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Vitali Kalesnik, Ph.D.

Reeling In Small-Cap Alpha

Vitali Kalesnik, Ph.D., and Noah Beck

"Small size alone does not guarantee outperformance."

KEY POINTS

1. Stocks of small companies have higher incidences of price volatility and mispricing, increasing opportunities for investors to earn excess returns.
2. Implementing outperforming strategies, such as value or momentum, in the small-cap universe amplifies their alpha-generating potential.
3. High trading costs of small-cap stocks requires skilled execution and careful indexing rules for passive investing.

Although we live at the edge of the Pacific Ocean, our weekend adventures often take us inland to enjoy the lakes and streams of California and her neighboring states. A favorite pastime is fresh-water fishing. For most, the lure of fishing is a combination of serene beauty, contemplative quiet, and the satisfaction of reeling in as many big fish as possible. We admit that the first two attractions are very appealing in their restorative powers, particularly to office-weary asset managers, but we can't help being most inspired by the basic challenge of catching a lot of big fish. The folklore claims 10% of fishermen catch 90% of the fish. What do the top 10% know that the others don't?

Investors' search for alpha is not dissimilar to the strategies of skilled and experienced fishermen. First, the skilled know the right location. They use multiple lines and hooks or lures to increase their opportunities. And they attract greater numbers of fish by chumming—adding scent or bait to the water. In the world of asset management, we can think of risk and mispricing as the chum that attracts alpha. Just as all fishing locations are not equal—contrast the teeming Lake Tahoe with the perishing Salton Sea—not all segments of the equity market are equal in the opportunities they present for finding alpha.

Small-Cap Alpha: Abundant, but Unreliable

Lake Tahoe is well known for both its abundance and diversity of fish. The academic literature has made a similar case for small stocks, often believed to be a deep pool into which an investor can cast her net and pull out a weighty haul of alpha.

Stocks of small companies vary significantly in price volatility, are more prone to defaults, and have high trading costs. In combination, these characteristics create an unpredictable risk distribution for small-cap stocks, and the same traits contribute to their frequently being mispriced. In addition, many known anomalies, or risk factors, have significantly higher return dispersion among small companies, creating numerous opportunities for alpha production.

Our research shows, however, that small stocks are not a dependable source of standalone premium. Granted, the small-cap universe is plentiful—there are thousands more small companies than large companies—and diverse—the U.S. economy encourages virtually any type of business or strategy an entrepreneur can envision—but these traits alone are insufficient to ensure small caps will unfailingly produce an excess return.

Media Contacts

United States and Canada
Hewes Communications
+1 (212) 207-9450
hewesteam@hewescomm.com

Europe
JPES Partners (London)
+44 (0) 20 7520 7620
ra@jpespartners.com

Many market participants believe that, just like value stocks outperform growth stocks, and positive momentum stocks outperform negative momentum stocks, small-cap stocks outperform large-cap stocks. In a recent article (Kalesnik and Beck, 2014), we discuss the evidence that supports the size premium. Table A1 in the Appendix lists the main arguments in favor and against small size as a standalone source of premium. In our view, the arguments against are much stronger than the arguments in favor: we judge the evidence that small-cap companies, in general, outperform large-cap companies to be unreliable. Our advice to the equity investor is to examine that small cap you are considering to be sure it has the alpha-producing qualities you seek—if absent, toss that small fish back, and cast your line again.

Small caps are not the fish, they are the fishing spot—not the source of alpha, but rather a place where alpha can be found.

A Fertile Fishing Spot

Even if small companies are not as a group reliably outperforming large companies, small-cap stocks still hold significant promise for investors—they are a fertile fishing spot for alpha. Small caps, like other investment strategies, benefit from two potential sources of outperformance: 1) exposure to sources of risk that are compensated with higher returns, and 2) systematic sources of mispricing that can be exploited.

Small stocks come with higher risk than large stocks as measured by credit rating, delisting probability, and volatility. **Table 1** reports the distress and volatility characteristics of U.S. stocks by size quintile. The S&P credit rating difference between small-cap stocks (B rated) and large-cap stocks (A+ rated) indicates the higher likelihood (over 200 times) of smaller stocks being delisted, often because of default. Small caps have a delisting rate of 2.38% versus 0.01% for large caps.

