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# Volatility: Implications for Value and Glamour Stocks

November 2011

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## Abstract

In this study, we introduce the context of market volatility for value and glamour stock returns. Tracking returns for style indices after periods of extreme volatility, we reveal evidence suggesting value stocks are less susceptible to high volatility episodes. Moreover, returns for the value index showed less variability, affirming better risk-adjusted performance. This paper adds to previous literature by providing another angle for value investing as a potentially successful long-term strategy.

## I. Introduction

Equity market volatility is typically a source of investor fear. Frequently, investors rely on fight-or-flight responses and run away from markets when volatility is high. We set out to study the implications of high and low volatility regimes and their effect on value and glamour stock returns. Volatility can be considered a barometer of investor reaction. The market's "fear gauge," volatility reflects behavioral biases such as overreaction, loss aversion, and herding (follow-the-crowd mentality). As value investors, we hypothesize that high volatility may provide potential investment opportunities due to price fluctuations relative to intrinsic values.

As an introductory discussion, it is important to note a few characteristics of volatility. First, volatility is commonly described as a persistent variable. Equity markets sustain relatively long periods of high or low volatility levels before any mean-reversion or other significant shifts may be observed. Second, when entering periods of great uncertainty, surprising jumps in volatility levels are common. Last, extreme upward moves in volatility are likely to be associated with negative returns in the stock market.

This last statement is commonly the greatest concern for investors regarding volatility. Therefore, we believe it is insightful to examine what happens to performance when investing after periods of extreme volatility. Moreover, we will look into performance metrics for style indices and contrast the results.

In brief, our study will track 1- and 5-year returns for value and growth indices after periods of high and low volatility. How should we define high or low volatility? We address this question with a practical decision rule to determine the appropriate levels using historical data. Our results reveal that volatility is not necessarily threatening to performance and, within this context, subsequent value stock returns appear less susceptible to the effects of volatile episodes. Furthermore, we will discuss evidence that supports the notion that high volatility may be an opportunity for value investors.

We begin the study with a description of our methodology. Data selection, methods to compute volatility, and performance are discussed in Section II. Section III discusses our key results along with the supporting exhibits. In Section IV we explore different approaches to quantify volatility as an opportunity to invest. Finally, Section V analyzes key findings with our closing remarks.

## II. Methodology

### Volatility

Market volatility was measured as the standard deviation of the S&P 500 Index. For the period June 1980 – June 2011, we computed the monthly standard deviation based on daily returns and scaled to an annual number.<sup>1</sup> Scaling to annual numbers is standard practice and will be consistent with the CBOE Volatility Index® (VIX) figures. Why not use VIX? In 1990, VIX underwent a change in its calculation methodology. Data prior to this date was

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<sup>1</sup> Daily standard deviation is scaled to an x-day horizon by multiplying the standard deviation by  $\sqrt{x}$ .

computed under an older method (VXO).<sup>2</sup> We opted to have one consistent measurement of volatility throughout the full period. Furthermore, VIX is forward-looking as it attempts to measure the implied volatility of options on the S&P 500 Index.

### **Determining high and low volatility months**

Our calculations measured ex-post volatility, which have implications for our determination of “high” and “low” volatility periods. Our approach attempts to eliminate hindsight bias and follow decision rules that are practical to implement. Rather than starting by looking back over 31 years and determining high- and low-volatility periods, we sought to replicate an investor’s experience with volatility in the market as it unfolded over the period of study by using an increasing window percentile calculation.

In the first year of the study, the volatility percentile values were calculated based on data from the preceding year, measuring  $t$  months of data up to (and including) month  $t$ . Values above the 90<sup>th</sup> percentile were labeled as high volatility; values below the 10<sup>th</sup> percentile as low volatility. The following month’s data was then added to the history of monthly data and high and low percentiles were recalculated. We repeated this process each month over the 31-year period, accumulating 40-plus data points for both high- and low-volatility periods. We think this approach is practically viable, as an investor would be able to immediately calculate, at month’s end, whether the prior month was a high- or low-volatility period relative to the accumulated history at that point.

### **Performance**

To measure performance, we tracked the 1- and 5-year returns of the S&P 500 Value and S&P 500 Growth style indices as proxies for value and glamour stocks. Tracking started in the immediate month after a high or low observation. We also tracked the returns of the S&P 500 Index to obtain a sense of the overall market returns for the studied periods. For example, if the volatility observed in October 1987 is deemed high, we computed returns starting in November 1987. Returns were annualized and averaged according to the high or low category. Average results from growth were subtracted from value to reach an outperformance measurement. Over the same measurement periods we computed the standard deviation of the style and market indices’ returns.

