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**HEALTH CARE:
AN EVALUATION OF THE INVESTMENT OPPORTUNITY SET**

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INTRODUCTION

There are many reasons an investor may seek dedicated exposure to a specific sector of the equity markets. These reasons include, but are not limited to, diversification benefits via uncorrelated sources of return, and the belief that certain sectors contain more potential for alpha when compared to the overall market. In this paper, we are defining “alpha” as the difference between an active manager’s return and their respective benchmark, for a given level of risk.¹

The hypothesis that certain sectors contain more potential alpha than others is based on the fundamental law of active management.² This “law” is designed to assess the value of active management and is divided into two components: opportunity set (breadth) and investor skill (information coefficient). Formally, the law states that the information ratio (“IR”), a measure of risk-adjusted relative return, is approximated by the formula $IR = (\text{information coefficient}) \cdot \sqrt{\text{breadth}}$. Conceptually, the law asks: does the manager operate within an area of the market that provides an abundance of potential outperformance, and does the manager have the skill to extract outperformance beyond other participants? In theory, when both components are satisfied, they are positively related to alpha. The analysis that follows is concerned with the latter component of the equation, breadth. We examine whether the Health Care sector offers higher breadth, and therefore a greater opportunity to outperform. Sectors with higher breadth may be better suited for high information coefficient (“IC”) active managers to extract alpha.³ Therefore, investors allocating to managers of sector-focused funds may find the Health Care sector appealing due to the sector’s higher breadth, where higher breadth is defined as a high level of dispersion and low level of correlation relative to other sectors, as well as the broad market.

HEALTH CARE BACKGROUND

Health Care is an integral part of the United States economy, with national Health Care expenditure comprising 17.9% of U.S. GDP in 2016. The U.S. leads all countries in this category, followed by Switzerland at 12.4%.⁴ As the graph below shows, this percentage has been increasing steadily over time and is projected to reach 19.7% by 2026.⁵

¹ Mathematically, alpha is defined as $R_p - [R_f + \beta \cdot (R_m - R_f)]$.

² Grinold, Richard. “The Fundamental Law of Active Management.” *The Journal of Portfolio Management*. 1989, 15 (3) 30-37.

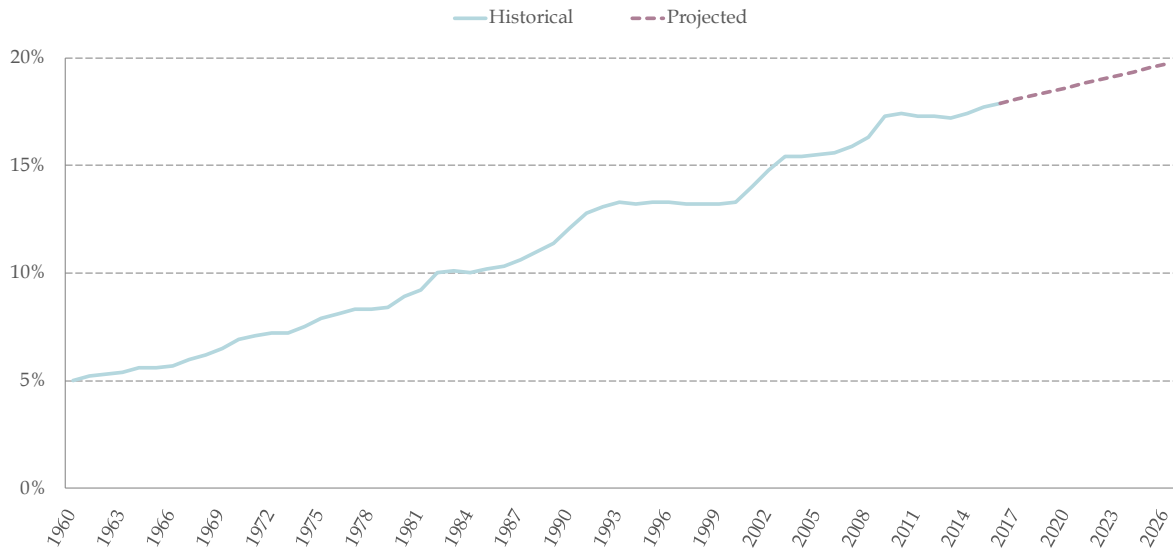
³ A forthcoming analysis will focus on the information coefficient, investor skill, and the manager landscape.

