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Over the past decade, the field of social finance has been an engine of financial innovation. Previously, investors interested in aligning their investment portfolios with their values were largely limited to *socially responsible investing*, the practice of avoiding investments in companies with poor environmental or social characteristics. Today, investors can deploy capital across a spectrum of social finance products that allow them to build investment portfolios that align with their values and also promote them.

Social finance is still a small field, but its growth has been rapid. As of 2015, the signatories to the United Nations (UN) Principles for Responsible Investment, who have committed to consider environmental, social, and governance issues in their investment processes, control roughly $59 trillion in assets, a nearly 10-fold increase since 2006 (United Nations Principles for Responsible Investment [n.d.]). That growth is likely to accelerate as a new generation achieves high net worth. Over the coming decades, Baby Boomers are expected to transfer more than $30 trillion to their Generation X and Millennial heirs who, more than previous generations, believe social responsibility should be a major factor in evaluating investments (Gilbert [2012]; Accenture [2015]).

To remain relevant and competitive, professional wealth managers will need to adapt their investment management processes to accommodate the social values of their clients. This article offers a theoretical and practical guide to that process. We begin with a literature review and conceptual framing, and then integrate social finance into *Modern Portfolio Theory* (MPT). In its final section, the article outlines a practical approach to implementing the theory.

A NOTE ON TERMINOLOGY

This article uses terminology that may be unfamiliar to some readers. To avoid confusion, it is worth outlining the specific meaning of several key terms used throughout the article:

- *Social* is used as shorthand to describe all types of social, environmental, or economic impacts investors may target.
- *Social finance, social investing*, and *social investors* are umbrella terms used to describe the full range of financial products, practices, and investors that consider the social characteristics of investments.
- *Socially responsible investing* (SRI) is used here to describe the practice of screening out investment opportunities that are considered harmful or inconsistent with an investor's values. SRI is often referred to as a employing a *negative screen*.

- *Environmental, social, and governance (ESG) investing* takes SRI a step further by incorporating ESG factors into the investment selection process, either as the basis of a positive screen or to identify investment opportunities for which ESG factors are drivers of financial risk and return.
- *Impact investing* describes the practice of deploying capital with the intention of generating measurable social impact alongside financial return. Whereas SRI investors are primarily interested in achieving values-alignment, impact investors use their capital as a tool to achieve measurable social outcomes.
- *Philanthropy* involves granting funds with the expectation of incurring a total financial loss.

A THEORETICAL APPROACH TO SOCIAL FINANCE

Literature Review

As described in Bodie, Kane, and Marcus' [2013] *Investments* (now in its tenth edition) and Maginn et al.'s [2007] *Managing Investment Portfolios* (now in its third edition), MPT has long served as the guiding framework of professional portfolio management. Although there is a vast body of literature commenting on the limitations of MPT's assumptions, the framework has remained substantially intact since it was introduced more than 50 years ago. Developments include adaptations in implementation, such as the Black–Litterman approach, and the integration of *behavioral finance*, or *human factors*, that affect the investment landscape. Nonetheless, the concept of balancing financial risk and return remains the essential touch point.

Over the past decade, social finance practitioners have taken the lead in shaping both practical and theoretical approaches to social investing. While a partner at Aquillian Investments, Brian Dunn made one of the first attempts to incorporate social factors into MPT. Dunn [2006] proposed recasting the traditional two-dimensional efficient frontier of MPT as a three-dimensional curve defined along the axes of risk, return, and social impact. In Saltuk and Idrissi [2012], J.P. Morgan's Social Finance Group elaborated on Dunn's three-dimensional framework and provided guidance on the mechanics of deal sourcing, due diligence, and portfolio monitoring based on the bank's own experience and that of 23 institutional investors it interviewed. Although these articles both offered useful qualitative analysis, neither treated their topics with mathematical rigor.

The academic community has made only a few efforts to fill this gap in the literature, although some authors have offered useful approaches to the challenge of comparing financial and social data. Peylo [2011] constructed a portfolio optimization around the so-called *best-in-class* approach to ESG investing, in which investors select those companies with the highest sustainability rankings within a given industry. Peylo suggested converting financial returns into ordinal data, then optimizing based on the investor's preferred trade-off between sustainability and financial return. Grabenwarter and Liechtenstein [n.d.] presented a useful model designed to incorporate measures of social impact into Sharpe's 1964 Capital Asset Pricing Model (CAPM). They proposed the use of a variable, γ, defined as the ratio of actual to expected social impact. Regardless of the underlying metric used to assess impact, whether acres of land conserved or tons of emissions reduced, the γ variable yields a standard measure of return.