### **Wait for high volatility to subside, then invest**

Given the persistent property of volatility, we averaged the volatility values by month to obtain the “typical” 5-year period initiated at a high observation. We found that volatility persisted for a few months, but on average, three months after high observations, volatility was almost halved. We decided to track returns after this “cool down” period and compare to the results when we decided to invest immediately.

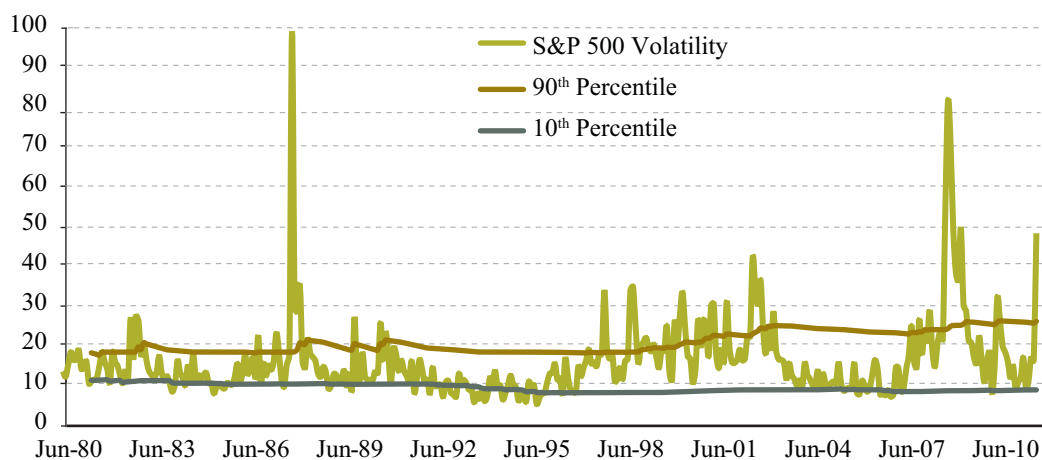
## **III. Results**

Exhibit 1 shows the time series of market volatility from 1980 to 2011. We also incorporated indicators that split our sample into high or low observations. Any values above the 90<sup>th</sup> percentile line were labeled as high and values below the 10<sup>th</sup> as low. Tables with a full list of high and low observations are in Appendix 1.

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<sup>2</sup> <http://www.cboe.com/micro/VIX/historical.aspx>

### Exhibit 1: S&P 500 Volatility 1980 - 2011, Monthly



Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

Using our set of high volatility observations, we obtained the market return (S&P 500) during the same month. We computed the correlation between these variables and obtained a value of -0.49. We believe this is consistent with the intuition that pairs high levels of market uncertainty with negative performance.<sup>3</sup>

Academic studies and Brandes Institute research have extensively documented the overall outperformance of value over glamour.<sup>4</sup> In this study, we introduce the volatility context into value vs. glamour returns. Our key findings are summarized in Exhibits 2 & 3. We find that with a 5-year horizon, value vs. glamour outperformance is materially greater following episodes of high volatility.<sup>5</sup> (For the 5-year results, we should note that significant market-wide events, such as systemic crashes or strong uptrends, may obscure the relationship between volatility and results.) Departing from a long-term analysis into a shorter 1-year comparison, we also find that value outperforms glamour after a high volatility episode. However, in this case it is by a smaller margin.

After periods of low volatility, returns were greater for all indices when compared to the performance after high volatility observations. We may explain this as a characteristic of our sample period when lulls in volatility have led to significant bull trends, such as the market run from the mid 1990s to the early 2000s. In our sample, 19 out of 44 low volatility observations fall within this time frame. The high clustering of low volatility months in this time period should not yield a quick conclusion that low volatility equates with greater overall subsequent returns. This clustering of low volatility observations may also be behind the growth outperformance over value in the low volatility set. Value stocks tend to lag growth in periods of exuberance, where market optimism benefits growth prospects.

