

**THE ROLE OF SMALL CAPS**

Small caps are part of the market portfolio and provide important diversification benefits to portfolios of large cap stocks.

Small caps are an important component of the total market—investors need a reason to exclude them, not a reason to include them. They tend to behave differently from large caps, thus providing important diversification benefits to portfolios of large cap stocks. Without these diversification benefits, returns of the equity market may not be captured in the most effective way.

An additional potential benefit of small cap stocks is that they are expected to earn a premium over large cap stocks. However, volatility in realized size premiums leaves room for some to question the existence of the size premium. The following points seek to address those primary critiques.

**1. The US Size Premium**

When examining the excess returns of small caps over large in the US, many investors use the returns of the Russell indices. Since January 1979, the Russell 2000 Index (a small cap benchmark) has slightly underperformed the large cap Russell 1000 Index (see Exhibit1).

Some investors may conclude from this data that there has been no size premium in the US over this period. However, the underperformance of small caps over this period may be unique to the Russell indices. For example, using the Dimensional US Small Cap Index and the Dimensional US Large Cap Index, we find that small cap stocks have outperformed large caps since 1979 and since the 1920s.

Given the assets that track the Russell 2000, these results suggest that flexible and careful trading to avoid the excessive price pressure exerted by the index funds around the time of the annual Russell reconstitution may be an important consideration when pursuing the size premium. Perhaps equally important is the interaction between the size, relative price, and profitability premiums. For example, the Dimensional Small Cap Index excludes small cap stock with high relative prices and low profitability. We believe that these considerations, as well as a good understanding of what drives returns, are critical in forming strategies to effectively pursue the size premium.

**Exhibit 1: Small Cap Index Performance, as of December 31, 2017**

Annualized Returns (%)	1 Year	3 Years	5 Years	10 Years	20 Years	Since 1/1979	Since 6/1927
Russell 2000 Index	14.65%	9.96%	14.12%	8.71%	7.89%	11.73%	—
Russell 1000 Index	21.69%	11.23%	15.71%	8.59%	7.39%	11.99%	—
Dimensional US Small Cap Index	13.29%	10.68%	15.15%	10.14%	10.84%	14.41%	12.25%
Dimensional US Large Cap Index	22.73%	11.53%	15.92%	8.76%	7.45%	12.09%	9.77%

*Past performance is no guarantee of future results. Results shown during periods prior to each index's inception date do not represent actual returns of the respective index. Other periods selected may have different results, including losses. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains.*

*It is not possible to invest directly in an index. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. Please see Appendix for descriptions of the Dimensional indices.*