⁴ Source: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group; U.S. Department of Commerce, Bureau of Economic Analysis; OECD; and U.S. Bureau of the Census.

⁵ Cuckler et al., “National Health Expenditure Projections, 2017-26: Despite Uncertainty, Fundamentals Primarily Drive Spending Growth,” *Health Affairs* 37, no. 3 (2018): <https://www.healthaffairs.org/doi/10.1377/hlthaff.2017.1655>. (Accessed April 13, 2018).

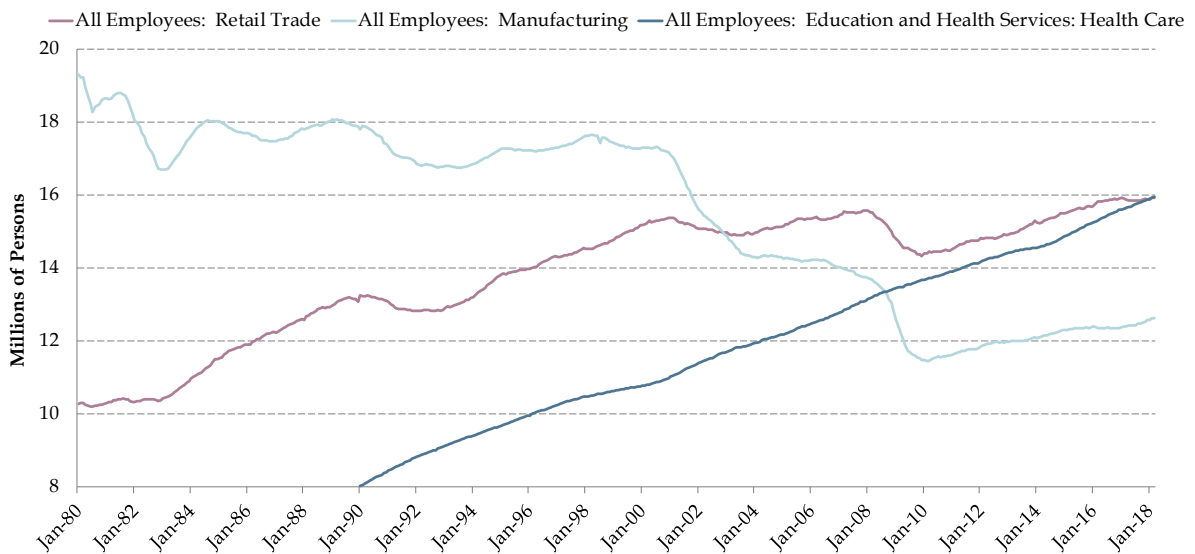


Health Care Expenditure as a Percentage of GDP



In addition to its significance to U.S. GDP, Health Care is also an integral part of the U.S. labor market. In 2017, Health Care surpassed Retail to become the number one employer in the U.S.⁶ Further, the Health Care sector is projected to account for one-third of new jobs by 2026.⁷

Monthly Employment Data by Sector⁸



⁶ Source: U.S. Bureau of Labor Statistics (BLS), Current Employment Statistics survey, December 2017.

⁷ Source: BLS employment projections. <https://www.bls.gov/news.release/pdf/ecopro.pdf>

⁸ Source: U.S. Bureau of Labor Statistics, Current Employment Statistics, retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/categories/11>, May 15, 2018.



Health Care’s significance to the U.S. economy is reflected in the equity markets as well. The Global Industry Classification Standard (GICS), a methodology used by MSCI and S&P, consists of 11 sectors, 24 industry groups, 68 industries, and 157 sub-sectors. Health Care, one of the sectors, comprises two industry groups, which are further divided into six industries and ten sub-industries.

| Sector | Industry Group | Industry | Sub-Industry |
|-------------|----------------------------------|--|---|
| Health Care | Health Care Equipment & Services | Health Care Equipment & Supplies | Health Care Equipment Health Care Supplies |
| | | Health Care Providers & Services | Health Care Distributors Health Care Services Health Care Facilities Managed Health Care |
| | | Health Care Technology | Health Care Technology |
| | | Pharmaceuticals, Biotechnology & Life Sciences | Biotechnology |
| | Pharmaceuticals | | Pharmaceuticals |
| | Life Sciences Tools & Services | | Life Sciences Tools & Services |

Depending on the index examined, the weight of the Health Care sector varies from as high as 38% in the Russell Microcap Growth index to as low as 6% in the Russell 2000 Value index.

