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The "Science" and "Art" of High Quality Investing

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Life is not an exact science, it is an art.
– Samuel Butler

There is a long tradition of investing in "quality" companies, one whose best-known modern practitioner is Warren Buffett, but which dates back to Benjamin Graham in the 1930s. But despite the length of its pedigree, and the respect commanded by its most successful practitioners, neither the academic literature nor investors have reached agreement on a clear definition of quality. Definitions are wide-ranging and, in some cases, even contradictory.

In this paper we explore the concept of "high quality investing." First, we review the "science" of approaching quality via financial statement and market performance measures. We review some widely known measures. We note that many of those widely known measures have been studied from an academic rather than practitioner perspective. Secondly, we further examine those widely used measures from the perspective of the long-term investor in today's market. We test for the persistence, and long-term performance implications, of these "scientific" measures. Thirdly, we review the "art" of approaching quality via qualitative measures including culture and ESG metrics. Finally, we propose that a combination of "science" and "art" is a promising approach for practitioners and researchers alike.

The traditional "Blue Chip" quality investment practitioner tends to recognize quality in the form of high ROEs, low debt, and stable earnings. This framework is consistent with the view that "quality" is the opposite of "junk," which is characterized by cyclical profitability, highly leveraged balance sheets, and erratic earnings streams. Another take on quality—one that came into vogue after the TMT bubble of 2000—is the view that "quality" is the opposite of "aggressive growth." In contrast to aggressive growth firms, quality companies generate large and fairly predictable free cash flow—that is to say, far more cash than they reinvest in the business—and are known to have disciplined capital allocation, management, and governance structures.

In addition to these traditional indicators of quality, academics in finance and accounting have produced research during the past two decades that has provided the basis for "accounting" measures of quality that attempt to classify companies according to the quality of their earnings. But whereas traditional versions of high quality tend to emphasize stable earnings, the more recent accounting research—and the investment strategies that have come out of it—begin with the recognition that the illusion of earnings stability can be created through practices known as "earnings management." The underlying premise of these studies and investment approaches is that high quality managements care more about producing operating cash flow and "economic earnings" than reported accounting earnings; and to the extent this is so, more volatile or lumpy reported earnings can actually be a reliable indicator of corporate integrity and a management culture committed to transparency.

Financial statement measures of quality are by their nature backward-looking. The S&P Quality scores have been published since 1956, and award high scores to companies with low earnings volatility and consistent, non-cyclical earnings and dividend growth. Studies have shown favorable returns to high (but not the very highest) quality buckets.[1] Take a business like Philip Morris, which satisfies the S&P high quality criteria and which Jim Collins identified as "great" in his business bestseller *Good to Great*. On financial statement criteria, Philip Morris—with strong brands supporting predictable, non-cyclical earnings and stable dividend payouts—is a poster-child for many models of high quality. However, for many investors, the negative health implications of cigarettes, the company's violation of the public trust (which culminated in the $206 billion industry settlement in the U.S. in 1998), and the negative volume trends of the underlying business, stand in stark contradiction to a notion of high quality.

Some investors look explicitly to ESG criteria to identify high quality businesses. By incorporating environmental, social, and governance practices into business analysis, investors are incorporating a forward looking perspective that includes a view on future customer relevance. As an example, David Swensen, Yale's chief investment officer, recently wrote to Yale's external managers that "…consideration of the risks associated with climate change should produce higher-quality

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1. Frederick L. Muller and Bruce D. Fielitz, "Standard & Poor's Quality Rankings Revisited," *The Journal of Portfolio Management*, Spring 1987, Vol. 13, No. 3.

portfolios."[2] This concept of "higher-quality" is fundamentally driven, and quite distinct from the economic cyclical and financial statement approach discussed above.

Yet another approach to quality investing is to define investments according to stock price "technicals" rather than "fundamentals." In this version, low-quality stocks are characterized by high volatility, and high betas—and high quality stocks are distinguished by low volatility and betas.[3] In terms of portfolio construction, since the 2008 financial crisis, minimum-variance or low beta portfolios have been marketed as "high quality" portfolios.

In our view, however, such an approach (if viewed as a form of "quality") risks being based on a flawed logic: while it's true that low-beta portfolios are likely to have many of the same characteristics as those valued by traditional fundamental analysis, there is no compelling reason to expect the companies identified by such a process to outperform the market over a long period of time.[4] This approach is based on a kind of "data mining" that has no persuasive theoretical or practical justification—even though billions of investor dollars are pursuing these so-called quality strategies.[5]

In sum, there are many contradictory yet plausible ways to think about quality as an attribute of a company or a security. As practitioners of high quality fundamental investing, we will assert that quality has very little to do with short- or medium-term financial or technical descriptors like beta or reported earnings volatility. We believe that the most reliable approach to identifying a high quality fundamental investment is to look for a durable business franchise with a sound business model and a conservative capital structure. A "quality" company is one with sustainable competitive advantages—sources of value that can be maintained or become even more pronounced in the future, increasing the relevance of its products and services to its customers and markets. For long-term equity investors like us, assessing quality is in large part a matter of understanding "reinvestment risk"; that is, we want to know whether the management team is committed to paying out excess capital after prudently investing to maintain and grow the firm's core franchises, and identifying and pursuing the firm's positive-NPV (or strategically prudent) investment opportunities. Our goal is to find quality companies with durable franchises and supportive governance, management, and cultural characteristics—companies where there is a high probability of maintaining long-term sustainable competitive advantages.

To be sure, the earnings quality analysis developed by academics—what we will refer to as "the science" of financial metrics—can help in identifying today's high quality businesses. But for long-term investors, the most valuable skill is likely to be the "art" of exercising forward-looking judgment about the durability of the franchise, the stewardship of management, and the effectiveness of the governance structure that will outlive the current management team. It is these characteristics that are likely to provide the most reliable guides to high quality investments—those that have the potential to be what have become known colloquially as "compounders."

What's more, in addition to the research on financial metrics, there is also a relatively new body of research on non-financial indicators of quality that we believe provides support for our business value approach to identifying quality companies. Such research looks for an association between "soft" variables like indicators of culture and sustainability as opposed to financial performance as measured by returns on capital or stock returns. The findings of this research, which is now in a preliminary phase, has shown some promise in informing the search by business value investors for quality. Because these variables generally don't lend themselves to quantification, their use by investors relies heavily on subjective judgment. And in this sense, their application to value investing can be described as more "art" than "science."

In the pages that follow, we will review the science and art of high quality investing from a fundamental practitioner perspective. We believe there is promise in this new work that attempts to make connections between the "science" of financial statement metrics and the qualitative and quantitative nonfinancial aspects of KPI's which frame cultural and forward-looking issues that are collectively important to the "art" of business value investing.

One last point about quality investing: Because high quality stocks tend to be large, mature companies with in some cases robust yet bounded growth potential (people call them "blue chip," but they often mean "boring"), they don't attract egregious overvaluation.[6] For this reason, long-term investors often find these assets to be underpriced in light of their low default risk and therefore limited risk of permanent impairment of capital. But that said, high quality investing is not a mechanical process of buying low beta or minimum variance portfolios; on the contrary high quality

2. As cited in "David Swensen on the Fossil Fuel Divestment Debate," Editors Corner, *Financial Analysts Journal,* Volume 71 No. 3. See also http://acir.yale.edu/pdf%20and%20hyperlinks/CCIR%20Statement%20(2014).pdf.

