

Measuring the Risk Impact of Social Screening

By Patrick Geddes, MBA

Since the nineteenth century investors have incorporated social or ethical values into their portfolios, an approach described over time with such labels as SRI (socially responsible investing), ESG (environmental, social, governance), or MRI (mission-related investing). Among investment professionals a contentious debate rages as to whether SRI is a well-intentioned effort doomed to suffer a performance penalty or a viable alternative with the potential for alpha due to screening based on the assumption that such screening will be rewarded in the market. The performance debate has been covered in other research;¹ this article focuses on the measurement of risk introduced by SRI screening for public equities. For simplicity, the term SRI is used as the term for screened investing in general, with ESG used as a term for the specific environmental, social, and governance issues screened.

Introducing more rigorous risk measurement may surprise both sides of this debate. SRI skeptics may be disappointed to learn that in certain cases the impact of screening on risk and return is almost nonexistent, and the more idealistic SRI advocates may be disappointed to learn that intense screening actually can be quite costly in terms of the incremental risk introduced. In the future, this debate would be much improved if any arguments for or against SRI were to include the proper risk metrics.

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Part of the problem inherent in the debate about SRI lies in the combining of two different goals: investors' financial goals and the ethical, moral, or religious goals they seek to achieve through their portfolios. In skeptics' dismissive arguments as well as advocates' passionate defense, these goals often are improperly synthesized and left unreconciled. Like contentious politicians, both sides selectively emphasize limited data without addressing the true impact of the trade-offs inherent in applying ESG screens. The best way to understand SRI lies in combining ESG issues with quantitative risk metrics. This article begins by defining these items separately, first within the process of how companies get screened and then within the process of measuring and managing incremental portfolio risk introduced by screening. After carefully defining both components,

the two are combined in an example to demonstrate the proper synthesis.

Investment vs. Expressive Utility

SRI investors seek to satisfy two different types of utility—investment and expressive, as defined in table 1. Investment utility reflects all of the trade-offs any investor faces between risk and return integral to modern portfolio theory, i.e., achieving the highest return at the lowest level of risk. Expressive utility, a term coined by behavioral finance researcher Meir Statman, describes investors' benefit from the expression of their ethical values (Statman 2007). The challenge for investment professionals lies in successfully incorporating both utilities into a portfolio. Advisors, like their clients, may face conflicting goals in that they often must act in a fiduciary sense to optimize investment utility while

TABLE 1: INVESTMENT AND EXPRESSIVE UTILITY

	Goal	Metrics	Advisor's Concern
Investment Utility	Maximize risk-adjusted return	Beta, alpha, Sharpe ratio	Fiduciary risk: ensure investment is prudent
Expressive Utility	Align portfolio with ethical values	Objective data on corporate behavior	Relationship risk: ensure client needs get served

simultaneously making SRI clients feel as though their values matter and can be included in a portfolio as long as the effect on risk and return, if any, is well understood. Advisors often have felt squeezed between a rock and a hard place in that they may view all SRI investing as harmful tinkering with a portfolio. On the other hand, they can't tell clients that it's silly to want to incorporate values in a portfolio—at least not if they want to keep them as clients.

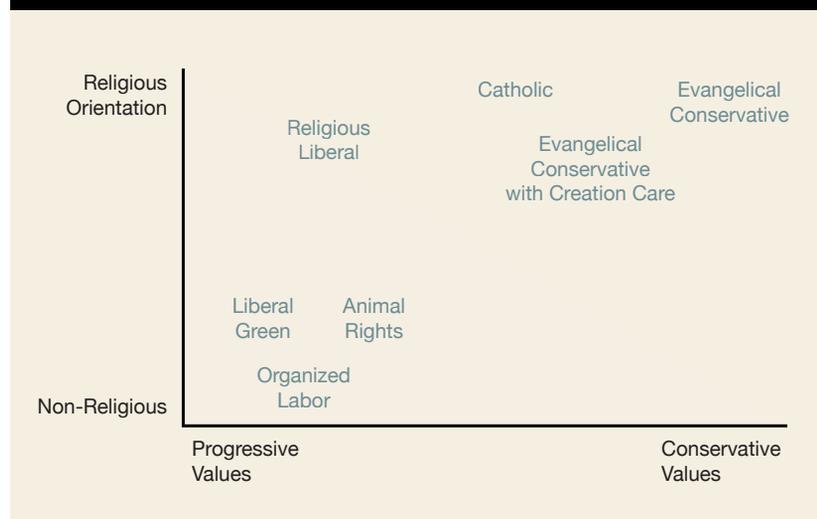
Expressive utility may seem like an emotions-driven exercise because the measurement of whether a portfolio “feels right” to a values-driven investor is so subjective. However, such an emotions-driven decision is effectively no different from the risk-return trade-off integral to creating optimal portfolios, i.e., investors are supposed to know when the level of risk “feels right” in terms of the loss they might face across different levels on a risk-return efficient frontier. To make the process of the risk-return trade-off work for investors, investment professionals use risk-adjusted return measurements such as the Sharpe ratio to determine if the incremental return offered in a portfolio justifies the additional risk borne. Below we introduce the equivalent metrics for SRI.

