Editor's Corner

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Opening the Market for Impact Investments: The Need for Adapted Portfolio Tools

Abstract: Social and environmental impact investing as an activity as well as a concept has grown in recognition on a truly global scale. Yet, apart from anecdotal success stories of some specialized forms such as social-impact bonds, little is known about the field and the complex interplay between agents, instruments and regulations. Neither the rationales of the various participants in the field, nor the evaluation criteria for some of its instruments have been scrutinized in-depth so far. Especially the important constructs of risk and returns from a financial as well as a social impact perspective have so far been used in differing fashions, thus rendering the applied logic constructs incompatible to each other. Compatibility, however, is a pre-requisite for the inclusion of impact investments into the portfolios of traditional institutional investors. Much can be gained from this, not only would a huge inflow of capital improve the social and environmental sector, but early evidence shows that the overall performance of mixed portfolios might profit because the experienced low correlation of impact investments to traditional markets reduces portfolio risk and increases sustainability. In addition, more and more investors demand ESG (environmental, social and governance) criteria to be considered when it comes to building portfolios because of the great opportunities provided.

Keywords: impact investing, social entrepreneurship, social finance, sustainable finance, portfolio management

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1 Introduction

While tackling worldwide social and environmental challenges through providing the means and funds for innovative entrepreneurs is maintained to be the core vision of the social finance movement, the market has developed in different directions. Over the last couple of years, the field of such investments advanced in terms of market structures, involved participants and investment vehicles. Among the diverse set of streams within the social finance sphere, progress achieved in impact investing currently receives exceptional attention in practice and in the media. Involved parties express their strong belief in an even more promising future of impact investing, with its potential to revolutionize how we think about investing itself (Wilson 2014; The Social Investment Consultancy and London Economics 2014; Salamon 2014).

According to investors' perceptions, the two key constraints limiting the expected growth are a "lack of appropriate capital across the risk/return spectrum" and the "shortage of high quality investment opportunities with a track record" (Saltuk et al. 2014) – a somewhat vicious circle, as one implies the other.

Large institutional asset owners, such as pension funds, endowments and insurers, are an especially important category of current and prospective impact investors as they play a fundamental role in domestic and world capital markets with total assets of over $20 trillion. In addition to their potential ability to grow the market, recognition by large institutional investors can help further legitimize the field for asset management intermediaries, financial institutions, consultants and policymakers. However, the road to unlock this potential is still paved with several barriers (Wood, Thornley, and Grace 2012, 2013):

First, institutional investors are demanding an infrastructure in terms of investable financial products (asset classes, metrics and instruments) and intermediaries, which the impact investment market cannot yet provide.

Second, embedded into regulatory frameworks, institutional investors are bound by their fiduciary duties and are committed to asset class specific benchmarks for expected financial risk and return. While some asset owners, such as family offices or certain funds are already implicitly or explicitly acknowledging environmental and social targets as part of their investment strategies, others are still tied to conservative legal and policy-related requirements.

Third, institutional investors apply conventional portfolio allocation frameworks built on the evaluation of financial risk and returns in order to make rational investment decisions (Wood, Thornley, and Grace 2012, 2013; Richardson 2011; Buckland 2014; Clark, Emerson, and Thornley 2013) and have not yet found a way to include social risks and returns other than through

negative screening (non-investments because of high social and environmental riskiness). Currently, only small and often dedicated funds apply some sort of positive screening as the instruments and metrics used in large institutional investors are not compatible with these constructs.

Since impact investments differ significantly from traditional investments through their hybrid goals (Doherty, Haugh, and Lyon 2014; Lehner 2012), such investments do not yet match the logic of traditional finance tools. Measuring the potential social and environmental impact of these investments in a generally agreed fashion will thus be a key component of new approaches, since impact investing explicitly seeks to intentionally generate quantifiable social and financial returns (see Figure 1). Not only investors, but also intermediaries, governments and social businesses themselves are currently striving for standardized, transparent and comprehensible industry-wide measurement metrics to create a market. Across sectors, there are already a number of measurement systems in use, endorsed by various actors. Among them are the Impact Reporting and Investment Standards (IRIS), the Global Impact Investing Rating System (GIIRS) and the B Impact Assessment powered by B Lab (Antadze and Westley 2012; Jackson 2013). Social Responsible Investing (SRI) presents itself as a broad category in literature, consisting of a range of different investment activities, such as negative screening. For a detailed elaboration on the issue of SRI, see, for example, Renneboog, Ter Horst, and Zhang (2008), Sandberg et al. (2008), Lee et al. (2010), Harji and Hebb (2010) and Berry and Junkus (2012).

