.	1,705.00	JPY	5	5	5	1	5	3	2	5	5	(12.8)	7,355		
VRX US	Valeant Pharmaceuticals International Inc	22.05	USD	5	5	na	na	na	4	2	5	5	(78.5)	7,349		
322 HK	Tingyi (Cayman Islands) Holding Corp.	8.61	HKD	5	5	5	3	1	4	3	4	5	(21.0)	6,150		
4536 JP	Santen Pharmaceutical Co. Ltd.	1,505.00	JPY	5	5	4	4	4	5	1	2	5	(23.3)	6,000		
US IM	UnipolSai Assicurazioni S.p.A.	1.69	EUR	5	5	4	na	5	3	4	2	5	(20.7)	5,114		
6770 JP	Alps Electric Co. Ltd.	2,603.00	JPY	5	4	4	3	5	2	4	5	5	(21.4)	4,967		
5334 JP	NGK SPARK PLUG CO. LTD.	2,029.00	JPY	5	5	4	3	2	2	2	4	5	(36.7)	4,404		
7012 JP	Kawasaki Heavy Industries Ltd.	300.00	JPY	5	5	5	4	2	3	4	2	5	(30.8)	4,266		
8252 JP	Marui Group Co. Ltd.	1,459.00	JPY	5	5	4	5	2	4	3	3	5	(25.0)	4,003		
6952 JP	Casio Computer Co. Ltd.	1,535.00	JPY	5	5	5	2	2	1	2	4	5	(45.9)	3,922		
SDF GY	K+S AG	18.32	EUR	5	3	5	5	2	4	3	3	5	(17.0)	3,807		
3086 JP	JFront Retailing Co. Ltd.	1,431.00	JPY	5	5	4	4	2	2	2	4	5	(17.1)	3,732		
5711 JP	Mitsubishi Materials Corp.	2,839.00	JPY	5	4	5	3	2	1	3	3	5	(22.1)	3,588		
RKET GY	Rocket Internet SE	19.72	EUR	5	5	5	5	2	2	5	5	5	(29.9)	3,536		
MS IM	Mediaset S.p.A.	2.62	EUR	5	4	5	1	2	4	5	4	5	(31.3)	3,351		
7779 JP	CYBERDYNE Inc.	1,588.00	JPY	5	4	3	5	5	4	3	5	5	(22.3)	3,279		
9706 JP	Japan Airport Terminal Co. Ltd.	3,980.00	JPY	5	4	4	3	2	5	4	3	5	(26.5)	3,176		
7180 JP	Kyushu Financial Group Inc.	699.00	JPY	5	5	5	na	na	na	1	4	5	(16.5)	3,105		
5406 JP	Kobe Steel Ltd.	848.00	JPY	5	5	5	4	2	2	5	2	5	(35.9)	2,963		
OCI NA	OCI NV	12.77	EUR	5	4	1	5	2	4	5	5	5	(44.3)	2,898		
8586 JP	Hitachi Capital Corp.	2,215.00	JPY	5	5	5	na	2	1	2	3	5	(27.3)	2,660		
3436 JP	SUMCO Corporation	919.00	JPY	5	2	5	2	2	4	5	5	5	0.0	2,649		
UBI IM	Unione di Banche Italiane SpA	2.53	EUR	5	5	5	na	2	1	5	4	5	(57.3)	2,422		
AZM IM	Azimut Holding Spa	14.96	EUR	5	5	5	na	2	2	2	2	5	(32.8)	2,384		
BP IM	Banco Popolare Societa Cooperativa SCRL	2.57	EUR	5	5	5	na	5	2	5	5	5	(71.1)	2,326		
