# Small Caps

While the Dow has now closed lower for 5 consecutive weeks, its longest losing streak since 2011, the Russell 2000 never fully recovered from its bear market low on Christmas Eve. From Bloomberg:

# List of Stock Losers Sends a Troubling Signal to Economy Bulls

By Lu Wang May 23, 2019

Stocks are tumbling anew. Is this another dip worth buying? ...

Stocks fell Thursday as the world's two largest economies hardened their trade-war stances, bringing the S&P 500's loss in three weeks to 4.2%. With the index poised for its first monthly decline of the year, strategists such as Tom Lee of Fundstrat have urged investors to <u>buy the dip</u>, saying equity losses from trade concerns are unlikely to go beyond 5%.

Indeed, the S&P 500's retreat at its worst point this month has been 4.5% as overnight losses were pared in regular trading and some of the year's worst days followed by bounces.

But underneath the resilience is a deterioration in the momentum of some of the most cyclical stocks. Trailing the market for a third month in a row, the Russell 2000 of smaller firms has fallen to the lowest level since 2016 relative to the S&P 500.

Small-caps rely on revenue at home more than their larger counterparts and when they struggle it can elicit skepticism in the domestic economy. The Russell 2000's relative peak in June foreshadowed the recession scare in late 2018 that fueled the worst retreat during this bull market. ...

From Morningstar:

# Sizing Up Small Caps

Ben Johnson, CFA 10 May 2019

Depending on which index provider's definition you rely on, small caps make up anywhere from 3% to 12% of the total investable market capitalization of the U.S. stock market. Looking outside U.S. borders, small caps account for 15% of the MSCI All-Country World ex-U.S. ...

#### **Small Wonders**

Rolf Banz is widely credited as being the "father of the small-firm effect." In his University of Chicago Ph.D. dissertation, published in 1981, Banz found that smaller stocks generated greater risk-adjusted returns, on average, than larger ones.[1]

Banz's findings were bolstered by many of the risk-based explanations that efficient-markets acolytes hold out as justification for higher risk-adjusted returns. Smaller firms aren't as well-capitalized as their peers, their business lines may be less diversified, their customers may be larger and have more clout over them, and so on. So, the theory goes that they should offer greater returns to compensate investors for the risk they assume. There are also intuitive institutional factors that could justify a small-cap premium. Fewer analysts cover small-cap stocks. A lack of coverage could lead to informational barriers that may result in mispricing. Moreover, small-cap stocks are less liquid and thus more costly to trade. Scant liquidity could further justify the existence of the small-cap effect as investors should--in theory--be rewarded for the risks associated with illiquidity.

#### **The Small-Firm Effect Shrivels**

In the decades since Banz published his work, the size premium has been picked apart. Here are the highlights of the takedown:

- It is concentrated in the smallest of the small. It turns out that the size effect gets most of its oomph from micro-caps. The smallest 5%–10% of stocks has dramatically outperformed all other size cohorts. Removing these stocks from consideration causes the size effect to disappear.[2]
- It was based on dodgy data. As it turns out, there were significant biases in the data set Banz used in his work. This isn't entirely surprising, as the publication of his dissertation predated the introduction of Microsoft Excel for the Macintosh by about four years. The specific data issue plaguing his work was related to delistings. The CRSP database Banz used was missing returns for many delisted stocks. These stocks' returns were generally large and negative. Adding back these missing detractors makes the size effect fade away.[3]
- It seems to have been particularly strong in January. Just two years after Banz published his findings, it was shown that half the excess returns of small-cap stocks came during the month of January and that half of the January returns were concentrated in the first five trading days of the new year.[4] This "January effect" has defied attempts at any rational, risk-based explanation. Furthermore, this effect has diminished with time.[5] Its dependence on a seasonal peculiarity that has weakened through the years is another example of the size effect's shaky footing.
- It just hasn't panned out. Most importantly, in practice, small caps simply haven't produced greater riskadjusted returns versus their large-cap peers. Exhibit 1 is a relative wealth graph. It plots the growth of an investment in the Russell 2000 Index (representing small caps) versus an investment in the Russell 1000 Index (representing large caps). When the line is sloping upward, small stocks are outperforming large ones and vice versa. Since the small-cap effect was documented in the early 1980s, small caps have in aggregate underperformed large caps. While the relationship outlined in the exhibit is decidedly