ESG Screening

While SRI can be incorporated into almost all asset classes, this article focuses exclusively on public equities, where investors can apply the following four different ways to align their portfolios to their values:

1. Negative screens, e.g., excluding tobacco producers
2. Positive screens, such as overweighting the companies with the best human rights records or emphasizing investments in environmentally sustainable practices or products, i.e., selecting the “best in breed,” or impact investing
3. Proxy voting to ensure that shareholder resolutions reflect an investor's values
4. Corporate activism to engage or lobby companies to influence them directly for positive change

FIGURE 1: RANGE OF BELIEF SYSTEMS



The first two can affect portfolio risk because they can change the composition of the universe of available stocks. The last two incorporate ethical values but do not generally affect risk. Many committed SRI investors believe that much of the value of ethical investing derives from proxy voting or activism, but those issues do not affect risk directly and thus are not addressed here.

For well-diversified portfolios of public equities, screening requires some sort of ESG research across a wide range of companies. While a great deal of ESG research has been available for many years, the breadth and sophistication of the research databases available has grown significantly in the past few years. A wide range of ESG issues is identified and cataloged by a number of research firms worldwide such as MSCI (which acquired KLD in 2010), Bloomberg, IW Financial, Sustainalytics, EIRIS, and Asset4 from Thomson Reuters. Some of these firms simply aggregate data from governmental, company, and other objective sources, while some provide interpretation and recommendation. These firms now offer the capability of rating U.S. and international companies according to a variety of ethical belief systems including environmental sustainability, conservative Christian values, corporate governance, labor practices, human rights, and animal rights.

These vendors offer in-depth statistics and data about the ESG issues germane to each belief system. In addition, data are available about companies' involvement in businesses such as tobacco, alcohol, and weapons. Data originate with governmental providers such as the U.S. Environmental Protection Agency (EPA) or the U.S. Department of Labor as well as directly from company filings with the Securities and Exchange Commission and other objective sources. These vendors provide databases that can be used to screen a large number of companies across many different ESG belief systems, which greatly reduces the time and cost of investment firms doing their own ESG research. These databases allow for all companies in broad benchmarks such as the Russell 3000 to be covered, which in turn allows for a broadly diversified investment strategy. Data about other areas of concern to issue-specific SRI investors may come directly from advocacy groups, such as the list of companies deemed unnecessarily cruel to animals as defined by People for the Ethical Treatment of Animals (PETA). However, the broad databases allow for a wide range of values to be incorporated into portfolios efficiently, thus offering SRI investors flexibility and economies of scale beyond what was available in the recent past.

Belief Systems and ESG Issues

SRI investors bring a bewildering variety of passions and preferences to the investment process. Figure 1 shows the range of beliefs from the progressive and conservative sides of the political spectrum (horizontal axis) as well as religious and non-religious viewpoints (vertical axis) that can be incorporated.

Each belief system focuses on a particular ESG issue or series of issues of particular concern, such as contraceptive manufacturing for a portfolio screened for Catholic values. The list in table 2 divides screens into two general categories: issues that typically are addressed through negative screens and issues that can be addressed through positive screens. The stocks that investors want to exclude through negative screens are generally more straightforward, because it's not complicated to determine whether or not a firm manufactures, for instance, tobacco. The level of involvement of course can vary, such as firms that may have a smaller sales component from adult entertainment, e.g., hotel operator Marriott International Inc.'s revenue from pay-per-view pornography versus companies that are clearly in the pornography business and derive a significant revenue percentage from it, such as Playboy Enterprises before it went private in 2011.

