Adding Value in Student-Managed Funds: *Benchmark and Sector Selection*

J. Christopher Hughen, Jack Strauss, and J.P. Tremblay

J. Christopher Hughen
is an associate professor of finance at Daniels College of Business at the University of Denver in Denver, CO.
chris.hughen@du.edu

Jack Strauss
is Miller Chair of Applied Economics at Daniels College of Business at the University of Denver in Denver, CO.
jack.strauss@du.edu

J.P. Tremblay
is an associate teaching professor of finance at Daniels College of Business at the University of Denver in Denver, CO.
jp.tremblay@du.edu

Student-managed portfolios allow universities to offer college credit for implementing investment decisions in a university's endowment fund. Such funds are an increasingly common offering at business schools and provide students with real world experience in portfolio management. As universities are risk-averse institutions, most student-managed portfolios pursue a "plain vanilla" strategy to satisfy risk management guidelines. These portfolios are typically constrained to large-capitalization stocks and often benchmarked to the S&P 500 Index.

Funds focusing only on picking well-known, large-cap stocks are missing opportunities to add value to their portfolios and education of their students. We describe components of a portfolio strategy that captures these opportunities with minimal risk. We also discuss how implementing these strategy components fits with the academic literature and provides a challenging, rigorous intellectual experience for students. Student-managed investment funds can purse low-risk approaches that still avoid the crowd.

In particular, we encourage funds to pursue alpha at all levels of the portfolio management process. First, select a universe of stocks that is under-researched by sell-side equity analysts and targeted by relatively few funds. This potential list of investments should also offer significant growth opportunities and be considered low risk by university administrators. Second, funds should utilize a method of sector allocation that is supported by empirical research and offers insights to students regarding the process of relative valuation across sectors. Students should also perform in-depth company-specific research and rigorous equity valuation to select undervalued securities with the highest expected alphas.

FINDING THE SWEET SPOT WITH BENCHMARK SELECTION

A significant portion of student-managed funds invest only in large-cap stocks. While university administrators find this to be a comforting and understandable operational constraint, it is also a crowded space for equity investors. The world's most popular measure of large-cap stocks, the S&P 500 Index, is typically used as a benchmark. While representing over 80% of the market capitalization of the U.S. stock market, this index serves as a benchmark for almost $8 trillion in funds under management and consists of companies that own many of the most valuable brands in the world.[1] In other words, these are not undiscovered companies.

Students should learn to form a diversified portfolio by including stocks outside of their limited personal experience, which often consists of local companies, companies

in the news, or companies of which they are customers. Academic research supports teaching investors to avoid behavioral biases. Barber and Odean [2008] documented that individual investors are more likely to buy—but not sell—stocks that have recently caught their attention. Such attention-driven behavior can lead to actively trading in a limited set of stocks, and such strategies are not financially healthy. Odean [1999] found that stocks purchased by active traders underperform the equities they sell. On average, highly active traders earn lower portfolio returns (Barber and Odean [2000]).

While the large-cap stocks in the S&P 500 are liquid securities issued by firms with minimal risk of bankruptcy, this segment of the equity market is unlikely to be the best universe to promote student learning in the area of stock selection. The first issue is the complexity of valuing these firms. The mean market cap of the index constituents is $43 billion, and firms of this size tend to have multiple segments. Students are better served by learning to model and value relatively simple business operations. Another concern is that these firms are more likely to be efficiently priced due to their liquidity, low impediments to short sales, and extensive coverage by analyst research and major news organizations.[2] Students face a bigger challenge in uncovering undervalued stocks with these characteristics. Finally, companies in this index are older with arguably fewer growth opportunities. As modeling corporate growth is one of the most challenging aspects of valuation, the task is relatively easy with these stocks.

The "sweet spot" for stocks and student learning is mid-cap stocks, which are best represented by the S&P MidCap 400 Index. According to S&P's index methodology for 2017, companies with market capitalization between $1.4 billion and $5.9 billion are eligible for inclusion in this index. Constituents in this index are mutually exclusive from the stocks in the more popular S&P 500.