| Index as of 12/31/2017 | Health Care Weight |
|-------------------------|--------------------|
| Russell Microcap Growth | 38.3% |
| Russell 2000 Growth | 23.8% |
| Russell Microcap | 23.3% |
| Russell 2000 | 15.3% |
| S&P 500 | 13.7% |
| Russell 3000 Growth | 13.7% |
| Russell 1000 Value | 13.5% |
| Russell 3000 | 13.3% |
| Russell Midcap Growth | 13.2% |
| Russell 1000 | 13.1% |
| Russell 3000 Value | 12.9% |
| Russell 1000 Growth | 12.8% |
| Russell Microcap Value | 11.9% |
| Russell Midcap | 9.4% |
| Russell Midcap Value | 6.5% |
| Russell 2000 Value | 6.2% |

Broadly speaking, the Health Care industry has four key stakeholders: patients, vendors, providers, and payers. Health Care regulation affects all industry participants, but is typically



directed toward influencing providers and payers. From a regulatory perspective, Health Care is one of the most complex industries in the U.S. economy, with many different governing bodies. However, the most important is the U.S. Department of Health and Human Services (HHS). HHS is a cabinet-level department of the federal government and includes eleven operating divisions. Three of the more well-known and influential divisions are the U.S. Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), and the Centers for Medicare and Medicaid Services (CMS). The rulings and announcements from these governing bodies, as well as the influence of various lobby groups and patient advocacy groups, can significantly impact the fate of a Health Care company. This regulatory and legislative ecosystem is one of the fundamental drivers of the high dispersion within the Health Care sector.

The pace of innovation is another important fundamental driver of the Health Care market. Two of the largest factors in recent history that have affected the pace of innovation are the completion of the Human Genome Project in 2003,⁹ which has translated into extraordinary investment in drug research and development; and aging populations, such as the Baby Boomer generation in the U.S. and Japan.¹⁰ Other fundamental drivers of the Health Care opportunity set include: continuous changes to the overall patient population, such as shifting demographics; the development of new economic models, such as the current transition from a fee-for-service Health Care system to a fee-for-quality (value based) system; and globalization, which is fueling quality of life improvements in emerging markets and leading to increased demand for health care services, modern biopharmaceuticals, and medical devices.

INVESTMENT OPPORTUNITY SET FOR HEALTH CARE

Studies have shown that an investor's opportunity set is a function of correlation and dispersion.^{11,12} Correlation represents the relationship between the returns of securities. Securities that are positively correlated tend to move in tandem, while securities that are negatively correlated tend to have dissimilar or opposite performance. If correlation is high (low), the value of investor skill is diminished (increased), as stocks generally move together (opposite). Dispersion is the second element defining a potential opportunity set. Dispersion has many measures, but in general, it seeks to quantify the size of the gap between the winners and losers within a market. If dispersion is low (high), the value of skill is lessened (amplified), as the need to identify winners and losers is reduced (increased) because the return difference between winners and losers is small (large).

⁹ The Human Genome Project was an international research program whose goal was to identify and map all of the genes of the human genome. <https://www.genome.gov/12011238/an-overview-of-the-human-genome-project/>

¹⁰ Aging populations create increased demand for health care services, medical devices, and therapeutics. This increased demand attracts new entrants to the space, which increases competition and leads to higher dispersion as the gap between winners and losers widens.

¹¹ Gorman, Sapra, Weigand, "The Role of Cross-Sectional Dispersion in Active Portfolio Management," *Investment Management and Financial Innovations*, Volume 7, Issue 3, 2010: pg. 58.

¹² Gregory Connor & Sheng Li, 2009. "Market Dispersion and the Profitability of Hedge Funds," Economics, Finance and Accounting Department Working Paper Series n2000109.pdf, Department of Economics, Finance and Accounting, National University of Ireland - Maynooth.



We base our evaluation of opportunity sets on the assumption that dispersion is positively related to alpha, and correlation is inversely related to alpha, meaning that the lower the correlation within the market and the higher the dispersion, the greater the potential for skilled managers to provide meaningful alpha. Therefore, we assume the ideal environment for active managers to add value is one of low correlation and high dispersion.¹³ Studies have supported this claim and shown, specifically related to hedge funds, that alpha and dispersion are positively related¹⁴.