Positive screening can present a more nuanced challenge, because there are many different ways to score and rate companies on their records and policies. For example, environmental screening (one of the most-popular screening issues—remember the “E” in ESG stands for environmental), involves many different ways of rating firms in terms of their impact on the planet. One screening system might use “best in class” scoring to highlight coal mining companies with the most sustainable practices—a type of positive screen. Positive screening means simply that each company is scored on a sliding scale. Alternatively, investors may implement a more absolute approach that shuns all coal companies to support a belief that the whole industry is disas-

trous for the planet—a negative screen. Negative screening rates each company as either included or excluded, with no middle ground. Technically any issue can be implemented as either a positive or negative screen, but table 2 shows common investor preferences.

How do passionate investors identify clearly which of these issues they want reflected in their investments, and how do their advisors convert those preferences into portfolios? We divide the process into two steps: 1) ascertaining which ESG issues matter to the investor (“the social conversation”) and 2) then constructing a portfolio that incorporates those issues while minimizing tracking error (see figure 2).

Step #1: The Social Conversation

Wealth managers and SRI money managers often use questionnaires about all the available issues, such as those in table 2, to help investors articulate and clarify their preferences. Investors can identify which issues matter and how intensely they care, such as a mild preference for negative screening on tobacco and a strong preference for positive environmental screening. This “social conversation”

allows an advisor in effect to convert a nonquantitative belief system to quantitative exclusions or scores. Many SRI investors may have a general sense of their preferences but remain unclear on exactly how to define them, e.g., “I want a more environmentally sound portfolio, but I’m not sure exactly how to implement such a goal.” The social conversation serves three purposes: 1) it identifies the specific issues about which the investor is passionate, 2) it sets the level of intensity for each issue, and 3) it clarifies which data are available from ESG research providers or other sources.

These values questionnaires don’t necessarily provide all the answers regarding an investor’s preferences, but they can be helpful to investment advisors in determining goals. Values questionnaires function analogously to risk tolerance questionnaires that attempt to gauge an investor’s ability to withstand significant drops in a portfolio’s value. Skeptics of SRI investing often point out that the definition of what’s socially or environmentally responsible varies, which indeed reflects the reality of so many belief systems. However, the availability of a wide range of ESG data

TABLE 2: COMMON SCREENS

Common Exclusions (negative screens)	Common Scoring (positive screens)
Adult Entertainment Alcohol Animal Testing Firearms and Weapons Gambling Life/Choice and Stem Cell Research Nuclear Power Tobacco	Board Diversity/Employee Policies Environmental Impact Human Rights Labor Relations Corporate Governance

FIGURE 2: STEPS TO CREATE CUSTOM SRI PORTFOLIOS



TABLE 3: EXAMPLE OF A COMPANY SCORE

Issue	DuPont Score*
Environmental Score	9
Corporate Governance Score	80
Overall Score (50% weighting to each score)	45

*Based on a scale of 1–100, with 1 the worst and 100 the best. For example, the chemical company with the lowest quantity of pollutants per million dollars of revenue would score 100; DuPont scored only 9.
Source statistics: IW Financial

allows investors to define their preferences, and in the section on portfolio construction below we focus on how those values get incorporated into a customized portfolio.

Let's examine an example of a basic scoring scheme for positive screening following a simplified social conversation. Assume that an investor studies all the screens in table 2 and determines that the two issues that matter are environmental impact and corporate governance. Based on data from IW Financial's SRI screening database, we look at how the process might score a company such as DuPont based on our investor's specific preferences. Against other chemical companies, DuPont scores fairly poorly on its environmental record based on data from the EPA such as pollution emitted per million dollars of revenue. However, based on publicly available data about DuPont's corporate governance such as its shareholder protections, board voting, and compensation, the company scores relatively well compared to other chemical companies. Finally, we assume that this particular SRI investor feels equal passion about a company's environmental policies and its corporate governance. Thus if we weight the two issues equally, we get an overall score that's middling, reflecting the offsetting effects of a good governance score and a poor environmental score, as judged by our hypothetical investor.

Table 3 shows that for this example DuPont nets a single score of 45. This process would be applied similarly to all stocks in a universe, say the Russell 3000 for a U.S. stock portfolio. Thus the numeric output for Step 1 is a comprehensive list of scores, one per company, customized to the investor's values. Next we turn to Step 2 and see how screening affects tracking error.