Exhibit 2 Small Is in the Eye of the	Index Provider					
	CRSP U.S. Small Cap Index	Dow Jones U.S. Small-Cap Total Stock Mrkt Idx	Russell 2000 Index	S&P Small Cap 600		
Total Market Capitalization	\$3.4 Tn	\$2.8 Tn	\$2.1 Tn	\$734 Bil		
Average Market Capitalization	\$2.5 Bil	\$1.9 Bil	\$2.4 Bil	\$1.3 Bil		
Median Market Capitalization	\$2.0 Bil	\$1.4 Bil	\$0.8 Bil	\$1.2 Bil		
Market Cap of Largest Constituent	\$12.0 Bil	\$14.2 Bil	\$8.7 Bil	\$4.3 Bil 2.8 601		
% of Total Market Cap of Parent Idx	12.0	9.5	6.8			
Number of Constituents	1,355	1,734	1,999			
Breakpoints CRSP assigns breakpoints based on cumu- lative market capitalization. The small cap index captures the bottom 2-15% of the investable market capitalization of the CRSP U.S. Total Market Index.		Count-Based. The Dow Jones U.S. Small-Cap Total Stock Market Index captures stocks 751-1,750 of the Dow Jones U.S. Broad Stock Market Index	Count-Based. The Russell 2000 Index captures stocks 1,001-3,000 of the Russell 3000E Index	Count-Based. The S&P Small Cap 600 captures the smallest 600 stocks within the S&P Composite 1500 Index.		
Screens Liquidity, Market Cap, Float, Domi- cile, etc.		Liquidity, Market Liquidity, Market Cap, Float, Domi- cile, etc. cile, etc.		Liquidity, Market Cap, Float, Domi- cile, etc. Also, additions to the index are required to have four consecutive quarters of positive earn- ings.		
Reconstitution	Quarterly after the market close on the third Friday of March, June, September and December	"Annually, at the opening of trading on the Monday following the third Friday of September."	Annually, on the last Friday in June.	Quarterly, after the close on the thrid Friday of the quarter- ending month		

Source: Morningstar Direct, CRSP, FTSE/Russell, S&P Dow Jones Indices, Analyst's calculations. Data as of Mar. 29, 2019 for CRSP U.S. Small Cap Index, Mar. 31, 2019 for Russell 2000 Index, Apr. 30, 2019 for Dow Jones U.S. Small-Cap Total Stock Market Index

#### Don't Call It a Comeback

More recently, AQR researchers have revived the small-firm effect, albeit in a form quite distinct from the original.[7] Specifically, they found that a significant size premium appears after controlling for stocks' quality. Homing in on quality small-cap stocks (those with solid, consistent profits; clean balance sheets; and responsible investment policies), or inversely, giving the boot to "junk" stocks, brings the size effect back to life. These findings pose interesting challenges to any risk-based explanation for the small-firm effect.

Additionally, while small caps on the whole may not offer an avenue to above-average risk-adjusted returns, they are fertile ground for more-careful farming of a variety of factors--factor exposures tend to be amplified within small caps.

#### Sizing Up Small-Cap Benchmarks

Investors looking for broad-based small-cap exposure have a plethora of options. It can be argued that Banz's dissertation launched a thousand funds in the ensuing decades. It also gave rise to a host of small-cap indexes and funds that track them. Investors in small-cap exchange-traded funds and index funds are spoiled for choice. But this is both a blessing and a burden. As is always the case in selecting among index fund options, index construction matters. Here are some things you should focus on when scrutinizing small-cap benchmarks.

Definitions of "small" vary widely. As I mentioned at the outset, depending on the index family in question, small caps might represent anywhere from 3% to 12% of the investable market capitalization of a given parent index. As shown in Exhibit 2, the S&P Small Cap 600 Index represents about 3% of the market cap of its parent index, while the CRSP U.S. Small Cap Index captures 12%. These differences owe to index design. The CRSP family of indexes uses market-cap-based breakpoints; the small-cap benchmark will always encompass the bottom 2%-15% of the investable universe. The S&P index follows a count-based construction process. It bundles the smallest 600 stocks from its parent index, the S&P Composite 1500 Index. As such, its market cap will fluctuate as a percentage of the market cap of the parent index over time. These nuanced differences will yield distinct risk/reward profiles over time, as shown in Exhibit 3.

