RAFIIndices™

Investment Principles of the RAFI Diversity & Governance Index

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Introduction

The RAFI™ Diversity & Governance Index series provides exposure to well-managed companies—as identified by measures of diversity, financial discipline, corporate governance, and stock volatility—while using the market-tested return engine of the Research Affiliates Fundamental Index™ (RAFI) methodology. The RAFI methodology avoids the return drag of market-capitalization weights and instead systematically rebalances to fundamental measures of company size (Arnott, Hsu, and Moore, 2005). The combination gives investors the potential for long-term excess returns, appealing risk characteristics, and portfolio constituents with attractive characteristics.

Good governance, low volatility, and financial discipline—the last being a relatively robust subset of what the factor-investing community refers to as "quality"—are all historically associated with well-managed companies. In certain cases, they are also associated with a history of outperformance. Diversity, however, is a relatively new dimension on which companies are assessed. Our understanding of why companies with greater diversity can be expected to have strong long-term *business* prospects is growing rapidly along with the size of the relevant academic literature. Nonetheless, given the currently unknown *investment* prospects of a "pure play" on diversity, investors are well advised to combine multiple signals of good firm management with the investment discipline of the RAFI methodology, as does the RAFI Diversity & Governance Index.

We wish to be explicit about an important point. Each component of the RAFI Diversity & Governance Index—from screening and tilting based on diversity to anchoring on fundamental weights—significantly contributes to a very compelling index design that, in our view, passed the stress test that capital markets dished out in the last quarter of 2018 (which happened to also be the index's first live quarter). As serious investors,

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however, we wish to acknowledge our varying degrees of confidence in each component's contribution to expected long-term outperformance:

- At the weaker end of our confidence spectrum, diversity and governance (according to traditional definitions) have academically robust links to improved corporate outcomes, but their contribution to investment returns is less consistently documented.
- In the middle of the spectrum, low volatility and financial discipline are part and parcel of the empirical factor literature and tend to be accepted sources of excess returns. Nevertheless, we believe valuations are critical to forming realistic forward-looking return expectations, even for otherwise-accepted return factors such as low volatility and financial discipline (Arnott et al., 2016).
- Finally, and unsurprisingly coming from RAFI Indices™, our confidence in the long-term structural excess returns of fundamentally weighted indices lies on the highest end of the spectrum. The core design of fundamentally weighted indices has been empirically tested in multiple regions, vetted in live applications for over a decade, and is consistent with best practices in quantitative asset management, especially as described by Arnott, Harvey, and Markowitz (2018).

What Investors Should Know About Diversity

Diversity is a word with many meanings, so it should not be surprising that a conversation about the benefits of diversity is multi-faceted. Research shows that cognitively diverse groups, which interact in a culture that embraces dissent, candor, and respect for other viewpoints (an inclusive culture), will tend to make better decisions. Indeed, the broad business case for diversity is quite compelling.

In general, cognitively diverse groups have higher levels of collective intelligence than nondiverse groups, resulting in greater creativity, innovation, and more effective corporate leadership. Alternatively, a lack of diversity can result in groupthink. When groupthink dominates a team's interactions, fewer questions are asked and prevailing notions may not be challenged. Andy Haldane, chief economist of the Bank of England, has gone as far to say that "Groupthink was the reason most banks—as well as many regulators, central banks, and academics—failed in 2008" (Cloney, 2019). Although an extreme example, and we can fairly conclude that multiple factors contributed to the financial crisis, it is reasonable to emphasize the business case for diversity in helping minimize the risks of groupthink.

The narrower investment case for diversity is less clear-cut, because empirical researchers lack the necessary data to determine whether a link exists between diversity and portfolio performance. Indeed, with the existing data, we can test the relationship between observable measures of diversity—specifically, gender diversity—and cross-sectional firm characteristics as Sherrerd, Treussard, and Wu (2018) examined the relationship between profitability and women on boards (**Exhibit 1**). We cannot conclusively test, however, whether more-diverse firms are better investments in a portfolio context; that is, whether diversity is a "factor." In other words, we do not know whether diversity attributes are priced in or if they should lead to otherwise unanticipated excess returns. In the meantime, investors who seek to promote diversity as a social choice as well as for its broad business benefits may prefer to rely on investment strategies that pair diversity with proven return-driving metrics in the pursuit of investment performance, as is done in the RAFI Diversity & Governance Index.[1]

1 This section is largely derived from Sherrerd, Treussard, and Wu (2018). Please see their article for a full treatment of the topic and a more complete set of references.

