AXA Investment Managers

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Rosenberg Equities

Does Diversity Provide a Profitability Moat?

"We're told by senior leadership that what we're doing is both the morally and economically correct thing to do, but without evidence this is just veiled left ideology that can irreparably harm Google."

Quote from James Danmore's viral 'Google's Ideological Echo Chamber' memo, written in response to Google's diversity initiatives. The document is widely known as the 'Google Anti-Diversity Manifesto'. It was circulated inside Google then appeared on the multi-media platform Motherboard in August of 2017.

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Putting aside the question of morality, we find evidence that diversity is 'economically correct' in that it is associated with positive economic outcomes for companies. As investors, our interest in diversity, governance, and ESG generally is grounded in the relationships we have found between ESG concepts and the fundamental drivers of risk and reward in the equity market. We are encouraged by the results of this study and believe them to be additive to the literature on the benefits of diversity in company leadership. Most importantly, for those of us committed to diversity in the workplace, these results support the idea that diversity is not just a 'nice to have'; we believe it is instead a 'must have' in the face of intense market competition.

Foreword

In this study we continue our ESG-focused, fundamental equity research. Of particular interest is how we might use governance data – in this instance board diversity information – to strengthen our appreciation of earnings quality. Earnings quality forms a core pillar of our investment approach. Finding companies that are high quality today is important, but the real challenge is finding high quality companies today that will remain high quality tomorrow. At the core of earnings quality is firm profitability, so we are specifically interested in finding companies that can sustain profitability over time. For the most profitable firms, this means defying the relentless competitive forces that work to pull firms' return on equity (ROE) toward a market-wide mean. We argue that diversity itself is an advantage that translates into a 'profitability moat', helping keep competitive forces at bay.

There is a considerable body of research that shows firms with more diverse management or boards have achieved better financial outcomes, as measured by any number of metrics including superior earnings[1] and return on sales[2]. Given the results of these and other studies, we were not surprised to find that more diverse companies exhibit higher current (contemporaneous) return on equity.

This is intuitive when one considers the combined benefits of diversity on attracting and retaining talented employees, strengthening the focus on the customer, and improving group decision making. We extend this basic analysis to show that the most diverse firms not only have higher current ROE, but that their future profitability is also potentially superior to peers. Turning the analysis on its side, we then isolate the most profitable companies – those naturally experiencing the greatest downward pressure on profitability – and ask ourselves the following question: does partitioning profitable companies along a diversity dimension help identify companies that are better able to avert future mean-reversion pressure? We indeed find this to be the case and offer an explanation as to why this might be, invoking Porter's Five Forces of competition.

[1] 'Diversity Matters', McKinsey & Company, 2015. Study concluded that there is a statistically significant connection between diversity and financial performance. [2] Catalyst, a U.S. nonprofit. In a 2011 study, Catalyst looked at American companies in the Fortune 500 and found that those in the top quartile in terms of female board representation—with women making up between nineteen and forty-four per cent of their boards—had a return on sales (that is, net income as a percentage of revenue) that was sixteen per cent higher than for companies with no women on their boards.

Data and definitions

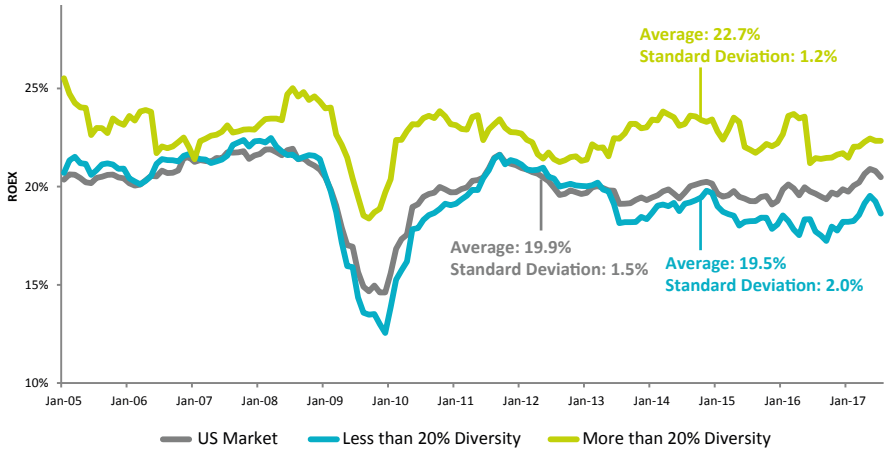
This study is based on data for the 1000 largest US companies over the period January 2005 – July 2017. Our definition of 'profitability' throughout is return on equity net extraordinary items (ROEX)[3]. We use Asset4's Board Diversity variable to gauge 'diversity' for individual companies. This variable assigns a percentage diversity score to companies based on gender diversity and/or evidence of foreign board members (i.e. those having a nationality different to the country of headquarters of the company). Here, companies are classified as 'higher diversity' if their Board Diversity score is greater than 20%, and 'lower diversity' if lower than 20%, per Asset4's definition. In choosing the cut-offs we believed that it was important to avoid what is often referred to as 'token diversity' on boards in which critical mass is not achieved, and to keep the membership categories broad enough such to have sufficient company representation within each diversity bucket.

Diversity and profitability

On average, based on the historical data, diverse companies are simply more profitable than their less diverse peers. Importantly, the variability of the profitability is less for more diverse companies. This is illustrated in exhibit 1. The profitability advantage of more diverse firms is consistent over time, becoming especially pronounced during the period 2009 – 2011 when the US market's aggregate profitability dramatically dipped.