Typically, correlation is higher in sectors highly sensitive to macroeconomic factors. For example, companies in the Financials sector generally have stock prices that move in tandem, despite differences across businesses. This high correlation is due in part to macroeconomic events, such as the Federal Reserve raising interest rates, impacting the entire sector concurrently. Energy stocks are also inclined to move higher and lower together, as most tend to be closely tied to the underlying commodity prices.

In contrast, Health Care is an expansive sector that encompasses a wide range of businesses. Health Care companies often trade autonomously and have independent catalysts, and as such, have the potential to be inherently complementary and diversifying even within the sector. Despite similar classifications, these companies may have different return drivers.

The large number of stocks in the Health Care sector and the dispersion of their returns suggests that a team of investors specializing in the sector have a greater opportunity to outperform. Health Care, as compared to the other ten GICS sectors, arguably requires an additional level of expertise in order to evaluate the science, technology, and regulatory framework that affect a company's long-term outlook. For this reason, the investment teams of many health care funds are populated with MDs and/or PhDs. These doctors or academics turned analysts work side-by-side with career research analysts, comprising a team solely dedicated to following the Health Care sector.

These specialized investment teams give Health Care-specific funds an advantage over generalists investing in the space, given the nuances of the sub-sectors and degree of knowledge necessary to understand the product types and functions. Not only do these individuals have the ability to understand the complicated science behind cutting-edge drugs and research, but many come to the investment industry with real world clinical research experience. In industries such as biotechnology or pharmaceuticals, where many of the small and micro capitalization companies do not have existing products or earnings, stock prices are often driven by scientific data readouts rather than financial statements. Companies' stock prices can be effected substantially by clinical trial data points and FDA decisions, regardless of the size of the companies' pipeline or whether they already have approved drugs in the market. Therefore, research analysts can add significant value to the investment process with their ability to interpret and opine on clinical trials.

¹³ The third pillar of an ideal environment, which we do not evaluate in this study, is low transaction costs.

¹⁴ Altshuller, Stan. "When Investing In A Specialist Makes Sense." *Novus Research*. June 2015.



For example, an experienced analyst will be able to assign a probability, with a reasonable significance level, to a drug’s approval and will adjust this probability based on the way the clinical trial was designed, the disease the drug is designed to treat, the estimated side effects, and the degree to which approved treatments already exist.

CORRELATION

We examined the average monthly correlation within each of the 10 GICS sectors¹⁵ by calculating the intra-stock correlation by sector for the Russell 3000 universe for the period 1990 through 2017.¹⁶ As the table below shows, average monthly intra-stock correlation was lowest in the Health Care sector over all time periods evaluated.

Average Monthly Correlation (1990 - 2017)

Table with 11 columns (Energy, Materials, Industrials, Cons. Disc., Cons. Staples, Health Care, Financials, Technology, Telecomm., Utilities) and 4 rows (5-Year, 10-Year, 15-Year, 27-Year) showing correlation values.

Additionally, the data supports the earlier statement that intra-stock correlation tends to be higher in sectors, such as Energy and Financials, that are highly sensitive to common macroeconomic factors.

DISPERSION

We examined the monthly returns of all stocks in the Russell 3000 index for the period 1985 through 2017 and calculated the monthly stock price dispersion for each sector, and for the entire index.¹⁷ As the following table shows, the average monthly dispersion numbers within the Health Care sector were higher than the broad index, as well as all other sectors, over the past 5-, 10-, 15-, 27-, and 32-years (since inception of the data set).¹⁸

15 There are 11 GICS sectors, however, we excluded Real Estate as this sector was not broken out from the financials sector until 2017.

16 Correlations were computed over the prior 3-months of daily returns.

17 Monthly dispersion is calculated as the monthly standard deviation of stock price returns.

18 Statistically significant at the 95% confidence level. See Appendix A for dispersion methodology.



Average Monthly Dispersion (%)
(1985 - 2017)

| | R3K | Cons. Disc. | Cons. Staples | Energy | Financials | Health Care | Industrials | Technology | Materials | Telecomm. | Utilities |
|---------|------|-------------|---------------|--------|------------|-------------|-------------|------------|-----------|-----------|-----------|
| 5-Year | 11.3 | 10.1 | 8.9 | 13.2 | 7.4 | 15.8 | 9.4 | 10.6 | 10.8 | 12.1 | 6.2 |
| 10-Year | 12.2 | 11.9 | 10.0 | 13.0 | 9.6 | 15.4 | 10.6 | 11.6 | 11.7 | 12.8 | 6.2 |
| 15-Year | 11.6 | 11.4 | 9.7 | 11.6 | 8.8 | 14.6 | 10.3 | 11.8 | 11.1 | 12.6 | 6.0 |
| 27-Year | 12.7 | 12.5 | 10.0 | 11.3 | 9.2 | 15.2 | 11.3 | 14.5 | 11.0 | 14.1 | 6.6 |
| 32-Year | 13.0 | 12.3 | 10.0 | 11.2 | 9.3 | 15.6 | 11.6 | 14.2 | 11.7 | 13.4 | 6.6 |