These midcap stocks offer multiple advantages over other size categories, as shown in Exhibit 1. First, midcap stocks have historically offered better return characteristics. Over an 18-year period, midcap stocks provided an average annual return of 8.7% versus large- and small-cap stock returns of 5.1% and 7.5%, respectively. The Sharpe ratio for midcap stocks is 0.47, which indicates these stocks provide more return for their raw risk than small- or large-cap stocks that have Sharpe ratios of 0.41 and 0.26.[3] Midcap stocks receive far less attention from Wall Street. As Panel B of Exhibit 1 shows, the typical midcap stock has half the analyst coverage of the typical large-cap stock.

EXHIBIT 1
Size-Based Characteristics

	Small Cap	Mid Cap	Large Cap
Panel A: Performance Metrics for S&P Indexes			
Return	7.5%	8.7%	5.1%
Volatility	18.0%	18.7%	19.6%
Sharpe Ratio	0.41	0.47	0.26
Panel B: Analyst Coverage			
Median	5	9	18
10th Percentile	1	3	10
90th Percentile	10	17	27

Notes: Panel A describes the performance of size categories of stocks over a 18-year period ending in 2014. Small-, mid-, and large-cap stocks are represented by the S&P 600 Index, S&P MidCap 400 Index, and S&P 500 Index, respectively. Panel B provides statistics for the number of analysts providing target prices on the constituents of each sized based S&P Index as of mid-2017.

Furthermore, fewer active funds operate in the midcap space than in small-cap space. While the Russell Midcap Index is 26% of the Russell 3000 Index, the Morningstar Mid-Cap category contains only 13% of all Morningstar U.S. Equity Mutual Fund Assets. Small-cap stocks have higher liquidity and transaction costs.

SECTOR ALLOCATION

After deciding on the most appropriate benchmark for potential returns and student learning, fund managers can add value through sector allocation. If the goal is outperforming the benchmark, a fund should only deviate significantly from the benchmark's sector allocation for objective reasons associated with the fund strategy. Unnecessary sector allocation deviations will lead to tracking error.

Integrating a formal sector valuation into a student-managed investment fund class has several advantages. This gives students the opportunity to learn about monitoring their relative returns through portfolio attribution analysis. The most popular model is the Brinson model (Brinson, Hood, and Beebower [1986]), which decomposes portfolio performance into sector allocation, stock selection, and interaction components. Furthermore, a formal sector allocation process assists students in understanding how companies are classified based on broad categories of business activity. We recommend the

EXHIBIT 2
Sector Return Dispersion

	Best Performing		Worst Performing		Return
Year	Sector	Return	Sector	Return	Spread
1980	Energy	92%	Utilities	8%	84%
1981	Telecom	37%	Energy	–35%	72%
1982	Consumer Discretionary	52%	Energy	–30%	82%
1983	Financials	40%	Energy	7%	33%
1984	Utilities	18%	Energy	–25%	42%
1985	HealthCare	54%	Energy	14%	40%
1986	Utilities	32%	Information Technology	–12%	44%
1987	Materials	27%	Financials	–10%	37%
1988	Telecom	50%	Information Technology	9%	41%
1989	Energy	56%	Information Technology	14%	42%
1990	HealthCare	26%	Telecom	–36%	62%
1991	HealthCare	108%	Energy	2%	107%
1992	Financials	25%	HealthCare	–10%	35%
1993	Telecom	32%	HealthCare	–7%	39%
1994	Information Technology	14%	Consumer Discretionary	–16%	30%
1995	Financials	53%	Consumer Discretionary	10%	43%
1996	Energy	50%	Telecom	–11%	60%
1997	Financials	70%	Materials	21%	49%
1998	Consumer Discretionary	76%	Energy	–41%	117%
1999	Telecom	166%	Consumer Staples	–23%	189%
2000	Energy	72%	Telecom	–45%	118%
2001	Consumer Discretionary	37%	Telecom	–46%	83%
2002	Consumer Discretionary	3%	Telecom	–49%	52%
2003	Information Technology	61%	Energy	13%	48%
2004	Energy	37%	Information Technology	2%	36%
2005	Energy	59%	Telecom	–11%	70%
2006	Telecom	48%	HealthCare	1%	47%
2007	Energy	46%	Financials	–11%	57%
2008	Utilities	–22%	Energy	–53%	31%
2009	Information Technology	68%	Financials	13%	55%
2010	Industrials	31%	Telecom	4%	27%
2011	Utilities	15%	Telecom	–19%	34%
2012	Materials	23%	Energy	2%	21%
2013	HealthCare	45%	Telecom	19%	26%
2014	Consumer Staples	37%	Energy	–24%	60%

Notes: This table identifies the best and worst performing sectors for midcap stocks. The return spread is the difference between the returns on these sectors in a given year.