> "On average, diverse companies are simply more profitable than their less diverse peers"

Exhibit 1 – Profitability of higher/lower diversity companies, January 2005 – July 2017

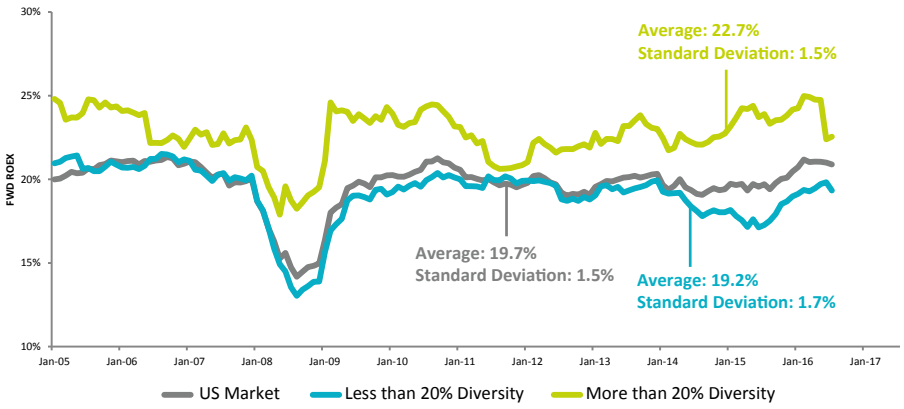


Source: Rosenberg Equities. The 'US Market' is the largest 1,000 US stocks in the Rosenberg Equities universe over the period of analysis. Profitability is defined as return on equity net extraordinary items (ROEX). Diversity segment is determined by Asset4 Board Diversity metric. Stocks within diversity segment are weighted using square-root-market-cap (SRMC). Please note that higher ROEX does not necessarily translate to higher stock returns.

[3] It should be noted that the results using ROE are nearly identical to what is presented here.

While companies with diverse boards have a distinctive profitability advantage at any point in time, we wondered if the more diverse companies of today go on to enjoy a profitability advantage in the future. We tested this by looking at the relationship between a company's diversity level at a point in time ('today') and profitability the subsequent year ('tomorrow') for our groups of more and less diverse companies. In exhibit 2, we observe that companies that are more diverse 'today' go on to have higher profitability 'tomorrow', compared to their less diverse peers and the market generally. The future profitability is less variable for the higher diversity group compared to less diverse companies, but not lower than the market as a whole.

Exhibit 2 – Forward one year profitability of high/low diversity companies, January 2005 – July 2017



Source: Rosenberg Equities. The 'US Market' is the largest 1,000 US stocks in the Rosenberg Equities universe over period of analysis. Future Profitability is defined as one-year-forward return on equity net extraordinary items (ROEX). Diversity segment is determined by Asset4 Board Diversity metric. Stocks within diversity segment are weighted using square-root-market-cap (SRMC). Please note that higher forward ROEX does not necessarily translate to higher stock returns.

> **"We can confidently say that, historically, higher diversity 'today' has translated into higher return on equity 'tomorrow'"**

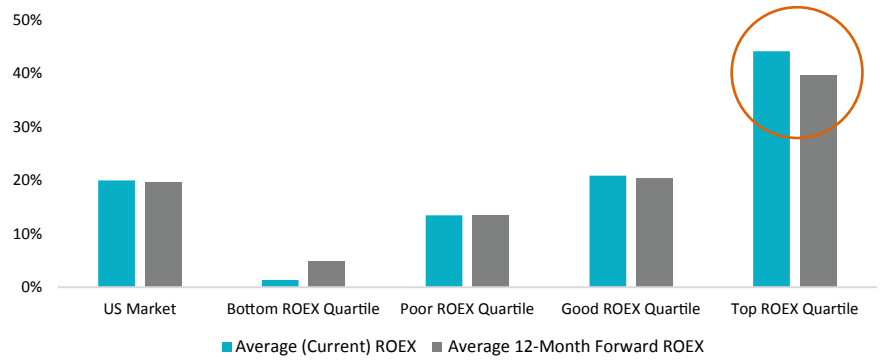
When viewed through this lens, **we can confidently say that, historically, higher diversity 'today' has translated into higher return on equity 'tomorrow'**. Over the period analysed, the profitability advantage for more diverse companies was 3.5%, on average. As mentioned earlier, we are especially interested in higher diversity companies' ability to preserve their ROE advantage over time because, like all high ROE companies, they face downward, mean-reversion pressures by virtue of the natural competitive forces in the market. This begs the question: Can diversity actually offer some protection against competitive forces among the most profitable stocks?

High profitability – does diversity provide a 'moat'?

We now re-orient the analysis by isolating the 25% most profitable stocks first, then dividing that top quartile into higher/lower diversity buckets. While we have established that diversity results in higher future profitability generally, we are now interested in understanding whether higher diversity can act as a 'moat', making some of the most profitable companies more resistant to mean-reversion forces associated with competitive pressure.

To answer the question of 'moat' directly, we look at the impact of diversity on future profitability for the most profitable stocks at a point in time. In exhibit 3, we start by showing current and one-year-forward return on equity for the market as a whole and then by ROEX quartiles. The final set of bars illustrates the downward, mean-reversion pressure on the most profitable group of companies, the Top ROEX Quartile. These are the companies with the highest starting (current) profitability, by definition, but these companies went on to lose an average of about 5 percentage points of ROE in the subsequent year over our period of study. It is very difficult for companies in this category to maintain their 'top' position in the face of competitive pressures like competitors offering similar products, other companies hiring away their best people, and pricing competition. This known drop in future profitability among the companies in the Top ROEX Quartile is the reason we are interested in company features that might act as a 'moat' to protect against mean reversion.