BPE IM	Banca Popolare dell'Emilia Romagna S.C.A.R.L.	4.17	EUR	5	5	5	na	2	2	4	5	5	(38.3)	2,125		
200 HK	Melco International Development Limited	10.20	HKD	5	4	2	4	2	3	4	4	5	(12.2)	2,114		
5105 JP	Toyo Tire & Rubber Co. Ltd.	1,655.00	JPY	5	5	5	4	2	4	5	5	5	(30.5)	2,035		
6472 JP	NTN Corporation	395.00	JPY	5	4	5	4	2	1	5	5	5	(20.8)	2,022		
OCDO LN	Ocado Group PLC	2.73	GBP	5	2	4	4	5	4	5	5	5	(9.8)	1,955		
6995 JP	Tokai Rika Co. Ltd.	2,137.00	JPY	5	5	3	5	2	3	2	5	5	(27.9)	1,954		
3668 JP	COLOPL Inc.	1,546.00	JPY	5	5	5	1	5	3	3	5	5	(34.7)	1,868		
ESNT LN	Essentra plc	5.01	GBP	5	5	4	3	4	2	2	5	5	(38.2)	1,619		
3398 JP	Kusuri No Aoki Co. Ltd.	5,100.00	JPY	5	4	3	4	4	5	1	5	5	(13.8)	1,535		
8595 JP	Jafoo Co. Ltd.	3,275.00	JPY	5	5	5	na	2	1	5	3	5	(26.7)	1,518		
BKL AU	Blackmores Limited	111.44	AUD	5	5	4	1	4	4	2	5	5	(50.7)	1,470		
1332 JP	Nippon Suisan Kaisha Ltd.	483.00	JPY	5	5	4	3	5	5	4	5	5	(26.4)	1,456		
CFP CT	Canfor Corporation	14.66	CAD	5	4	5	4	1	3	4	3	5	(25.9)	1,425		
6141 JP	DMG MORI CO. LTD.	1,094.00	JPY	5	4	4	4	2	1	4	3	5	(22.2)	1,397		
2685 JP	Adastria Co.Ltd.	2,602.00	JPY	5	4	5	2	2	5	1	5	5	(19.0)	1,379		
6976 JP	Taiyo Yuden Co. Ltd.	1,098.00	JPY	5	5	5	4	2	3	4	4	5	(33.8)	1,262		
9605 JP	Toei Company Ltd.	855.00	JPY	5	5	4	1	2	3	2	3	5	(28.2)	1,192		
7003 JP	Mitsui Engineering & Shipbuilding Co.Ltd	147.00	JPY	5	4	5	4	2	1	5	2	5	(24.8)	1,184		
9616 JP	Kyoritsu Maintenance Co. Ltd.	6,200.00	JPY	5	5	4	5	5	4	3	2	5	(40.4)	1,150		
6740 JP	Japan Display Inc.	203.00	JPY	5	5	5	5	2	2	5	5	5	(41.3)	1,122		
2193 JP	COOKPAD Inc.	996.00	JPY	5	5	5	1	4	5	1	5	5	(61.2)	1,040		
9375 JP	Kintetsu World Express Inc.	1,393.00	JPY	5	5	5	3	2	5	3	5	5	(33.7)	948		
6474 JP	Nachi-Fujikoshi Corp.	391.00	JPY	5	5	5	5	2	1	3	4	5	(28.7)	947		
8202 JP	Laox CO.LTD.	789.00	JPY	5	5	5	5	1	3	5	3	5	(66.0)	511		

Source: Empirical Research Partners Analysis.