3. An engaging summary discussion of both the academic and practitioner history of low volatility investing by Eric Falkenstein: *http://falkenblog.blogspot.com/2014/12/history-of-low-volatility-investing.html*.

4. Steve Johnson, "Minimum variance bandwagon worries Union Investment," *Financial Times*, April 5, 2015, More than a third of Union's equity assets, about €20bn, are managed in minimum variance and minimum volatility strategies…But Schindler fears that booming demand for minimum variance approaches means the uncorrelated stocks central to the strategy are now becoming more and more correlated, destroying its rationale.

5. Kalsenik Kose (2014) makes a provocative point around academic research on the topic of quality investing, and "the obvious incentives pushing academics to ferret out investment strategies with anomalous returns lead to what John Cochrane (2011) memorably characterized as a zoo of factors." They mention that out of 40 quality factors examined by them, only 25 yielded positive results, of which 6 were statistically different from zero. Comparing this to published factors, they found them indistinguishable from random occurrences, though there is a bias to publish those with positive returns. Regarding factor publications, they mention that "With statistical instability like this, one catches a whiff of data-snooping." Published as a Research Associates piece: *https://www.researchaffiliates.com/Production%20content%20library/The_Moneyball_of_Quality_Investing_pdf.pdf.*

6. Chuck Joyce and Kimball Mayer, "Profits for the Long Run: Affirming the Case for Quality," GMO White Paper, June 2012, gmo.com.

investing means thinking about the long-term drivers of business success, the fundamentals, not the short-term market technicals. To the extent that factors like low trading volumes, stock price volatility, and hedge fund ownership provide clues to stocks that are underappreciated, we would encourage fundamental investors to pay attention to them. But we would also caution such investors against assuming a causal relationship between such indicators and stock returns, or that such variables alone provide insights with predictive power. And finally, because our goal is to invest and generate returns, valuation matters. While we may not yet be in agreement with how to define or measure quality, we very much agree with the practical concept of "QARP" (Quality at a Reasonable Price) as a framework for incorporating quality into investment portfolios.[7]

Examining the Performance of Financial Signals in Today's Data-oriented Markets

As we noted earlier, an extensive literature on the area of "quality investing," as detected through an examination of corporate financial statements, has been produced by academic finance and accounting in the past two decades. At the same time, a more recent, but rapidly growing body of work is now being produced on the area of "non-financial" corporate reporting, which includes efforts to evaluate corporate culture, reputation, and corporate performance on a host of issues that are collectively known as "ESG" (environmental, social, and governance). As practitioners of high quality fundamental investing, we believe that the use of a combination of quantitative and qualitative information is critical to identifying companies likely to sustain high quality attributes. Relying on financial data alone, which is by its nature backward-looking, is the equivalent of driving while looking through the rear-view mirror. And thus the most effective fundamental investment process is bound to be a combination of art and science—forward-looking and backward-looking, qualitative and quantitative analysis.

Our objective as high quality investors is to identify attractively valued equity securities of companies that we believe have—and most importantly will continue to have—high quality characteristics. For that reason, the *persistence* of key characteristics and indicators is of real relevance to the investment outcome in a way that is not true of many "factor based" or mean-reversion approaches to investing. (For example, in the case of low P/E or low P/B approaches, because investment success is driven by mean reversion, both the investing windows of opportunity and the optimal holding periods are relatively short.)

In a study we conducted for this article, we began by evaluating the more recent performance of a number of widely used financial measures of earnings quality. But our results were mixed: although earlier academic studies have generally supported the predictive power of these indicators, our findings suggest that almost all of them have lost their power to generate abnormal stock returns during the last decade or so. The extraordinary growth in investors' use of data analytics capabilities, along with the huge amounts of capital chasing these strategies, appears to have sharply limited the effectiveness of these approaches.

In the second part of our study, we analyzed the persistence of these financial indicators and the effect of such persistence on stock returns. We believe persistence is highly relevant for long-term investors with multi-year holding periods. At the same time, the academic literature may well exaggerate the profitability of short-term investment strategies by ignoring implementation frictions, such as the constant rebalancing needed for short portfolios and the trading costs associated with high turnover.

There has been much discussion of "short termism" influencing and corrupting market behavior, by investors and management teams alike.[8] For long-term investors (which we define as 2+ year holding periods), much of the traditional finance literature misses the mark insofar as factor models typically incorporate monthly, quarterly, or annual rebalancing. Mean reverting factor based approaches typically lose effectiveness at 1+ year holding periods, and so we examine the return implications to various quality models at time horizons of one, two, three, four, and five years. As practitioners of long-term, high quality investing, our objective is to identify *a priori* companies that are high quality, and that we believe are likely to sustain high quality status while generating strong returns over a 3+ year time horizon.

Moreover, with regard to the "science" of quality investing, both the literature and the investment analysis appear to have been too ready to simply "follow the data." In the last decade or so, an explosion of both computing power and readily downloadable accounting financial data has contributed to an increase in "data mining"—practices that have been summed up by a cartoon of a boy digging through a pile of horse dung saying, "there's got to be a pony in there somewhere."

This is not to say that data mining—which means identifying patterns and relationships over long periods of time—can't

7. Asness et al. (2014) explores the valuation of quality (and invokes the "QARP" concept) in detail and finds that high quality stocks do have higher prices on average, but not by a very large margin. As such, they find that high quality stocks have high risk-adjusted returns. While this work is compelling, we do note that their definition of quality includes technical, non-fundamental factors like beta and volatility. As such it is not surprising to note that this measure of quality is strongly counter-cyclical (low quality sharply outperforms after market lows, in a "risk-on" environment). We believe that the QARP concept can be most robustly implemented by incorporating forward-looking fundamental and qualitative considerations. Asness, Clifford S. and Frazzini, Andrea and Pedersen, Lasse Heje, Quality Minus Junk (June 19, 2014). Available at SSRN: http://ssrn.com/abstract=2312432.

8. Harford, Jarrad and Kecskes, Ambrus and Mansi, Sattar, "Do Long-Term Investors Improve Corporate Decision Making?" (April 18, 2015). *Finance Down Under* 2015 Building on the Best from the Cellars of Finance Paper; Asian Finance Association 2015 Conference Paper. Available at SSRN: http://ssrn.com/abstract=2505261 or http://dx.doi.org/10.2139/ssrn.2505261.

produce results, at least for a while. Take, for example, the minimum variance and low beta strategies. These "black box" approaches were discovered by back-fitting the data in a way that produced an observed alpha. We would argue that such min-var and low beta strategies amount to "fighting the last war," as they dramatically outperformed many widely followed factor approaches such as book value or momentum strategies during the 2008-2009 credit crisis (and also August 2007 "quant crisis").

In any event, the common thread of these approaches is a realization that "quality" (whether measured with financial or non-financial indicators or judgments) can provide important incremental information to equity investors. Where assessments of quality become especially important is in the evaluation of corporate reinvestment, or capital redeployment, risk—the risk that management will waste corporate free cash flow on overpriced acquisitions or value-destroying attempts to preserve market share.