The following table examines dispersion at the industry level within the Health Care sector. It shows that Biotechnology (“Biotech”) has significantly contributed to overall Health Care dispersion, while Life Sciences has exhibited lower dispersion than the overall sector.

Average Dispersion (%)

| | Biotech | Equipment & Supplies | Health Care Technology | Life Sciences, Tools, & Services | Pharma |
|-----------------|---------|----------------------|------------------------|----------------------------------|--------|
| 5-Year | 19.7 | 10.7 | 9.1 | 9.3 | 15.9 |
| 10-Year | 19.3 | 11.1 | N/A | 9.0 | 15.9 |
| Since Inception | 17.1 | 12.7 | N/A | 9.1 | 14.6 |

While the Biotech and Pharmaceutical (“Pharma”) industries have both exhibited high dispersion, there are some important distinctions to be made between the two industries. Biotech and Pharma companies both produce medicines, but Biotech drugs have a biological basis, whereas Pharma drugs have a chemical basis. Due to differences in the scientific makeup, the scope of Biotech is much larger than that of Pharma. For example, within the Russell 3000 Biotech industry index there are 178 companies compared to 64 in the Russell 3000 Pharma industry index. Additionally, Biotech companies tend to be more focused on the research and development of drugs for the treatment of rare and orphan diseases, whereas Pharma companies are focused on manufacturing drugs. This focus on research and development means that Biotech companies tend to have very high operating costs and volatile profits (and stock prices).

On a relative basis, the Biotech industry also has more early-stage companies. Many of these companies operate at a loss for years until they get their first drug approved by the FDA. As a result, Biotech has been characterized as an industry where there are many binary outcomes - either a drug or treatment is a success or it is a failure, and the fate of the company hinges on this outcome.



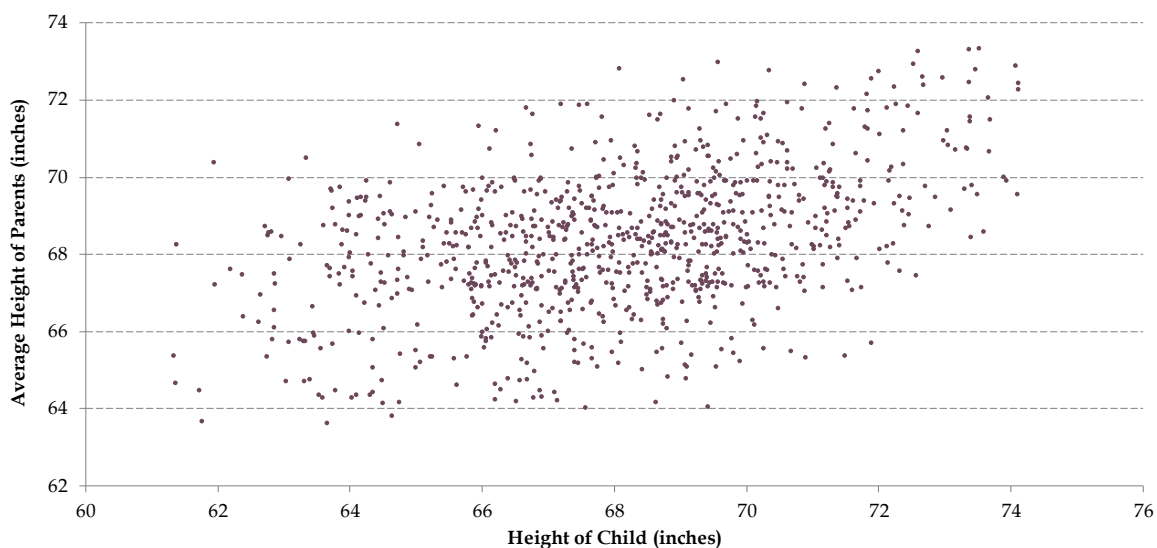
PERSISTENCE & ENDPOINT BIAS

Thus far, our analysis has evaluated historical data. We studied how the correlation and dispersion of Health Care sector returns have compared to those of the other ten GICs sectors. However, as any good student of finance knows, past performance is no guarantee of future results. Just because Health Care has historically presented the most attractive alpha opportunity, how do we know that this opportunity will continue to exist in the future? Said another way, is past dispersion/ correlation a good predictor of future dispersion/ correlation (i.e., will they persist)?