Standard deviation shows a degree of mean-reversion observed by contrasting the 1-year values with the 5-year results. In both cases, there is a sense of convergence toward the market historical average volatility of 15.6% (declining from high levels to the average in Exhibit 2 and rising from low levels to the average in Exhibit 3). Interestingly, the value index not only outperformed glamour after high volatility, but risk-adjusted returns were

<sup>3</sup> Correlation values range from -1 to 1. Values close to 1 imply high positive correlation (i.e. variables move in the same direction); values close to -1 imply high negative correlation (i.e. values move in opposite directions).

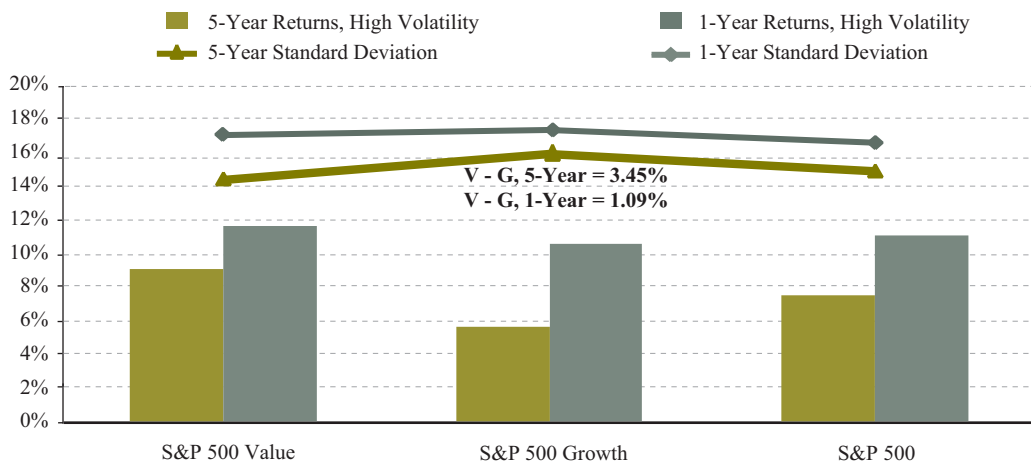
<sup>4</sup> *Value vs. Glamour: A Global Phenomenon* (2010) <http://www.brandes.com/Institute/Documents/White%20Paper%20-%20Value%20vs%20Glamour%20Global%20Phenomenon%20with%20appendix.pdf>

<sup>5</sup> We believe using the S&P 500 Value and S&P 500 Growth are appropriate proxies for “value and glamour” as described in other studies.

also materially better, especially in the 5-year horizon. In all instances, the variability of value returns was lower than both the growth counterpart and the broad market. Another feature to note is the greater decline in standard deviation after high volatility for value stock returns. We should note the change from the 1-year standard deviation (17.02%) vs. the result after five years (14.94%). In the growth stock index, standard deviation did not greatly decline; the 1-year result was 17.22% and after five years it reached 16.03%. Furthermore, the growth index sustained more volatile returns even in low volatility regimes. Keep in mind that these return periods were started immediately after months of very high market volatility.

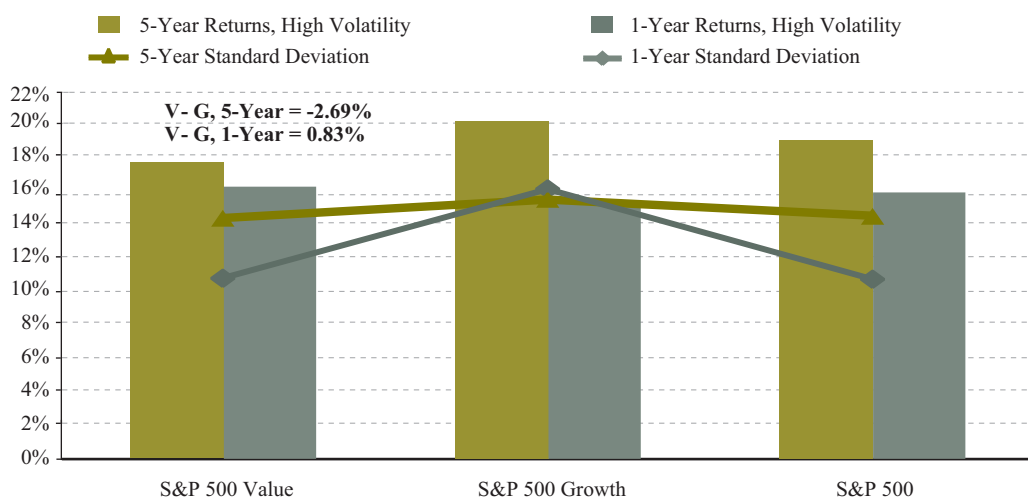
We do not advocate an investment strategy rooted in timing or volatility forecasting. Instead, studying performance within the context of volatility may shed some light into behavioral biases responsible for abandoning equities as soon as high volatility sets in.