The higher price volatility of small caps is evident at both portfolio and stock-specific levels. The portfolio composed of the smallest 20% of stocks is about 44% more volatile than the portfolio of the largest 20% of stocks—20.6% versus 14.3%, respectively. A portfolio, however, masks a lot of stock-specific volatility. A comparison of the median stock volatility of the highest and lowest quintiles is significantly more striking: the median volatility of the smallest stocks (50.5%) is almost 100% more volatile than the median volatility of the largest stocks (25.5%). Also, the dispersion in stock volatility is much greater for small stocks than for large stocks, with a 25th–75th percentile range of 32.1%–76.0% compared to 19.8%–33.2%, respectively. With a much wider dispersion in stock-level risk, investors looking to capitalize on known risk premia should consider doing their fishing in the small-cap side of the pond.

Smaller companies, by virtue of their vast numbers, limited market liquidity, and

Table 1. Distress and Volatility Characteristics of Stocks by Size Groups (U.S., 1988–2014)

Size Quintile	S&P Credit Rating (Average over full period)	% of Companies Delisted (Annual average)	Portfolio Volatility	25th Percentile Stock Volatility	Median Stock Volatility	75th Percentile Stock Volatility
1—Smallest 20%	B	2.38%	20.6%	32.1%	50.5%	76.0%
2	BB-	0.37%	20.6%	26.8%	37.6%	51.7%
3	BB	0.13%	19.0%	23.8%	32.1%	42.8%
4	BBB-	0.03%	17.0%	21.1%	28.2%	37.0%
5—Largest 20%	A+	0.01%	14.3%	19.8%	25.5%	33.2%

Note: Quintiles are defined by joint NYSE/NYSE MKT (formerly American Stock Exchange) breakpoints.
Source: Research Affiliates, LLC, using CRSP/Compustat Database.

resultant lower investor demand, tend as a category to have very light analyst coverage. Therefore, much less is known by, or available to, the average investor about the fundamental strength of most small companies. Investors struggle to digest this complexity and to translate the information they are able to discern into efficient prices. Greater instances of mispricing are the practical outcome. Such mispricing creates an opportunity for investors to capture excess returns, much as the fisherman's baited hook entices the next bream that skims by.

If mispricing in the small-cap segment of the market is well known, why does the mispricing persist? Why is it not arbitraged away? One likely reason is high trading costs. **Table 2** lists the average bid–ask spreads for each of the size quintiles over the period 1988–2014. The bid–ask spread serves as a proxy for trading costs. Clearly, the average spread is much higher for the smallest-cap quintile compared to the largest over both the entire 27-year period and the last 10 years. Large trading costs make potential trades of small-cap stocks less profitable, allowing the mispricing to persist.

> *"Small caps are not the fish, they are the fishing spot."*

Just as a lake with heavier vegetation provides a more fertile environment for fish to thrive, we believe the small-cap universe provides fertile ground for finding highly mispriced stocks. In the never-ending debate over whether certain sources of outperformance—such as value and momentum—arise from risk or mispricing, for our purposes, it actually doesn't matter! Based on the evidence we have just presented, small caps offer a bountiful location to find alpha.

Reeling In Alpha

As we stated in the previous section, outperformance requires that risk be adequately compensated by return. In seeking excess returns, we can attempt to exploit the higher riskiness and greater probability of mispricing in small-cap stocks by implementing outperforming strategies—such as those that capture the value, momentum, and quality premiums—within the small-cap universe.

Value in small caps. In the simplest interpretation, value strategies favor the stocks of companies with high accounting fundamentals-to-price ratios (value stocks) relative to those with low fundamentals-to-price ratios (growth stocks). The high ratio of fundamentals relative to price can signal that the stock is justifiably risky so that the market is willing to purchase the stock only at a reduced price. Alternatively, the high ratio may signal that the stock is actually underpriced for its fundamentals. In either case, historical experience has shown that buying value companies has been a profitable strategy.