Conceptual Background

The model that follows begins with Dunn's insight that MPT needs a third axis to describe the behavior of social investors. However, social impact is not the most appropriate parameter for that additional dimension, as MPT depends on the assumption that investors act rationally to maximize their own individual utility. From that perspective, the social impact of an investment is a public good and an externality, making it a poor candidate for inclusion in the model. Expanding MPT while preserving its enabling assumptions instead requires adding a term that measures the private benefit an investor receives as a result of an asset's social impact: the social *return* to the investor rather than the social *impact* on the community.

To help illustrate the concept, consider a scenario in which an individual has the opportunity to give $100 to a poor neighbor or an equally impoverished stranger living across the country. An altruist, concerned only with social impact, would have no reason to favor one recipient over the other and would split the gift between the two. Few would be surprised, though, if the donor decided to give all $100 to his or her neighbor. Although the donor knows neither recipient is more deserving of the gift, assisting a neighbor gives the donor greater satisfaction and enhances his or her own happiness more than assisting the stranger. The literature on giving refers to this phenomenon as the *warm glow effect* or *impure altruism* (Andreoni [1989]; Harbaugh [1998]).

The concept of social return brings the idea of the warm glow into the world of finance, reconnecting the economic concept of utility with its origins. Bentham and Mill, the founders of utilitarianism in the 18th and 19th centuries, equated utility with happiness, defined in terms of pleasure and pain. They also thought of it as cumulative, arguing that society's total level of utility could be measured as the sum of each individual's well-being (Mill [2001]; Bentham [2007]).

Confronted with the challenge of measuring such an intangible concept, the economists of the 20th century, such as Hicks, Pareto, and Samuelson, shifted their profession's attention away from total utility and toward the idea of marginal utility (Samuelson [1938]; Hicks [2001]; Pareto [2014]). Essential to MPT and other neoclassical economic models, *marginal utility* is a useful framework that allows the value of goods, services, and assets to be compared solely on the basis of price. However, in doing so, it abandons the relationship between utility and well-being.

Behavioral economists have since shown that price can often be an imperfect measure of value. Their insights have inspired practices such as *goals-based investing*, which recognizes that "individuals have assets for a variety of purposes, and managing their financial wealth is only one of the purposes" (Brunel [2012]).

The model outlined in the following section maintains MPT's marginal utility framework but, like goals-based investing, accounts for those investor motivations that are unrelated to financial return. The model is labeled *"Postmodern" Portfolio Theory* (PMPT) because it looks back to Bentham and Mill's original definition of utility but does so through the contemporary lens of positive psychology. A relatively new field, *positive psychology* is the scientific study of happiness and posits that individual well-being is a function not just of pleasure, but also engagement, meaning, achievement, and personal connection (Seligman [2011]). PMPT, which incorporates a measure of social return, brings these various elements of well-being directly into the investment process, allowing investors to optimize their portfolios based on a richer definition of utility.

MODEL SPECIFICATION

Before adding the crucial third dimension of social return to the MPT framework, it is worth exploring the assumptions that underlie the original model:

- The model features assets $i = 1, \ldots, N$ and investors $k = 1, \ldots, M$.
- Investors are rational and risk-averse.
- Investors agree on e, the N-vector of expected asset returns, and C, the $N \times N$ variance–covariance (VCV) matrix of asset returns.
- Riskless borrowing and lending takes place at rate r_f.

Each investor in the market is seeking to maximize the weight of each asset i in the portfolio according to the following utility function:

$$\begin{gathered} \max_{w_k} w_k^T e - \lambda_k \cdot w_k^T C w_k \\ s.t.\ w_k^T \iota = 1 \end{gathered} \tag{1}$$

where λ_k is investor k's risk aversion parameter, w_k is investor k's N-vector of asset weights, and ι is a vector of 1s.

Utility in this model is solely a function of risk and expected return. To achieve the same level of utility, clients with high levels of λ_k must either earn greater expected returns or experience less risk than clients with low levels of λ_k.

Extending the model to include social impact requires several additional assumptions, structured in a similar fashion to those underlying the original MPT framework:

- Investors are interested in $j = 1, \ldots, L$ social impact metrics. Each metric relates to a discrete impact theme, such as education, affordable housing, or financial inclusion. Enumerating these varied themes is a challenge for implementation. In a theoretical context, it is sufficient to treat them as vectors that exist for each asset.
- Investors agree on the expected social impact in each of the L metrics, for all N assets. The result is an $N \times L$ matrix of expected social impact, labeled V. Although the definitions underlying the values in V are important, the values themselves are

scale invariant. Note also that the expected social impact of each asset is not investor-specific, but rather reflects the market's view of the benefit a particular asset is expected to generate for society as measured by each of the L metrics.[1] Finally, these values are not risk-adjusted; they simply reflect the probability-weighted mean of the asset's possible social return outcomes.