Exhibit 1. Average Profitability Rank Score by Quintile based on Percent of Women on Board

Region	Gender Quintile	Profitability			
		Operating Profitability	Return on Assets	Return on Equity	Average
United States	Top 20%	71%	61%	73%	68%
	Bottom 20%	58%	60%	58%	59%
Dev ex US	Top 20%	71%	68%	71%	70%
	Bottom 20%	60%	58%	56%	58%

Note: Vigeo diversity data available 2011–2017. The US sample includes 3,000 companies in the years 2011 and 2012, and roughly 3,800 companies in the years 2013–2017. The Developed ex US sample includes 6,800 companies in 2011, 10,000 companies in 2012, and roughly 12,500 companies in the years 2013–2017.
Source: Research Affiliates, LLC, based on data from Compustat, WorldScope, and Vigeo Iris.

How Governance Matters

Governance characteristics have long been used to pursue improved returns and reduced risk, in particular, headline risk. The academic literature provides solid, although sometimes indirect, reasons for this approach. For instance, Gombers, Ishii, and Metrick (2003) showed that companies with stronger corporate governance (as measured by strong shareholder rights) had higher firm value, higher profits, higher sales growth, lower capital expenditures, and made fewer corporate acquisitions than those with weak shareholder rights. A decade later, Bebchuk, Cohen, and Wang (2013) concluded that good governance appeared to be priced in. Whether this was the result of permanent learning on the part of market participants or a more temporary focus on good governance after the tech bubble crash seems open to debate, based on our research findings.

The RAFI Diversity & Governance Index takes a broad approach to assessing a company's governance strengths, considering both narrow corporate governance practices (e.g., board of director independence and audit and internal controls) and general business behavior (e.g., anti-competitive practices and responsible lobbying). In **Exhibit 2**, we review the investment performance and corporate attributes of companies in the developed markets. We separate these attributes into three portfolios by governance strength—the top 1/3, middle 1/3, and bottom 1/3—as measured over the 10-year period ending December 31, 2018. Each hypothetical portfolio is weighted by market capitalization to isolate the impact of governance.[2]

We find the top tier by governance is dominated by larger firms (i.e., the small-minus-big, or SMB, loading was significantly negative) that pay out a relatively high dividend and have more-conservative investment policies (i.e., the conservative-minus-aggressive, or CMA, loading was positive). In other words, these are well-managed blue-chip companies.

2 The three governance portfolios were constructed by ranking the RAFI developed-markets starting universe by governance rating from highest to lowest as determined by Vigeo Eiris. The top 33% of companies by market capitalization were selected for the "Top 1/3 by Governance" portfolio. The next 33% of companies by market capitalization were selected for the "Middle 1/3 by Governance" portfolio. The bottom 33% of companies by market capitalization constitute the "Bottom 1/3 by Governance" portfolio. The portfolios were cap-weighted and reconstituted on an annual basis at the beginning of each year.

Exhibit 2. Performance and Characteristics by Governance: Developed Large + Mid, Jan 2009–Dec 2018

Strategy	Absolute Performance			Relative Performance			Factor Regression								
	Return	Vol	Sharpe Ratio	Value-Add	TE	IR	Alpha	Alpha (*t*-stat)	Mkt_RF	SMB	HML	RMW	CMA	WML	BAB
Top 1/3 by Governance	10.00%	15.5%	0.63	–0.45%	2.25%	–0.20	–0.98%	–1.26	1.07	–0.23	0.01	0.01	0.13	–0.10	0.04
Middle 1/3 by Governance	11.76%	15.0%	0.77	1.31%	2.17%	0.61	1.42%	1.53	1.01	–0.20	0.05	0.11	–0.07	0.04	–0.04
Bottom 1/3 by Governance	8.53%	13.9%	0.59	–1.91%	4.55%	–0.42	–1.03%	–0.67	1.01	0.13	0.15	–0.21	–0.34	–0.02	0.20
Cap-Weighted Simulation	10.45%	14.7%	0.69												

Strategy	Average P/B	Average P/E	Average Dividend Yield	Current P/B	Current P/E	Current Dividend Yield
Top 1/3 by Governance	2.03	16.14	3.19%	2.17	17.36	3.17%
Middle 1/3 by Governance	2.41	17.44	2.38%	2.96	20.25	2.02%
Bottom 1/3 by Governance	1.76	16.86	2.05%	1.85	16.36	1.65%
Cap-Weighted Simulation	2.09	16.72	2.63%	2.31	18.07	2.42%

Notes: Return, volatility, and alpha are annualized. The factor regression includes Beta (Mkt_Rf), Size (SMB), Value (HML), Profitability (RMW), Investment (CMA), Momentum (WML) and Low Beta (BAB). All strategies displayed are simulated. Please see important disclosures at end of paper. Cap-weighted simulation includes the top 86% of the region measured by cumulative market capitalization. The strategy is reconstituted at the end of each year.
Source: Research Affiliates, LLC, based on data from Worldscope, Datastream, and Vigeo Eiris.