**Exhibit 2: 1- and 5-Year Average Annualized Returns after High Volatility Months, 1980 - 2011**



Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

**Exhibit 3: 1- and 5-Year Average Annualized Returns after Low Volatility Months, 1980 - 2011**

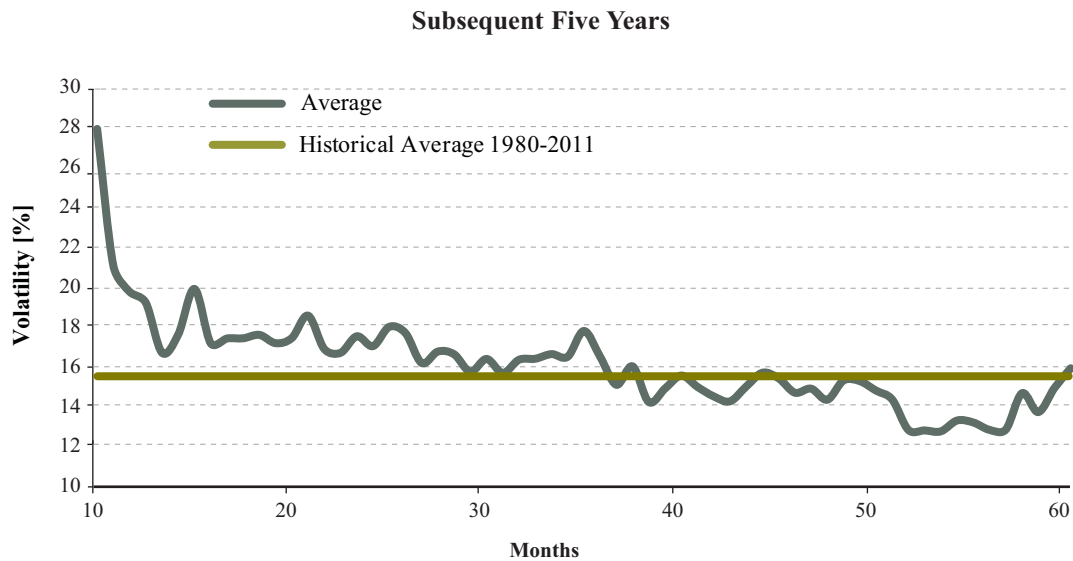


Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

We illustrate the persistence of high volatility in Exhibit 4. Computing the average volatility by month we arrived at a “typical” 5-year period after a high volatility observation. Volatility clearly descends after three months and investors may be more comfortable investing when volatility is not at high extremes. Therefore, we tracked style returns initiated after a 3-month volatility “cool down” period. Results are summarized in Exhibit 5. The 5-year results reveal a very similar trend as investing without a 3-month wait. However, the 1-year outperformance appears to be better when investing after a 3-month delay. On the other hand, standard deviation presented less extreme values, not surprising as we are delaying investing until high or low extremes of volatility have subsided.

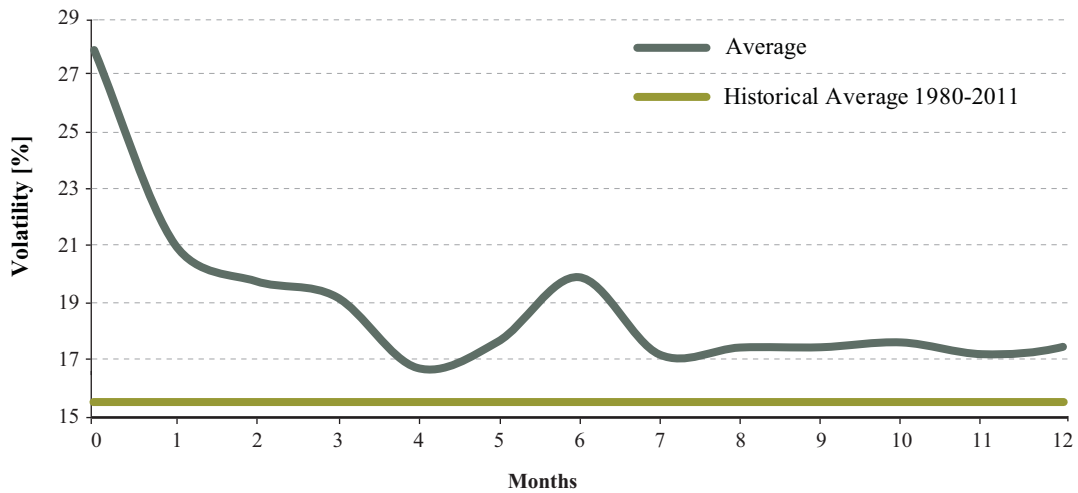
The results from the “wait three months” strategy point out an important clue for investors concerned with enduring high volatility regimes. The 3-month delay to invest produced smaller returns in all indices when compared to investing immediately after a high volatility observation. We note the 5-year annualized returns for the value index were 9.14% by investing immediately and 8.23% by delaying. These results have a positive connotation for all investors as the overall returns proved to be higher investing immediately versus attempting to wait for volatility to subside and then invest.