- Each investor k has a unique vector p_k, which is an L vector of weights in [0, 1] that sum to one. The vector p_k expresses the relative preferences of investor k across the L vector of social impact metrics. (Note that if the columns of V are rescaled with respect to one another, this can be compensated for by a change in the vector p_k.)
- Each investor k has a unique impact coefficient φ_k, such that $0 \leq \varphi_k \leq 1$, which denotes the investor's enthusiasm for social return relative to financial return. (Note that if the units of V are rescaled, this can be compensated for by a change in φ_k.)
- The variance of an asset's social return can be subsumed into the VCV matrix of an asset's financial returns, C, or ignored because of investor indifference. This assumption deserves a full explanation, not only because it is essential to the tractability of the model, but also because it is likely to be controversial. However, rather than pause to address the issue here, the topic is explored in the Appendix.

These assumptions form the basis of PMPT and allow the utility function to be rewritten as:

$$\underset{w_k}{\text{Max}}\left((1-\varphi_k)\cdot w_k^T e + \varphi_k \cdot w_k^T V p_k\right) - \lambda_k \cdot w_k^T C w_k \qquad s.t.\ w_k^T \iota = 1 \tag{2}$$

In this new model, investors seek to maximize their utility on the basis of risk and expected return, but the expected return investors receive is no longer defined in financial terms alone. The linear term enclosed in parentheses in Equation (2) splits an investor's expected total return into a combination of expected financial and social returns. Unlike the financial return of an asset, the social component of an asset's total return is unique to each investor via the vector p_k. An asset the market expects to generate outstanding social impact may have a high value in V, but if an investor's preference vector p_k does not align with the sources of the asset's impact, the social return of the asset to that investor will be low. Furthermore, the extent to which an asset's expected total return is derived from the social return component will depend on an investor's overall enthusiasm for social return. Even highly impactful assets that align well with an investor's preference vector may not be overweighted in the portfolio if the investor is relatively indifferent to earning social returns from the portfolio.

Note that PMPT does not describe the behavior of SRI investors, who rely solely on negative screens. Whereas the utility function lays the foundation for the portfolio optimization process, SRI screens simply limit the investable opportunity set. Screening can be considered akin to other portfolio constraints clients may impose on their portfolio, such as liquidity or tax considerations.

General Equilibrium Model

The utility function in Equation (2) permits the derivation of a general equilibrium model. The adjustment begins with the linear term in the utility function that describes asset returns. Readers may recognize this term as being similar to the linear term in the derivation of the CAPM, except that it treats the vector of expected asset returns as unique to each investor rather than common to all. The result is a CAPM with heterogeneous return expectations but homogeneous VCV expectations. This article is not the first to explore the implications of heterogeneous beliefs for the CAPM and will borrow the methodology used by Gerber and Hens [2009] and Chiarella, Dieci, and He [2006].

To begin, the universal vector e is replaced with the per-investor e_k. Under the assumption that investors hold common beliefs regarding the variance–covariance matrix of returns, C, the linear term in Equation (2) can be rewritten as:

$$w_k^T \cdot \hat{e}_k \tag{3}$$

where

$$\hat{e}_k = e + \varphi_k \cdot (V p_k - e) \tag{4}$$

The expected return on asset i averaged across all investors k can be derived as:

$$\overline{e_i} = \sum_k a_k \cdot \hat{e}_{k,i} \tag{5}$$

where a_k denotes investor k's relative importance in the economy as measured by his or her proportion of total risk-adjusted wealth:

$$a_k = \frac{W_k}{\lambda_k}\left(\sum_u \frac{W_u}{\lambda_u}\right)^{-1} \tag{6}$$

where W represents the initial wealth endowment of an investor, and the a_k sum to one.

Equation (4) can be substituted into Equation (5), then reduced as follows:

$$\overline{e} = e + \sum_k a_k \varphi_k (p_k - e)$$

$$\overline{e} = e \cdot \left(1 - \sum_k a_k \varphi_k\right) + \sum_k a_k \varphi_k V p_k$$

$$\overline{e} = e \cdot (1 - \overline{\varphi}) + V \cdot \overline{p} \tag{7}$$

where $\overline{\varphi}$ denotes the importance-weighted average value of all investors' social enthusiasm coefficients, φ_k; and $\overline{p}$ denotes the average value of all investors' preference vectors, p_k, weighted by both relative importance and social enthusiasm.

Continuing with the methodology of Gerber and Hens [2009], these results permit the derivation of a CAPM with heterogeneous beliefs. In the case in which all investors agree on the covariance matrix and differ only with respect to expected return, we find the following general equilibrium model:

$$\overline{e} - r_f = \beta \cdot (\overline{e}_M - r_f) \tag{8}$$

where $\overline{e}$ is the vector of adjusted expected returns per Equation (4); β is a vector of asset betas; and $\overline{e}_M$ is the adjusted expected return on the market portfolio, that is, $\overline{e}_M = w_M^T \overline{e}$ where w_M^T is the market portfolio aggregate weights, defined by averaging each investor's investment weights in risky assets by using weights that reflect each investor's relative wealth allocation to risky assets (see Gerber and Hens [2009] for a full derivation). This is the security market line, with the expected returns adjusted for social impact enthusiasm.