In contrast, the bottom-tier companies by governance are dominated by smaller and more cheaply valued firms based on their SMB and high-minus-low, or HML, loadings, respectively. These companies tend to pay limited dividends and make aggressive corporate investments, having significant loadings on CMA; in other words, these companies could be considered "junk."

Over the last decade, the top-tier companies outperformed the bottom-tier companies by nearly 1.5% a year. Interestingly, both the top and bottom tiers underperformed the cap-weighted benchmark (and the middle tier). *Ex post facto* this finding is unsurprising (as most things tend to be!), but nevertheless bodes well for strong-governance companies going forward. Indeed, the middle-tier companies were comparatively high-profitability (based on their robust-minus-weak, or RMW, loading) and high-momentum (based on their winners-minus-losers, or WML, loading) growth stocks with higher valuations. During the study period, these mid-tier firms had a higher average (17.44) and current (20.25) price-to-earnings (P/E) ratio than both the top- and bottom-tier firms and could be described as "market darlings." We can infer that better-run and more-conservative companies (i.e., the top-tier companies with lower relative valuations) should have an advantage in capital markets when investors refocus their attention on stock prices and away from empire-building growth stories which fuel positive, persistent increases in stock prices.

Finally, recent data do not confirm a volatility reduction from good governance alone. Therefore, investors with a preference for lower risk may choose to incorporate low volatility as well—again, as the RAFI Diversity & Governance Index does.

The Low-Volatility Factor

As noted previously, the objective of the RAFI Diversity & Governance Index is to invest in well-managed companies (measured on the dimensions of diversity and financial discipline) while controlling for downside risk and headline risk. Headline risk is limited through the addition of the governance criterion and downside risk is limited by considering volatility.

The historical record strongly supports the low-volatility effect, as first identified by Haugen and Heins (1975). Several theories provide narratives for low-volatility stocks outperforming high-volatility stocks. Baker, Bradley, and Wurgler (2011) motivate the low-volatility "anomaly" (labeled as such because it defies the efficient market hypothesis) by positing a preference investors have for skewness, or more simply put, a preference for gambling. The capital asset pricing model (CAPM) theorizes that investors should expect a higher return for holding a riskier stock and also assumes investors are rational and risk averse. In practice, investors have shown a willingness to experience a small finite loss (i.e., the price paid for a stock) for the possibility of receiving an abnormally high return. Thus, in theory, the demand for high-volatility stocks results in their having higher valuations and lower forward-looking returns when compared to low-volatility stocks.

Brennan, Cheng, and Li (2012) offer another theory to explain the low-volatility effect in the data. They suggest that given the high tracking error of low-volatility strategies, arbitraging it away is very difficult due to benchmark constraints. **Exhibit 3** illustrates the performance, volatility, Sharpe ratio, and tracking error of simulated minimum-variance and low-volatility portfolios in the US, developed, and emerging markets. Low-volatility strategies tend to have high tracking error relative to the capitalization-weighted benchmark, ranging from 6% to 10%. Many institutional portfolio managers are prohibited from investing in low-volatility strategies in large scale because of the tracking error constraints imposed upon them in their strategies' investment policy statement. Alternatively, managers may seek to avoid maverick risk and instead "hug the benchmark" to avoid any significant short-term underperformance.

Given the increase in popularity of low-volatility investing after the global financial crisis, some investors have expressed concern that the low-volatility effect will not persist. Rising valuations of low-volatility investment strategies have resulted in lower forward-looking returns. As illustrated by the Research Affiliates Smart Beta Interactive (SBI) tool on the Research Affiliates homepage, at year-end 2018, minimum-variance strategies in the US, developed, and emerging markets are trading at historically high relative valuations relative to the cap-weighted benchmark. These "pure low volatility" strategies have forward-looking expected five-year excess returns between –1.0% and –1.3%. Over the long term, however, we reasonably expect low-volatility investing to provide downside protection and attractive results on a risk-adjusted basis.