**Exhibit 4: Average Volatility for Subsequent Periods Initiated after a High Volatility Month, 1980 - 2011**



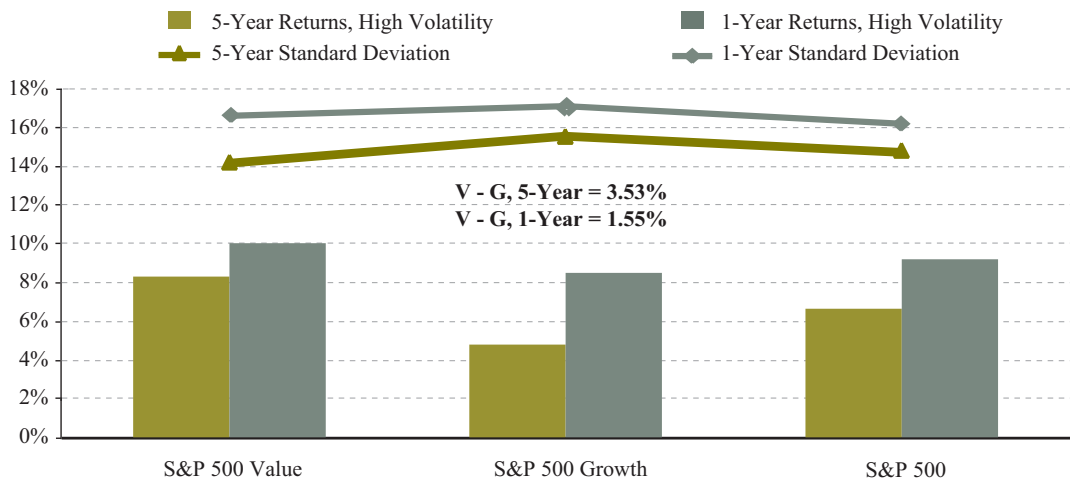
Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

### Subsequent 12 Months



Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

### Exhibit 5: Wait Three Months, 1- and 5-Year Average Annualized Returns after High Volatility Months, 1980 - 2011



Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

### What do these results suggest for value stocks?

In our view, returns for value stocks appear less susceptible to high volatility. Independent of introducing volatility scenarios into value vs. glamour returns, in general, value stocks are expected to outperform glamour. Although returns were tracked after observing high market volatility, we show on average that the variability of the value style index exhibited stronger reversion to historical averages than the growth index. This is another positive trait of value stocks. More stable performance – even after extreme market volatility – suggests value stocks may not

only outpace glamour stocks in the long run but the variability of subsequent returns could be materially below the variability in the growth index. (A more detailed layout for the results described in Exhibits 2-3, and 5 is in Appendix 2).