IMPLICATIONS OF THE UTILITY FUNCTION AND GENERAL EQUILIBRIUM MODEL

Social investors may find the central implication of PMPT's utility function and general equilibrium model disheartening. In both cases, the theory only allows investors to earn expected social returns at the expense of expected financial returns. In an efficient market, investors with positive impact enthusiasm coefficients will flock to those assets with high expected social returns, driving up their prices. Meanwhile, investors with no interest in earning social return will purchase the relatively inexpensive assets that remain. The result will be a clientele effect analogous to that seen in the municipal bond markets, wherein the tax benefits associated with municipal bonds provide utility to one class of investor but not another. As a result, the pretax yield on municipal bonds is typically lower than the yield on otherwise identical bonds.

Although the analogy of the municipal bond market is apt, the magnitude of the clientele effect in social finance is very small because the field is still in an early stage of development. As of March 30, 2015, approximately \$3.7 trillion worth of U.S. municipal bonds were outstanding, representing over 9% of the \$39 trillion U.S. bond market (Securities Industry and Financial Markets Association [2015a, 2015b]). By contrast, impact investors, who have the highest values of φ and might be expected to have the greatest effect on asset prices, were estimated to have just \$60 billion under management in 2014, or just 0.08% of global assets under management (Saltuk et al. [2015]; Shub et al. [2015]).

The informational challenges inherent to social finance also act as a drag on its efficiency. Whereas the tax benefits of municipal bonds are well defined and widely known, information regarding social returns is inconsistent and often imprecise. The industry has made substantial progress in developing standardized impact measurement and reporting methodologies, but determining the V value for a particular asset remains difficult. In the absence of definitive information, φ-positive investors are attracted to different assets, diffusing their collective effect on asset prices.

Rather than sacrificing financial returns, these factors combine to create an opportunity for social investors to earn transitory alpha in anticipation that their share of overall investor wealth will grow. Asset prices today reflect an investor base with a low importance-weighted average value of $\overline{\varphi}$. As impact measurement systems improve and the importance-weighted average value of $\overline{\varphi}$ rises, the prices of assets with strong social characteristics will rise along with it, yielding gains for early investors.

Skeptics of social finance would dispute this analysis, arguing that social investments are inherently less remunerative on a risk-adjusted basis than traditional investments. In some areas of social finance, this is undeniably true. Community development financial institutions, for instance, often intentionally make loans at below-market rates. However, the emergence of the ESG investing community suggests that in other areas, the market evolution is already underway and may be accelerating.

ESG investors generally evaluate companies for good governance, sustainable business practices, and community engagement not only for the opportunity to earn a social return, but primarily because they believe these factors are fundamental drivers of financial returns. In a metastudy of 41 academic papers discussing "sustainability and its relation to financial market performance," Clark, Feiner, and Viehs [2015] reported that 80% of the studies reviewed reported a "positive correlation between good sustainability and superior market performance." If these results hold, the broader investment community is likely to take notice, and upward pressure on asset prices will only increase. In that case, traditional investors will join social investors in favoring securities with the strongest ESG profiles.

WEALTH MANAGEMENT FOR SOCIALLY CONSCIOUS INVESTORS

Incorporating the concept of social return into the day-to-day management of client portfolios does not require professional wealth managers to fundamentally alter the long established standards of portfolio construction and management. The section that follows offers guidance on how advisors can make practical use of PMPT when working with social investors, from the development of the Investment Policy Statement (IPS) to the production of performance reports.

The Investment Policy Statement

The process of drafting an IPS gives clients an opportunity to articulate the specific factors that will define the advisor's investment mandate. Whereas a client's financial return requirements, liquidity needs, tax considerations, and time horizon constraints are relatively easy to identify, risk aversion is difficult to quantify with precision. For that reason, many wealth managers employ a heuristic approach, using proprietary techniques to assign clients to bins of risk tolerance, ranging from low to high. As shown in Exhibit 1, advisors are then able to build model portfolios along the efficient frontier that corresponds to each risk bin.

Impact Enthusiasm

When working with social investors, advisors must extend the discussion to evaluate the client's willingness to sacrifice financial return or accept additional risk in pursuit of social returns. Rather than attempting to plot an optimal portfolio along a three-dimensional curve, advisors can again take advantage of a simple approach without any loss of fidelity to theory. As with the risk binning process, the advisor can develop a proprietary method of helping clients make selections from a predefined set of social investor types, each with a different impact enthusiasm coefficient. Those investor types are then plotted along a second, social return frontier, defined by the axes of risk-adjusted financial return and social return, as shown in Exhibit 2.