Exhibit 3 – Mean reversion pressures on profitability, January 2005 – July 2017

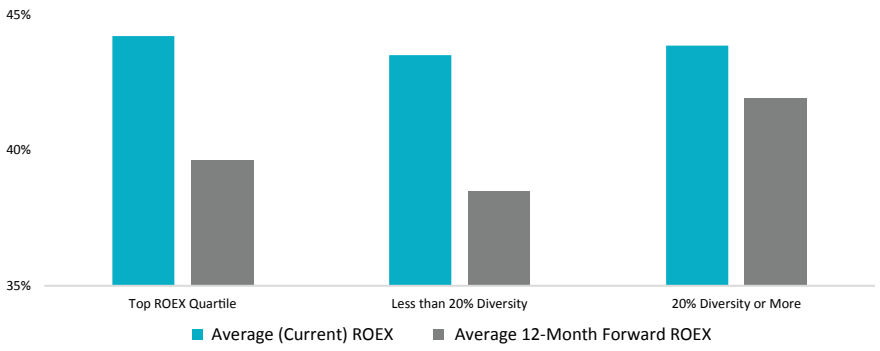


Source: Rosenberg Equities. Universe is the largest 1000 US stocks over the period of analysis. Profitability is defined as return on equity net extraordinary items (ROEX). ROEX quartiles represent 25% of market cap when ranked on profitability. Averages are calculated over period January 2005 – July 2017.

We find evidence that diversity on the board can create such a 'moat'. In exhibit, we partitioned the Top ROEX Quartile into higher and lower diversity groups. Within this most profitable part of the market, the higher diversity stocks appeared significantly more resilient in the face of competitive pressures. While their forward profitability is still lower, the more diverse companies simply lost less than their peers during the timeframe shown.

> **"Higher diversity stocks appeared significantly more resilient in the face of competitive pressures"**

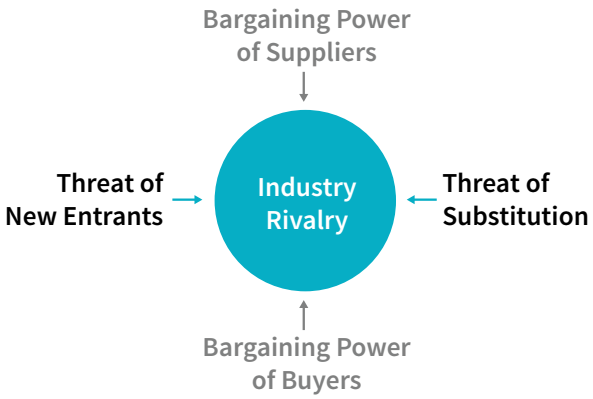
Exhibit 4 – Top ROEX quartile partitioned by diversity, January 2005 – July 2017



Source: Rosenberg Equities. Universe is the largest 1000 US stocks over the period of analysis. Profitability is defined as return on equity net extraordinary items (ROEX). The top quartile is defined by ranking on profitability then isolating top 25% of stocks, by market cap. Diversity segment is determined by Asset4 Board Diversity metric. Stocks within diversity segment are weighted using square-root-market-cap (SRMC). Averages are calculated over period January 2005 – July 2017.

Invoking Porter…

In the preceding analysis, we demonstrate that higher diversity seems to act like a protective moat, enabling some high-profitability firms to withstand competitive market forces better than their peers. But which competitive forces, specifically, are higher diversity names better able to withstand? We invoke Porter's Five Forces as a framework for identifying potential advantages had by more diverse firms in the face of competition[4].

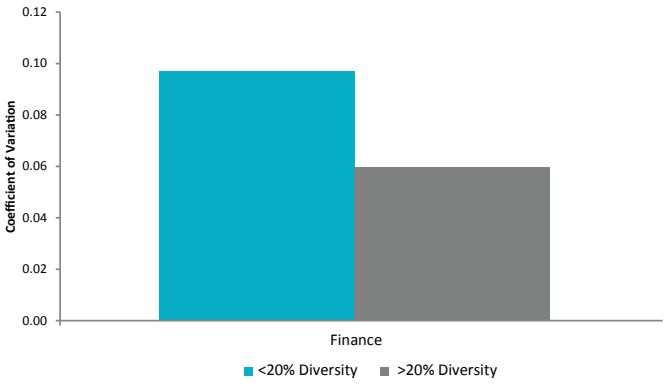


We believe that more diverse firms most likely have advantages when it comes to discouraging new entrants, discouraging brand/product substitution, and innovation. Several studies[5] have shown evidence of better problem solving (thanks to improved 'collective intelligence') among diverse teams – and problem solving is indeed at the core of the fight against the competition! Specifically, we think it logical to assume that firms with more diverse strategic leadership are better able to create goods and services that engender brand and product loyalty, which may act as a barrier to entry for competitors. Similarly, more diverse companies may be able to stave off the substitution effect via consumer's perception of product differentiation which, in the extreme, would lead consumers to believe that 'there are no substitutes'. Finally, within Porter's 'industry rivalry' concept, we note research by others pointing to superior innovation at more diverse companies[6]. A competitive advantage created by innovation can, in theory, work to make firms less subject to competitive forces.

Within the most profitable companies, the challenge to firms lies in maintaining or even growing customer and brand loyalty, or further diversifying product lines. It is our belief that, within the most profitable firms, there may be a strong temptation to not challenge the status quo ('if it's not broken, why fix it?'), thus leading successful companies to fall prey to competitive forces. It could be the case that the more diverse among the most profitable quartile are more willing or able to innovate, despite the firm's success. A study by the Center for Talent Innovation showed superior growth in market share for more diverse firms – those results work to support this hypothesis[7].