Step #2: Constructing a Portfolio to Minimize Tracking Error

"What is the performance penalty faced by SRI investors for including their values in a portfolio?" is usually the key question about SRI. But the research data on returns support neither a penalty nor a benefit. Like most performance studies, the results are far less conclusive than we would prefer (UNEP and Mercer 2007).

Instead of focusing on returns, however, we address instead the impact of screening on risk. This can be measured and predicted more reliably than returns, although it's returns that investors care about most. Given that the studies on SRI are inconclusive regarding a return penalty, the question becomes far more effective when rephrased as, "What is the risk penalty for SRI screening?"

To isolate the impact of screening on risk for a U.S. stock portfolio, we start with the Russell 3000—a standard U.S. market index—as a benchmark for comparison. Then as we introduce screening, we measure how far from the benchmark various SRI strategies deviate. To measure that difference, we use the Barra Aegis multi-factor model that measures stock risk across fundamental and industry factors. The model generates a forecast for tracking error, which is the statistical measurement of deviation from a target benchmark.² Tracking error is analogous to the concept of darts thrown at a dartboard, where the bull's-eye is the benchmark return and the measurement of the dispersion of dart throws around the bull's-eye is the tracking error. A small or tight tracking error means the darts are clustered around the bull's-eye and a large or loose tracking error means the darts are all over the board.

The Barra Aegis model generates a forecast tracking error representing an estimate of standard deviation of a particular portfolio versus a benchmark. For the U.S. market, Barra Aegis uses a total of sixty-eight factors to estimate the tracking error: thirteen fundamental factors such as price-to-earnings ratio, market capitalization, leverage, and dividend yield as well as fifty-five industry factors. While the examples discussed in this section are all domestic benchmarks, the exact same methodology can be applied to foreign or global stock benchmarks such as the MSCI EAFE or the MSCI All Country World.

Milevsky et al. (2006) and Jennings (2007) have explored the technical issues of using multi-factor equity models and an optimizer to incorporate SRI screening. Milevsky et al. (2006) posits that statistical optimization allows SRI investors to achieve virtually the same level of diversification by finding substitutes so that a portfolio "can maintain a statistically indistinguishable level of diversification while incorporating corporate social responsibility based screens and constraints on portfolio holdings." Following a similar goal of minimizing tracking error and the impact on diversification, in this paper we use the Barra Aegis multi-factor model and optimizer to squeeze out all possible tracking error, thus assuring the optimal level of minimized unsystematic risk. In a similar vein, Jennings (2007) proposes using a multi-factor model to eliminate unnecessary tracking error, labeling such an approach as "socially enhanced indexing."

Optimizing an SRI portfolio in this fashion minimizes the tracking error to the lowest possible level given the SRI constraints defined in the social conversation. This method allows for optimal risk because this type of model compensates for any factor tilts introduced by the SRI constraints. For example, traditionally progressive SRI portfolios such as the KLD 400 (previously tracked by the Domini Social Equity mutual fund) often have introduced growth tilts because they tend to overweight sectors such as technology

TABLE 4: EXAMPLES OF IMPACT OF SCREENING ON RISK

Value Set	Screens	Tracking Error vs. Russell 3000	# of Stocks Excluded
Animal Rights	Avoid nonpharmaceutical testing, factory farming, fur production	0.59%	273
Catholic	Avoid abortion, contraception, stem cell research, pornography, nuclear weapons, tobacco, alcohol, gambling	0.57%	116
Environmental	Positive screening	0.85%	0
Tobacco	Avoid tobacco	0.50%	8
Corporate Governance	Positive screening	0.85%	0
Nonviolence Pragmatic	Avoid weapons	0.41%	61
Nonviolence Idealistic	Avoid companies contracting with Department of Defense	2.84%	853

Sources: IW Financial for screening and Barra Aegis for risk forecasts

and underweight value sectors such as energy. Those tilts are unavoidable because any constraints will shift a portfolio off of its benchmark. However, a multi-factor optimizer can minimize the risk impact of the tilts, leaving the investor with a portfolio that incorporates the desired values while at the same time introducing the smallest possible amount of risk.