11 sectors in the Global Industry Classification Standard (GICS), which are described in Appendix A. Bhojraj, Lee, and Oler [2003] documented that GICS is superior to other industry classification systems at explaining return comovements and variation in financial metrics.

Most individual investors give little thought to sector allocations relative to a benchmark. Therefore, students will certainly wonder whether over/underweighting sectors can add value. Bunn and Shiller [2014] constructed sectors returns over a 140-year period to investigate the possibility of sector mispricings. They concluded that sectors "show frequent mispricings that can be exploited by an investment strategy" to beat the market.

DATA

As motivation for a fund strategy implementing sector allocation, Exhibit 2 shows the sectors with the highest and lowest returns for each year. The median difference in the returns between the top and bottom performing sectors for midcap stocks is 47% and is never below 21% over this 35-year period. In other words, sector performance varies consistently through both bull and bear markets. This supports the importance of sector classification systems, which group companies into distinct categories based on their business activity and operational sensitivities.

Exhibit 3 shows the percentage of calendar quarters from 1980 to 2014 that each sector of midcap stocks is the top or bottom performing sector. While all the sectors offer both the best or worst return over some quarters during the period, some sectors are more frequently at the extreme of performance. As the energy sector has considerable sensitivity to volatile commodity prices, it is at the top or bottom of performance in over 40% of the quarters. In contrast, the material and industrial sectors are not frequently the best or worst performing sectors.

Identifying sectors that will subsequently be at the top or bottom of performance is truly challenging. Valuation is typically done on a relative basis, and Pinto, Robinson, and Stowe [2015] found that portfolio managers use the market multiples approach in 93% of their valuations. By their inherent nature, however, sectors do not lend themselves to relative valuation because each sector in theory consists of companies with fundamentally different business operations. This argument is consistent with the findings of Da and Schaumburg [2011] who showed that target prices from equity analysts add value only within industries.

Sectors have fundamental differences in operating leverage, financial leverage, profitability, and noncash expenses. To illustrate this issue, Exhibit 4 shows the common size income statements for sectors in the S&P 400 MidCap Index for 2016. Sectors exhibit considerable variation in their cost structure. The cost of goods sold varies from 36% of revenue for the real estate sector to 81% for the energy sector. Operating income ranges from −4% for energy to over 20% for highly leveraged sectors like real estate and financials.

Exhibit 5 shows the common size balance sheets for the midcap sectors. Some sectors have inherently different asset structures. Real estate, utilities, and energy have high levels of fixed assets, while consumer discretionary and information technology use relatively more current assets. Utilities and financials have capital structures with significant portions of long-term debt, while financials use large relative amounts of short-term debt as a raw material in their business models.

EXHIBIT 3
Quarterly Analysis of Best and Worst Sector Performance

Sector	Quarters as Best Performer	Quarters as Worst Performer
Consumer Discretionary	10%	9%
Consumer Staples	10%	7%
Energy	22%	24%
Financials	4%	5%
Health Care	10%	12%
Industrials	4%	1%
Information Technology	13%	9%
Materials	5%	5%
Telecom	11%	17%
Utilities	11%	11%

Notes: This table describes the best and worst performing sectors for midcap stocks from 1980 to 2014. It shows the percentage of quarters over this period that each sector was the top and bottom performing sector.