Another way we might observe the impact of better innovation, better brand loyalty, or lack of perceived substitutes is to look at the volatility of firm-wide sales for high and lower diversity firms, with in the highest profitability quartile. Our hypothesis is that more diverse firms would experience lower volatility of sales. **What we see is that within the most profitable end of the equity spectrum, it is indeed the case that more diverse firms saw greater sales stability**[8], this is illustrated below when we observe the forward 3-year volatility of sales for more and less diverse firms within the top profitability quartile. We believe that this result is a tangible demonstration of how high profitability/higher diversity firms may better defy competitive forces, maintaining more of their profitability over time.

Exhibit 5 – Top quartile ROEX average 3-year forward sales volatility by diversity segment, January 2005 – July 2017



Source: Rosenberg Equities, Asset4. Universe is largest 1,000 US stocks over the period of analysis. Sales Volatility the coefficient of variation defined as the standard deviation of total sales divided by mean sales, over a forward 36 month window. Diversity segment is determined by Asset4 Board Diversity metric. Averages are calculated over period January 2005 – July 2017. Please note that lower sales volatility does not necessarily translate to higher stock returns.

[4] 'Porter's Five Forces', attributed to Michael Porter of Harvard University (1979) is traditionally used to evaluate competitiveness within industries. It points to more attractive industries as those with fewer pressures from the Forces, and less attractive industries as being those approaching 'pure competition' in which economic profits are driven from the system. Here, we use 'Porter's Five Forces' to simply name competitive pressures as opposed to using it for industry evaluation.. [5] Woolley et al., 'Evidence for a Collective Intelligence Factor in the Performance of Human Groups', Science, October 2010. David Rock and Heidi Grant, 'Why Diverse Teams are Smarter', Harvard Business Review, 2016. Alison Reynolds and David Lewis, 'Teams Solve Problems Faster When They're More Cognitively Diverse', Harvard Business Review, 2017. [6] Cristian L. Dezsö and David Gaddis Ross, 'Does Female Representation in Top Management Improve Firm Performance? A Panel Data Investigation,' Strategic Management Journal, September 2012. [7] 'Innovation, Diversity, and Market Growth,' Center for Talent Innovation, 2013. Note that this study and the study by Dezsö and Ross go beyond diversity at the board level by focusing on diversity within the company workforce. We believe that the core arguments in these studies are applicable to diversity more generally and hence we use them to motivate possible advantages of more diverse firms within the Porter framework. [8] To measure volatility of sales we use Coefficient of Variation of total company sales defined as follows: $CV=\frac{\sigma}{\mu}$ where σ is the standard deviation of the total company sales for the forward 36 months and μ is the mean of the series, requiring a minimum of 24 data points availability to make this computation. A lower Coefficient of Variation indicates greater stability of sales.

Concluding remarks

We are interested in earnings quality and importantly, finding high quality stocks today that will continue to be high quality tomorrow. As profitability is a key component of earnings quality, our focus in this piece has been on profitability and its link to diversity. Based on analysis of historical data, we find that higher diversity firms are potentially associated with higher current profitability as well as higher future profitability. Among the most profitable firms, those with greater board diversity also showed a better ability to withstand competitive forces compared to their less diverse peers. When we isolate the highest profitability companies we find that there is a possible 'profitability moat' that is attributable to higher diversity and suggest that this moat is driven by greater resistance to three of the five 'Porter Forces'. With the thesis that diverse companies may be better able to engender brand loyalty and encourage innovation, we show greater stability of sales as one type of tangible, economically-valuable outcome that may underlie the 'profitability moat' for more diverse firms.

Looking forward, we will continue to pursue research ideas that are at the intersection of governance and quality as we believe the former can strengthen our framework for the latter. We are encouraged by our findings and emphatically support the idea of diversity as an 'economically correct' pursuit on the part of companies.

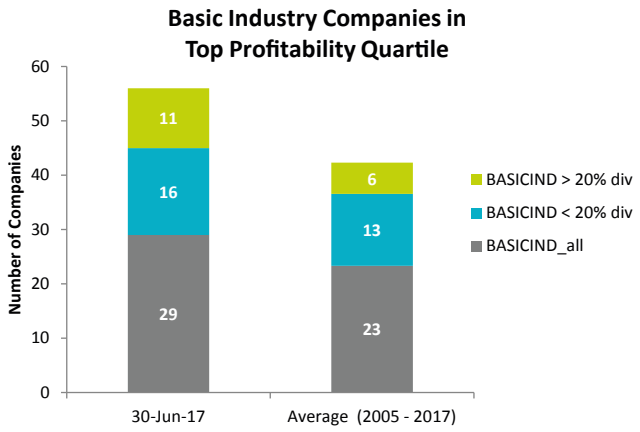
> **"Diverse companies may be better able to engender brand loyalty and encourage innovation"**

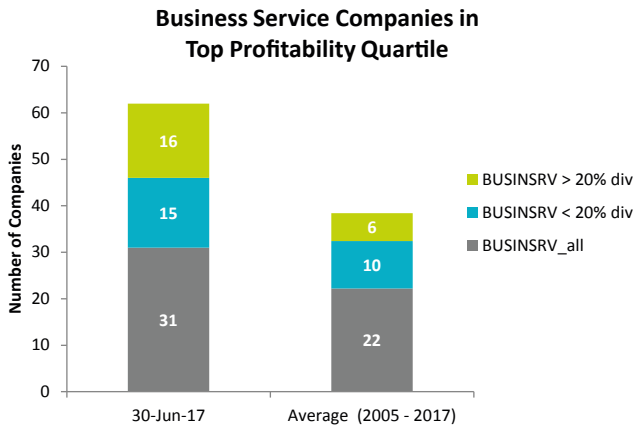
Appendix 1 | Data coverage and sample size