Appendix 4: Developed Markets (ex-U.S.): Stable Stocks
The Lowest and Second Lowest Quintiles of Volatility
Sorted by Average of Valuation and Forecast Change in Volatility Ranks
As of Late-October 2016

		Factors That Foretell an Increase in Volatility (5=Volatility Likely to Increase; 1=Volatility Likely to Decline)															Average of the Two	YTD Returns	Market Capitalization (\$ Million)
Symbol	Company	Price (Local)	Local Currency Code	Memo: Trailing Volatility (1=Lowest)	Fundamental Stability (5=Lowest)	Nine-Month Price Trend (5=Lowest)	Three-Month Earnings Revisions (5=Lowest)	Capital Spending Growth (5=Highest)	Growth Score (5=Highest)	Free Cash Flow Yield (5=Lowest)	Failure Model (5=Worst)	Correlation With Treasury Bonds (5=Highest)	Arbitrage Risk (5=Highest)	Forecast Change In Volatility (5=Largest Increase)	Valuation (5=Worst)				
1038 HK	Cheung Kong Infrastructure Holdings Limited	63.50	HKD	1	3	4	4	3	5	3	5	5	4	5	5	5.0	(8.8) %	\$21,831	
UCB BB	UCB S.A.	64.72	EUR	2	1	4	3	2	5	5	5	3	4	5	5	5.0	(21.3)	13,787	
NZYMB DC	Novozymes A/S Class B	253.90	DKK	2	1	4	4	4	5	4	5	4	5	5	5	5.0	(22.3)	11,449	
ITX SM	Industria de Diseno Textil S.A.	32.74	EUR	2	1	3	3	1	5	4	3	4	1	4	5	4.5	4.2	110,237	
HMB SS	Hennes & Mauritz AB Class B	254.30	SEK	1	1	5	5	5	5	4	5	3	4	5	4	4.5	(12.8)	47,155	
RMS FP	Hermes International SCA	371.20	EUR	2	1	1	4	2	5	4	2	5	5	4	5	4.5	20.3	42,612	
ADS GY	adidas AG	149.40	EUR	1	2	1	1	5	4	5	4	4	5	4	5	4.5	68.6	34,125	
ATD/B CT	Alimentation Couche-Tard Inc. Class B	66.68	CAD	2	1	2	1	5	5	4	4	3	5	5	4	4.5	9.9	28,622	
EI FP	Essilor International SA	103.50	EUR	1	1	4	4	5	5	4	5	4	4	5	4	4.5	(9.1)	24,731	
LUX IM	Luxottica Group S.p.A.	44.10	EUR	1	2	5	4	4	4	3	5	3	5	5	4	4.5	(25.7)	22,665	
BEI GY	Beiersdorf AG	80.50	EUR	1	1	4	4	1	4	4	5	5	3	4	5	4.5	(3.5)	22,147	
ASSAB SS	ASSA ABLOY AB Class B	167.10	SEK	2	1	3	4	2	4	4	5	4	3	4	5	4.5	(4.7)	20,749	
UHR VX	Swatch Group Ltd. Bearer	310.30	CHF	2	3	5	5	1	3	4	5	1	5	5	4	4.5	(9.2)	17,084	
MC FP	LVMH Moet Hennessy Louis Vuitton SE	168.05	EUR	2	2	3	4	4	4	3	2	5	3	4	4	4.0	17.6	92,981	
SAB LN	SABMiller plc	44.95	GBP	1	2	3	3	2	5	4	5	4	1	3	5	4.0	12.2	89,356	
66 HK	MTR Corporation Limited	43.25	HKD	1	2	1	1	4	4	5	4	3	3	3	5	4.0	22.7	32,995	