Advisors can define their own investor categories, but the following profiles match those often used in the market:

- **Financial Only Investors ($\varphi = 0$):** These investors have no interest in the social component of asset returns. Investors in this category have a φ of zero and will invest their capital directly on the vertical axis of risk-adjusted return, represented as point 1 in Exhibit 2.

EXHIBIT 1
Risk Binning

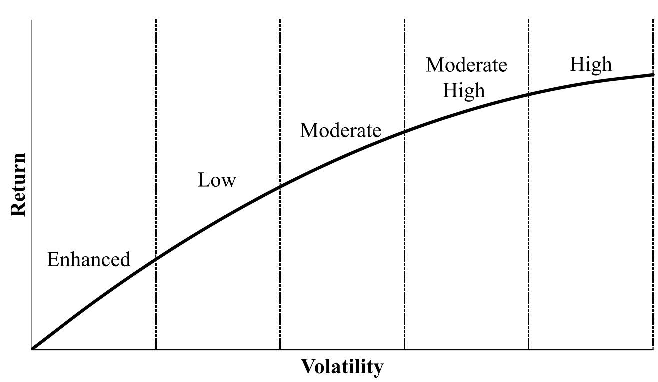
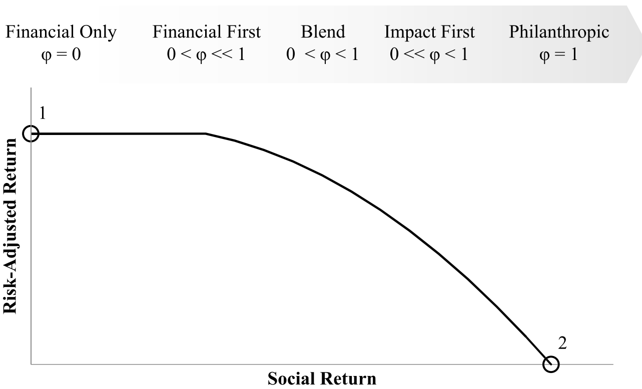


EXHIBIT 2

Social Investor Categories



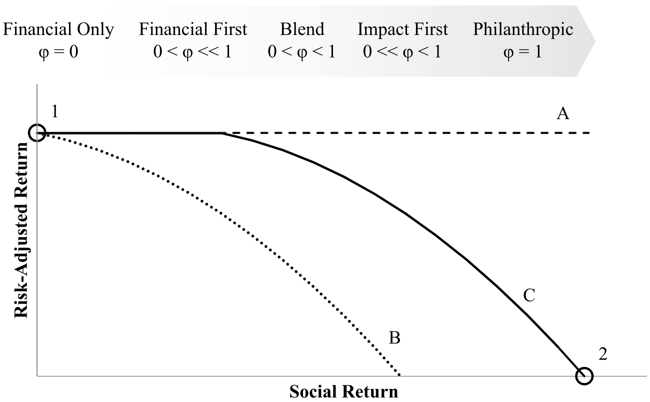
- **Financial First Investors (0 < φ << 1):** These investors have an interest in social returns, but they expect to receive a risk-adjusted financial return consistent with that generally available in the market. Investors in this category can be modeled as having a small φ coefficient and will plot their portfolio close to the vertical axis, along that portion of the curve that has yet to inflect downward.
- **Blend Investors (0 < φ < 1):** Blend investors include one of two types of clients. First, there are those who simply have an incrementally higher impact enthusiasm coefficient and are willing to move further away from the axis of risk-adjusted return. The second type of Blend Investor, on the other hand, holds a slightly more nuanced view. Not only are these investors concerned with the position of their portfolio on the curve, but they also have a view regarding the shape of the curve itself. Although this second type of investor may entertain a handful of concessionary impact investment opportunities, they generally expect their portfolio to earn market-rate financial returns while also generating strong social returns.
- **Impact First Investors (0 << φ < 1):** These investors have a large φ coefficient and are primarily focused on expected social returns. Impact first investors accept that their capital may earn a below-market risk-adjusted return.
- **Philanthropists (φ = 1):** With a φ coefficient equal to one, philanthropists are donors rather than investors. They hold portfolios of grants, represented as point 2 in Exhibit 2, and are unconcerned with an asset's expected financial return.

Advisors may find it helpful to have their clients consider two key questions as they evaluate which social investor type best matches their needs. First, the client should not only consider the differing purposes behind social and financial investments, but also the potential differences between social investments and charitable activities. What is the role of each? How should the investment portfolio complement philanthropic activities or vice versa? Second, advisors should ensure clients understand the difference between expected financial return and risk-adjusted return. Clients will readily grasp the idea that certain social investments may generate relatively lower financial returns, but the idea that a social investment could be expected to yield market rate returns at much greater financial risk is less obvious.

One example of the correlation between financial risk and social return can be found in the equity markets. To maintain their overall exposure to equities, impact investors often must overweight private equity, where the bulk of high impact investing occurs in today's market, while underweighting public equities. The expected financial return of the overall equity portfolio may remain constant, but the risk profile is likely to increase substantially.