**Inside this issue:**

The Roll of Small Caps

1–4

Portfolio Returns

2

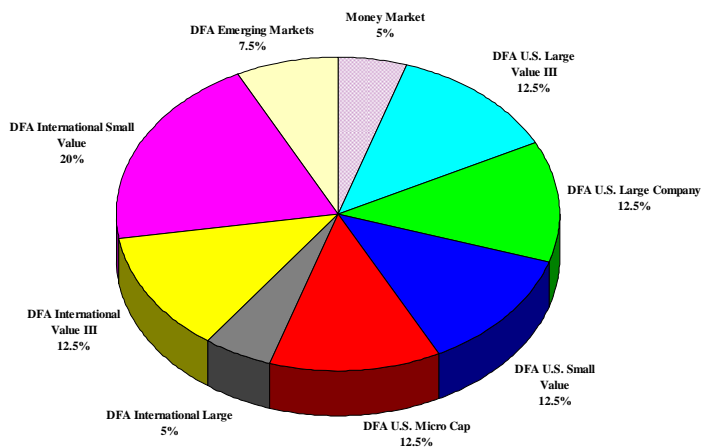
Meeting Expectations

4

# Portfolio Returns: January 1, 2018—June 30, 2018\*

## AGGRESSIVE GROWTH

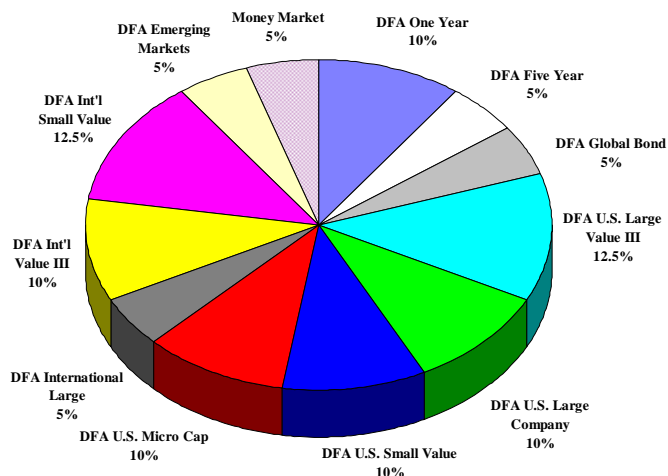
95% Equities/5% Fixed



Rate of Return -1.54%

## LONG TERM GROWTH

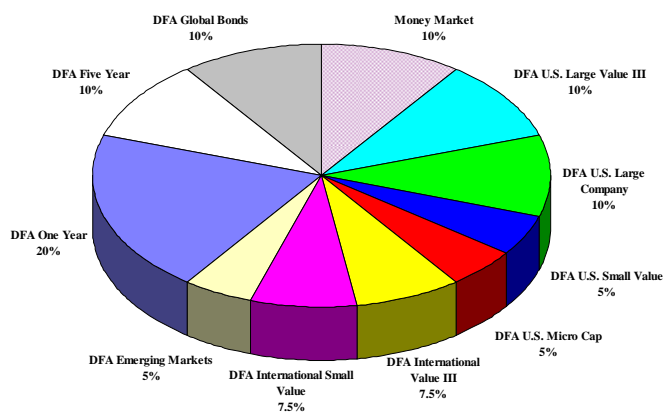
75% Equities/25% Fixed



Rate of Return -1.11%

## BALANCED GROWTH

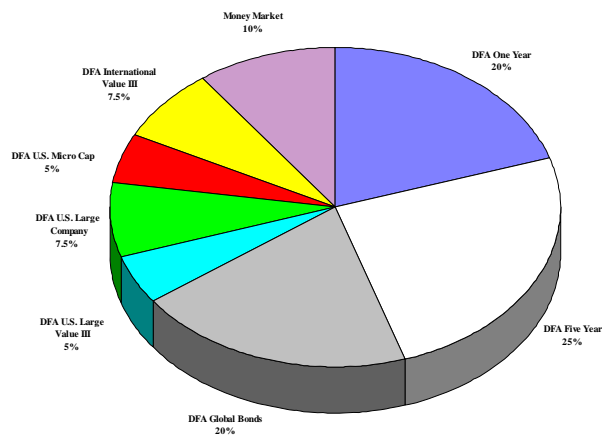
50% Equities/50% Fixed



Rate of Return -1.30%

## INCOME & GROWTH

25% Equities/75% Fixed



Rate of Return -0.68%

\*Individual returns may vary slightly based upon assets, size and fees charged, performance shown is net of fees. Performance shown reflects the reinvestment of dividends and other earnings. The returns shown represent past performance and are not indicators of future results.

## 2. The size premium does not survive trading costs.

This argument has been around for 30 years (see, for example, Stoll and Whaley, 1983). From January 1982 through March 2015, the annualized net return on the DFA US Micro Cap Portfolio was 61 bps higher than the annualized return on the CRSP 9-10 Index and 164 bps higher than the annualized return on the Russell 2000 Index. We have always taken into consideration the challenges associated with trading smaller stocks. Our strategies are designed and implemented to address those challenges and strive to deliver cost-effective solutions to our clients. The DFA US Micro Cap Portfolio's net returns reflect trading costs, and they are not impacted by delisting bias.

## 3. The size premium is the result of data mining.

Arguments that the size premium is due to data mining can be addressed with out-of-sample evidence. Banz (1981) was the first to document the size premium. The 1981-2013 period offers out-of-sample evidence documenting the following average annual return differences:

	Average Difference (%)	t-statistic
Small Value–Large Value	4.32	2.12
Small Neutral–Large Neutral	3.95	2.14
Small Growth–Large Growth	-3.23	-1.36

Source: [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). See Index Construction for details.  
Past performance is no guarantee of future results.