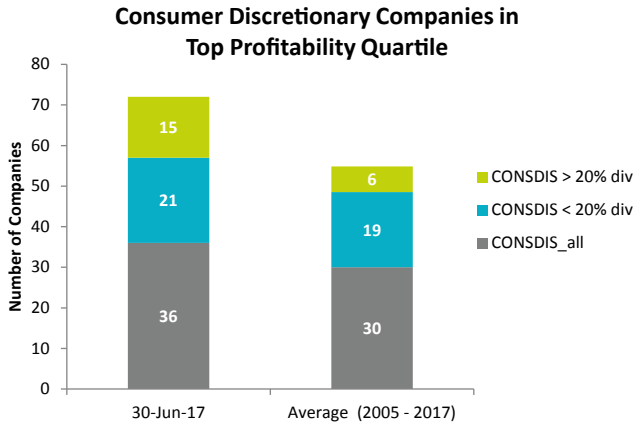
The challenge of any quantitative exploration of ESG themes that the breadth and history of ESG data is simply not comparable to what we take for granted when working with traditional financial statement information. At Rosenberg Equities, our objective is to do as much quantitative analysis as the data will allow. We are mindful that smaller sample sizes and shorter histories may present problems with respect to the confidence we would place on the results. We believe that a 'proceed with caution' approach best serves us when doing this type of work.

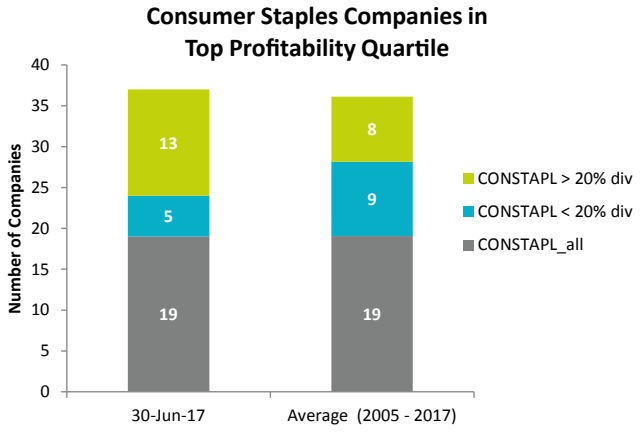
Appendix 2, which explores sector-level analysis, is an example of such 'cautious' work. Our starting universe is the top 1000 US companies (ranked by capitalization), observed over the period January 2005 – July 2017. As mentioned in the body of the paper, we use Asset4's Board Diversity metric as our diversity measure. While the Asset4 coverage is strong for most periods, it is not perfect, meaning that the sample size of diversity-reported data is less than 1000 companies. Further, as we isolate the top quartile of stocks by profitability, then in Appendix 2, further subdivide by economic sector and diversity measure, the company counts in each category become understandably small. Again, we are of the belief that it is good to do the analysis, but that interpretation must be within the context of the small sample sizes. We ultimately decided to omit two economic sectors – Telecom and Utilities -- from the analysis in Appendix 2 based on the company count results below. In each instance, the sectors were so thinly represented in the top profitability quartile that keeping them was not justifiable.

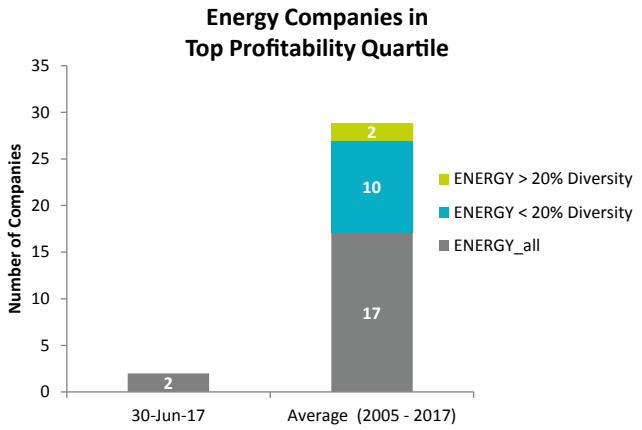
What follows are the company counts by economic sector for companies that appear within the top quartile of profitability. We present the count for the sector as a whole then also report the count by higher/lower diversity. Note that the sum of the higher/lower diversity count does not necessarily equal the total for the sector as a whole. This is because there are companies that are within the top profitability segment for which diversity data is missing.