If the drivers of dispersion discussed in the “Background” section are truly secular and not cyclical, then their effects should be apparent and persist through time. However, there is an argument to be made that capital market flows work to counteract these drivers and erode the alpha opportunity they create. Mainly, if a sector such as Health Care displays an attractive alpha opportunity relative to the broad market, investors will increasingly allocate to this area until the additional alpha is competed away. As capital flows out of other sectors and into Health Care, these other sectors will become under-followed and less efficient, presenting a better alpha opportunity relative to Health Care, thus balancing out in the long run.

To better understand the idea of persistence, we illustrate a clear case of persistence from outside the realm of economics and finance. The following chart shows the average height of parents on the Y-axis (vertical) and the height of their children on the X-axis (horizontal). Although there is variation of the height of the children relative to the height of their parents, the fact that there is a distinct upward slope of the points is a clear example of persistence -- in this example, that tall parents tend to have tall children.¹⁹

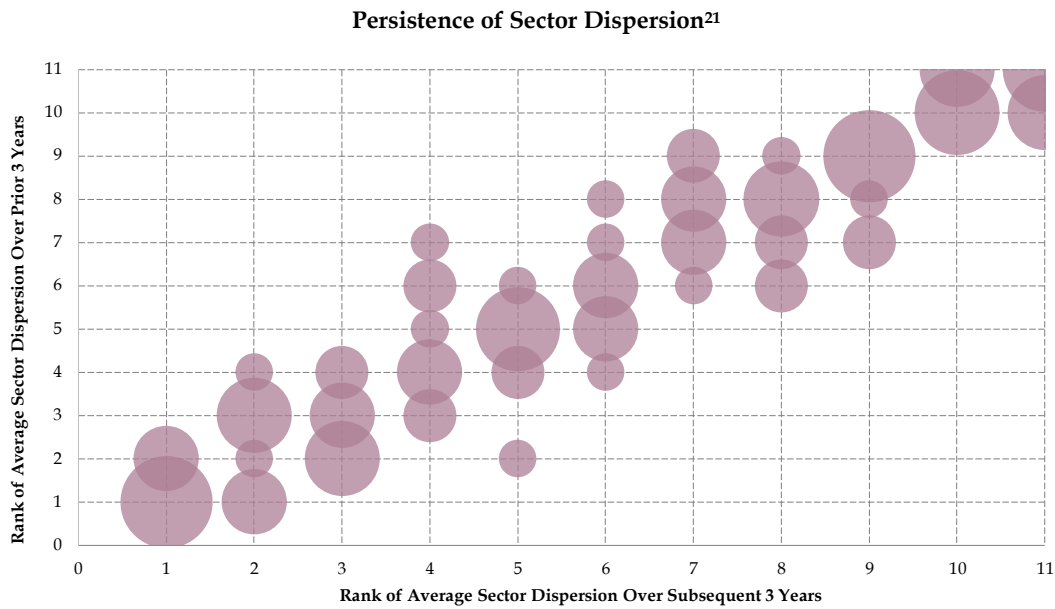
Persistence of Height



¹⁹ “Active Manager Performance: Alpha and Persistence.” Meketa Investment Group. 2012.



In order to test for the presence of persistence in the dispersion and correlation of sector returns, we compared each sector’s relative dispersion/correlation rank from one three-year period to the subsequent three-year period. Our hypothesis was, if persistence exists in the dispersion and correlation of sector returns, we would expect to see a highly ranked sector maintain this high rank throughout the observation period. The bubble chart shown below confirms our hypothesis; relative dispersion ranks persist over time. We found similar results for correlation persistence.²⁰



In addition to persistence, we also examined the data set for endpoint bias.²² We approached this issue in two ways. First, we divided the 33-year data set into three 11-year sub-periods. For each sub-period, we examined the 11-year average monthly dispersion for each sector. As the table below shows, Health Care had the highest, or in one case, the third highest, dispersion for each sub-period. For the period 1996-2006, Health Care had the third highest dispersion number after Technology and Telecomm, respectively. These two sectors were significantly affected by the dot-com bubble, which was an abnormal and unsustainable period for these sectors.