For value stocks deemed to be cheap because of higher risk, this characteristic should be magnified in the more opaque small-cap universe, and hence, offer

Table 2. Bid–Ask Spreads by Size Groups (U.S., 1988–2014)

Size Quintile	Bid–Ask Spread (Average over full period)	Bid–Ask Spread (Average last 10 years)
1—Smallest 20%	4.56%	1.57%
2	2.11%	0.29%
3	1.25%	0.13%
4	0.83%	0.10%
5— Largest 20%	0.46%	0.06%

Note: Quintiles are defined by joint NYSE/NYSE MKT (formerly American Stock Exchange) breakpoints.
Source: Research Affiliates, LLC, using CRSP/Compustat Database.

investors a higher premium for assuming that risk. For value stocks attributed to mispricing (i.e., fundamentally strong stocks being temporarily priced too low, and vice versa), returns should be higher when the value strategy is executed in small caps because of the greater potential for the mispricing of small companies. In **Table 3** we show the performance of different definitions of value strategies implemented in both large-cap and small-cap stocks from 1967 to 2014.

Value stocks, regardless of the definition of value,[1] outperform growth stocks in both large-cap and small-cap market segments. More importantly, the outperformance of value stocks relative to growth stocks is significantly larger for the strategies executed in small-cap stocks. The *t*-stats of two of the long–short value strategies implemented in small caps are significant at the 1% level, and one is significant at the 5% level. This compares to two of the same strategies implemented in the large-cap universe being significant at the 5% level, and one at the 10% level.

Momentum in small caps. The momentum strategy favors stocks that over a recent period have risen steadily in price. Once identified, these stocks typically continue their upward, outperforming trajectory for an additional period of time; momentum can also assume a downward trajectory. Like the value strategy, the momentum strategy's ability to deliver excess returns has both risk and mispricing explanations. In our view, the most convincing argument is related to risk, that is, market participants initially underreact to earnings surprises (up or down), only to follow up with a buy or sell action when the earnings information is later confirmed. Similar to the argument we made for implementing a value strategy with small-cap stocks, the risk associated with a momentum strategy would also be amplified when implemented with small caps and would generate a higher return premium.

If momentum derives its value-add from mispricing, the fact that small caps are potentially more prone to

Table 3. Performance of Value Strategies in Large-Cap and Small-Cap Universes (U.S., 1967–2014)

	Definition	Value		Growth		Sharpe Ratio of Long–Short	*t*-Stat of Long–Short
		Return	Volatility	Return	Volatility		
Large Cap	Book-to-Price	13.1%	16.7%	9.3%	16.8%	0.29	2.02**
	Earnings-to-Price	13.3%	16.0%	8.8%	17.8%	0.31	2.14**
	Cash Flow-to-Price	13.0%	16.3%	9.2%	17.3%	0.28	1.92*
	Dividends-to-Price	12.7%	13.9%	9.4%	20.0%	0.13	0.89
	Performance of Average Portfolio	**13.1%**	**15.5%**	**9.2%**	**17.8%**	**0.26**	**1.81***
Small Cap	Book-to-Price	16.6%	23.2%	10.5%	22.8%	0.44	3.04***
	Earnings-to-Price	15.9%	20.7%	10.2%	25.3%	0.30	2.11**
	Cash Flow-to-Price	17.0%	22.5%	10.2%	23.1%	0.46	3.17***
	Dividends-to-Price	15.4%	16.7%	11.2%	25.1%	0.14	0.96
	Performance of Average Portfolio	**16.3%**	**20.5%**	**10.6%**	**24.0%**	**0.37**	**2.54****

*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.
Source: Hsu et al. (2015) and Research Affiliates, LLC, using CRSP/Compustat data.

mispricing should make a momentum strategy implemented in small caps even more profitable. In **Table 4** we compare the performance of the recent winners versus losers in the universes of large-cap and small-cap stocks. The gains from momentum are much higher among the small caps. The *t*-stats of all five momentum strategies implemented in small caps are significant at the 1% level compared to only two of the five strategies being significant at the 10% level when implemented in large caps.