Exhibit 3. Simulated Low Volatility Performance

	Annualized Return	Annualized Volatility	Sharpe Ratio	Tracking Error
United States (1968–2017)				
Minimum Variance	11.37%	13.16%	0.50	5.58%
Low Volatility	11.29%	11.91%	0.55	9.02%
Cap-Weighted Benchmark	10.31%	15.17%	0.36	
Developed (1989–2017)				
Minimum Variance	8.24%	11.14%	0.47	6.66%
Low Volatility	10.34%	9.61%	0.77	9.95%
Cap-Weighted Benchmark	7.44%	14.86%	0.30	
Emerging Markets (2001–2017)				
Minimum Variance	14.48%	17.69%	0.74	6.77%
Low Volatility	14.83%	16.06%	0.84	8.63%
Cap-Weighted Benchmark	15.65%	21.68%	0.66	

Source: Research Affiliates, LLC, based on data from Worldscope and Datastream.

Financial Discipline: A Factor That Favors Well-Managed Firms

To state the obvious, companies that prioritize short-term gains, which benefit the firm's management team over the long-term success of shareholders, fail to meet the most basic requirements of good management and instead chip away at shareholder value. The RAFI Diversity & Governance Index defines financial discipline as a company's ability to put long-term firm value ahead of short-term "wins" for management.

Consistent with Hsu, Kalesnik, and Kose (2019), the RAFI Diversity & Governance Index uses the following four robust and complementary historical sources of risk-adjusted returns which speak directly to good long-term firm management:

High Profitability. Empirical analysis shows an historical return premium is associated with corporate profitability, measured by metrics such as operating profitability, return on equity, and return on assets. Novy-Marx (2013) proposed that the so-called profitability anomaly results from investors' limited attention, a form of cognitive and behavioral bias.

Low Investment. Discipline in avoiding superfluous corporate investments is a key positive attribute from the perspective of good governance and is associated with superior performance, particularly when it comes to highly profitable companies. For instance, Brightman, Clements, and Kalesnik (2017) studied "sustainable" businesses, those companies with the discipline to return earnings to investors in the absence of attractive net-present-value (NPV) projects. In contrast, "unsustainable" companies, such as Compaq and Yahoo in recent decades, tend to fuel aggressive noncore investments with excessive stock and debt issuance coincident with the height of their profitability. Eventually such companies' bottom lines suffer from ill-conceived business expansions, and their shareholders pay the price.[3]

Low Issuance. Empirical studies consistently document a negative relationship between high net stock issuance and subsequent stock performance. The exact causality has not been isolated in the extant literature, although experience suggests firms that are issuing extra shares may either possess private information about their stock price's near-term overvaluation or, as just described, are issuing shares and debt to finance poor-NPV projects.

Low Accounting Accruals. Poor governance can manifest itself in the form of high accounting accruals. A high level of accruals can indicate that the firm's leadership may be engaging in "short-termist" earnings management by booking sales aggressively with no certainty that cash revenue will materialize. A number of studies have found that differences between reported and actual profits, as indicated by net operating assets and accruals, predict lower subsequent returns.[4]

3 Roll (1986) argued that managers' hubris and tendency to engage in empire building for its own sake (and their private benefit) leads to a firm's aggressive investment, often accompanied by disappointing subsequent outcomes.

4 This section is largely derived from Li, Sherrerd, and Treussard (2018). Please see their article for a more complete exposition and set of references to the relevant academic literature.

The Fundamental Index: An Index Chassis for Long-Term Outperformance

The RAFI Diversity & Governance Index combines measures of diversity, governance, financial discipline, and low volatility with the proven return engine of the RAFI methodology, which relies on fundamental measures of a company's size (de-levered sales, cash flow, dividends + buybacks, and book value) to determine index weights. The RAFI methodology is a market-tested return engine, which we view as a key component in the index's ability to generate returns. Most ESG and diversity indices apply tilts to a market-capitalization baseline, which links portfolio weights with stock prices, thus systematically overweighting the most overvalued securities and underweighting the most undervalued securities. In markets that are not completely efficient and that exhibit long-term mean reversion (i.e., the real world), this inherent bias results in performance drag over time.

The RAFI fundamental weights act as stable rebalancing anchors, systematically rebalancing into stocks that have fallen in price and rebalancing out of stocks that have become expensive. Built on the principles of contrarian investing and disciplined rebalancing, the methodology has been shown to outperform traditional cap-weighted benchmarks by approximately 1.5% to 2.0% a year over a full market cycle (Arnott, Hsu, and Moore, 2005).