SECTOR METRICS

Given these challenges of comparing valuations across sectors, what is the best approach for deciding which sectors to over- or underweight in sector allocation? One approach is to use the price-to-earnings ratio (P/E), which is the most popular ratio for relative valuation. Bunn et al. [2014] developed a cyclically adjusted P/E for sectors that compensates for different payout ratios that vary significantly across industries. Their sector rotation strategy of overweighting sectors with low P/E values generates alpha of 4% per year.

We argue that another approach to sector allocation yields greater outperformance. Hughen and Strauss [2017] compare the performance of sector allocation strategies using seven fundamental ratios. They find that the ratio of enterprise value/EBITDA (earnings before interest, taxes, depreciation and amortization) is the best ratio for identifying sectors both to overweight and underweight to exploit subsequent sector returns. The portfolio payoff from a sector allocation strategy

EXHIBIT 4
Common Size Income Statements for Midcap Sectors

	S&P 400	Sector										
		CD	CS	EN	FN	HC	IN	IT	MT	TL	UT	RE
Total Revenue	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cost of Goods Sold	75%	68%	70%	81%	0%	68%	75%	74%	78%	48%	58%	36%
Selling General & Admin Exp.	15%	21%	21%	5%	22%	13%	13%	13%	11%	34%	6%	18%
R&D Exp.	2%	0%	0%	0%	0%	1%	1%	5%	1%	0%	0%	0%
Operating Income	10%	9%	8%	–4%	21%	10%	9%	7%	8%	1%	19%	26%
Interest Expense	–2%	–1%	–1%	–3%	0%	–2%	–1%	–1%	–2%	–3%	–5%	–10%
EBT Excl. Unusual Items	8%	8%	6%	–8%	19%	8%	8%	6%	7%	2%	15%	17%
Income Tax Expense	–2%	–1%	–1%	–3%	0%	–2%	–1%	–1%	–2%	–3%	–5%	–10%
Earnings from Cont. Ops.	8%	8%	6%	–8%	19%	8%	8%	6%	7%	2%	15%	17%
Net Income	5%	5%	3%	–12%	12%	4%	4%	3%	3%	1%	9%	21%
Other Earnings Measures												
EBITDA	15%	12%	11%	12%	–	13%	12%	10%	13%	18%	29%	46%
EBITA	10%	9%	8%	–4%	–	10%	10%	8%	9%	2%	19%	27%
EBIT	10%	9%	8%	–4%	–	10%	9%	7%	8%	1%	19%	26%
Normalized Net Income	5%	5%	4%	–5%	11%	4%	5%	3%	4%	1%	9%	10%

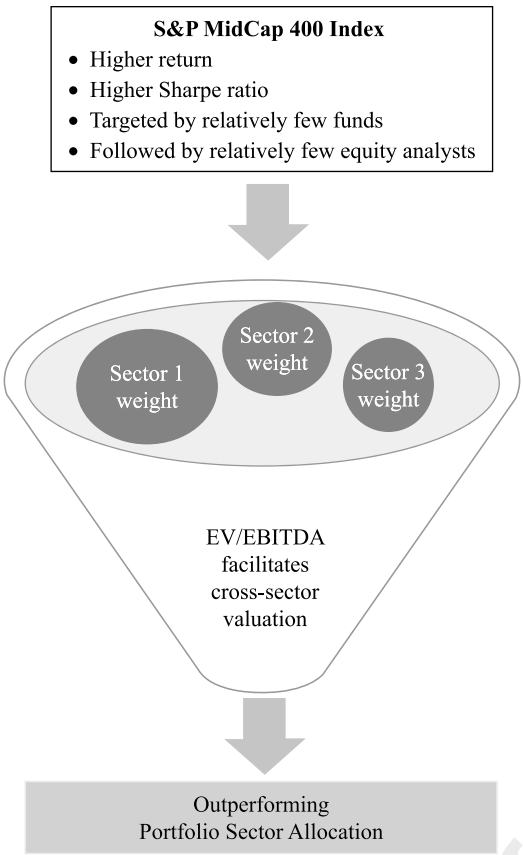
Notes: This table shows the common size income statement for each of the sectors in the S&P 400 MidCap Index for the calendar year 2016. Appendix A describes these sectors and provides their abbreviations.