#### IV. Volatility as Opportunity

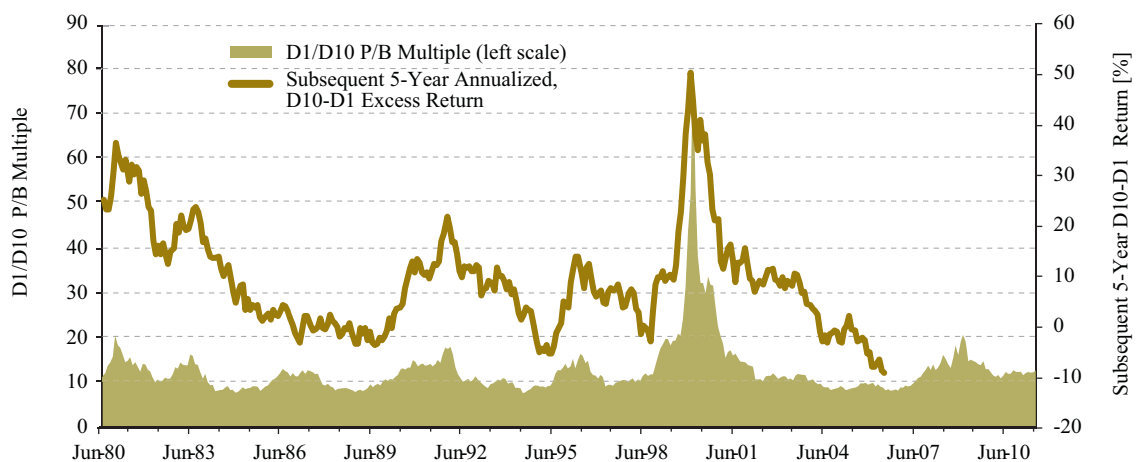
In theory, greater price fluctuations may result in greater chances for mispriced securities and sources of opportunity for value investors. As an exercise to quantify this effect, we combined this data with approaches from previous Brandes Institute research. We revisited a previous study on price-to-book (P/B) dispersion and subsequent value stock outperformance and combined this measure of dispersion with the time series of market volatility.

As prices are more variable than intrinsic values, opportunities to buy (or sell) may arise, especially in turbulent markets. This intuition about price fluctuations is brilliantly described by Benjamin Graham in *The Intelligent Investor*. Graham represents this with the metaphor of a bipolar business partner named Mr. Market. Every day, Mr. Market offers investors the chance to trade their securities. Sometimes his ideas of prices are plausible but at other times emotions take over and his proposals appear outrageous; prices might be ridiculously low or high. Despite this simple metaphor, the notion of market fluctuations as opportunity is challenging to quantify.

In the aforementioned Brandes Institute work, we described the relationship of value vs. glamour outperformance when P/B dispersion was high. Our paper measured P/B dispersion as the ratio of decile 1 (glamour) stocks to decile 10 (value) stocks. A higher ratio implied a greater disparity in security prices and therefore greater opportunity to discover mispriced securities. The upshot from this research was superior relative returns for value stocks subsequent to these periods, as shown in Exhibit 6.

Introducing volatility into our price-to-book dispersion analysis, we show that episodes of high price-to-book dispersion coincide with high volatility (Exhibit 7). Periods of P/B disparity are observed simultaneously with volatility at or above the 75<sup>th</sup> percentile (using our previous increasing window percentile rule).

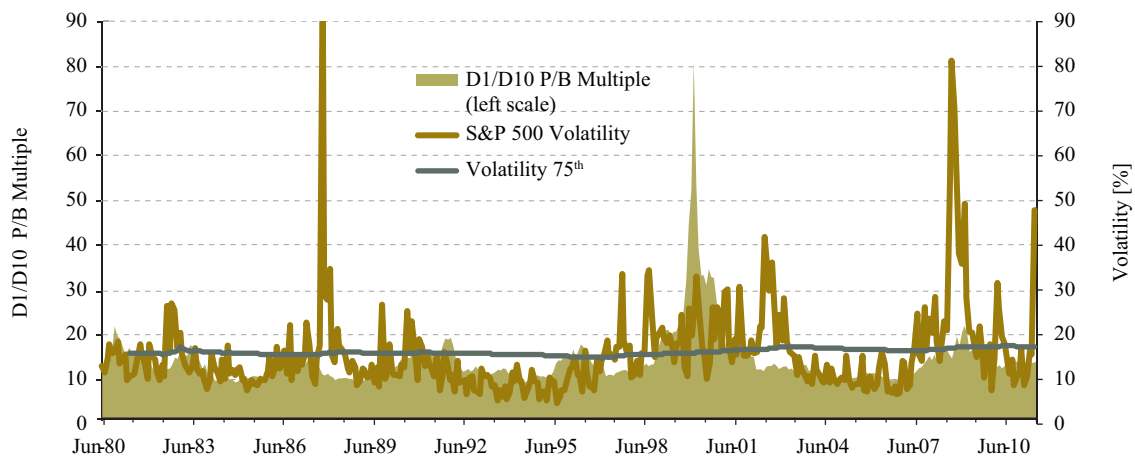
**Exhibit 6: Decile 1 / Decile 10 P/B Multiple and Subsequent 5-Year Annualized Excess Returns, 1980 - 2011**



Source: FactSet, The Brandes Institute as of 8/31/11. Past performance is not a guarantee of future results.