Using a multi-factor model and an optimizer allows measurement as well as management of the risk impact of screening. These tools can change the opinionated debate around SRI by grounding it in an objective metric straight from classic portfolio theory. Each particular set of beliefs or values brought to the investment process by an SRI investor can thus be “priced” in terms of the minimum incremental increase in risk due to tracking error. In other words, different value screens cause different levels of tracking error.

Table 4 shows tracking errors for a range of issues including religious, non-religious, conservative, and progressive values. After all, “socially responsible” means different things to different investors, which is why measuring the risk impact of all the different screens is critical.

What can we conclude from these examples? For one thing, single-issue screens often can be quite inexpensive in terms of additional tracking error. However, the intensity of interpretation of values matters greatly, as can be seen in the Nonviolence Pragmatic and Nonviolence Idealistic examples. Both reflect the same belief system, but

the screening bar is set much higher for Nonviolence Idealistic. Thus it’s both the nature and intensity of a set of values that drives the impact on risk. In the example of Nonviolence Idealistic, many more companies get rejected (e.g., Kraft Foods Inc. gets thrown out because it sells cheese and other products to the military).

Some issues just don’t affect tracking error much. One example is tobacco, which has very few publicly traded firms. Skeptics enjoy pointing out that excluding certain tobacco manufacturers has harmed returns over certain periods, taking that as proof that screening is just a tax on investing. However, cherry-picking the data with one example against SRI is as indefensible as picking a short period when certain screened portfolios have outperformed to prove that SRI can create alpha. Instead, emphasizing tracking error as estimated by a multi-factor model allows investors to understand both 1) the magnitude of the factor bets or style tilts inherent in SRI screening and 2) which factor bets are created by the screening process, e.g., a growth tilt or underweight in a particular industry.

Historically many investors have presumed that SRI screening introduces a growth tilt, and this has been the case for certain liberal or progressive screening strategies. However, more conservative faith-based screening may introduce value tilts, so the direction and magnitude of factor tilts depend on the specific belief system and intensity with which it is applied to a portfolio (Kurtz and diBartolomeo 2011).

What Does Additional Tracking Error Cost the Investor?

If investors are to decide whether a tracking error of 0.41 percent to exclude weapons manufacturers is reasonable or excessive, they need some context for what that number implies. First, tracking error has an expected value of zero, meaning that in a passive management framework a portfolio’s return is just as likely to be above the benchmark as below. Second, the average expected tracking error for institutional active management is 5.0 percent according to a survey of large U.S. pension funds,³ which means that investors already bear comparatively significant tracking error with their active managers. Third, recall that standard deviation is the square-root of variance, so the standard-deviation estimate of tracking error cannot be simply added to overall portfolio risk (see table 5). In other words, if the total market’s risk is 21.67 percent (the Barra Aegis forecast standard deviation for the Russell 3000 as of July 31, 2011), the portfolio risk does not rise by another 0.41 percent to 22.08 percent. Instead, the impact of screening on absolute portfolio risk must be calculated using variance terms.

As table 5 shows, adding 0.41 percent of tracking error increases absolute portfolio risk by only 0.0039 percent, or less than one-half of one one-hundredth of a percent. In other words, the portfolio does become riskier, but by such a trivial amount that it’s basically an irrelevant impact on risk. However, investors technically are bearing additional risk for which they are not com-

TABLE 5: SRI PORTFOLIO WITH LOW TRACKING ERROR, E.G., NONVIOLENCE PRAGMATIC

	Standard Deviation	Variance = (Std. Dev.) ²	Theoretical Return Penalty
Market Risk (Russell 3000)	21.6700%	4.6959%	
Tracking Error	0.4100%	0.0017%	
Combined (SRI) Portfolio	21.6739%	4.6976%	
Incremental Risk	0.0039%		0.0013%

Note: We can convert the uncompensated risk to a theoretical return penalty by using a simplified historical risk premium. Based on S&P 500 returns and risk (as a proxy for the market) from January 1926 to June 2011, we find a total market annual return of 9.88 percent versus T-bills over the same period of 3.60 percent for an excess return of 6.29 percent.⁴ From the same data set, the S&P 500 has had an annualized standard deviation of 19.14 percent, giving a simplified market Sharpe ratio of 0.33, calculated as follows: Market Sharpe ratio = $(r_m - r_f) / \sigma_m$, where r_m is return on market, r_f is risk-free rate, and σ_m is the risk of the market as measured by standard deviation. The simplified historical market Sharpe ratio is calculated as follows: $(9.88\% - 3.60\%) / 19.14\% = 0.33$. The theoretical return penalty in the table above is calculated as follows: 0.0039% incremental standard deviation times a Sharpe ratio of 0.33 equals 0.0013%, or slightly more than one-tenth of a basis point in theoretical foregone return. In other words, the impact on return, according to standard portfolio theory, is virtually nonexistent.

compensated. (An SRI investor may believe in the alpha potential from screening, but overall the research on returns does not support the existence of positive alpha any more than it supports negative alpha due to SRI screening.)