EXHIBIT 5
Common Size Balance Sheets for Midcap Sectors

	S&P 400	Sector										
		CD	CS	EN	FN	HC	IN	IT	MT	TL	UT	RE
ASSETS												
Cash and Equivalents	5%	9%	6%	8%	3%	12%	7%	11%	7%	10%	2%	2%
Short Term Investments	1%	1%	0%	2%	1%	2%	1%	3%	0%	0%	1%	0%
Accounts Receivable	7%	6%	9%	6%	0%	11%	16%	17%	11%	8%	8%	4%
Other Receivables	1%	1%	1%	0%	2%	1%	1%	1%	0%	1%	0%	1%
Inventory	6%	22%	12%	3%	0%	4%	9%	9%	14%	2%	2%	0%
Total Current Assets	24%	44%	29%	20%	16%	34%	37%	48%	34%	22%	14%	7%
Net Property, Plant & Equipment	20%	22%	27%	72%	1%	19%	19%	8%	34%	38%	68%	80%
Total Assets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LIABILITIES												
Accounts Payable	27%	7%	8%	5%	49%	7%	7%	12%	8%	4%	3%	2%
Total Current Liabilities	36%	22%	16%	10%	57%	20%	21%	28%	16%	9%	13%	6%
Long-Term Debt	20%	31%	40%	32%	6%	36%	24%	24%	35%	26%	28%	45%
Total Liabilities	72%	68%	66%	50%	85%	63%	64%	58%	66%	50%	68%	54%
Total Common Equity	26%	31%	33%	48%	15%	33%	35%	39%	34%	44%	30%	43%
Total Equity	28%	32%	34%	50%	15%	37%	36%	40%	34%	50%	32%	46%

Notes: This table shows the common size balance sheet for each of the sectors in the S&P 400 MidCap Index for the calendar year 2016. Appendix A describes these sectors and provides their abbreviations.

EXHIBIT 6
Benchmark and Sector Selection Process



Notes: This graph illustrates two unappreciated tactics for generating portfolio outperformance in a student-managed investment fund. These tactics are to select an underfollowed benchmark and use the best metric (EV/EBITDA) for cross-sector valuation.

using EV/EBITDA is five times the resulting portfolio value from a strategy using P/E. Exhibit 6 illustrates the process of adding alpha by benchmark and sector selection.

The EV/EBITDA ratio is particularly effective for comparing sectors that consist of companies with fundamentally different business models. Enterprise value, which equals the value of common equity, preferred stock, and debt minus cash, is in the numerator of this multiple. It is less sensitive to the differences in capital structure shown in Exhibit 5 because it reflects the value of all providers of capital. The denominator, EBITDA, measures core profitability. This metric is relatively insensitive to operating leverage, financial leverage, and capital structure as it is earnings before "ITDA." This earnings measure is robust to many of the sector differences found in the income statements in Exhibit 4.

Another advantage to using EV/EBITDA for sector allocation is that it exposes students to an informative ratio that is relatively unknown outside of professional portfolio managers. The P/E is widely popular, perhaps in part because of its obvious rationale. This metric compares the price an investor pays for a share of stock to the per-share earnings that theoretically accrue to the owner of a share. However, the rationale for the EV/EBITDA ratio, which receives meager coverage in academic textbooks on investments, is more challenging for investors to grasp. The ratio compares the market value of all securities issued by the firm to the pre-tax earnings that could be paid to the owners of those securities. While this ratio is typically not covered in college, Pinto, Robinson, and Stowe [2015] conducted a global survey of practicing equity analysts and found that 77% of those utilizing relative valuation use EV/EBITDA.

The value of the EV/EBITDA ratio is well documented in leading academic journals. Loughran and Wellman [2011] used this ratio to create a return factor that yields a premium of over 5% a year. Walkshäusl and Lobe [2015] found that EV/EBITDA has robust predictive value that extends for up to five years. They document that a long–short strategy based on the ratio earns 1% a month, and existing asset pricing models fail to explain this return premium.