## Exhibit 7: Decile 1 / Decile 10 P/B Multiple and S&P 500 Volatility, 1980 - 2011



Source: FactSet, The Brandes Institute as of 8/31/11. Past performance is not a guarantee of future results.

### V. Conclusions

Investors may find that periods of high volatility are hard to endure. When volatility sets in, emotional behavior may further aggravate erratic markets. This is a consequence of biases such as overreaction or trend-following (commonly called herding). However, over a long-term investment horizon, patient investors may “surf the wave” of volatility until comfortable values replace extreme episodes. Volatility is a fact of life in financial markets. Investors who keep this in mind may be well positioned for potential long-term success.

Based on results revealed in this study, high volatility regimes are not necessarily threatening to performance. Contrasting the results of style indices, subsequent value stock returns appear less affected by periods of high volatility. Value outpaced both glamour and the market in 1- and 5-year periods following high volatility instances. Even if value outperformance over glamour was to be expected, the variability of value returns was considerably less than their glamour counterparts, affirming also better risk-adjusted performance. This points out another favorable characteristic of values stocks as a potentially superior long-term strategy. Given the notoriety of volatility since the 2008 crisis, we believe it is relevant to research the implications of this phenomenon for investors.

## Appendix 1

### Table 1: High Observations

Date	Volatility	S&P 500 Return	Date	Volatility	S&P 500 Return
Jan-82	18.1	-1.3	Sep-01	30.8	-8.1
Aug-82	26.6	12.1	Jul-02	41.9	-7.8
Oct-82	26.9	11.5	Aug-02	34.1	0.7
Nov-82	25.7	4.0	Sep-02	29.9	-10.9
Jan-83	20.5	3.7	Oct-02	36.2	8.8
Sep-86	22.2	-8.3	Jan-03	24.6	-2.6
Apr-87	22.8	-0.9	Mar-03	28.2	1.0
Oct-87	98.7	-21.5	Aug-07	24.7	1.5
Nov-87	29.1	-8.2	Nov-07	26.2	-4.2
Dec-87	28.0	7.6	Jan-08	23.6	-6.0
Jan-88	34.9	4.2	Mar-08	28.5	-0.4
Apr-88	21.4	1.1	Sep-08	54.7	-8.9
Oct-89	26.8	-2.3	Oct-08	81.2	-16.8
Aug-90	25.4	-9.0	Nov-08	70.3	-7.2
Oct-90	23.0	-0.4	Dec-08	49.4	1.1
Apr-97	18.8	6.0	Jan-09	38.2	-8.4
Oct-97	33.6	-3.3	Feb-09	36.0	-10.7
Nov-97	18.7	4.6	Mar-09	49.3	8.8
Aug-98	33.4	-14.5	Apr-09	29.8	9.6
Sep-98	34.5	6.4	May-09	28.4	5.6
Oct-98	24.5	8.1	May-10	31.8	-8.0
Dec-98	19.3	5.8	Jun-10	26.1	-5.2
Jan-99	20.5	4.2			
Feb-99	21.7	-3.1	<b>Average</b>	<b>31.0</b>	<b>-0.9</b>
Mar-99	19.3	4.0			
May-99	20.0	-2.4			
Oct-99	24.6	6.3			
Jan-00	25.9	-5.0			
Feb-00	19.8	-1.9			
Mar-00	27.0	9.8			
Apr-00	33.1	-3.0			
May-00	24.7	-2.1			
Oct-00	26.2	-0.4			
Dec-00	26.2	0.5			
Jan-01	23.8	3.6			
Mar-01	29.6	-6.3			
Apr-01	30.3	7.8			