Exhibit 3 Small Differences in Methodology May be Magnified Over the Long Term								
	Ann	ualized Tota	l Return (%)	Sharpe Ratio				
Index	5-Yr	10-Yr	15-Yr	5-Yr	10-Yr	15-Yr	Max Draw- down (%)	
CRSP US Small Cap TR USD	9.17	15.75	10.25	0.62	0.97	0.57	-53.45	
DJ US TSM Small Cap TR USD	8.33	15.26	9.82	0.54	0.91	0.53	-54.35	
Russell 2000 TR USD	8.63	14.10	8.66	0.54	0.83	0.47	-52.89	
S&P SmallCap 600 TR USD	9.90	15.57	10.08	0.62	0.93	0.55	-52.15	
S&P 500 TR USD	11.63	15.32	8.97	0.96	1.18	0.60	-50.95	

Exhibit 3 Small Differences in Methodology May Be Magnified Over the Long Term

Source: Morningstar Direct

Screens matter. The S&P index family is unique in that it employs a "financial viability" screen to stocks being considered for addition to its indexes. To be included in the index, a stock must have four consecutive quarters

of positive earnings. This acts as a quality screen of sorts. Thus, it's unsurprising that the funds tied to this benchmark have shown a statistically significant loading on the quality factor and--given what we discussed previously about the effect of screening for quality among small caps--have produced superior long-term risk-adjusted returns relative to their peers. This "edge" underpins our Morningstar Analyst Rating of Gold for iShares Core S&P Small-Cap ETF (IJR).

Reconstitution has a price. There is perhaps no greater example of the real costs of reconstitution than the Russell 2000 Index. At the bottom of its portfolio, the index dabbles in illiquid micro-cap names. These stocks are expensive to trade. The index does little to buffer the regular addition and deletion of these names from its portfolio, resulting in meaningful transaction costs. Furthermore, the Russell 2000 Index is the most widely followed of small-cap benchmarks, so its annual reconstitution attracts a lot of attention. The sums of money sloshing into and out of the smallest names in the index further compound the issue. The ill effects are apparent in the index's performance and reflected in our Bronze ratings for iShares Russell 2000 ETF (IWM) and Vanguard Russell 2000 ETF (VTWO).

[1] Banz, R.W. 1981. "The Relationship Between Return and Market Value of Common Stocks." *J. Financial Economics*, Vol. 9, No. 1, P. 3.

[2] Horowitz, J.L., Loughran, T., & Savin, N.E. 2000. "The Disappearing Size Effect." *Research in Economics*, Vol. 54, No. 1, P. 91. //doi.org/10.1006/reec.1999.0207

[3] Shumway, T., & Warther, V. 1998. "The Delisting Bias in CRSP's NASDAQ Data and Its Implications for the Size Effect." //www-personal.umich.edu/~shumway/papers.dir/nasdbias.pdf

[4] Keim, D.B. 1983. "Size-Related Anomalies and Stock Return Seasonality: Further Empirical Evidence." *J. Financial Economics*, Vol. 12, No. 1, P. 13.

[5] Easterday, K.E., Sen, P.K., & Stephan, J.A. 2009. "The Persistence of the Small Firm/January Effect: Is It Consistent With Investors' Learning and Arbitrage Efforts?" *Quarterly Rev. Economics and Finance*, Vol. 49, No. 3, P. 1172.

[6] Crain, M.A. 2011. "A Literature Review of the Size Effect." SSRN Working Paper. //papers.ssrn.com/sol3/papers.cfm?abstract\_id=1710076

[7] Asness, C.S., Frazzini, A., Israel, R., Moskowitz, T.J., & Pedersen, L.H. 2015. "Size Matters, If You Control Your Junk." Fama-Miller Working Paper. <u>//ssrn.com/abstract=2553889</u>

### Why the Size Premium Should Persist

By Larry Swedroe March 20th, 2019

... The size premium's relatively poor performance in U.S. stocks over the eight-year period from 2011 through 2018 caused many investors to question its persistence. Using <u>Fama-French three-factor model data</u>, the annual premium was negative in six of the eight years, with returns of -5.0 percent, -0.8 percent, +5.5 percent, -7.0 percent, -4.1 percent, +6.2 percent, -4.1 percent, and -3.1 percent, respectively. The annualized premium over that period was -1.6 percent, with a total return over the period of -12.4 percent. Its performance was similar in

international markets—from 2011 through November 2018, the World ex-US Small minus Market factor was an annual average -1.3 percent.