ANALYSIS

To examine whether EV/EBITDA can identify undervalued and overvalued sectors, we use S&P Compustat data to compute the ratio for each sector on a quarterly basis over a 35-year period from 1980 to 2014. These sector ratios are an equally weighted average of the ratios for each company in the sector. Then, we identify the two sectors with the lowest ratios. These are likely to be undervalued as they offer more earnings relative to the value of capital provided to the company. Furthermore, we identify the two sectors with the highest ratios. These sectors are likely to be overvalued because the companies in the sectors generate relatively low operating earnings compared to the total value of their capital.

To determine whether this ratio can identify undervalued sectors, we examine the value of a portfolio that invests in the two sectors with the lowest EV/EBITDA ratios. To account for delays in the release of

EXHIBIT 7

Percentage of Quarters Outperforming the Benchmark

Period	Low EV/EBITDA Sectors	High EV/EBITDA Sectors
1980–2014	56%	43%
1980s	54%	48%
1990s	55%	38%
2000s	59%	43%
2007–2014	62%	41%

Notes: This table shows the consistency of relative performance for the top and bottom two sectors that are ranked using EV/EBITDA. The numbers show the percentage of quarters in which the sectors outperform the benchmark for various periods.

financial data, we use the sector returns two quarters following the end-of-period date for the financial statements used to calculate the sector ratios. An investment of $100 in this portfolio strategy results in an ending portfolio value of $15,863 over this time period. This value is twice the ending portfolio value for an investment in the equally weighted index over this period and 2.9 times the ending portfolio value for an investment in the value weighted index. Does this ratio also identify overvalued sectors? The ending portfolio value from the strategy of investing in the two sectors with the highest EV/EBITDA ratios is $1,767. This is significantly less than the ending portfolio value from investing in the lowest EV/EBITDA sectors, the equally weighted index, or the value weighted index.

We also investigate whether these return patterns are consistent over time. Exhibit 7 shows the percentage of quarters in which the sector returns exceed the benchmark over various periods. The lowest ratio sectors, which should be undervalued, beat the benchmark in 56% of the quarters over a 35-year period. These sectors also outperformed the benchmark in the majority quarters during subsamples of decades and a period following the Great Recession. The two sectors with the highest EV/EBITDA, which should be overvalued, beat the benchmark in only 43% of the quarters and less than 50% of the subsample periods examined.

SUMMARY

While many student-managed funds focus on stock selection, we recommend two additional steps for adding value to both the fund's return and the student's understanding of the portfolio management process. The first step is to select the right benchmark. Midcap stocks offer favorable risk–return characteristics and are followed by relatively few equity analysts and actively managed mutual funds. The second step is to utilize a formal sector allocation strategy. The ratio of EV/EBITDA facilitates effective relative valuation of sectors, which are composed of companies with significantly different business activities. These differences include financial leverage, operating leverage, capital structure, and profitability. Our analysis indicates this ratio can identify both undervalued and overvalued sectors consistently over a 35-year period.

APPENDIX A

SECTOR DEFINITIONS

The Global Industry Classification Standard (GICS) includes the following 11 sectors and their percentage of the total market capitalization of the S&P MidCap 400 Index as of June 30, 2017. The two-letter sector abbreviations shown in parentheses are used to identify the sectors in Exhibits 4 and 5.

1. *Information Technology Sector* (IT), 17.8%: This sector includes companies that develop computer software, manufacture technology hardware and equipment, and produce semiconductors.
2. *Financial Sector* (FN), 16.4%: This sector includes companies in banking, real estate (including REITs and mortgage finance), investment banking, brokerage, and other lenders in the area of consumer, corporate, and specialized finance.
3. *Industrial Sector* (IN), 15.1%: This sector includes companies that manufacture capital goods, provide commercial services, and provide transportation services.
4. *Consumer Discretionary Sector* (CD), 11.7%: This sector includes companies with sales and earnings that are sensitive to the business cycle. This sector includes manufacturers of automobiles, household durable goods, and leisure products. The sector also includes service providers in the segments of hotels, restaurants, media services, and consumer retailing.
5. *Real Estate Sector* (RE), 9.8%: This sector includes companies engaged in real estate development and operation. These include equity real estate investment trusts (REITs) and firms providing real estate–related services.
6. *Health Care Sector* (HC), 9.1%: This sector includes companies that manufacture medical equipment and

supplies, provide health care services, and develop or sell pharmaceuticals.