Though it is critical that clients understand the potential trade-offs involved in pursuing social returns, advisors can remain agnostic with regard to the exact shape of the social return frontier. An impassioned advocate of impact investing who considers himself or herself a Blend Investor might argue that line A in Exhibit 3 best represents the shape of the frontier, extending perpendicularly from the axis of risk-adjusted return and requiring no trade-off at all. Social finance skeptics might argue that the frontier looks more like line B, inflecting downward at the vertical axis with a steep negative slope. Most industry participants agree that the curve has a downward slope, consistent with line C, but considerable debate remains regarding the steepness of the curve and the location of the inflection point along the x-axis. Yet even if wealth advisors remain silent in the theoretical debate, they are likely to encounter the bounds of the curve as they attempt to construct portfolios that satisfy their clients' demands. This is particularly true when working with Blend Investors whose views

EXHIBIT 3
Social Investor Categories



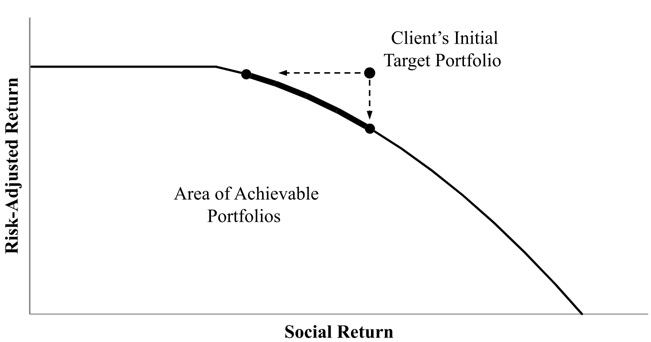
on the shape of the social frontier may differ from the realities the advisor confronts in the marketplace.

Exhibit 4 illustrates a scenario in which no combination of assets will simultaneously satisfy the client's demand for expected risk-adjusted return and demand for expected social return. The advisor must guide clients toward portfolios that exist along the curve as it is defined in the market, helping them evaluate the appropriate combination of financial and social return to sacrifice in order to invest their capital.

Social Return Preferences

The final step in completing the IPS is recording the investor's social return preferences, represented in the model as vector *p*. Advisors should approach this discussion with two objectives in mind: understanding the client's values and interests, and educating the client

EXHIBIT 4
Selecting a Portfolio



on the realities of the market. Social finance is still a nascent field and does not yet have investment offerings that address all issue areas. For instance, advisors will likely have little trouble satisfying a client's interest in microfinance, but clients excited about the potential for social impact bonds to improve the effectiveness of government programs should be made aware that fewer than 50 of these transactions have ever closed (Gustafsson-Wright, Gardiner, and Putcha [2015]).

An effective method of balancing these objectives is to provide clients with a comprehensive menu of options, reflecting the range of issue areas generally addressed in the market. The advisor can then instruct the client to allocate a hypothetical stack of 100 $1 bills across the various options: A high priority issue area might receive $20 or $30, whereas issue areas of little interest to the client may not receive any cash at all. Once every dollar has been allocated, the advisor will be left with a clear and precise guide to the client's social return priorities, an essential resource for the asset allocation and investment selection process.

Asset Allocation and Investment Selection

The portfolio optimization process generally begins with the development of capital market expectations for each asset class and then proceeds to a strategic asset allocation process designed to maximize the portfolio's risk-adjusted return. Theoretically, social return should be a key input in this process when constructing portfolios for social investors. However, data limitations and the fact that social returns vary widely within asset classes make such an approach impracticable. Advisors instead may be better off employing an iterative process in which they set allocation targets based solely on the financial characteristics of the asset classes, fill out those asset classes with individual investment opportunities, and then revisit their strategic asset allocations to ensure risk-adjusted social and financial return opportunities are being maximized across the portfolio.

By contrast, the process of filling out asset and sub-asset class allocations with individual investment opportunities depends heavily on social impact and return metrics. Advisors must develop an objective view of the impact each investment opportunity in their pipeline is expected to deliver within each of the issue areas identified in the client's list of social return priorities.

Represented in the model as the V matrix, the social impact assessment is unique to the investment and does not vary by investor. Some investments may be expected to generate impact across a range of issue areas, whereas others will offer more concentrated results. Advisors can use a variety of methods to rate social impact, but to facilitate comparison with financial return, it is helpful to express the results as rates of return.

The advisor can next transform each investment's social impact rating into a measure of social return by combining it with the client's social return preferences. Exhibit 5 provides a simplified example of the process, using the basic issue categories of environmental impact, social impact, and governance. As shown, the sources and magnitude of the hypothetical Eco Investor Fund I's social impact is fixed, but because Client B prioritizes environmental impact more than Client A, the investment's social return is higher for Client B than it is for Client A.