On the other hand, investors struggle to allocate capital toward the social sector, because the above proposed performance measurement metrics do

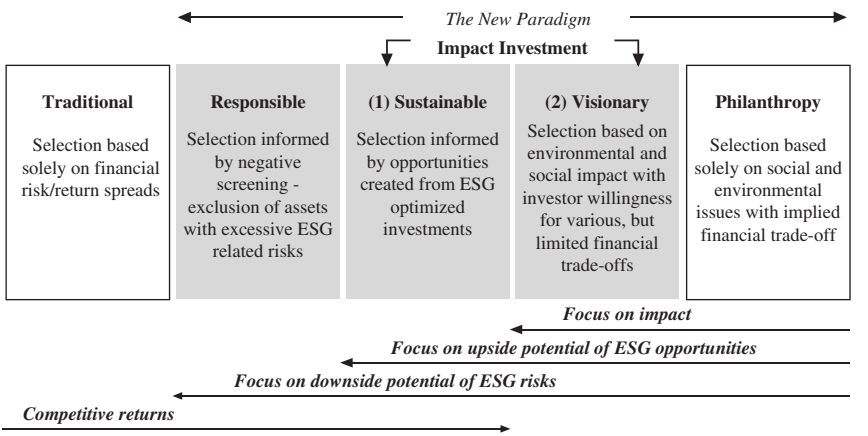

Figure 1: The spectrum of capital (adapted from Nicklin 2012, and Clara Barby, Bridges Ventures).

neither fully assess risks associated with the generation of impact nor consider relationships and interdependencies between parameters of risks and return. This becomes an aggravated problem when looking at a portfolio level, due to inevitable covariances that remain unaccounted for. Portfolio models can only be applied in situations where risk and return metrics are accurately measurable and comparable. Unfortunately, such consistent metrics are largely absent within the emergent field of social finance (Geobey, Westley, and Weber 2012).

Therefore, since an optimized asset allocation is an indispensable necessity for institutional investors, the expected market growth of impact investing will be dampened as long as impact investments' characteristics do not match conventional portfolio tools.

Already some researchers point out the need for adapted financial tools (e.g. Geobey, Westley, and Weber 2012; Lyons and Kickul 2013), yet there is no scholarly publication so far addressing the integration of impact investments into traditional portfolio optimization tools. There is some substantial ground work however, as some authors already propose further research referring to the decision framework and investment criteria of social investors (Lyons and Kickul 2013) and others see financial risks as one of the most severe barriers to social innovation and ask for mechanisms of risk reduction through the inclusion of ESG (environmental, social and governance) criteria (Krlev, Glänzel, and Mildenberger 2013). There are some fundamental paradigms implied, however, as much debate is dedicated to negative screening, meaning the exclusion of certain non-ESG compliant investments. The active search for investments in creating a social impact as "positive screening" is still somewhat limited in literature, yet early evidence suggests even a financial Uber return in some of these impact investments.

One mathematical approach that seems most suitable to bridge the gap between the social and financial logics in the context of impact investing is the Black–Litterman (BL) model by Black and Litterman (1992), with major contributions by Mankert and Seiler (2011), He and Litterman (1999), Idzorek (2005), Walters (2014), Bevan and Winkelmann (1998).

The current ongoing research by the authors thus seeks to bridge social and financial return and risk considerations in portfolio optimization by adapting the BL model to the specific needs in impact investing. To overcome the subproblem of measuring social returns and risks given various institutional policies, the authors turn to an ex-ante examination of factors as capabilities, which can be individually defined to fit the specific institutions' logic. These factors are currently the focus of research in the work of highly valued colleagues around the globe and can then be easily integrated into the proposed model.

2 Social finance and impact investments

As social and environmental finance, and especially impact investing, is a nascent field of research, the number of purely academic and theory-building publications is still quite limited and major leaps in literature have been written by only a handful of highly interconnected scholars. At the moment, it is mostly practitioners' reports and documents that are driving the field forward, partly because of the fast pace of innovations in practice.

As the recent economic crisis showed, businesses and the capitalist system are in many respects capable of dealing with its financial consequences. Unfortunately, the same cannot be said of the social consequences.

Going back to the roots of the current movement, social finance partly emerged because governments, charities and philanthropists alone are no longer capable of dealing with the twenty-first century's social and environmental challenges. Focusing on the act of charitable giving rather than on achieving social outcomes and a dependence on unpredictable funding hindered many charitable organizations from realizing their full potential concerning innovations, effectiveness and scale. Realizing that governments are not best placed to find solutions to social issues and fiscal expenditures fall far short of expected needs, the third sector adapted methods and logic of the business sector to become more *"businesslike"* (Canadian Task Force on Social Finance 2010; Cohen 2014). To do so, however, the public has to be aware of the critical role that financiers play to help achieve social goals and mitigate social ills (Shiller 2013). Given the nature of how resources are distributed in the world, private investors may have a special role and responsibility in addressing social challenges (World Economic Forum 2013).