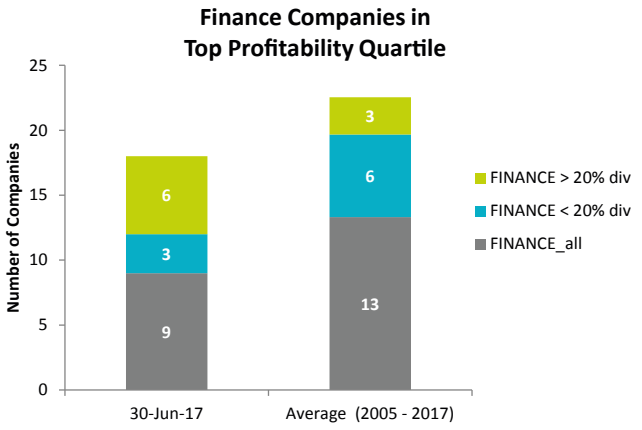


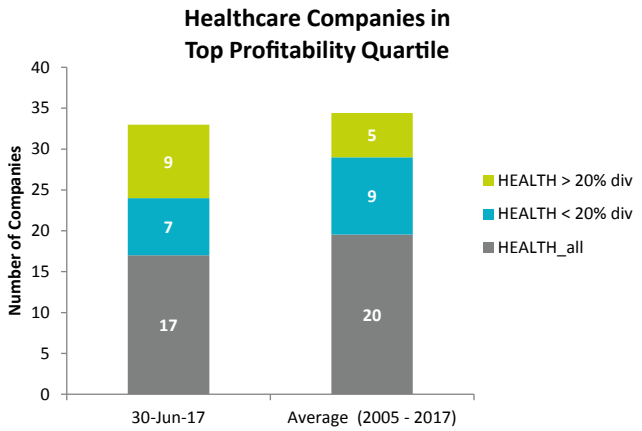


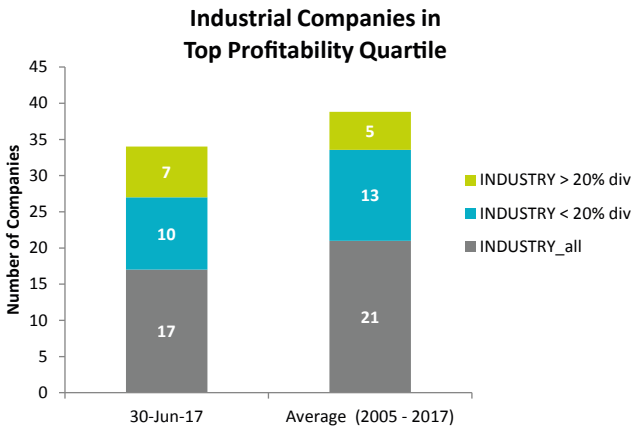


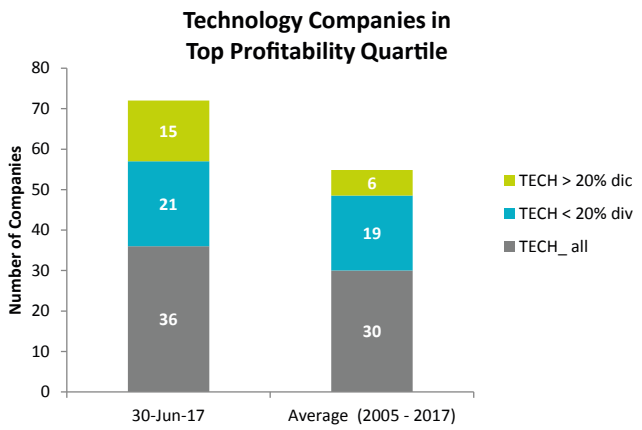


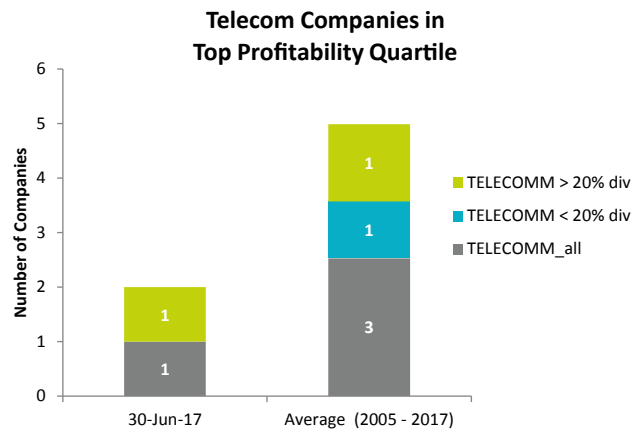


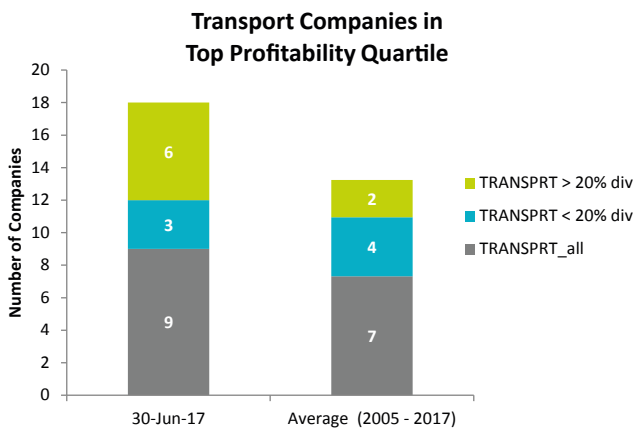


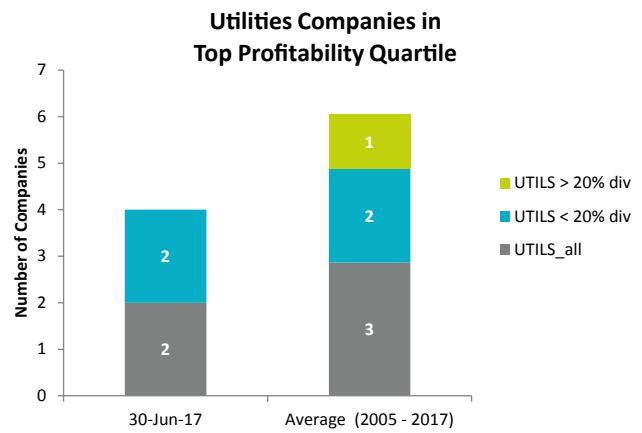












Source: Rosenberg Equities, Asset4. Universe is the largest 1000 stocks over the period of analysis. Rosenberg proprietary economic definitions are used. Averages are calculated over period January 2005 – July 2017.