A client's impact enthusiasm coefficient plays a similarly important role when comparing investment opportunities. Traditional MPT advises that, ceteris paribus, investors should select the investment or combination of investments with the highest Sharpe ratio, a measure of risk-adjusted return. PMPT allows for a similar measure, a social Sharpe ratio that balances financial return, financial risk, and social return using the client's impact enthusiasm coefficient, φ:

EXHIBIT 5

Calculating Social Return—Investment Rating for Eco Investor Fund I, LP

Issue Area	Social Impact (V)		Client Preferences (p)		Social Return ($V \cdot p$)
Client A					
Environmental Impact	18%	×	35%	=	6.30%
Social Impact	5%	×	60%	=	3.00%
Governance	0%	×	5%	=	0.00%
TOTALS:	**n.a.**		**100%**	**=**	**9.30%**
Client B					
Environmental Impact	18%	×	80%	=	14.40%
Social Impact	5%	×	20%	=	1.00%
Governance	0%	×	0%	=	0.00%
TOTALS:	**n.a.**		**100%**	**=**	**15.40%**

Note: Social Impact Rating Scale: Low (–20%) to High (+20%).

$$\frac{\left(e_i \cdot (1-\varphi_k) + \varphi_k \cdot V_i p_k - r_f\right)}{\sigma_i} \tag{9}$$

where e_i is the expected financial return of asset i; φ_k is the impact enthusiasm coefficient of investor k; V_i is the social impact matrix for asset i; p_k is the preference vector of investor k; and σ_i is the standard deviation of asset i.

In practice, many considerations, both qualitative and quantitative, influence an investment decision. Nonetheless, where data are available, the social Sharpe ratio offers advisors a useful quantitative measure that brings together all the various components of risk and return.

Exhibit 6 provides a simple example of how an advisor might use the ratio to select the best investment option for inclusion in a client's U.S. Large Cap Equity allocation. Client C has an impact enthusiasm coefficient of 0.2, a value generally consistent with a Financial First investor. Given the importance of risk-adjusted financial return to the client, the advisor will likely dismiss Funds 2 and 4 because they have the lowest traditional Sharpe ratios. Although Fund 3 has the highest Sharpe ratio, it does not deliver any social return, suggesting that Fund 1 may be a better option. Indeed, the social Sharpe ratio indicates that Fund 1 yields the highest risk-adjusted financial and social returns for Client C.

Client D, in contrast, has an impact enthusiasm coefficient of 0.8, which is consistent with that of an Impact First Investor for whom social return carries much greater weight in the social Sharpe ratio calculation than financial return. Although Fund 4 has the weakest financial metrics, its higher expected social return recommends it for selection.

Portfolio Reporting

One of the biggest challenges advisors face in managing social investment portfolios is the process of portfolio reporting, particularly with respect to actual social return outcomes. However, advisors can begin with two relatively simple yet informative reporting exercises: First, advisors can sort investments according to their expected social return to illustrate the relative values of an investor's holdings and the expected attribution of the portfolio's total social return. Second, an investor's exposure across different issue areas, such as access to finance or sustainable agriculture, can be aggregated

EXHIBIT 6
Investment Selection: Client C—U.S. Large Cap Equity Selection

	Annualized ROR	Standard Deviation	Sharpe Ratio (Rf = 2%)	Social Return	Social Sharpe Ratio
Scenario 1: Impact Enthusiasm Coefficient (φ) = 0.2					
Fund 1	6.9%	15.3%	0.321	3.0%	0.270
Fund 2	7.2%	16.8%	0.310	3.5%	0.265
Fund 3	7.0%	14.9%	0.337	0.0%	0.242
Fund 4	5.6%	15.0%	0.240	4.0%	0.219
Scenario 2: Impact Enthusiasm Coefficient (φ) = 0.8					
Fund 1	6.9%	15.3%	0.321	3.0%	0.117
Fund 2	7.2%	16.8%	0.310	3.5%	0.133
Fund 3	7.0%	14.9%	0.337	0.0%	(0.040)
Fund 4	5.6%	15.0%	0.240	4.0%	0.155

by asset class and across the portfolio, then tracked over time to assess how targets for impact exposure in their preferred areas are being met. Akin to a report on portfolio exposures to financial factors, clients will find it helpful to see how their portfolio's total expected impact exposure breaks down by issue area, geography, and asset class.

Reporting on the ex post realized social impact of an investment is far more difficult. Unlike financial metrics, which are varied and plentiful, the social finance industry has yet to develop the standards needed to consistently assess an investment's actual, realized social impact on an absolute and relative basis. Although a full exploration of this topic is beyond the scope of this article, it is worth highlighting several promising efforts currently underway to solve this challenge.