²⁰ See appendix for persistence calculation methodology.

²¹ A bubble chart is a variation of a scatter plot. In this instance, the size of the bubbles is positively related to the number of overlapping data points.

²² For more information on endpoint bias, see Meketa Investment Group’s white paper, “Endpoint Bias.”

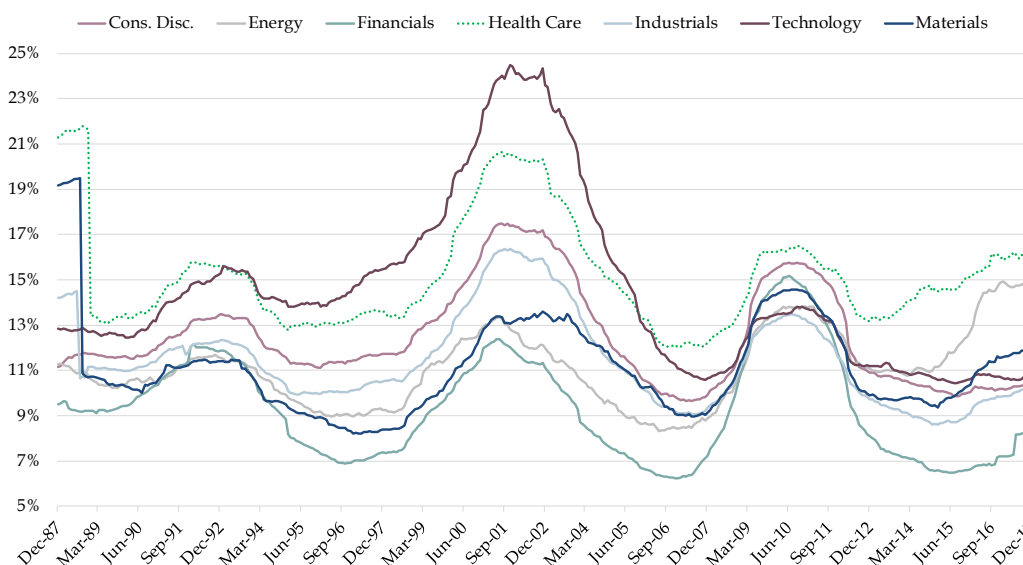


Average Monthly Dispersion (%)

| | R3K | Cons. Disc. | Cons. Staples | Energy | Financials | Health Care | Industrials | Technology | Materials | Telecomm. | Utilities |
|-----------|------|-------------|---------------|--------|------------|-------------|-------------|------------|-----------|-----------|-----------|
| 1985-1995 | 13.2 | 11.8 | 9.6 | 10.6 | 9.6 | 16.0 | 11.9 | 13.7 | 12.5 | 10.3 | 6.6 |
| 1996-2006 | 13.9 | 13.3 | 10.6 | 10.4 | 8.7 | 15.7 | 12.2 | 17.5 | 10.9 | 17.2 | 7.2 |
| 2007-2017 | 12.0 | 11.8 | 9.9 | 12.7 | 9.6 | 15.2 | 10.5 | 11.5 | 11.5 | 12.6 | 6.1 |

We also analyzed the rolling 36-month average dispersion over the full period (1985-2017).²³ As the chart below shows, we found that Health Care had the highest 36-month average dispersion in 57% of the rolling 36-month periods.²⁴ For the 43% of periods where Health Care did not have the highest dispersion, the sector was within the top three (after Technology and Telecomm, respectively).

Rolling 36-Month Average Dispersion²⁵



²³ We chose to look at rolling periods as these are useful in evaluating both the consistency, and the magnitude, of the calculated statistic.

²⁴ Health Care dispersion was no lower than third highest for 100% of the rolling 36-month periods.

²⁵ Only the largest seven sectors were included in the chart.



CONCLUSION

The Health Care sector offers a unique investment opportunity set for active management. There is a high level of dispersion and a low level of correlation across the sector, giving managers an opportunity to create alpha that does not exist to a similar degree in most other sectors.

Recall the fundamental law of active management that we discussed earlier and the equation $IR = (\text{information coefficient}) * \sqrt{\text{breadth}}$. This equation suggests that the presence of breadth alone does not imply a high IR. From a distribution perspective, if dispersion is high it implies the presence of big winners and big losers. This opportunity set presents the prospect of significant outperformance, but without the presence of investor skill, it also presents the opportunity for significant underperformance.