7. *Materials Sector* (MT), 7.6%: This sector includes companies that mine or manufacture commodities, such as chemicals, construction materials, paper products, and metals.
8. *Utilities Sector* (UT), 5.5%: This sector includes companies that produce or distribute electric power, gas, and water.
9. *Consumer Staples Sector* (CS), 3.7%: This sector includes companies with sales and earnings that are less sensitive to the business cycle. These firms include manufacturers and retailers of food, beverages, and other nondurable household products.
10. *Energy Sector* (EN), 3.0%: This sector includes companies involved in the exploration, production, and refining of oil and natural gas. It also includes firms that operate or manufacture rigs and other drilling equipment.
11. *Telecommunications Sector* (TL), 0.2%: This sector includes companies that provide communication services through fixed-line, wireless, and other networks.

ENDNOTES

[1]These metrics are from the S&P Dow Jones Indices website (us.spindices.com) as of mid-2017.

[2]Asquith, Pathak, and Ritter [2005] found that stocks with significant short sales constraints underperform by over 2% a month. However, the large levels of institutional ownership in large-cap stocks means that few constituents in the S&P 500 face these constraints.

[3]The results are similar when measured using Russell Indexes over a 20-year period ending on March 31, 2017. Midcaps have the highest return and Sharpe ratio when using the Russell 2000 Index, Russell Midcap Index, Russell 1000 Index to represent the performance of small-, mid-, and large-cap stocks.

REFERENCES

Asquith, P., P.A. Pathak, and J.R. Ritter. "Short Interest, Institutional Ownership, and Stock Returns." *Journal of Financial Economics*, Vol. 78 (2005), pp. 243-276.

Barber, B.M., and T. Odean. "Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors." *Journal of Finance*, Vol. 55 (2000), pp. 773-806.

——. "All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors." *Review of Financial Studies*, Vol. 21 (2008), pp. 785-818.

Bhojraj, S., C.M.C. Lee, and D.K. Oler. "What's My Line? A Comparison of Industry Classification Schemes for Capital Market Research." *Journal of Accounting Research*, Vol. 41 (2003), pp. 745-774.

Brinson, G.P., L.R. Hood, and G.L. Beebower. "Determinants of Portfolio Performance." *Financial Analysts Journal*, Vol. 42 (1986), pp. 39-44.

Bunn, O., A. Staal, J. Zhuang, A. Lazanas, C. Ural, and R. Shiller. "Es-cape-ing from Overvalued Sectors: Sector Selection Based on the Cyclically Adjusted Price-Earnings (CAPE) Ratio." *The Journal of Portfolio Management*, Vol. 41, No. 1 (2014), pp. 16-33.

Bunn, O.D., and R.J. Shiller. "Changing Times, Changing Values: A Historical Analysis of Sectors within the US Stock Market 1872–2013." NBER Working Paper No. 20370, 2014.

Da, Z., and E. Schaumburg. "Relative Valuation and Analyst Target Price Forecasts." *Journal of Financial Markets*, Vol. 14 (2011), pp. 161-192.

Hughen, J.C., and J. Strauss. "Portfolio Allocations Using Fundamental Ratios: Are Profitability Measures Effective in Selecting Firms and Sectors?" *The Journal of Portfolio Management*, Vol. 43, No. 3 (2017), pp. 87-101.

Loughran, T., and J.W. Wellman. "New Evidence on the Relation between the Enterprise Multiple and Average Stock Returns." *Journal of Financial and Quantitative Analysis*, Vol. 46 (2011), pp. 1629-1650.

Odean, T. "Do Investors Trade Too Much?" *American Economic Review*, Vol. 89 (1999), pp. 1279-1298.

Pinto, J.E., T.R. Robinson, and J.D. Stowe. "Equity Valuation: A Survey of Professional Practice." Working paper, September 2015.

Walkshäusl, C., and S. Lobe. "The Enterprise Multiple Investment Strategy: International Evidence." *Journal of Financial & Quantitative Analysis*, Vol. 50 (2015), pp. 781-800.