The Sustainability Accounting Standards Board (SASB) is working to develop sustainability reporting standards for public corporations in 80 industries, across 10 sectors, by 2016 (SASB [2015]). The Global Impact Investing Network hosts a similar initiative called the Impact Reporting and Investment Standards (IRIS), which has a catalogue of standard metrics that are often most relevant to investments in developing countries. Finally, B Lab maintains a set of standards it uses to rate individual companies, which forms the basis of their Global Impact Investing Ratings System, an impact ratings service for investment funds (B Lab [2013]).

As these and other systems are adopted more widely, the quality of impact measurement and reporting is likely to improve. In the meantime, advisors should take care during the diligence phase of the investment process to identify which impact metrics they intend to use to assess the success of a particular investment.

CONCLUSION

Millennials and others are increasingly interested in investment portfolios that align with their social values or that have the potential to generate positive social impact. As a result, the ability to execute a values-based social investment strategy is becoming an important part of an advisor's skill set. PMPT provides a framework for building utility-maximizing portfolios that incorporate elements of investor well-being that extend beyond financial return. The approach is relatively simple, but more importantly, it is systematic, reportable, and understandable to a variety of constituencies.

Appendix

DERIVATION OF VARIANCE–COVARIANCE ASSUMPTIONS

Just as the outcome of financial return, r, is uncertain, so, too, is the outcome of social return, s. A mean–variance investor is presumed to want to trade off the expectation of total return, R, against the variance of R. The total return, incorporating both financial and social return, can be written as:

$$\tilde{R} = \varphi_k \cdot \tilde{r} + (1-\varphi_k) \cdot \tilde{s} \tag{A-1}$$

Return expectations, which are linear, are simple:

$$E(\tilde{R}) = \varphi_k \cdot E(\tilde{r}) + (1-\varphi_k) \cdot E(\tilde{s}) \tag{A-2}$$

Variances are more complex and depend on the variance of r, the variance of s, and the covariance matrix between r and s:

$$var(\tilde{R}) = \varphi_k^2 \cdot var(\tilde{r}) + 2 \cdot \varphi_k \cdot (1-\varphi_k) \cdot covar(\tilde{r},\tilde{s}) + (1-\varphi_k)^2 \cdot var(\tilde{s}) \tag{A-3}$$

Constructing a model of investor utility based on this specification of risk is possible in mathematical terms, but the result would be intractable in any practical sense. Forecasting the variances of future financial returns already presents a significant challenge without adding the task of quantifying the variances of social returns. However, if the variances of social returns (referred to hereafter as *social risk*) can be eliminated from the variance specification or subsumed into the existing variance–covariance matrix of financial return, the obstacle is removed. There are indeed reasons why such an approach may be justified, each of which is examined in detail.

First, it may be reasonable to assume that socially conscious investors have low levels of aversion to social risk, selecting investments almost entirely on the basis of expected social return. This argument follows from the implication of the oft-quoted maxim, "What is measured gets done." Investors do not (yet) have the means to estimate or, a fortiori, forecast the variance of an asset's social return in the same way they might estimate the variance of the S&P 500 Index using the index's historical monthly returns. Even fewer options exist for estimating the covariance of social and financial returns. Without consistent and reliable data on social risk, investors may be indifferent enough to its effects that the variable can be dropped from the variance function.

Given that many social investors also engage in philanthropic activities, the benefits of diversification will further reduce their sensitivity to social risk. A key attraction of social investments is the exposure they offer to differentiated theories of social change. The drivers of social return in a commercial enterprise tend to be very different from those that produce social returns in a grant portfolio. This lack of correlation means that individuals and institutions will often benefit from combining social investments with their philanthropic activity, even if those social investments carry greater amounts of social risk.

Finally, the variance in Equation (A-3) can be simplified if the covariances of financial and social returns in a portfolio are assumed to equal zero, and the variance of social returns is assumed to be proportional to those of financial returns. These two assumptions allow the variance–covariance matrix of social returns to be subsumed into that of financial returns. Although it may be reasonable to assume zero correlation between the financial return of one asset and the social return of another, this approach is admittedly less compelling because it also requires the more controversial assumption that the financial and social return of the same asset are uncorrelated. In some cases, this may indeed be true: The social return derived from a bank's best-in-class waste management policies is unlikely to correlate with movements in its stock price. However, as Clark, Feiner, and Viehs [2015] showed, there are numerous examples in which a firm's sustainability practices correlate positively with its financial performance.

The treatment of social risk is complicated and worthy of further discussion in the literature. The explanations provided here for excluding social risk from the investor utility function may not settle the issue, but given that misspecifications in the variance have less of an effect than misspecifications in the expectation, they are sufficient to permit the full elaboration of the model.

ENDNOTE

[1]In real life, just as investors do not necessarily agree on the value of the vector e, likewise they need not agree on the value of the matrix V. The model could easily be extended to include investor-specific V matrixes because p is already investor-specific.

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