Quality in small caps. Quality investing as a standalone strategy has been gaining a lot of attention. Investing in quality companies is intuitively appealing, but what drivers underlie the strategy? Again, the possible explanations are mispricing and risk. Mispricing theory would argue that investors are unable to correctly translate information beyond simple financial metrics into efficient prices, and risk theory would argue that several metrics related to quality are associated with a distinct undiversifiable correlation pattern, which in a multifactor setting may signal that quality stocks are compensated by a risk premium. If either or both of these explanations are true, we would expect a stronger relationship in the universe of small-cap stocks.

A quality strategy encompasses a very broad category of possible signals, creating the danger of focusing on a nonrepresentative outlier. To avoid this potential problem, we identify nine broad groups of quality definitions, and within these groups, 35 narrower definitions. Table A2 in the Appendix provides the definitions. We simulate the performance of the 35 quality definitions in both large-cap and small-cap universes. **Table 5** provides these results.[2]

We find that for large-cap stocks in the aggregate, quality stocks do not have a performance advantage over junk

Table 4. Performance of Momentum Strategies in Large-Cap and Small-Cap Universes (U.S., 1967–2014)

	Definition	Winners		Losers		Sharpe Ratio of Long–Short	*t*-Stat of Long–Short
		Return	Volatility	Return	Volatility		
Large Cap	–2 to –12 Months	13.0%	17.2%	8.3%	18.7%	0.27	1.88*
	–2 to –12 Months 3-Mo. Hold	12.3%	17.5%	8.3%	18.5%	0.24	1.67*
	–2 to –12 Months 1-Yr. Hold	11.2%	17.5%	9.3%	17.5%	0.13	0.92
	–2 to –6 Months	10.4%	16.9%	10.7%	18.8%	–0.04	–0.29
	–1 to –12 Months	12.4%	17.0%	9.3%	19.3%	0.16	1.11
	Performance of Average Portfolio	**11.9%**	**17.0%**	**9.2%**	**18.3%**	**0.17**	**1.17**
Small Cap	–2 to –12 Months	17.9%	21.2%	3.7%	27.1%	0.72	4.99***
	–2 to –12 Months 3-Mo. Hold	16.3%	21.3%	4.3%	26.4%	0.65	4.51***
	–2 to –12 Months 1-Yr. Hold	14.7%	21.2%	8.4%	25.1%	0.39	2.69***
	–2 to –6 Months	15.3%	21.2%	5.6%	26.7%	0.51	3.54***
	–1 to –12 Months	16.5%	20.9%	5.8%	27.9%	0.47	3.24***
	Performance of Average Portfolio	**16.2%**	**21.1%**	**5.6%**	**26.4%**	**0.58**	**4.04***

*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.
Source: Hsu et al. (forthcoming) and Research Affiliates, LLC, using CRSP/Compustat data.

Table 5. Performance of Quality Strategies in Large-Cap and Small-Cap Universes (U.S., 1967–2014)

Strategy	Definition	Quality		Junk		Sharpe Ratio of Long–Short	*t*-Stat of Long–Short
		Return	Volatility	Return	Volatility		
Large Cap	Performance of Average Portfolio	10.7%	15.3%	10.3%	16.1%	0.06	0.40
Small Cap	Performance of Average Portfolio	13.9%	20.7%	12.4%	22.1%	0.38	2.66***

*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.
Source: Hsu et al. (2015) and Research Affiliates, LLC, using CRSP/Compustat data.

stocks.[3] By contrast, in the small-cap universe, quality stocks outperform junk stocks. The performance advantage as indicated by the *t*-stat of the long–short quality portfolio is statistically significant at the 1% level for small caps.

In the recent article "Size Matters If You Control Your Junk," Asness et al. (2015) document that small-cap companies outperform the market if low-quality companies are avoided. We have a minor quibble with the interpretation of trying to rescue the size premium by controlling for junk. Why not "Size Matters If You Control Your Growth" or "Size Matters If You Avoid Losers"? Arguing that size matters if you control for junk, rather than arguing that most anomalies generate better performance—or any performance at all—when implemented in small-cap stocks, is not much different from arguing, for example, that rebalancing is a repackaged value strategy. At the end of the day, however, our empirical findings and those of Asness et al. are similar: quality small-cap stocks can be a good source of excess return.