Whether financial or nonfinancial, our objective is to explore how this information about quality can be useful to long-term fundamental investors. So, for example, whereas gross profits or ROIC may be effective proxies for profitability, indicators of board independence or effective governance disclosure practices may turn out to be effective proxies for ESG characteristics.

Revisiting the Financial Quality Indicators: Methods and Findings

In deciding which financial signals to examine, we decided to recreate and extend the findings of a working paper by University of Rochester professor Robert Novy-Marx[9] by focusing on a subset of his financial metrics. We examined the following financial quality metrics:

• *Gross profitability:* Revenue minus COGS scaled by total book assets. This is a useful measure of profitability due to its simplicity.

• *ROIC:* EBIT-to-tangible capital, where tangible capital is property, plant and equipment plus working capital. The very definition of "financial quality" is high and sustained profits relative to capital employed, so this measure has economic appeal.

• *Sloan's Accrual:* Measured as the year-over-year change in current assets excluding cash and short term liabilities, minus the change in long term liabilities excluding debt in current liabilities and income taxes payable, minus the depreciation and amortization. As specified in an article published in 1996, accruals are scaled by the average of total assets and total assets lagged one year.[10] Historically, as Sloan's work has demonstrated, companies with lower accruals tend to have higher quality earnings, as reflected in their lower risk of later negative earnings events (such as earnings restatements) and higher stock price returns.

• *Piotroski's "F" score:* Constructed as the sum of nine binary variables that take the value zero (indicating weakness) or one (indicating strength), the F-score assigns one point for each of four profitability signals (positive earnings before extraordinary items, positive cash flows from operations, increasing returns on-assets (IB/AT that exceeds that of the previous year), and negative accruals); one point for each of three liquidity signals (decreasing debt, increasing current ratio, and no equity issuance); and one point for each of two efficiency signals (increasing gross margins (revenues minus cost of goods sold scaled by revenues) and increasing asset turnover (revenues scaled by assets)).

• *Grantham's quality score:* Average ranks of returns-on-equity, asset-to-book equity, and the inverse of ROE volatility. ROE is net income-to-book equity. ROE volatility is the standard deviation of ROE over the preceding five years.

In addition to the above quality metrics, for context we included an analysis of two traditional value factors, P/E and P/B:

• *Earnings to Price:* Net income divided by market equity.

• *Book to price:* Book equity scaled to market equity

We recreated the returns on an annual basis using both CAPM and Fama/French three factor models. The data methodology we used was as follows:

• We identified the largest 1,036 U.S. Equity stocks (by market cap as of 2015) and analyzed their results[11] during the 14-year period from 2000 through the end of 2013.

• Replicating a retail investor approach, we used annual data and rebalanced portfolios on an annual basis.

• We formed a long only portfolio based on the top 30 percentile of companies in terms of the quality metric ranking of all the companies

• We analyzed the portfolio results based on two approaches: standard CAPM Alpha[12] vs. market as defined by our complete dataset as well as the three factor alpha. For the three factor approach, we used Fama/French's annual factors for U.S. equities and regressed[13] the portfolio returns vs. the published factors to generate the model alpha.

The main differences in our treatment of data from the research summarized by the Novy-Marx paper were in our

9. Robert Novy-Marx, "Quality Investing" (working paper), December 2012, significantly revised May 2014, http://rnm.simon.rochester.edu/research/QDoVI.pdf.

10. Richard Sloan, "Do Stock Prices Reflect Information in Accruals and Cash Flows About Future Earnings?," *The Accounting Review,* 71, 1996.

11. The results were based on total stock return (including dividends) over the calendar year immediately after the year that financial results are evaluated. For e.g., if we look at a company's financial results in 2001 and select it for our portfolio, we would buy it around January 1, 2002 and sell it around January 1, 2003 with slight adjustments based on market closures. Its total stock return over this period is reflected in the results of our portfolio.

12. $E(R_i) = R_f + \beta_i (E(R_m) - R_f)$ For the market return we are using the market as defined by our complete data set rather than the Fama French market factor.

13. $r_{it} - r_{ft} = a_i + \beta_{im}(r_{mt} - r_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \varepsilon_{it}$ The factors were downloaded from their website – *http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html*.

Table 1 **Alphas Generated by Financial Quality and Value Factor Portfolios**[14]

				Three factor model results			
	Sort Variable	**E[re]**	**Alpha CAPM**	**Alpha**	**Beta market**	**Beta SML**	**Beta HML**
Financial quality factors							
	Gross profitability	4.9%	0.8%	1.7%	0.79	0.04	(0.08)
	p values		*0.48*	*0.23*	*0.00*	*0.78*	*0.46*
	ROIC	4.9%	0.8%	1.9%	0.83	(0.15)	0.03
	p values		*0.38*	*0.08*	*0.00*	*0.17*	*0.72*
	Sloan's accrual	6.4%	1.3%	1.7%	0.97	0.02	0.04
	p values		*0.17*	*0.19*	*0.00*	*0.87*	*0.71*
	Piotroski's score	5.6%	1.6%	2.2%	0.80	(0.09)	0.08
	p values		*0.16*	*0.16*	*0.00*	*0.53*	*0.53*
	Grantham's score	6.8%	-0.2%	0.5%	0.77	(0.29)	0.23
	p values		*0.91*	*0.71*	*0.00*	*0.27*	*0.15*
Value Factors							
	Earnings to price	7.4%	3.6%	3.4%	0.74	(0.30)	0.39
	p values		*0.02*	*0.03*	*0.00*	*0.04*	*0.00*
	Book to price	6.3%	1.9%	0.7%	0.84	(0.16)	0.45
	p values		*0.34*	*0.71*	*0.00*	*0.38*	*0.01*

time period (we use 2000 onwards compared to his 1967 onward analysis), as well as our annual (vs. their quarterly) rebalancing, and our use of long-only portfolios (his focus is on a long-short strategy). We also did not correct for any potential industry biases (he corrected for financial industry biases). While our data set is more limited, we believe it is more reflective of the market opportunity today.

Statistical findings

Within a CAPM framework, we find that none of these strategies generate positive alphas (at a statistically significant level of 0.05 p value), with the exception of the value factor Earnings to Price. It is noteworthy that P/E but not P/B was effective in the sample period 2000-2013, potentially due to the adverse returns to P/B strategies during the 2008-2009 financial crisis.

Using a Fama/French three-factor model framework, our tests show that again the P/E value factor is effective, but among the financial quality factors only ROIC generates statistically significant alphas. The most plausible explanation of these findings is that the explanatory value of financial quality metrics as a returns strategy has been arbitraged away in the current data heavy environment of financial markets. These results are significantly different from those of the Novy-Marx study, in which the measure of gross profitability had a significant alpha and most strategies generated significant alphas when using a three-factor framework.

Our hypothesis on statistical findings

The recent advent of easy to download data from Factset, Capital IQ, Bloomberg, and other sources has made financial metric analysis a trivial exercise for most practitioners. Also, there has been a lot of popular literature published on the metrics discussed above, which has led to widespread awareness, and, prior to the "quant crisis" of August 2007, to an extended period of (arguably illusory) high returns by quant factor strategies enabling them to attract significant capital.