4452 JP	Kao Corp.	5,751.00	JPY	2	1	4	3	4	4	4	4	4	4	3	5	4.0	(7.4)	28,584	
WOW AT	Woolworths Ltd	25.12	AUD	1	5	4	2	2	1	5	4	3	5	5	3	4.0	6.0	24,916	
4661 JP	Oriental Land Co. Ltd.	6,220.00	JPY	2	1	5	4	4	5	4	5	4	3	3	5	4.0	(14.8)	21,658	
DSY FP	Dassault Systemes SA	72.41	EUR	1	2	3	3	2	5	4	2	2	2	3	5	4.0	(1.2)	20,370	
6 HK	Power Assets Holdings Limited	72.95	HKD	2	4	2	4	1	5	3	3	5	1	3	5	4.0	6.1	20,206	
COLOB DC	Coloplast A/S Class B	476.50	DKK	2	1	4	4	2	5	3	4	4	1	3	5	4.0	(13.7)	15,091	
LISN SW	Chocoladefabriken Lindt & Spruengli AG	61,355.00	CHF	1	1	5	4	4	5	5	5	2	1	3	5	4.0	(16.9)	13,469	
SN/ LN	Smith & Nephew plc	11.89	GBP	4	2	3	4	4	4	4	4	4	4	4	4	4.0	0.4	13,130	
FTS CT	Fortis Inc.	43.89	CAD	1	2	2	3	1	5	5	4	5	2	3	5	4.0	20.7	13,063	
OR FP	L'Oreal SA	165.35	EUR	1	1	2	4	4	4	4	3	5	2	2	5	3.5	8.6	101,558	
DGE LN	Diageo plc	21.90	GBP	1	2	2	1	1	5	3	4	5	1	2	5	3.5	21.4	68,416	
ST SP	Singapore Telecom	3.90	SGD	2	2	2	4	2	4	3	2	4	4	3	4	3.5	9.1	45,214	
KNEBV FH	Kone Oyj Class B	43.40	EUR	2	1	1	3	3	4	3	3	5	2	2	5	3.5	14.7	24,763	
6098 JP	Recruit Holdings Co. Ltd.	4,265.00	JPY	2	2	3	3	5	5	2	2	3	5	3	4	3.5	21.5	23,316	
RB/ LN	Reckitt Benckiser Group plc	72.04	GBP	1	1	1	3	2	5	3	1	5	1	1	5	3.0	17.1	62,260	
HEN3 GY	Henkel AG & Co. KGaA Pref	116.65	EUR	1	2	2	2	2	4	3	1	5	3	2	4	3.0	14.7	50,853	
CNR CT	Canadian National Railway Company	84.30	CAD	1	1	3	4	3	4	3	2	4	2	2	4	3.0	10.5	48,407	
JM SP	Jardine Matheson Holdings Limited	61.30	USD	2	3	1	5	2	1	1	2	5	4	3	3	3.0	29.1	43,937	
4578 JP	Otsuka Holdings Co. Ltd.	4,609.00	JPY	1	2	3	1	5	4	4	2	3	5	2	4	3.0	7.9	24,683	
SCHP VX	Schindler Holding AG Pref	185.70	CHF	2	1	2	4	2	4	3	5	1	1	1	5	3.0	12.3	20,333	
GIVN VX	Givaudan SA	1,921.00	CHF	1	2	2	2	1	4	3	3	2	2	1	5	3.0	8.5	17,970	
SAP CT	Saputo Inc.	47.10	CAD	2	1	2	2	3	4	3	1	5	4	2	4	3.0	43.8	13,869	
PGHN SW	Partners Group Holding AG	500.50	CHF	1	1	1	1	na	2	na	1	1	5	1	5	3.0	42.2	13,567	
1878 JP	Daito Trust Construction Co. Ltd.	17,300.00	JPY	2	1	2	1	na	2	na	1	5	3	1	5	3.0	27.1	12,955	
PPL CT	Pembina Pipeline Corporation	41.63	CAD	1	2	1	3	2	4	5	3	2	3	1	5	3.0	44.1	12,022	
EMSN SW	EMS-CHEMIE HOLDING AG	499.50	CHF	1	1	1	3	3	5	3	3	1	3	1	5	3.0	16.5	11,844	
9201 JP	Japan Airlines Co. Ltd.	3,099.00	JPY	2	4	5	5	3	2	1	3	4	5	5	1	3.0	(26.8)	10,823	