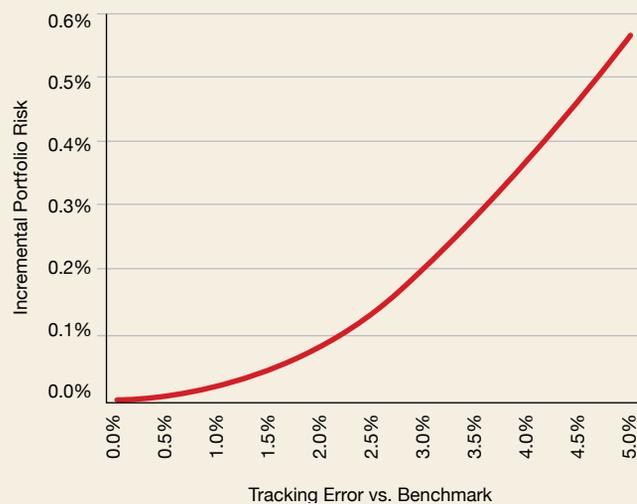
Now let's turn to an example of the Nonviolence Idealistic screen, which requires no investment in firms doing business with the U.S. Department of Defense. As described in table 4, the tracking error versus the Russell 3000 for Nonviolence Idealistic is 2.84 percent, which introduces significantly more risk penalty to the screening than in table 5's example of the Nonviolence Pragmatic portfolio. Table 6 shows that the stricter screening means that an investor faces 0.1853-percent extra risk, which equates to about six basis points in theoretical lost return.

This amount of risk and return penalty no longer can be deemed trivial from an investment perspective, but it may be an acceptable price for an idealistic investor who is strongly opposed to investing with firms that do business with the Department of Defense. The point for investors and their advisors is not whether it's appropriate or inappropriate to engage such a screen; the point is to measure the impact on risk and foregone theoretical return. Only by such rigorous metrics can the debate about SRI move beyond preconceived notions and inconclusive return histories. An SRI skeptic still can claim that Nonviolence Pragmatic is a foolish investment choice, but the math shows it to have an almost irrelevant negative impact on both risk and theoretical return penalty. However, that same skeptic now can argue more force-

TABLE 6: SRI PORTFOLIO WITH HIGH TRACKING ERROR, E.G., NONVIOLENCE IDEALISTIC

	Standard Deviation	Variance = (Std. Dev.) ²	Theoretical Return Penalty
Market Risk (Russell 3000)	21.6700%	4.6959%	
Tracking Error	2.8400%	0.0807%	
Combined (SRI) Portfolio	21.8553%	4.7765%	
Incremental Risk	0.1853%		0.0609%

FIGURE 3: COST OF TRACKING ERROR



fully that Nonviolence Idealistic does introduce significant risk and should be implemented by only the most passionate SRI investor who, for example, might eschew stocks altogether if it means owning companies that work with the Department of Defense. Anyone weighing in on the SRI debate should look first to quantify the risk impact and theoretical return penalty before opining that screening should be judged as either harmful or beneficial.

Can we determine any general guidelines on how much incremental

risk a prudent investor should bear? Figure 3 shows the incremental absolute portfolio risk for a range of tracking errors up to 5 percent. At tracking errors of 2 percent or less, the incremental risk and associated theoretical return penalty remain quite small, with incremental risk of about 0.10 percent or less and commensurate theoretical return penalty of 0.03 percent or less. At higher levels of tracking error the incremental risk rises to become more significant, with an exponentially increasing negative impact on both

TABLE 7: TRACKING ERROR FOR SAMPLE SRI MUTUAL FUNDS

	FTSE KLD 400 Social Index	iShares MSCI USA ESG Select Index	Domini Social Equity	Calvert Social Equity	Vanguard FTSE Index	TIAA-CREF Social Equity
Standard Deviation	19.98%	20.86%	19.84%	19.67%	20.33%	20.87%
Forecast Tracking Error, %	3.06%	2.36%	2.59%	4.55%	3.35%	2.88%
Optimal Tracking Error, %	1.91%	1.34%	2.26%	2.98%	1.98%	1.06%
Unnecessary TE, %	1.15%	1.02%	0.33%	1.57%	1.37%	1.82%

Source: Holdings from Morningstar Principia, June 30, 2011. Risk data from Barra Aegis.

risk and return. As a comparison for forecasted tracking error, recall that the average active manager will take 5-percent tracking error in an effort to generate alpha.