Although any one measure of company size has the potential to outperform capitalization weighting on its own, as illustrated in **Exhibit 4**, the RAFI methodology uses an average weight of all four metrics to smooth out biases. For example, an index weighted by sales would favor companies with large sales, but possibly thin margins, and an index weighted by dividends would fail to allocate to growth companies that are not paying a dividend at the time of rebalancing. Using the four-measure average paints a more complete picture of a company's size in the economy. Moreover, there is no statistical evidence that the best performing metric in one period will be the best performing one in another period, lending additional value to our approach, intentionally not chasing data-mined and illusory advantages.

Exhibit 4. Performance of Non-Price Weighting Metrics

1997–2018	Return %	Volatility %	Tracking Error %
MSCI ACWI	6.5	15.2	—
Equal Weight	8.2	16.3	5.2
Adjusted Sales	10.1	14.9	4.2
Cash Flow	9.6	15.6	3.8
Dividends + Buybacks	9.5	14.7	4.4
Book Value	8.7	16.4	4.4
RAFI Fundamental Composite	9.5	15.3	3.9

Note: For the period 12/31/1997–12/31/2018, return, volatility, and tracking error are annualized. Equal Weight is a simulated index that equal weights the top 3,000 global equities and rebalances annually. The index data published herein is simulated. Please see important information at the end of this white paper regarding simulated data.
Source: Research Affiliates, LLC, based on data from CRSP/CompuStat, and FactSet.

A Fortuitous Out-Of-Sample Stress Test

The last three months of 2018 reminded investors that market declines can quickly snowball and rattle even the most experienced of investors. The RAFI Diversity & Governance Index is purposefully designed, buoyed by an emphasis on high quality and fairly valued companies, to achieve relatively robust performance in challenging market environments such as those we have just witnessed. For empirically curious students of markets, Q4 2018 and Q1 2019 have provided a real-world trial of the index design's performance. Results are reported in **Exhibit 5**.

During the difficult bear market in Q4 2018, the RAFI Diversity & Governance Index outperformed in the United States, Europe, and developed regions. In the Q1 2019 recovery that followed, the index lagged in all three regions. Despite not keeping pace with their respective benchmarks during the recovery, RAFI Diversity & Governance Indices earned positive excess returns over the full period in two of the three regions. Although only a short time frame, this window provides a helpful insight into how the indices should be expected to perform in varying market environments. This knowledge may be of particular value to investors as they position themselves for a potential recurrence of the challenges that drove market dynamics at the end of 2018.

The full simulated history in the official backtest, reported in Exhibit 4, shows comparable results. Over the trailing four-year period ending March 31, 2019, two of the three indices—RAFI Diversity & Governance Developed Index and RAFI Diversity & Governance US Index—performed similarly to the market-cap index. The RAFI Diversity & Governance Europe Index, however, outperformed MSCI Europe by over 100 basis points. Although quite a bit longer than two quarters, four years is still a very short time frame to draw any definitive conclusions, particularly when markets have been dominated by raging bull markets led by high-momentum growth stocks with high (and rising) valuations. Nonetheless, each index produced solid risk-adjusted returns. These results are consistent with what we would expect from an index that invests in well-managed companies with limited downside risk and headline risk, and that is driven by the return-enhancing engine of fundamental weighting.

To learn more about the RAFI Diversity & Governance Index series, please visit https://www.rafi.com/investor-support/esg-investing

Exhibit 5. RAFI Diversity & Governance Index Performance Summary

Index	9/30/18–12/31/18	12/31/18–3/31/19	Full Period	Full History (4/30/15–3/31/19) Annualized Return	Standard Deviation	Sharpe Ratio	Tracking Error
Developed							
RAFI Diversity & Governance Developed	–11.44%	9.88%	–2.69%	7.45%	10.76%	0.61	2.0%
MSCI World	–13.31%	12.65%	–2.35%	7.57%	11.59%	0.58	
Europe							
RAFI Diversity & Governance Europe	–11.13%	9.30%	–2.87%	4.26%	12.43%	0.27	2.1%
MSCI Europe	–12.68%	11.00%	–3.07%	3.20%	13.03%	0.18	
United States							
RAFI Diversity & Governance US	–11.25%	11.39%	–1.14%	10.17%	11.00%	0.84	2.8%
S&P 500	–13.52%	13.65%	–1.72%	10.46%	11.74%	0.81	

Source: Research Affiliates, LLC, based on data from FactSet.

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