NESN VX	Nestle S.A.	72.25	CHF	1	1	3	3	2	3	3	3	4	3	1	4	2.5	0.0	227,610	
9437 JP	NTT DoCoMo Inc.	2,600.50	JPY	2	1	3	3	2	5	2	2	4	3	1	4	2.5	7.7	98,204	
SAN FP	Sanofi	68.11	EUR	2	2	4	4	5	4	2	5	4	1	3	2	2.5	(9.7)	96,751	
BCE CT	BCE Inc.	60.51	CAD	1	1	2	4	2	4	2	3	5	1	1	4	2.5	17.2	39,350	
JS SP	Jardine Strategic Holdings Limited	34.55	USD	2	3	2	5	2	1	1	1	5	2	2	3	2.5	27.7	38,534	
WES AU	Wesfarmers Limited	41.45	AUD	1	2	3	na	2	2	4	3	4	2	2	3	2.5	4.2	36,065	
4503 JP	Astellas Pharma Inc.	1,557.00	JPY	2	1	4	3	4	5	1	1	5	5	3	2	2.5	(8.2)	32,066	
SHBA SS	Svenska Handelsbanken AB Class A	125.00	SEK	1	2	4	4	na	2	na	3	3	2	2	3	2.5	16.9	27,670	
2 HK	CLP Holdings Limited	78.60	HKD	1	1	1	4	4	1	3	1	5	3	1	4	2.5	23.0	25,650	
FME GY	Fresenius Medical Care AG & Co. KGaA	74.45	EUR	2	1	3	4	4	4	4	4	5	2	3	2	2.5	(3.2)	24,968	
9735 JP	Secom Co. Ltd.	7,706.00	JPY	2	1	4	4	3	4	3	2	1	2	1	4	2.5	(4.8)	17,474	
2502 JP	Asahi Group HoldingsLtd.	3,617.00	JPY	2	1	4	2	2	3	2	3	4	4	2	3	2.5	(4.0)	17,355	
ATLN VX	Actelion Ltd.	144.10	CHF	1	2	1	3	1	5	3	1	1	2	1	4	2.5	4.2	15,628	
FBAVP BB	BNP Paribas Fortis SA/NV	25.50	EUR	2	2	3	na	na	na	na	3	na	1	2	3	2.5	(6.3)	13,453	
4508 JP	Mitsubishi Tanabe Pharma Corporation	2,122.00	JPY	2	1	4	1	3	4	3	1	4	4	2	3	2.5	3.6	11,431	
NOVN VX	Novartis AG	71.20	CHF	1	2	4	3	1	4	2	5	2	1	1	3	2.0	(14.9)	189,099	
7751 JP	Canon Inc.	3,053.00	JPY	1	2	5	5	3	3	1	3	1	2	2	2	2.0	(14.7)	39,125	
PWF CT	Power Financial Corporation	31.83	CAD	1	2	4	5	na	1	na	3	1	3	2	2	2.0	4.0	16,925	
KNIN VX	Kuhne & Nagel International AG	134.30	CHF	1	1	3	3	4	4	3	4	1	1	1	3	2.0	1.2	16,252	
RY CT	Royal Bank of Canada	83.65	CAD	1	2	2	2	na	2	na	2	1	1	1	2	1.5	17.6	92,833	
TD CT	Toronto-Dominion Bank	60.63	CAD	1	1	3	2	na	2	na	1	1	1	1	2	1.5	16.2	84,140	
BNS CT	Bank of Nova Scotia	71.76	CAD	2	1	1	2	na	2	na	1	2	1	1	2	1.5	32.6	64,719	
BMO CT	Bank of Montreal	86.67	CAD	1	2	2	2	na	2	na	1	1	1	1	2	1.5	14.6	41,764	
9432 JP	Nippon Telegraph and Telephone Corporation	4,725.00	JPY	1	2	4	1	2	4	1	2	3	4	1	1	1.0	0.1	96,388	
CM CT	Canadian Imperial Bank of Commerce	100.67	CAD	1	1	2	1	na	2	na	1	1	1	1	1	1.0	14.5	29,692	
NA CT	National Bank of Canada	46.90	CAD	2	2	1	2	na	2	na	1	1	1	1	1	1.0	20.7	11,842	

Source: Empirical Research Partners Analysis.