Necessary and Unnecessary Tracking Error

We've already established that incorporating SRI screens increases tracking error, but some SRI managers may incur more tracking error than the amount caused by just screening. Jennings (2007) found that many SRI mutual funds incur more tracking error than the amount indicated by just the social screens. We performed a similar analysis on selected SRI mutual funds and confirmed the results of Jennings (2007), as shown in table 7. For each mutual fund portfolio, the same universe is optimized to track a standard all-capitalization index, the Russell 3000 in this case. For each portfolio, the same stocks are optimized against the benchmark to obtain the minimum, optimal tracking error.

These funds' managers could validly dispute the choice of benchmark or the time lag of holdings, but the basic concept remains true. SRI funds do bear unnecessary tracking error, i.e., tracking error that could be diversified away. After all, the capital asset pricing model (CAPM) posits that an investor will not be compensated for unsystematic risk (the source of tracking error) precisely because it can be diversified away. Of course active SRI managers incur tracking error from two completely different sources: alpha-seeking security selection and SRI screening. Unfortunately it can be difficult for an investor to determine how much of the tracking error derives from which source. Rules-based

passive SRI managers, however, theoretically have no justification for bearing unnecessary tracking error beyond the minimum created by screening.

The concept of unnecessary tracking error also applies to many SRI benchmarks such as the KLD 400 or the FTSE4Good, which bring indexing methodology to SRI investors. However, funds that track these benchmarks may bear unnecessary tracking error, as shown in table 7. These SRI indexes may have provided screened universes in an accessible way, but because they typically are not fully optimized against a capitalization-weighted benchmark they carry the burden of unnecessary risk. Whether these SRI benchmarks make good portfolios depends on the

we turn now to synthesizing the two components discussed so far: screening and risk measurement. These can be combined into a series of choices for individual or institutional investors in a way that allows maximum utility and highlights the trade-offs between investment and expressive goals. To illustrate these trade-offs, we use an example of positive SRI screening on environmental issues.

Many investors are interested in incorporating environmental sustainability and innovation into their portfolios. Among more idealistic SRI investors, the term "impact investing" often is applied to selecting the companies whose businesses will change how the economy operates while maintaining some expectation of return. Here the expressive

“ Whether these SRI benchmarks make good portfolios depends on the investor's goals in the context of overall asset allocation. ”

investor's goals in the context of overall asset allocation. If an investor seeks a well-diversified representation of U.S. equities, for example, then the higher tracking error may be problematic. If an investor has a small portion of total U.S. equity exposure in SRI, then higher tracking error may matter significantly less.

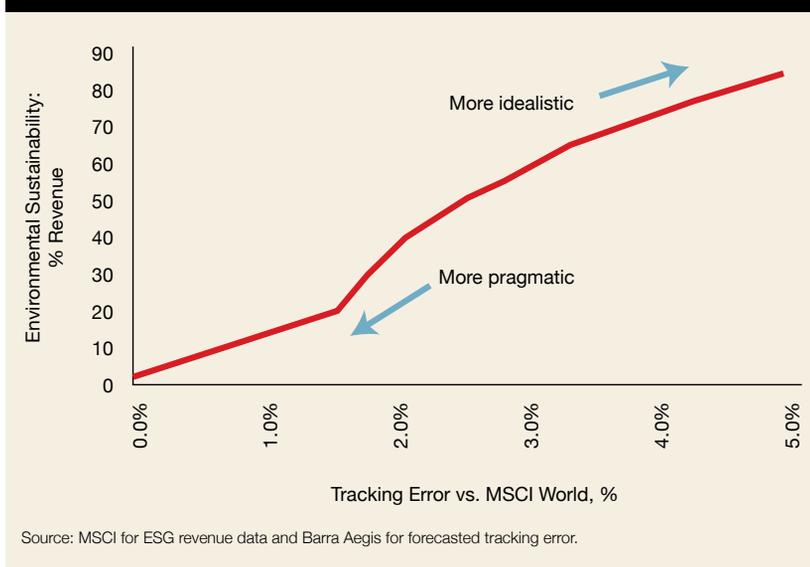
Synthesizing Screening and Risk: The Socially Responsible Efficient Frontier