> *"The small-cap universe provides fertile ground for finding highly mispriced stocks."*

Both Location and Skill Matter

The key to a successful day of fishing is location. The same is true of outperforming in the equity market. The investor must find where alpha is located. Small size—along with value and momentum—is generally considered to be a singularly promising location. Our empirical research, however, calls this general wisdom into question.

We find that small size alone does not guarantee outperformance. But small size does offer fertile waters in which to find alpha and reel it in. Both sources of outperformance in investment strategies—compensated risk and mispricing—are amplified when implemented in the small-cap universe because small-cap stocks take both characteristics to the extreme; well-known anomalies show much stronger outcomes when implemented among smaller companies. We conclude that exploiting outperforming strategies within the small-cap universe can deliver excess returns.

Because small-cap stocks have high trading costs, implementation skill matters—a lot. Passive implementation of investment strategies in the small-cap segment of the market requires careful indexing rules for construction in order to lower turnover and increase capacity. Both passive and active managers need solid execution skill to benefit from the trades in small-cap stocks. Ultimately, the equity investor will haul in a larger alpha catch by emulating the skilled fisherman: first, identifying a promising location (i.e., small-cap stocks); then, using multiple lines and hooks (i.e., implementing value, momentum, and quality strategies to exploit the chum of risk and mispricing in each); and lastly, dangling the lure of skilled execution to tease out the smallest trading costs possible.

Endnotes

1. The only value strategy that lacks statistical significance in Table 3 is the strategy defined by dividend yield. It comes with significant volatility reduction, a feature, however, that can make the strategy attractive to some investors. The lower volatility of the high dividend-yield portfolio increases the volatility of the long–short portfolio used in the statistical test and renders the difference statistically insignificant. Hsu et al. (forthcoming) document that in terms of Sharpe ratios, the value strategy defined as dividend yields provides an economically and statistically significant advantage.
2. We show only the aggregate results in the interest of space.
3. We interpret these findings as a lack of robustness for quality as a broad investment category. It does not mean that individual definitions of quality may not have investment merits; further characteristics may be of interest and deserve more detailed study.

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APPENDIX

Table A1. Summary of Findings on the Size Premium

Arguments in Favor:	Arguments Against:
• Over the period July 1926 to July 2014, there was a size premium of 3.4% per annum in the United States. • The U.S. size premium is statistically significant (with a *p*-value of 1.7%), *assuming the returns are normally distributed*. • In the 30+ years since the publication of Banz's (1981) article, there has been an average size premium of 1.0% per annum across 18 developed markets including the United States.	• There is an upward bias in size premium estimates due to inaccurate returns on delisted stocks in major databases. • Indices and hypothetical portfolios ignore trading costs. • The statistical significance of the size premium estimates is likely overstated due to data-mining and reporting bias. • Even ignoring biases, there is no unquestionably significant evidence in support of the size factor. • The estimate of the U.S. size premium is dominated by extreme outliers from the 1930s. • The assumption of normality used to obtain statistical significance in the U.S. sample is extremely dubious. • There is no statistical significance outside the United States. • Even ignoring biases, there is no risk-adjusted performance advantage attributable to the size factor.

Source: Research Affiliates, LLC, and Kalesnik and Beck (2014).

Table A2. Quality Signal Definitions

Quality Group	Definition	Quality Group	Definition
Accounting Quality	Accruals Net Operating Assets Accruals (Sloan, 1996) Accruals Decline/Growth Earnings Smoothness	Profitability	Gross Profitability ROA ROE Net ROE Cash Flow Profitability
Financial Constraints / Distress	Kaplan Zingales Index Debt Coverage Ratio S.T. Change in Asset Liquidity Net Cash Outflow Interest Coverage Ratio	Growth in Profitability	L.T. Change in ROA L.T. Change in ROE L.T. Change in Cash Flow Profitability L.T. Change in Gross Profitability
Earnings Stability	S.T. Change in Inventory Stability of Gross Profitability Stability of Cash Flow Profitability Stability of Margins	Margins	ROR Margins Operating Margins
Growth Activities	R&D Expense Capital Expense Advertising Expense	Growth in Margin	L.T. Change in Margin S.T. Change in Asset Turnover S.T. Change in Margin
		Capital Structure	Change in L.T. Leverage Market Leverage Book Leverage

Source: Research Affiliates, LLC.