Given the scientific and technological nuances of the sector, as well as the presence of a unique regulatory framework, the analysis of Health Care companies requires an additional level of expertise compared to other sectors. This fact suggests that investor skill may be more highly valued in the Health Care sector as compared to the other sectors. Based on our analysis, as well as the fundamental law, we would expect to see wide dispersion of the returns of managers that operate in sectors with high dispersion of individual stocks.²⁶

We expect the low level of stock correlation and high level of stock dispersion in Health Care to continue. Both are qualities that have existed in the sector historically, driven by the wide range of subsectors and disruptive developments. Additionally, both are qualities that are likely to persist, given industry trends and continued advances in technology. Given this expectation, in concert with the depth necessary to understand the sector's nuances, we conclude that the Health Care sector presents an attractive opportunity set for active management.

²⁶ In our next paper, we will dive deeper into the health care manager landscape and explore this concept.



APPENDIX A: DISPERSION CALCULATION

For N = the number of stocks in a sector for the month,

$$\text{Dispersion in month } z = \sigma_z = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

And

$$\text{Annual Dispersion in Year } t \text{ for } 1985 \leq t \leq 2017 = \frac{\sum_{z=Jan.}^{Dec.} \sigma_z}{12}$$



APPENDIX B: TESTS FOR STATISTICAL SIGNIFICANCE – DISPERSION

Our initial analysis showed the mean dispersion for the health care sector was higher than the mean dispersion for the Russell 3000 index, as well as the mean dispersion for the other ten GICS sectors. To test these findings for statistical significance we followed the same process outlined in Appendix C.

F-Test Two-Sample for Variances. Health Care and _____

| | R3K | Disc. | Staples | Energy | Financials | Industrials | Technology | Materials | Real Estate | Telecomm | Utilities |
|---------------------|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------|-------------------------------|-----------------------|-----------------------|-----------------------|
| F | 1.34 | 2.87 | 8.40 | 4.39 | 2.69 | 2.57 | 1.29 | 1.07 | 4.79 | 3.47 | 6.74 |
| F Critical one-tail | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.82 | 1.82 |
| P value | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.43 | 0.00 | 0.00 | 0.00 |
| Conclusion | Fail to reject H ₀ | Reject H ₀ | Reject H ₀ | Reject H ₀ | Reject H ₀ | Reject H ₀ | Fail to reject H ₀ | Fail to reject H ₀ | Reject H ₀ | Reject H ₀ | Reject H ₀ |

t-test Two-Sample Assuming (Un)Equal Variances. Health Care and _____

| | R3K | Disc. | Staples | Energy | Financials | Industrials | Technology | Materials | Real Estate | Telecomm | Utilities |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|
| t | 2.46 | 3.57 | 6.58 | 4.95 | 6.73 | 4.29 | 1.31 | 3.44 | 10.09 | 1.91 | 10.48 |
| t Critical one-tail | 1.67 | 1.67 | 1.68 | 1.68 | 1.67 | 1.67 | 1.67 | 1.67 | 1.68 | 1.67 | 1.68 |
| P value | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.03 | 0.00 |
| Conclusion | Reject Null | Reject Null | Reject Null | Reject Null | Reject Null | Reject Null | Fail to Reject | Reject Null | Reject Null | Reject Null | Reject Null |

In summary, the extent to which the mean dispersion in health care is greater than the mean dispersion in the Russell 3000, as well as the mean dispersion in all GICS sectors except for technology is statistically significant at a 95% significance level.



APPENDIX C: PERSISTENCE CALCULATION METHODOLOGY

To evaluate persistence in dispersion, and correlation we started at 12/31/1990 and calculated the average monthly dispersion/correlation over the prior 3-year period (1/31/1988-12/31/1990). We then looked at the average monthly dispersion/correlation over the subsequent 3-year period (1/1/1991-12/31/1993). We repeated these calculations for all 11 GICS sectors over the total period 1/31/1988 through 12/31/2017.

Next, at each point in time (12/31/1990, 12/31/1993,...,12/31/2014, 12/31/2017) we ranked the 11 GICS sectors, 1-11, with 1 representing the highest average 3-year dispersion/correlation statistic over the period. We plotted each sectors' rank at t-3 on the Y-axis, and it's rank at t+3 on the X-axis.



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