When asked to address this type of question, the first thing I generally point out is that all factors, including market beta, have gone through, and likely will continue to go through, very long periods of negative premiums. ... That must be the case, or there would be no risk when investing in them, and efficient markets would arbitrage away any premium.

The following table shows the odds of a negative premium, expressed as a percentage, for the three Fama-French factors of market beta, size and value. Data is from the Fama/French Data Library and covers the period 1927 through 2017. Using the historical mean premium, the historical standard deviation of the premium, and Monte Carlo simulations, we can estimate the odds of a premium being negative in future periods. As you can see, even at 20 years, we should expect the equity premium to be negative in 3 percent of periods. (Note that most financial economists believe the equity risk premium, or ERP, will be smaller than the historical average because valuations are now much higher than average. All else being equal, that increases the odds of a negative premium over all time frames.) As you can also see, the most recent eight-year period of poor performance certainly isn't unusual for the size premium, as it should be expected to be negative in almost one-quarter of even 10-year periods.

	l-Year		5-Year	10-Year	20-Year		
Market Beta	34	24	18	9	3		
Size	41	34	30	23	15		
Value	37	28	22	14	6		

The lesson here is that, if you are considering investing in any factor, you should be prepared to endure long periods of negative premiums and understand the importance of staying disciplined. One reason investors fail to earn market returns is that they lose discipline, which is why Warren Buffett stated that temperament is more important than intellect when it comes to investing, and that investing is simple but not easy.

There's another point worth noting, and it demonstrates the importance of diversification. While the annual average U.S. size premium was -1.6 percent during the eight-year period ending in 2018, the international size premium was +1.5 percent. If the size premium in the United States had disappeared because it was well known, one might think it would also have disappeared in the rest of the developed world.

In "<u>Your Complete Guide to Factor-Based Investing</u>," (one of the texts that I use for my Advance Topics in Investments class at the University of Oklahoma) my co-author, Andrew Berkin, and I provide five criteria a factor must meet before you should consider allocating assets to it. We established the criteria to minimize, if not eliminate, the risk of a finding being the result of data mining. The five criteria are that a factor is persistent across very long periods, pervasive around the globe (and where appropriate, across asset classes), robust (to various definitions), implementable (survives transaction costs) and intuitive. The size premium meets all the criteria. The following briefly summarizes the findings presented in the book, providing intuitive, risk-based explanations for believing the premium should persist (risk cannot be arbitraged away). Relative to large companies, small companies typically are characterized by the following:

- Greater leverage.
- A smaller capital base, reducing their ability to deal with economic adversity.

- Greater vulnerability to variations in credit conditions due to more restrictive access to capital.
- About 50 percent greater price volatility (about 30 percent versus about 20 percent).
- Higher volatility of earnings.
- Lower levels of profitability.
- A premium positively correlated with economic cycles—the risk of small stocks tends to show up in bad times, and assets that perform poorly in bad times require risk premiums.
- Greater uncertainty of cash flow.
- Less liquidity, which therefore makes their stocks more expensive to trade.

Other explanations might include:

- A less proven, or even unproven, track record for the business model.
- Less depth of management.

Roger Grabowski of Duff and Phelps contributes to the literature on the size factor with his November 2018 paper "<u>The Size Effect Continues to be Relevant When Estimating the Cost of Capital.</u>" The paper reviews the size effect and potential reasons why one observes the size effect, corrects common misconceptions, and addresses criticisms of the size premium. He shows why using a pure market factor as the sole risk factor in estimating the expected return provides an incomplete estimate.