Having defined and measured tracking error, both necessary and unnecessary,

utility of impact investing is measured by the amount of revenue generated from publicly traded companies in environmentally sustainable industries. ESG data researcher MSCI has defined five specific industries or services that support environmental sustainability: alternative energy, clean technology, green building materials, pollution prevention, and sustainable water.

For each of these, MSCI collects data on companies worldwide that offer products and services in these areas, then determines what percentage of company revenue is derived from such

FIGURE 4: SOCIAL EFFICIENT FRONTIER



environmentally sustainable endeavors. An environmentally oriented SRI investor could view the percentage of revenue from sustainable businesses as a good metric for companies that may change the world from an environmental perspective, i.e., as a way to represent expressive utility. For such a values-based investor, a higher percentage of revenue means a more responsible company and higher expressive utility. However, for a diversified global portfolio in this example, a higher level of required sustainable revenue means a higher tracking error, or lower investment utility. In other words, more rigorous ESG restrictions or scoring cause more unsystematic risk in the portfolio.

To measure the range of trade-offs facing an SRI investor keen to own companies with a positive environmental impact, we construct a series of portfolios using the Barra Aegis model to optimize to the lowest possible tracking error for varying levels of percentage of revenue from the five sustainable businesses. Figure 4 shows the tracking error versus the MSCI World index, a commonly used global benchmark that includes all developed economies worldwide. Like the earlier examples of tracking error versus the Russell 3000, here the portfolios are compared to a standard broad diversified benchmark, not a specialized SRI benchmark.

Figure 4 shows that a more idealistic investor pays a price in increased tracking error in order to achieve greater impact and expressive utility. The shape of the efficient frontier appears similar to the traditional mean-variance efficient frontier where the vertical axis represents a portfolio's expected return and the horizontal axis absolute risk. For the social efficient frontier shown in figure 4, the ESG value is on the vertical axis, which in this case is the portfolio's weighted average percentage of revenue from sustainable businesses. The horizontal axis still represents risk, but it's the comparative risk measure of tracking error versus the benchmark, the MSCI World index. As with the conventional risk-return efficient frontier, reaching for extra benefit bears a cost in risk.

Though figure 4 shows the expressive utility for one particular value set, it could be adopted to include any set of values, conservative or progressive, e.g., Christian evangelical or pro-labor. Combining the basic tools of ESG databases with a multi-factor optimizer allows for any variation of custom portfolios to reflect any SRI issue for which data are widely available. SRI investors now can invest in ways that match their specific values while also measuring the negative impact of the incremental risk of different levels

of strictness in how those values are applied to a portfolio.

Summary

SRI investing in public equities encompasses two distinct components: screening and its impact on investment risk. Screening can incorporate a wide variety of issues across a wide variety of belief systems. Implementation requires ESG research on many companies in order to build a diversified portfolio. The degree of diversification can best be measured by tracking error, the deviation from a target benchmark. Only in measuring the tracking error impact can screening's true effect on investment performance be understood. Both skeptics and advocates of screened investing can benefit from using tracking error to gauge the trade-offs between screening and risk.

The debate about SRI no doubt will continue, but the dialogue should reflect the capability of measuring the extra risk cost of screening. As economist Joseph Stiglitz said: "What you measure affects what you do. If you don't measure the right thing, you don't do the right thing" (Goodman 2009).



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Endnotes

- ¹ For a summary of twenty academic articles on the topic, see UNEP and Mercer (2007).
- ² The forecast tracking error is the expected standard deviation of the variation between a portfolio and its benchmark. It also can be calculated historically, and it is in fact the denominator of the information ratio, widely used by institutional investors and their advisors. The information ratio is alpha divided by tracking error.
- ³ Survey of Callan Associates, Inc., Mercer Investment Consulting and Watson Wyatt Worldwide. See GMO (2006).
- ⁴ Source: Dimensional Fund Advisors.

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