Our best guess is that all the attention paid to these various factors has largely arbitraged away the alphas associated with these strategies. Although the P/E factor still appears significant in our analysis, P/B fails to outperform during in the 2000-2013 sample period, potentially because of the low (and perverse) returns to P/B strategies during the 2008-2009 financial crisis.[15]

14. We look for significance of alpha generated through the p values. Statistical significance is usually assumed at 0.05 p values. In our results, we find that the only truly statistically significant alpha is generated by the Price to Earnings factor. However, we also find ROIC to be somewhat significant with a borderline line p value of 0.08. All of the other metrics are not found to be significant.

15. There is no sense in which our findings contradict or disprove those reported by Novy-Marx since both our time period and methodology are different. Although we generally agree that "more is better" from a standpoint of sample size, we also believe that our approach does reflect long-term investors' current opportunity—set for returns in today's data intensive era.

Understanding the Role of Persistence in Delivering High Quality Returns

In finance there are differences between theory and practice that can have major consequences. For investors, actual realized returns—returns that you can "eat"—are what matters. The taxes, transaction costs, and "impact costs" associated with carrying out trading strategies (which arguably should include the ability to "stick with" the strategy through all kinds of markets) should all be taken account of when assessing the allegedly high returns promised by such trading rules. Also potentially important is acknowledgment of the behavioral impediments and agency problems in the investment industry that are reflected in, if not actually caused by institutional short-termism. The problem can be summed up simply by pointing to the institutional reality that pension and endowment funds with multi-decade liability horizons use asset managers with average holding periods of less than 18 months.[16] This observation supports our belief that "time arbitrage"—the ability to take a long-term view—can be a sustainable competitive advantage for investors in public equity securities.

For investors with a long time horizon, there is enormous "upside optionality" to being aligned with high quality management with a demonstrated ability and commitment to the effective redeployment of capital. As already suggested, for the long-term equity holders of most large, well-established companies, the returns from future capital redeployment actions are likely to be the single most important determinant of their total investment returns.

This dynamic of reinvestment by "compounders" is reflected in Warren Buffett's much-repeated statement, "Far better to buy a wonderful company at a fair price than a fair company at a wonderful price."

As already noted, Buffett's approach is the polar opposite of the quantitatively driven investment and factor approaches that are based on the implicit (if not explicit) principle that all values (including the quality aspects of corporate performance) revert to a mean. And such mean reversion, which appears to assume the impermanence of all aspects of corporate performance, calls for an annual, or even quarterly, rebalancing approach to investing. By taking such an approach, investors effectively forgo the meaningful potential upside from identifying and then holding exceptionally well-run companies.[17]

Reflecting our perspective as long-term investors, we have given a new twist to the Novy-Marx quality analysis by examining the persistence of the financial indicators of quality that he examined, and then attempting to determine whether such persistence has any incremental effect on stock returns. We set out to answer the question: Are there any additional incremental returns associated with investing in companies whose earnings are rated as "high quality" for not just one year, but for two, three, four, and five consecutive years? In other words, does the data support our contention as fundamental investors that there are rewards to investors for identifying companies that are not only high quality today, but are likely to remain high quality? And are such persistent financial indicators of quality likely to be associated with consistently higher returns?

To examine the impact of persistence, we looked at each of our examined financial metrics and created portfolios of companies showing persistence in that measure of one, two, three, four, and five years. For the one-year cohort, we select all companies that were above the 30% threshold for that particular year. For the other cohorts, we select companies that fall exactly into that cohort. For example, our three-year persistence sample for a given financial metric consists of a portfolio of companies[18] that have been rated in the top 30 percentile of that metric for each of the last three years[19] (and not the last two or the last four or the last five). We now discuss the persistence of each of the metrics and its association with stock returns

Gross profitability. As can be seen in Table 2, we find that persistence in maintaining higher than average levels of gross profitability does not add value in any of the cohorts. (The closest to statistical significant alpha generation is the three-year persistence cohort.)

What explanation do we offer for this finding? Since the initial signal itself also failed to produce alpha during our more recent (2001-2013) sample period, we don't find it surprising that the persistence of this signal does not add alphas across cohorts. Although gross profit may be an effective proxy for "profits" more generally, in a reasonably efficient market such profits—and their persistence—are likely to be reflected into current valuations.

ROIC. We find that ROIC is close to statistical significance in its performance. However, the significance and the

16. Average pension manager portfolio turnover is 67.2% (implying holding periods of <18 months). Chakrabarty, B., Moulton, P. C., & Trzcinka, C. (2013, March). Institutional holding periods [Electronic version]. Paper presented at the annual Finance Down Under conference, Melbourne, Australia. Retrieved June 2015, from Cornell University, SHA School site: http://scholarship.sha.cornell.edu/conf/2/.

17. A few other thoughts on time horizons: stated very simply, for a 20x PE stock, 19/20 (95%) of the value in the stock reflects earnings beyond the current year. Clearly future earnings, future earnings growth as a consequence of capital redeployment decisions, and future payouts will dominate near term results as value drivers. In defining "long-term," longer is better insofar as the benefits of deferring tax events, and the negatives of frictional impact costs, compound to greater effect with greater time horizons. Using the language of options, one might attribute the positive alpha in high quality equities to underpricing of the long-term time horizon or "theta" (time value) for compounded upside, since the marginal investor does not have a long-term time horizon.

18. In creating these samples, we also use the market as a control signal—note that we do not have a beta of 1.0 with the market in the 3 factor model, due to differences in portfolio construction vs. Fama/French (for example, our universe of the 1,036 largest stocks has a large cap bias relative to using a broader universe).

19. We use rolling periods of 5 years starting from 1996 to 2013. Since we have to have minimum 5 years of data to form 1 to 5 year cohorts, we create cohorts from 2000 to 2013. This gives us 14 data points for each cohort. For e.g., for the 4 year cohort, we have 14 such cohorts starting from 2000. The 2000 cohorts would include data from 1997 to 2000. Also, the 2 to 5 year cohorts are based on exact persistence of signal i.e. a 4 year cohort means that company signal has persisted for exactly 4 years, not less or more. Only in the case of the 1 year cohort do we take all companies that exhibited the metric i.e., it encompasses the 1,2,3,4 and 5 year cohorts.

Table 2 **Persistence of Gross Profitability Cohorts**[20]

Gross profitability							
	Avg. no in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	310						
Factor		4.9%	1.7%	0.79	0.04	(0.08)	0.8%
P-Value			0.23	0.00	0.78	0.46	0.48
2 year exact persistence	23						
Factor		4.8%	1.8%	0.77	0.03	(0.09)	0.8%
P-Value			0.19	0.00	0.84	0.40	0.47
3 year exact persistence	18						
Factor		4.9%	1.9%	0.76	0.02	(0.08)	1.0%
P-Value			0.18	0.00	0.88	0.49	0.40
4 year exact persistence	15						
Factor		4.6%	1.7%	0.75	0.02	(0.08)	0.8%
P-Value			0.24	0.00	0.89	0.48	0.52
5 year exact persistence	221						
Factor		4.3%	1.3%	0.74	0.03	(0.08)	0.5%
P-Value			0.34	0.00	0.81	0.50	0.67

Table 3 **Persistence of ROIC Cohorts**[21]

ROIC							
	Avg. no in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	310						
Factor		4.9%	1.9%	0.83	(0.15)	0.03	0.8%
P-Value			0.08	0.00	0.17	0.72	0.38
2 year exact persistence	35						
Factor		4.4%	1.7%	0.83	(0.16)	0.01	0.3%
P-Value			0.16	0.00	0.19	0.93	0.76
3 year exact persistence	26						
Factor		4.9%	2.2%	0.80	(0.21)	0.08	1.0%
P-Value			0.10	0.00	0.10	0.44	0.37
4 year exact persistence	21						
Factor		4.3%	1.7%	0.79	(0.21)	0.06	0.4%
P-Value			0.24	0.00	0.16	0.61	0.73
5 year exact persistence	175						
Factor		4.0%	1.4%	0.77	(0.19)	0.06	0.2%
P-Value			0.34	0.00	0.20	0.59	0.87

absolute alpha value seems to diminish almost monotonically (with the exception of the two year cohort) as we increase the persistence of the signal.