Citing the academic literature, Grabowski offers the following characteristics of smaller firms that cause the rate of return investors expect when investing in stocks of small companies to be greater than the rate of return expected when investing in stocks of large companies. These traits provide a risk-based explanation for why the premium should persist—why it cannot be arbitraged away:

- Potential competitors can more easily enter the "real" market (the market for the goods and/or services offered to customers) of the small firm and take the value that the small firm has built.
- Large companies have more resources to better adjust to competition and avoid distress in economic slowdowns.
- Small firms undertake less research and development and spend less on advertising than large firms do, giving them less control over product demand and potential competition. Small firms have fewer resources to fend off competition and redirect themselves after changes in the market occur.
- Smaller firms often have fewer analysts following them, and less information available about them.
- Smaller firms may have less access to capital.
- Smaller firms have thinner management depth.
- Smaller firms have a greater dependency on a few large customers.
- The stocks of smaller companies are less liquid than the stocks of their larger counterparts.
- Analysts and investors have difficulty evaluating small, little-known companies and estimating traditional quantitative risk measures for them. This ambiguity adds to the risk of investment and increases the return required to attract investors.

Grabowski also showed that the size premium was robust to various definitions. His database covered the period 1981 through 2016. He chose this period to demonstrate that the premium has not disappeared in the post-Banz period (Rolf Banz's paper, "<u>The Relationship between Return and Market Value of Common</u> <u>Stocks</u>," was published in March 1981).

To study the size premium, he created quintile portfolios of the smallest companies. He excluded financial services companies because the regulated nature of banks and insurance companies causes their underlying characteristics to differ from those of nonregulated companies. He also excluded speculative start-ups, distressed (i.e., bankrupt) companies and other high-financial-risk companies. (These groups of stocks are often referred to as "lottery" stocks.) Grabowski wrote: "This methodology was chosen to counter the criticism of the size effect by some that the size premium is a function of the high rates of return for speculative companies and distressed companies in the data set."

The author found that, when ranking by market cap, the size premium increased monotonically from 2.8 percent in the first quintile to 8.0 percent in the fifth. In addition to market cap, he also examined the results based on ranking by net income. He found the same monotonic increases—the premium increased from 1.7 percent (first quintile) to 6.6 percent (fifth quintile). When ranking by net assets, the premium also increased monotonically, from 2.2 percent (first quintile) to 6.4 percent (fifth quintile). Similar results (though not exactly monotonic increases) were found when ranking by EBITDA (earnings before interest, tax, depreciation and amortization)—the premium increased from 3.4 percent (first quintile) to 6.0 percent (fifth quintile).



When Grabowski examined the subperiod 1990 through 2016, he found very similar results across all size metrics, with premiums tending to increase as size decreased—and in the case of two of the four metrics, the increase in returns was monotonic across quintiles.

Grabowski also examined whether the size premium is a proxy for other risk characteristics. For example, he found that smaller companies tend to have higher leverage and both lower operating margins and much greater volatility of that margin. For example, when breaking the market into 25 portfolios by market cap, the volatility of operating margin for the smallest stocks was about five times that of the largest stocks. These are clear indicators of increased business risk. He also found that business risk as measured by the unlevered asset beta (i.e., greater asset beta indicates greater business risk) generally increases as size decreases. He found these relationships to be robust to the various size metrics he used.

Summarizing, Grabowski noted: "Small companies are believed to typically have greater expected rates of return compared to large companies because small companies are inherently riskier. However, this leaves the question of why small-stock returns have not consistently outperformed large-company stocks for various periods. When talking about expectations, two factors are considered: the probability and the magnitude. Assuming that the small stocks will always outperform large stocks implies that the probability is 100%, which

cannot be true. In a recent study, F-F [Eugene Fama and Ken French study '<u>Volatility Lessons</u>'] find that the estimated probabilities that small-cap companies can be expected to underperform large-cap companies over a five-year investment horizon is only 29.8%. But they also find that as the investment horizon increases, the likelihood that the returns on small-cap companies will exceed returns of large-cap companies increases: In short, value and small stock premiums over Market are always risky, but for longer return horizons, good outcomes become more likely and more extreme than bad outcomes."