Appendix 2 | Sector-level analysis using profitability moat ratio and sales volatility

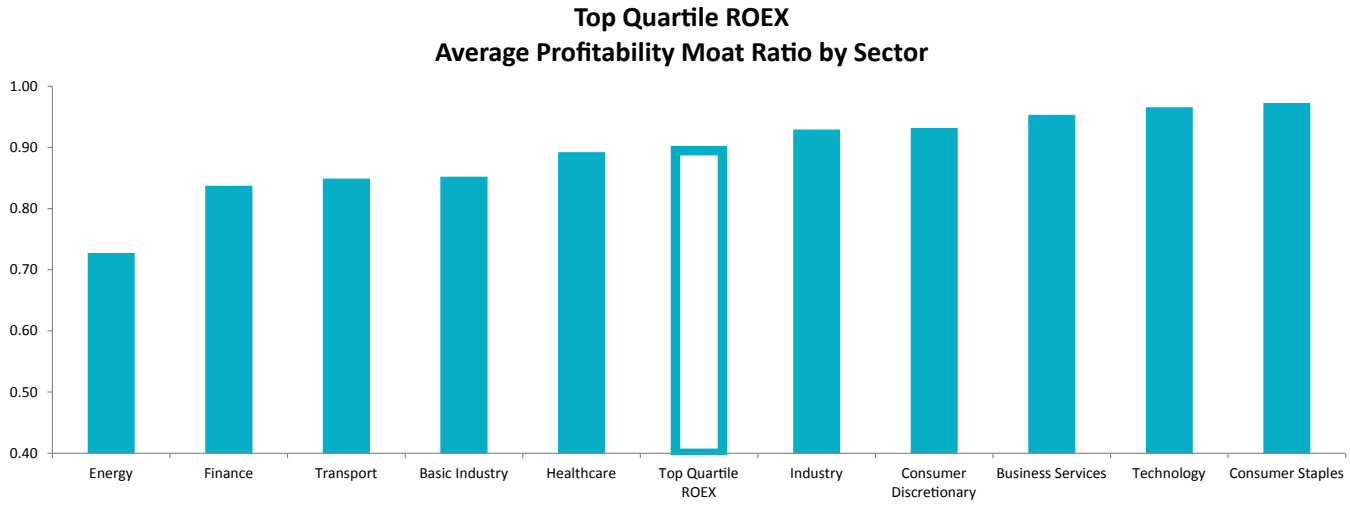
In the main body of this piece, we establish a positive relationship between higher diversity and greater 'profitability moat'. Do these relationships hold within economic sector, or is our 'profitability moat' just capturing a sector effect? To answer this question we segment the top profitability quartile (Top ROEX Quartile) by sector then look to see whether diversity makes a difference with respect to an ability to achieve a higher moat ratio[9].

To facilitate comparisons, we introduce the idea of a 'profitability moat ratio':

This ratio effectively captures the extent to which a basket of stocks is subject to competitive forces. Higher ratios indicate that less future profit is given up for a stock relative to its profitability today; lower ratios indicate the opposite.

$$\text{Profitability Moat Ratio} = \frac{\text{Average One-Year-Forward RODEX}}{\text{Average Current RODEX}}$$

Before reintroducing diversity we should make the simple observation that, while the most profitable quartile of the market as a whole experiences a decline in future profits of approximately 5%, some sectors are much more affected by competitive forces than others. Below we show the moat ratios by economic sector for the highest profitability stocks[10]. The sectors are ranked from lowest moat ratio (most subject to mean reversion forces) to highest moat ratio (least subject to mean reversion forces).

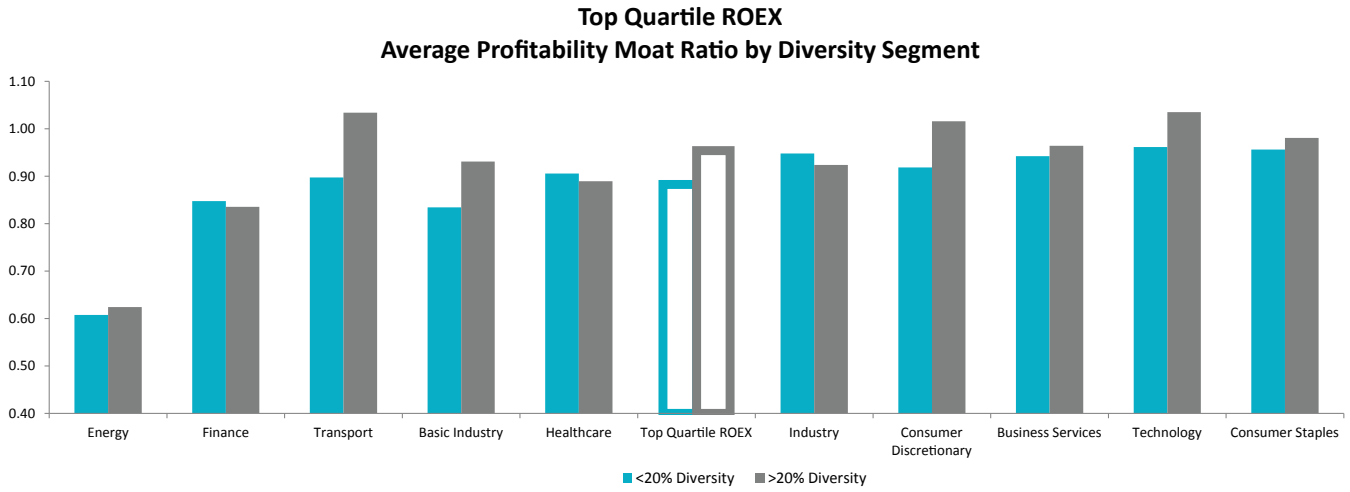


Source: Rosenberg Equities. Rosenberg proprietary economic definitions are used. Profitability Moat Ratio is defined as year-ahead ROE divided by current ROEX by sector based on an aggregation of stocks within sector. Stocks within economic sector are weighted using square-root-market-cap (SRMC). Averages are calculated over period January 2005 – July 2016.