Given that ROIC is a simple proxy for operating performance, it would indicate that high performing companies initially return higher value. However, given the steady drop

20. For gross profitability, we find that none of the cohorts come close to statistical significance (p value of 0.05). The closest significant alpha is in the 3 year cohort with a p value of 0.18, indicating 82% certainty of significance.

21. For this metric, we find that the first 3 years are very close to statistically significant, especially the first and third year cohorts. The first year has a p value of 0.08 and the third year has a p value of 0.10, both of which fall within 90% certainty of significance. Even the 2 year cohort with a 0.16 p value is not far off from significance. The results are made more relevant by the fact that the alpha's generated in all three years are quite large, i.e. in the 1.7% to 2.2% range.

Table 4 **Persistence of Sloan's accrual cohorts**[22]

Sloan's accrual							
	Avg. no in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	307						
Factor		6.4%	1.7%	0.97	0.02	0.04	1.3%
P-Value			0.19	0.00	0.87	0.71	0.17
2 year exact persistence	62						
Factor		9.3%	3.8%	1.15	0.30	(0.20)	3.3%
P-Value			0.32	0.00	0.44	0.51	0.30
3 year exact persistence	20						
Factor		11.8%	2.7%	1.12	0.99	(0.29)	5.2%
P-Value			0.69	0.00	0.17	0.61	0.40
4 year exact persistence	6						
Factor		19.5%	10.5%	1.32	0.92	(0.37)	12.1%
P-Value			0.30	0.01	0.37	0.65	0.17
5 year exact persistence	4						
Factor		35.3%	7.8%	2.00	3.22	(1.31)	21.2%
P-Value			0.54	0.00	0.06	0.33	0.13

Table 5 **Persistence of Piotroski's score cohorts**[23]

Piotriski's score							
	Avg. no in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	201						
Factor		5.6%	2.2%	0.80	(0.09)	0.08	1.6%
P-Value			0.16	0.00	0.53	0.53	0.16
2 year exact persistence	36						
Factor		1.7%	-0.9%	0.87	(0.15)	(0.05)	-2.7%
P-Value			0.73	0.00	0.57	0.83	0.23
3 year exact persistence	10						
Factor		4.4%	0.9%	0.95	(0.19)	0.06	-0.5%
P-Value			0.80	0.00	0.61	0.83	0.87
4 year exact persistence	3						
Factor		4.6%	1.4%	1.00	(0.46)	0.23	-0.4%
P-Value			0.74	0.00	0.30	0.51	0.90
5 year exact persistence	1						
Factor		1.3%	-1.0%	0.47	(0.25)	0.22	-1.8%
P-Value			0.88	0.11	0.75	0.74	0.72

in persistence portfolios, we would assume that high quality operating companies start to get "priced in" for quality, and so the expected returns drop. Nonetheless, ROIC stands out as showing the strongest persistence among the quality metrics that we tested.

Sloan's Accruals. Our findings provide strong evidence that Sloan's accrual signal appears to have been completely arbitraged away, with almost no persistence. Prior to publi-

22. For this metric we find that none of the cohorts seem to be significant. The closest cohort to significance is the first year with a 0.19 p value but it deteriorates after that across all cohorts.

23. For this metric we find that none of the cohorts seem to be significant. The closest cohort to significance is the first year with a 0.16 p value, but it deteriorates after that across all cohorts.

Table 6 **Persistence of Grantham's score cohorts**[24]

Granthams's							
	Avg. n in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1035						
Factor		8.1%	0%	0.90	(0.12)	0.11	NA
P-Value			0.33	0.00	0.18	0.06	NA
1 year at least persistence	310						
Factor		6.8%	0.5%	0.77	(0.29)	0.23	-0.2%
P-Value			0.71	0.00	0.27	0.15	0.91
2 year exact persistence	54						
Factor		6.1%	-0.2%	0.80	(0.40)	0.24	-1.0%
P-Value			0.93	0.00	0.24	0.23	0.58
3 year exact persistence	38						
Factor		6.3%	-0.2%	0.79	(0.34)	0.28	-0.9%
P-Value			0.92	0.00	0.28	0.15	0.57
4 year exact persistence	31						
Factor		5.8%	-0.8%	0.80	(0.29)	0.26	-1.5%
P-Value			0.65	0.00	0.36	0.18	0.37
5 year exact persistence	122						
Factor		5.4%	-1.0%	0.79	(0.34)	0.29	-1.8%
P-Value			0.58	0.00	0.32	0.17	1.00

cation in 1996 and widespread adoption in the 2000's, the Sloan's accrual signal generated significant alpha. However, our analysis of the period 2000-2013 shows no statistical significance. Furthermore, given the self-correcting nature of the accruals signal, we are not surprised to see increasingly "noisy" results with longer periods of persistence. The nature of the accrual signal is such that it identifies companies with aggressive (or conservative) earnings. For example, if management is boosting sales by extending lenient credit terms to unworthy customers, and then receivables balloon, the accruals signal will identify low quality earnings. Later the company is likely to hit a wall, finds it cannot sustain sales growth, and takes the inevitable write-down.

But as already noted, the success and widespread adoption of this strategy by market participants appears to have caused it to lose its predictive power, and the historical effectiveness of the accruals signal has been arbitraged away.

Piotroski's F-Score. This measure seems to generate no significant alpha over our time period. And the more persistent the signal, the lower the stock returns. While the immediate 1-year portfolio does hold some information (albeit at a 84% confidence level), at high persistence there is not statistical significance.

One explanation, as we suggested earlier with the case of gross profitability, is that the high quality signaled by a high Piotroski score effectively gets priced into the stock early. Another explanation, however, is that given the large number of variables that form this metric, it could be a case of too many variables driving uncorrelated final signals. The nature of a highly-fitted multifactor approach, which includes mean reverting measures (which require periodic rebalancing to exploit), is such that a sustained alpha is unlikely and so this signal is not likely to be useful for multi-year holding periods.

Grantham's score. Our findings show that this signal does not generate any significant alpha at *any* time, and thus it does not seem to have any informative value. Our finding is consistent with Novy-Marx's findings in his paper. Moreover, in some sense the earnings (ROE) volatility measure is arguably "upside down," in the sense that low earnings variability may indicate smoothing of reported results via "earnings management."