# Summary

One of the more common mistakes investors make is to believe that research publicizing the existence of a premium will eliminate it. The best demonstration of this point is that the ERP—the annual average return to the market beta factor—is certainly well known. Yet, no one believes that it should disappear. The simple explanation is that there are risk-based explanations for it to persist, and risk cannot be arbitraged away. That said, all premiums are subject to potential shrinkage post-publication. They can shrink as more investors become aware of the factor and desire exposure to it, being willing to accept the risks. Alternatively, they can shrink because risks become lower.

For example, it's logical that the ERP is lower today because economic volatility is much lower than it was 100 years ago. Another rationale for a lower ERP is that implementation costs (fund expenses, commissions, bid-offer spreads) are lower, allowing investors to capture more of the premium. Thus, they should be willing to pay a higher price for exposure to market beta. These same two explanations apply to the size premium (and the value premium). It is for these reasons that, when the Investment Policy Committee at Buckingham Strategic Wealth estimates returns for use in Monte Carlo simulations, we use current valuations to estimate the ERP, while we give historical factor premiums a 25 percent haircut.

To repeat, investors must expect that any risk-based factor will experience long periods of underperformance. One only has to observe the U.S. value factor to see that it's having a very rough <u>decade</u>. However, that's not a reason to avoid exposure to a factor, such as size. In fact, investors should find satisfaction in the erratic performance of small stocks. If you believe that small stocks are riskier than large stocks, it should follow that small stocks should not always outperform large stocks in all periods—sometimes the risks show up. This is true even though the expected returns are greater for small-cap stocks over the long term.

The right way to think about the issue of underperformance over long periods is to diversify across factors so your risks are not concentrated in the one (or the few) that happens to go through an extended period of poor performance. <u>Alpha Architect</u> and many others have specifically looked at the benefits of diversifying the value and momentum factors. Diversification becomes especially important as you approach and enter retirement, when the order of returns matters a great deal.

#### **Our thoughts**

"The race is not always to the swift, nor the battle to the strong, but that's the way to bet." - Damon Runyon

And so we continue to overweight Small Caps for our clients. At the end of my class on Advanced Topics in Investments I divide the students into teams that are then required to critique a portfolio that a HCM client

submitted for analysis, provide an IPS (Investment Policy Statement) for the client, and a proposed portfolio that this year had to have a **Risk** ratio of **0.8** to the S&P 500. HCM's solution:

	Symbol	Name	Туре	Description	Factors (1)	Yield	(2)	Exp.	M*	Risk (3)	
15	GIFIX	Guggenheim Floating Rate Strats Instl	OEF	Bank Loan		4.8%	М	0.79%	4	0.2	
15	ANGIX	Angel Oak Multi-Strategy Income Instl	OEF	Multisector Bond		5.0%	Μ	1.12%	4	0.3	
10	SFREX	Schwab Fundamental Global Real Estate Idx	OEF	Global Real Estate-Large Blend		3.7%	Q	0.39%	5	0.9	
10	MTUM	iShares Edge MSCI USA Momentum Factor ETF	ETF	US Large Growth	М	1.3%	Q	0.15%	5S	1.0	
20	SMLF	iShares Edge MSCI Mltfct USA SmCp ETF	ETF	US Small Blend	S, V, M, Q	1.1%	Q	0.30%	4	1.2	
10	SMMV	iShares Edge MSCI Min Vol USA SmCp ETF	ETF	US Small Blend	S, LV	1.6%	Q	0.20%		0.8	
20	ISCF	iShares Edge MSCI Mltfct Intl SmCp ETF	ETF	Foreign Small/Mid Blend	S, V, M, Q	1.9%	S	0.40%	4	1.3	
	Weighted Average: 0.8										
Notes											
1	1 V=Value, M=Momentum, Q=Quality, S=Size, LV=Low Volatility										
2	2 Distribution Frequency: A=Annual, M=Monthly, S=Semi-Annual, Q=Quarterly										
3	3 Ratio of average historical Max. Drawdowns to S&P 500 declines greater than 10% since 2007										

3 Ratio of average historical Max. Drawdowns to S&P 500 declines greater than 10% since 2007

We have added SMLF (orange line) to Morningstar's SMMV (blue line) chart. Both have outperformed the Russell 2000 (green line) since SMMV's inception. We have also added MTUM (yellow line), the only Large Cap fund we recommend, and the S&P 500 (maroon line) for comparison.