When viewed this way it is clear that Energy and Finance stocks within the highest profitability quartile suffer the most extreme drops in one-year-forward profitability, on average. Business Services, Technology and Consumer Staples, as categories, experience the least mean reversion pressures, achieving moat ratios of close to one.

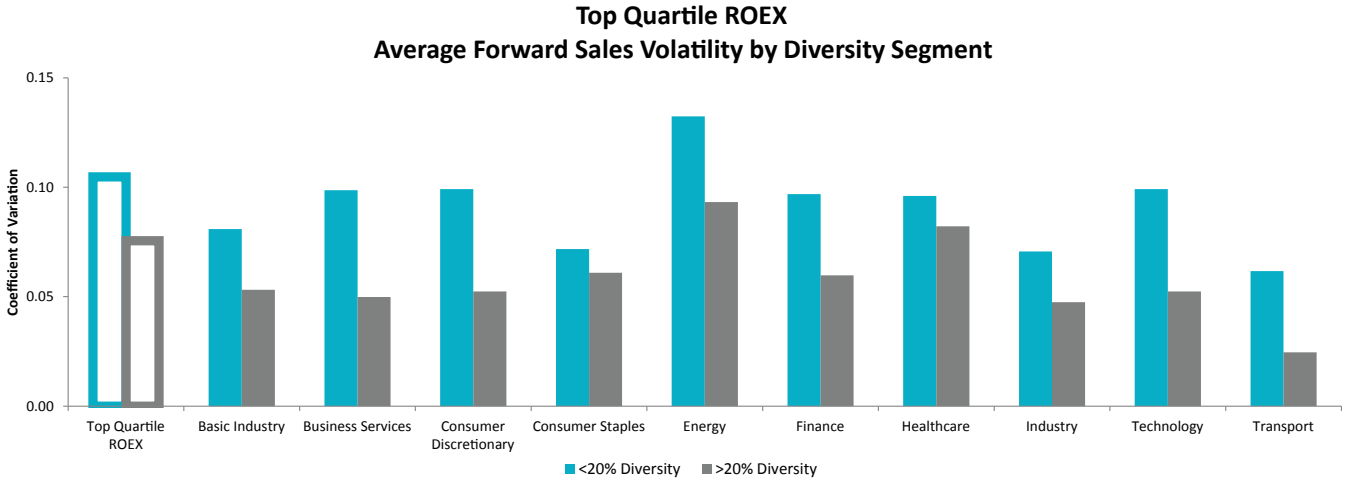
[9] Utilities and Telecom were omitted from the final results of this analysis because of their near-absence in the top profitability quartile stemming from their regulated or quasi-regulated features. [10] Real Estate is also omitted from the analysis While there were a small handful of Real Estate stocks within the top quartile of overall profitability we purposely exclude them as ROEX is not an effective lens through which to evaluate REITS and property developers. The more appropriate measure would be payout ratio.

Below, when we further parse these sector buckets on diversity, we see that the 'higher diversity, higher moat ratio' rule generally held. The three exceptions to the rule are Finance, Healthcare, and Industry, though the first two appear almost equal. In all other sectors, higher diversity names appeared less subject to reversion-to-the-mean pressures (i.e. they have higher moat ratios) than lower diversity companies. Interestingly, for most profitable Transport, Consumer Discretionary, and Technology stocks, higher diversity led to a moat ratio of greater than one, indicating that future profitability is actually higher than [already high] current profitability.



Source: Rosenberg Equities, Asset4. Rosenberg proprietary economic definitions are used. Profitability Moat Ratio is defined as year-ahead ROEX divided by current ROEX by sector based on an aggregation of stocks within sector. Stocks within economic sector are weighted using square-root-market-cap (SRMC). Diversity segment is determined by Asset4 Board Diversity metric. Averages are calculated over period January 2005 – July 2016. Please note that higher profitability moat ratio does not necessarily translate to higher stock returns.

In the body of the paper we argue that the profitability moat of more diverse companies is driven by greater resilience in the face of three of the five Porter forces. As evidence of this resiliency, we show that sales volatility was lower among more diverse firms within the highest profitability quartile. Viewing those results along sector dimensions, below, we see a consistent advantage – that is, lower volatility of sales – within the more diverse portion of the sector. We believe that this is evidence of how the most profitable diverse firms maintain more of their profitability over time.



Source: Rosenberg Equities, Asset4. Rosenberg proprietary economic definitions are used. Sales Volatility the coefficient of variation defined as the standard deviation of total sales divided by mean sales, over a forward 36 month window. Stocks within economic sector are weighted using square-root-market-cap (SRMC). Diversity segment is determined by Asset4 Board Diversity metric. Averages are calculated over the period January 2005 – July 2017. Please note that lower sales volatility does not necessarily translate to higher stock returns.

Building an inclusive and equitable workplace for both men and women is a key focus of AXA IM's Diversity and Inclusion action plan. We are therefore proud to have been certified for our gender equality practices by EDGE (Economic Dividends for Gender Equality).

Aniela Unguresan, Co-founder EDGE Certified Foundation:
"AXA Investment Managers have made a global commitment to gender equality in the workplace putting them at the forefront of financial institutions; a growing number of whom are committing to closing the workplace gender gap through EDGE Certification. The results demonstrated a superior gender balance compared with the industry and there was consistency across its locations. This provides a good foundation from which to build sustainable progress in the future."

Learn more about diversity and inclusion at AXA IM on our website: www.axa-im.com/en/diversity-inclusion.

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