**Table 2: Low Observations**

Date	Volatility	S&P 500 Return	Date	Volatility	S&P 500 Return
May-81	10.7	0.3	Feb-95	7.4	3.9
Dec-81	10.2	-2.6	Mar-95	7.3	3.0
May-82	10.1	-3.4	Apr-95	5.5	2.9
Nov-83	10.1	2.1	Aug-95	4.9	0.3
Dec-83	8.0	-0.5	Sep-95	6.3	4.2
Jan-84	9.9	-0.6	Nov-95	7.6	4.4
May-84	9.6	-5.5	Jun-96	7.3	0.4
Feb-85	10.0	1.2	Jun-05	8.2	0.1
Apr-85	7.5	-0.1	Nov-05	7.7	3.8
May-85	9.1	5.8	Dec-05	7.3	0.0
Jul-85	9.2	-0.2	Mar-06	8.0	1.2
Aug-85	8.8	-0.9	Aug-06	7.3	2.4
Nov-85	9.8	6.9	Sep-06	7.9	2.6
Jul-87	9.2	5.1	Oct-06	7.1	3.3
Dec-88	8.7	1.7	Dec-06	6.7	1.4
Jan-89	9.6	7.3	Jan-07	7.2	1.5
Jul-89	9.3	9.0	Mar-10	7.6	6.0
Sep-89	8.5	-0.4			
Sep-91	7.7	-1.7	<b>Average</b>	<b>8.0</b>	<b>1.6</b>
Mar-92	7.5	-1.9			
May-92	9.5	0.5			
Jun-92	9.6	-1.5			
Aug-92	6.7	-2.1			
Nov-92	7.8	3.4			
Dec-92	7.4	1.2			
Jan-93	6.7	0.8			
Jun-93	8.4	0.3			
Jul-93	8.7	-0.4			
Aug-93	5.3	3.8			
Sep-93	7.6	-0.8			
Oct-93	6.2	2.1			
Nov-93	8.4	-1.0			
Dec-93	5.6	1.2			
Jan-94	7.0	3.4			
Jul-94	6.0	3.3			
Aug-94	7.7	4.1			
Jan-95	5.7	2.6			

## Appendix 2

### Exhibit 2: 1-and 5-Year Average Annualized Returns after High Volatility Months, 1980 - 2011 [%]

	5-Year, High			1-Year, High			S&P 500	
	Value	Growth	V - G	Value	Growth	V - G	5-Year, High	1-Year, High
Returns	9.14	5.69	3.45*	11.72	10.63	1.09	7.55	11.13
Standard Deviation	14.94	16.03		17.02	17.22		15.31	16.64
Average Market Volatility	27.97			31.00				
Observations	44			54				

*\*Significant at the 1% level*

Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

### Exhibit 3: 1-and 5-Year Average Annualized Returns after Low Volatility Months, 1980 - 2011 [%]

	5-Year, Low			1-Year, Low			S&P 500	
	Value	Growth	V - G	Value	Growth	V - G	5-Year, Low	1-Year, Low
Returns	17.74	20.43	-2.69*	16.47	15.64	0.83	19.27	16.14
Standard Deviation	14.42	15.57		10.80	16.17		14.54	10.74
Average Market Volatility	8.03			7.95				
Observations	44			54				

*\*Significant at the 1% level*

Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

### Exhibit 5: Wait 3 Months, 1-and 5-Year Average Annualized Returns after High Volatility Months, 1980 - 2011 [%]

	5-Year, High			1-Year, High			S&P 500	
	Value	Growth	V - G	Value	Growth	V - G	5-Year, High	1-Year, High
Returns	8.23	4.70	3.53*	9.96	8.41	1.55	6.59	9.10
Standard Deviation	14.75	15.70		16.50	16.90		15.13	16.20
Average Market Volatility	27.97			31.00				
Observations	44			54				

*\*Significant at the 1% level*

Source: FactSet, The Brandes Institute as of 6/30/11. Past performance is not a guarantee of future results.

Price/Book: Price per share divided by book value per share.

The CBOE Volatility Index® (VIX®) is a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices. Since its introduction in 1993, VIX has been considered by many to be the world's premier barometer of investor sentiment and market volatility.

The S&P 500 Index with gross dividends is an unmanaged, market capitalization weighted index that measures the equity performance of 500 leading companies in leading industries of the U.S. economy. The index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities. This index includes dividends and distributions, but does not reflect fees, brokerage commissions, withholding taxes, or other expenses of investing.

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The S&P 500 Value Index with gross dividends is an unmanaged, market capitalization weighted index that measures the equity performance of those S&P 500 Index companies with lower price-to-book ratios. The S&P 500 Growth and Value Indices measure Growth and Value in separate dimensions across six risk factors. Value factors include book value to price ratio, sales to price ratio and dividend yield. This index includes the reinvestment of dividends and income, but does not reflect fees, brokerage commissions, withholding taxes, or other expenses of investing.

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