Earnings to Price. This stalwart value factor was the highest alpha generated in our data set and it was found to be statistically significant. This finding suggests that trading on the basis of low PE multiples would have generated significant profits over the last 13 years (and as it would during almost any period). Nevertheless, we also find, as can be seen in Table 7, that the significance of the metric falls as the persistence of

24. For this metric we find that none of the cohorts seem to be significant. Note that the complete market is slightly different in this metric measurement as we have data only from 2004 instead of 2000 for the others. This was due to the fact that it requires a 10 year's signal as one of its components. We note there will be significant industry bias in this metric.

Table 7 **Persistence of Earnings to price cohorts**[25]

Earnings to price							
	Avg. n in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	310						
Factor		7.4%	3.4%	0.74	(0.30)	0.39	3.6%
P-Value			0.03	0.00	0.04	0.00	0.02
2 year exact persistence	62						
Factor		8.3%	4.1%	0.69	(0.25)	0.40	4.7%
P-Value			0.03	0.00	0.15	0.01	0.01
3 year exact persistence	38						
Factor		9.0%	5.5%	0.69	(0.36)	0.41	5.5%
P-Value			0.02	0.00	0.09	0.03	0.01
4 year exact persistence	26						
Factor		8.1%	4.9%	0.67	(0.38)	0.39	4.7%
P-Value			0.07	0.00	0.15	0.08	0.05
5 year exact persistence	74						
Factor		6.6%	2.3%	0.62	(0.29)	0.51	3.4%
P-Value			0.44	0.00	0.34	0.06	0.25

Table 8 **Persistence of Book to price cohorts**[26]

Book to price							
	Avg. n in cohort	E[r]	Alpha	Rm-rf	SMB	HML	Alpha(CAPM)
Complete market	1036						
Factor		4.5%	0%	0.88	(0.11)	0.13	NA
P-Value			0.23	0.00	0.01	0.00	NA
1 year at least persistence	310						
Factor		6.3%	0.7%	0.84	(0.16)	0.45	1.9%
P-Value			0.71	0.00	0.38	0.01	0.34
2 year exact persistence	37						
Factor		8.6%	2.9%	0.78	(0.32)	0.63	4.4%
P-Value			0.20	0.00	0.17	0.00	0.10
3 year exact persistence	28						
Factor		9.3%	3.8%	0.78	(0.43)	0.71	5.2%
P-Value			0.11	0.00	0.08	0.00	0.07
4 year exact persistence	23						
Factor		9.8%	4.6%	0.77	(0.47)	0.70	5.8%
P-Value			0.07	0.00	0.07	0.00	0.05
5 year exact persistence	162						
Factor		9.0%	4.5%	0.78	(0.50)	0.63	5.1%
P-Value			0.09	0.00	0.07	0.01	0.07

the metric increases beyond 3 years, which makes sense given that the mean reversion dynamic drives a large proportion of the alpha.

Our findings would indicate that a low PE strategy can be effective in a multiyear portfolio, however alpha is most reliably generated in the early years of portfolio formation. Also, the decreasing alpha generated of the signal in the case of persistently low PE stocks in the five year cohort suggests

25. For this metric, most of the cohorts seem to be highly statistically significant with p values below 0.05 for the 1-3 year cohorts and 0.07 for the four year. Only the 5 year cohort is not significant with a p value far exceeding acceptable limits.

26. For this metric, most of the significant cohorts lie at the longer durations. The 3,4 and 5 year cohorts are close to significance with p values from 0.07 – 0.11. However, the earlier two cohorts do not appear to exhibit significance.

that persistently low PE multiples are probably priced in by the market for, and could be considered a potential red flag (the classic "value trap"), by investors.

Book to Price. Surprisingly, the Book to Price variable shows no statistical significance in predicting stock returns for the current year or for year two, but the measure becomes significant for the three-, four-, and five-year portfolios. In fact, the year four and five portfolios generate significant alphas in the range of 4.5%.

This is an intriguing result, as it suggests that a basket of confirmed "value traps" has outperformed recently de-rated companies. It would indicate that over a five-year period, most low P/B companies will revert towards market mean leading to significant alpha generation for investors. A caveat is that these results likely relate to the particular experience of overleveraged firms in the 2008 financial crisis. The one- and two-year persistence cohorts included numerous "crash and burn" companies which, after absorbing significant losses, were re-rated by the market to low P/B status in 2008, and subsequently in 2008 & 2009 suffered permanent losses as a result of bankruptcy, mergers, and dilutive capital raises. By contrast, the 3/4/5 year persistence cohorts, ex post, were (in general) the companies which survived the financial crisis. While these persistently cheap companies may include some "value traps," in general companies that were cheap in the cyclical peak of 2006 did not go bankrupt in 2009.

Using Signals of Quality and Culture to Complement Financial Metrics

In the first two sections, we focused on financial metrics as predictors of market-based success. We reported finding that very few financial quality metrics appear to generate significant alpha. The main exception was ROIC, the use of which has created alpha consistently over a long period of time. Furthermore, the persistence analysis shows that for investors capable of identifying *a priori* high ROIC companies that will maintain their high ROIC attributes for multiple years, the alpha will continue as "the gift that keeps giving." This is nirvana for the long-term investor who seeks to identify and build a portfolio of multi-year holdings, which thereby have the potential to compound alpha.

In recent years a wide literature of academics and practitioners has been developed which supports the proposition that high ESG characteristics are associated with lower costs of capital and higher quality profitability including high ROIC. Several meta studies illustrate the "do well by doing good" premise that corporate responsibility as proxied for by ESG is consistent with stronger firm performance.[27] As we observe across these multiple studies, there seems to be clear evidence that companies with high non-financial indicators of quality seem to perform significantly better on market and accounting-based metrics.

What we examine specifically is whether non-financial indicators of quality such as corporate culture, ESG or "sustainability" practices can be used to predict either superior operating or market performance. That is to say, can ESG and other factors be used together with financial quality metrics to help analysts identify *a priori* those high ROIC companies that are likely to maintain their high ROIC attributes?

We processed our data set of operating financial quality metrics versus a broad set of non-financial metrics to determine if we can identify these high quality cohorts using non-financial metrics. We focused on operating rather than market performance because we believe that, at least over the relatively short period examined by our study, quality is defined more reliably by operating performance than by stock market performance. Within accounting metrics, we selected ROIC as the key variable given our earlier findings of its materiality to market performance and high quality stock selection. The non-financial metrics are regressed versus the observed ROICs.