We have known about the lack of evidence of a size premium in small growth since the 1990s. In the mid-2000s, Dimensional began conducting research that ultimately led to the enhancement of our understanding of the historical returns of small growth stocks. This seeks to allow investors to improve their expected performance of small growth by systematically isolating the stocks responsible for the poorer relative performance.

The most recent research development is the recognition that underperforming small growth stocks also tend to have low profitability, which has allowed us to further refine our small-cap low profitability exclusion.

Evidence of both size and value premiums are observed after incorporating profitability. Average annual returns from 1975-2013:

	Small	Large
Value	21.86	17.03
Growth	13.88	12.51
Growth with Profitability	17.98	13.91

Past performance is no guarantee of future results. It is not possible to invest directly in an index. Source: Dimensional US Small Cap Value Index, Dimensional US Small Cap High Price-to-Book Index, Dimensional US Small Cap Growth Index, Dimensional US Large Cap Value Index, Dimensional US Large Cap High Price-to-Book Index, and Dimensional US Large Cap Growth Index. See Index Descriptions for details.

## Investment Implications

The existence of a size premium (excepting small growth low profitability stocks) does not mean that small caps will outperform large caps every month or year. If that were the case, no one would want to hold large cap stocks. Yet, in equilibrium, all stocks must be held in proportion to their market capitalization. The size premium is volatile (as are the equity, relative price and profitability premiums). Given that volatility, and everything else we have covered, how should we think about structuring an allocation to small cap stocks and their role in a broadly diversified portfolio?

Small caps play a role in a total market portfolio. They are part of the market portfolio, behave differently from large caps, and thus provide important diversification benefits to portfolios of large cap stocks. As shown, an additional potential benefit of small cap stocks is that, over time, they are expected to earn a premium over large cap stocks.

## Conclusion

When we look at US, developed ex US and emerging markets data, there has been a size premium except among small growth low profitability stocks. The relative performance of US small cap stocks in recent years has not been abnormal and is consistent with the historical volatility in the realized returns of small caps. Finally, and most importantly from the perspective of investors, the size premium can still be captured with careful implementation.

Dimensional has managed strategies providing exposure to the size premium since 1981. Our strategies cover various geographical areas, including both developed and emerging countries. When building portfolios, we are mindful of how premiums interact with one another. Implementation decisions also make a difference. We manage the exposure to premiums every day, ensuring that no unintended drift occurs, as can happen with passive funds tracking quarterly or annually rebalanced indices. Over time, we believe that our ability to capture the premium consistently and in a cost-effective manner has allowed us to make a difference for investors.

Sources: *Dimensional Fund Advisors, Understanding the Performance of Small Cap Stocks, June 2018, Stanley Black, PhD Vice President, Research, Eric Geffroy, Senior Associate, Institutional Services & Lukas Smart, Senior Portfolio Manager and Vice President, Portfolio Management; The Role of Small Caps, February 2015*

	DIMENSIONAL FUND ADVISORS			
	US LARGE	US LARGE VALUE	US MICRO	US SMALL VALUE
06/30/18	2.66%	-1.94%	7.56%	5.24%
2017	21.73%	19.11%	11.18%	7.21%
2016	11.90%	19.09%	25.63%	28.26%
2010	15.00%	20.37%	31.29%	30.90%
2009	26.62%	30.43%	28.06%	33.62%
2008	-36.76%	-40.74%	-36.72%	-36.79%
10 Yr. Avg.	10.16%	9.87%	11.75%	10.57%
15 Yr. Avg.	9.28%	10.13%	10.97%	11.08%
Total Holdings	622	316	1,603	1,069