The key non-financial metrics we examined are as follows:

Environment and efficiency

- Sustainalytics environment score
- Bloomberg Environment disclosure score

Social and stakeholder management

- Sustainalytics social score
- Fortune best places to work
- CR magazine's top 100 corporate citizens list
- Bloomberg social disclosure score

Governance

- Sustainalytics governance score
- Bloomberg disclosure score
- % of women on board
- Board attendance meeting %
- % of independent directors

Miscellaneous and Third party indices (constituents or not)

27. The existing literature is increasingly prolific and includes work by practitioners. Fulton & Kahn's (*Sustainable Investing: Establishing Long-Term Value and Performance*, Deutsche Bank, 2012) is a meta study published in June 2012 which summarizes a number of studies as below with ESG acting as a proxy for non-financial indicators of quality and found that 15 out of 18 studies on ESG vs. correlation to higher market based performance indicated positive results. Another meta study by Arabesque partners ("From the Stock Holder to the Stakeholder," Clark Feiner Viehs in September 2014) found that 88% of studies show that solid ESG practices are associated with better operating performance, and that 90% of the studies of cost of capital show that sound sustainability standards lower the cost of capital of the firm. An academic study that focuses on strong corporate ESG as a predictor of market based performance compares performance of the responsible portfolio (150 companies derived from the KLD) with the S&P 500 and found that it had "slightly superior average returns and only marginally more risk despite having 70% less stocks." See "Investing for Change: Profit from Sustainable Investment," Landier, Augustin Nair, Oxford University Press 2009. Finally, Serafeim et al. (2015) find that firms with good performance on material sustainability issues significantly outperform firms with poor performance on these issues, suggesting that investment in *material* sustainability issues are shareholder value enhancing. He uses SASB's materiality map to determine relevant KPI's by industry. See "Corporate Sustainability: First evidence of materiality," Serafeim Khan Yoon, *http://ssrn.com/abstract=2575912*, March 2015.

Table 9 **Regression on non-financial metrics vs. ROIC**[28]

		Coefficients	Standard Error	t Stat	P-value
	Intercept	**(0.59)**	**0.49**	**(1.20)**	**23%**
E	Sustainalytics E	(2.16)	1.34	(1.61)	11%
	Bloomberg Env Disc Sc	(0.36)	0.46	(0.78)	44%
S	Sustainalytics S	1.35	1.34	1.01	31%
	Fortune best places to work	(1.81)	1.22	(1.48)	14%
	CR citizen	(0.37)	0.83	(0.45)	66%
	Bloomberg Soc Disc Sc	(0.13)	0.47	(0.28)	78%
G	Sustainalytics G	(0.96)	1.31	(0.73)	47%
	Bloomberg Gov Disc Sc	7.82	2.89	2.70	1%
	% Women on Bd:Y	(0.14)	0.39	(0.35)	73%
	% Indep Directors:Y	4.57	2.59	1.76	8%
Misc.	ISS	(0.73)	0.52	(1.42)	16%
	Index or not	(0.13)	0.57	(0.22)	83%

- ISS score
- MSCI KLD
- FTSE sustainable companies
- Dow Jones sustainable companies

Such non-financial metrics are released at different times during the year, starting from February and ending in November. We used data from 2014, and regressed them against year- end 2014 ROIC. Our analysis indicated there are two variables with statistically significant correlations with ROIC at the 10% or better confidence level, and two more at the 15% level.

As we can be seen in Table 9, the key variables appear to be the Bloomberg governance disclosure scores, and the Percentage (%) of Independent Directors on Board. Both of these values appear to add significant coefficients to the predicted ROICs. This result is consistent with previous studies that have shown that (1) performance on governance issues is associated with strong firm performance, and (2) that strong corporate governance is often an effective proxy for performance on a broader set of ESG issues.[29]

At the same time, and surprisingly, both the Sustainalytics Environment Score and the Fortune Best Places to Work survey appear to be associated with lower ROICs and thus reduced corporate value (albeit with confidence <90%). In summary, the most significant variable—the one that stands out—is the Bloomberg governance disclosure score, which appears in this analysis to be the most significant of the non-financial metrics in predicting ROIC, and, as a result potentially generating alpha over time.

In sum, we found that our initial findings have received strong support from prior academic research. Having identified governance as the key proxy of non-financial quality metrics, we now conclude this section with a discussion of the "art" of investing. How can long-term investors identify, *a priori*, those companies which are likely to maintain their high quality status?

As fundamental investors, we believe that the answer is in the culture and leadership of the business. These areas have not in the past readily lent themselves to traditional finance theory. They are low frequency observations (annual rather than daily, weekly, monthly, or quarterly), with a higher degree of qualitative and subjective content than the toolkit of quantitative finance is suited for. However, with the computing power and ability to analyze narrative data, and the explosion of qualitative KPIs describing business practices, the traditional "art" of high quality business analysis is increasingly addressable by the framework of the "science" of academic finance.

28. We find that the Bloomberg governance score and the % of independent directors are the most significant metrics given the low p values. From a statistical significance perspective, the Bloomberg governance score is the most relevant with 99% certainty of significance. It also has the highest coefficient in the model. The Bloomberg governance disclosure score is a proprietary score assigned, calculated by Bloomberg based on their assessment of the governance metrics reported by individual companies.

29. A number of academic studies demonstrate the link between governance and accounting-based financial performance, including: "Corporate governance, corporate social responsibility and corporate performance" Huang, *Journal of Management and Organization*, 2010, which explores the relationship between corporate governance, CSR, financial performance (as measured by ROA) and CSP. He found that a governance model which includes independent outside directors and which has specific ownership characteristics has a significant positive impact on financial performance and CSP. "Corporate governance and Firm performance," Bhagat Bolton, *Journal of Corporate Finance*, 2008, finds a significant positive correlation of stock ownership by board members, along with CEO-Chairman separation to positive operating performance; "Governance mechanisms and equity prices," Cremers Martin Nair, *Journal of Finance* (2005), 2859-2894, found that external and internal governing mechanisms are strong complements that are associated with long-term abnormal returns and accounting measures of profitability; "Corporate governance and firm value: International evidence" Ammann Oesch Schmid, *Journal of Empirical Finance,* 2010 and Bauer et al. (2009), find a positive relationship between good corporate governance and accounting based performance (or firm value), in addition to market performance; "Governance and stock market performance" Hooper Sim Uppal, Elsevier 2009, demonstrated a significant positive association between stock market performance measures and the quality of the institutional environment. These findings suggest countries with better-developed governance systems have stock markets with higher returns on equity and lower levels of risk.

Figure 1 **No. of companies in each persistence cohort for ROIC in 2014**

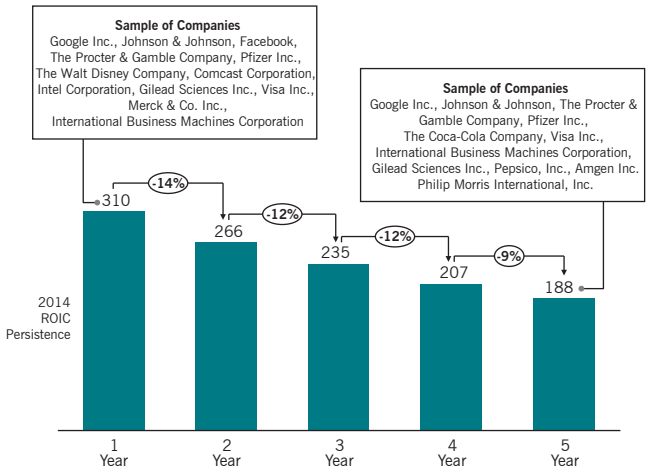
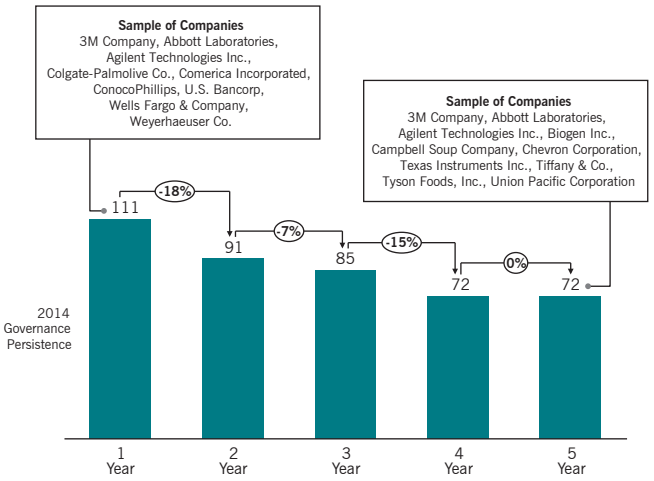


Figure 2 **No. of companies in each persistence cohort for Governance in 2014**



The Intersection of Financial and Non-Financial Metric Persistence

Long-term investors buy stocks they intend to hold for years. Hence, the "Holy Grail" for long-term fundamental investors is to identify companies that are high quality both in terms of financial and non-financial metrics, and thus, likely to continue delivering high quality performance. In the previous sections, we have identified the most relevant metric for each type of metric. For financial metrics, we suggest using ROIC and for non-financial metrics we suggest using Governance (in our case proxied by the Bloomberg Governance score). We examine the persistence trend for both and attempt to identify companies that generate positive alpha as well as show persistent high governance scores.

For the ROIC metrics,[30] we used our dataset of the 1,000 or so largest companies in the US with a top 30 percentile threshold to generate a persistence trend for 2014. In this case, we use a definition of at least x years persistence to define cohorts; for example, if x is 3, a company with three-year persistence will make the one-, two-, and three-year cohorts.

One clear finding of our analysis is a steady decrease in number of companies by about 12% across each cohort. We also note that the number of companies starts to reach similar levels as we increase the time period of the cohorts. We hypothesize that high ROIC companies in the final cohorts will tend to remain the same as our financial results suggests. And since we also find that the higher persistent cohorts do not add significant alpha, the sweet spot for long-term investors would seem to be in identifying the three-year cohorts, with the potential expectation that they will outperform during the next two or more years.

Similarly, we looked at the non-financial metric for corporate governance, as proxied for by the Bloomberg Governance score. (In this case, we used the same 30 percentile threshold but used the S&P 500 as our database given data constraints.) As can be seen in Figure 2, the numbers of companies in the four- and five-year cohorts stay the same, indicating that high quality companies tend to remain high quality. And so in the case of this metric, the sweet spot appears to be after the fourth year, since we can reasonably expect those companies to keep their high governance scores. This finding may also reflect the evolving (and sometimes suspect) quality of the data in the arena of ESG. Our aim here is just to illustrate how non-financial metrics can be helpful to complement financial data in identifying potential persistently high quality businesses.

Finally, we combined the two lists in terms of their most relevant datasets—that is, the three-year persistence cohort for ROIC and the four-year persistence cohort for governance. In so doing, we found 14 companies that meet both criteria (and are listed in Table 10).[31] We think of this list, or filtering an investment universe by a similar process, as providing a useful starting point for the search for quality companies.

That said, there appears to be a clear bias in our methods toward non-cyclical industries, with approximately one third of companies in the health care sector and another one third in the consumer staples sector (approximately two times and three times the respective market weights). While it's easy

30. For this exhibit, we form cohorts differently from section 2. In section 2, our cohorts (with the exception of the 1 year) were exact cohorts, i.e. 4 year meant 4 year persistence exactly. For this analysis, we create inclusive cohorts, i.e. the 4 year cohort includes the 4 and 5 year cohorts. Each cohort thus includes all the stocks of the cohorts that come after it. The reason for this methodology change is to illustrate the rate at which companies lose persistence.

Table 10 **Companies matching both criteria**

• Johnson & Johnson	• Hewlett-Packard Company
• Pfizer Inc.	• Northrop Grumman Corporation
• The Coca-Cola Company	• Dr Pepper Snapple Group, Inc.
• Pepsico, Inc.	• The Clorox Company
• Amgen, Inc.	• Wyndham Worldwide Corporation
• CVS Health Corporation	
• 3M Company	
• Biogen Inc.	
• Starbucks Corporation	

to see a potential industry or business model bias, as fundamental investors we would argue that this simply reflects the reality that certain business models are more attractive to long-term fundamental investors because the sustainable competitive advantages that drive high ROICs are more prevalent in businesses that are more reliant on the intangibles of brands and patents.[32]

Conclusion

"Quality" investing has been an area of increasing interest by academics. But the definitions of "quality" in most finance studies have been incomplete, limited by the "science" of ad hoc and sometimes conflicting financial metrics. At the same time, the "art" of making judgments on corporate culture, and intangibles more broadly—due in part to the challenges of measurement—has been underappreciated by academic finance.[33]

Nevertheless, practitioners of fundamental investing understand that the quality of culture and leadership matters, and the "science" of measurement can be brought to this "art." For example, a recent (2010) study by Alex Edmans showed that buying the Fortune 100 "Best Firms to Work For" has outperformed (while those which fall off the list underperform) market averages.[34] In the 1990s John Kotter's *Corporate Culture and Performance*, in the 2000s Jim Collins's *Good to Great*, and in the 2010s Laura Rittenhouse's *Investing Between the Lines* all attempt to put an empirical framework around the subjective and forward-looking aspects of culture and leadership. Given the general acceptance of "quality" investment approaches, how is it that widely admired "high quality" companies continue to outperform? Why is quality not fully valued by the market?

The short answer is that those investors with a relatively short-term focus tend to undervalue intangible assets—the kind that don't show up on corporate balance sheets, such as the payoffs from corporate R&D spending, advertising, and patent citations. History—in the form of consistently high returns by business value investors—has shown that investors (and managers) who take a long-term view have an opportunity to identify opportunities missed or underpriced by a world focused on a shorter time horizon. For this reason, we are encouraged that the developing area of ESG reporting will prove to be a useful tool for fundamental investors seeking a more robust assessment of quality. At the same time, we are confident that the "art" of high quality analysis will benefit from an expanded palette of data and, in so doing, reinforce the predictive power of the "science" of systematic analysis.

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31. Note this is for 2014 only and is limited by the S&P 500 dataset used for governance.

32. Hanson, Dan, "ESG Investing in Graham & Doddsville" (Summer 2013). *Journal of Applied Corporate Finance*, Vol. 25, Issue 3, pp. 20-31, 2013. Available at SSRN: http://ssrn.com/abstract=2371473.

33.Zingales et. al. (2013) note that "the finance literature has ignored the role corporate culture can play," despite the "incomplete contract" framework (Grossman and Hart, 1986) which posits that "values can play a role in ameliorating the inefficiencies created by the incompleteness in the contractual environment… [and] a company's financial choices have consequences on the corporate culture." This naturally links to the implications of ESG & CSR (corporate social responsibility) activities. Guiso, Luigi, Sapienza, Paola and Zingales, Luigi, "The Value of Corporate Culture" (September 1, 2013). Chicago Booth Research Paper No. 13-80; Fama-Miller Working Paper. Available at SSRN: http://ssrn.com/abstract=2353486.

34. Edmans, Alex, "Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices" (January 20, 2010). *Journal of Financial Economics* 101(3), 621-640, September 2011. Available at SSRN: http://ssrn.com/abstract=985735.

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