### Top 25 Holdings:

	DIMENSIONAL FUND ADVISORS			
	US LARGE	US LARGE VALUE	US MICRO	US SMALL VALUE
1 Apple Inc	Intel Corp	First Financial Bancorp	CACI Int'l Inc Class A	
2 Microsoft Corp	JPMorgan Chase & Co	Exponent Inc	Kemper Corp	
3 Amazon.com Inc	Exxon Mobile Corp	LHC Group Inc	The Hanover Ins Group Inc	
4 Facebook Inc A	Wells Fargo & Co	Chart Industries Inc	Delek US Holdings Inc	
5 Berkshire Hathaway Inc B	AT&T Inc	Calloway Golf Co	PBF Energy Inc Class A	
6 JPMorgan Chase & Co	Pfizer Inc	Cavco Industries Inc	Cree Inc	
7 Exxon Mobile Corp	Chevron Corp	Kaman Corp Class A	American Eq Inv Life Hldg	
8 Alphabet Inc C	Cisco Systems Inc	WD-40 Co	Darling Ingredients Inc	
9 Alphabet Inc A	Bank of America Corp	Medifast Inc	Associated Banc Corp	
10 Johnson & Johnson	Comcast Corp Class A	Innospec Inc	PDC Energy Inc	
11 Bank of America Corp	Walmart Inc	American States Water Co	Vishay Inertechnology Inc	
12 Intel Corp	Citigroup	Walker & Dunlop Inc	Adtalem Global Ed Inc	
13 Chevron Corp	Medtronic PLC	Axon Enterprises Inc	Aaron's Inc	
14 Wells Fargo & Co	Time Warner Inc	Insperty Inc	Tech Data Corp	
15 Visa Inc Class A	Berkshire Hathaway Inc B	Integer Holdings Corp	GATX Corp	
16 UnitedHealth Group Inc	Valero Energy Corp	Ameris Bancorp	Oasis Petroleum Inc	
17 The Home Depot Inc	Aetna Inc	Conmed Corp	Commercial Metals Co	
18 Pfizer Inc	Anthem Inc	Merit Medical Sysms Inc	Fulton Financial Corp	
19 Cisco Systems Inc	Micron Technology Inc	Kaiser Aluminum Corp	Washington Federal Inc	
20 AT&T Inc	CVS Health Corop	Forward Air Corp	MB Financial Inc	
21 Verizon Comm Inc	Morgan Stanley	Omnicell Inc	TRI Pointe Group Inc	
22 Boeing Co	Abbott Laboratories	Ensign Group Inc	WESCO Int'l Inc	
23 Procter & Gamble Co	General Motors Co	Horace Mann Educators Corp	Domtar Corp	
24 Mastercard Inc A	Charter Communications	Ferror Corp	SkyWest Inc	
25 Citigroup Inc	Goldman Sachs Group	Saia Inc	Carpenter Technology	

Source: Morningstar, Inc. 6/30/18

## Meeting Expectations

All DFA portfolios are designed to deliver "market rates of return." DFA is not trying to "beat" the market by employing crystal ball type strategies, only working to achieve market returns, historically outpacing 90% of the active managers who attempt to beat the market.

To evaluate your portfolio, it is helpful to look at the various DFA funds and **compare them** to the specific markets in which they are invested:

	01/01/18 through 06/30/18 Return*
<b>DFA U.S. Large Co.</b>	<b>2.66%</b>
S&P 500 Index	2.65%
<b>DFA U.S. Large Value</b>	<b>-1.94%</b>
S&P 500 Value	-2.22%
<b>DFA U.S. Micro Cap</b>	<b>7.56%</b>
Russell 2000	7.47%
<b>DFA U.S. Small Value</b>	<b>5.24%</b>
Russell 2000 Value	5.44%
<b>DFA Emerging Markets</b>	<b>-7.55%</b>
MSCI Emerging Market Idx	-7.68%
<b>DFA Int'l Large Company</b>	<b>-2.34%</b>
MSCI EAFE Large Co Idx	-2.75%
<b>DFA Int'l Large Value</b>	<b>-4.47%</b>
MSCI EAFE Value	-4.61%
<b>DFA Int'l Small Value</b>	<b>-5.66%</b>
MSCI EAFE Small Value	-5.55%
<b>DFA One Yr. Gov't Bond</b>	<b>0.58%</b>
BarCap 1-3 Yr. Gov't	0.06%
<b>DFA Short-Term Gov't Bond</b>	<b>-0.39%</b>
BarCap 1-5 Yr. Gov't	-0.27%
<b>DFA 5 Yr. Global Bond</b>	<b>0.18%</b>
Citi WGBI AA 1-5 Yr. USD	-0.94%

\*Morningstar 06/30/18

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