Social finance also serves as a mechanism for channeling capital toward social innovation that contributes to a public benefit. It comprises a spectrum of approaches, such as impact investing, governmental backed finance and mission-related philanthropic investments. Motivations of investors are widespread and range from impact-first investors who are willing to provide funding for organizations that are not able to generate market returns to more financially focused investors who are interested in achieving both an adequate financial and a social return (Moore, Westley, and Brodhead 2012; Wilson 2014).

As in traditional finance, social investment instruments can include grants, loans, guarantees, quasi-equity, bonds and equity. Additionally, impact investments may also fall in the category of real assets. Ranging from forest and farmland to affordable residential developments, these projects usually require a substantial sum of capital (Wilson 2014; Rodin and Brandenburg 2014). Given that

the sector is still a small niche in traditional financial markets, existing products, however, do not always align with mainstream definitions of asset classes (Harji et al. 2014) because of the idiosyncrasies of the underlying ventures.

One significant aspect about social enterprises is that their features characterize them as hybrid organizations, which incorporate elements of different institutional logics (Pache and Santos 2012). For hybrids the strategic challenge is the integration and balance of public and private values so that these apparently competing goals leverage each other to maximize operational efficiency and effective delivery of social and environmental impact (Florin and Schmidt 2011). Especially in terms of capital allocation, these two quite distinct and historically incompatible logics are by nature arenas of contradiction. The social welfare logic implies the well-established practice of gift-giving, state spending and mutualism primarily used to create public goods appropriated by specific beneficiaries or society at large. In contrast to that, the traditional business aspect draws on the investment logics and practices of mainstream financial investment management to reframe the processes by which capital generates social or environmental returns (Nicholls 2010). The confluence of these two traditions has generated a good deal of innovation in social enterprises so far and the perceived boundaries that previously delineated not-for-profits from for-profits and investments from philanthropy may no longer apply. However, the different institutional logics and emerging norms have also introduced increased complexity in the markets (Nicholls 2010; Antadze and Westley 2012).

Apart from the early research by Nicholls (2010), who outlines an institutional matrix by conceptualizing investors' logics and rationalities through a Weberian analytic lens, there are few scholarly publications dealing with the landscape of the sector on a macro level. Tackling the void and need, practitioners already developed frameworks to structure the market in order to facilitate the communication with investors and advisers (e.g. Nicklin 2012; Lai et al. 2013).

The heterogeneity within the social investment movement suggests that a variety of risk and return models may be applied in practice and the spectrum of financial instruments and investment approaches is quite diverse. Since underlying investment logics typically determine the financial instruments and deal structures in a market, this variety and inherent complexity currently undermines efforts of standardization.

Drawing on previous work by Nickling and Barby, the authors provide an overview of what can be seen as impact investments in Figure 1. While the research and the model currently developed by the authors may well serve the "Responsible" logic (negative screening of ESG risks) as well, the motivation and following sections in this paper deal with the positive screening, actively looking for ESG opportunities.

Voices in the social sector have long been stressing the fact that the allocation of funding needs to be optimized for social enterprises (Desjardins 2011; Trelstad and Katz 2011). For example, Bishop and Green (2010) argue that the sector needs an efficiently functioning *social capital curve* to fill pressing funding gaps starting at the stage of a good idea to scalable business models. Installing such a curve would ensure that available resources are directed to the most promising ventures at different critical levels. One pre-requisite for this however would be an in-depth examination of underlying (social and impact) risks and hybrid returns.

3 Two-dimensional performance framework of risk and return

One of the particularly outstanding features of impact investments is the simultaneous generation of financial and social returns. Yet this interplay of objectives increases complexity when it comes to risk/return spectrums.

As outlined above, especially institutional investors commonly use a two-dimensional framework of risk and return to select investment opportunities and arrange portfolios. Since impact investors' focus is to generate an additional social impact alongside a financial return, applying the traditional lens evokes the following questions:

(a) How does financial risk change when adding a second return perspective?
(b) What kind of risks influence the social returns?

While risk is already perceived as an important factor for evaluating social innovation in general (Krlev, Glänzel, and Mildenberger 2013), a deeper understanding of risk and how it is financially priced in terms of investing has yet to be developed (Brown and Swersky 2012). For the measurement of social impact on the other hand, various market participants have already developed different sets of metrics and frameworks (e.g. IRIS, GIIRS and SROI). However, these look at the investments from an *ex-post point of view*, thus are only helpful if the ventures are already well established in the markets and do little in the judgment of potential investments from an *ex-ante* point of view.

To gain a comprehensive overview of current efforts made by market participants to conceptualize the logic of measuring ex-ante impact investments' performance, the authors reviewed existing literature and reports and talked to investors. One of the striking, yet not unexpected, outcomes is that the perception and interpretation of an investment's impact performance is directly

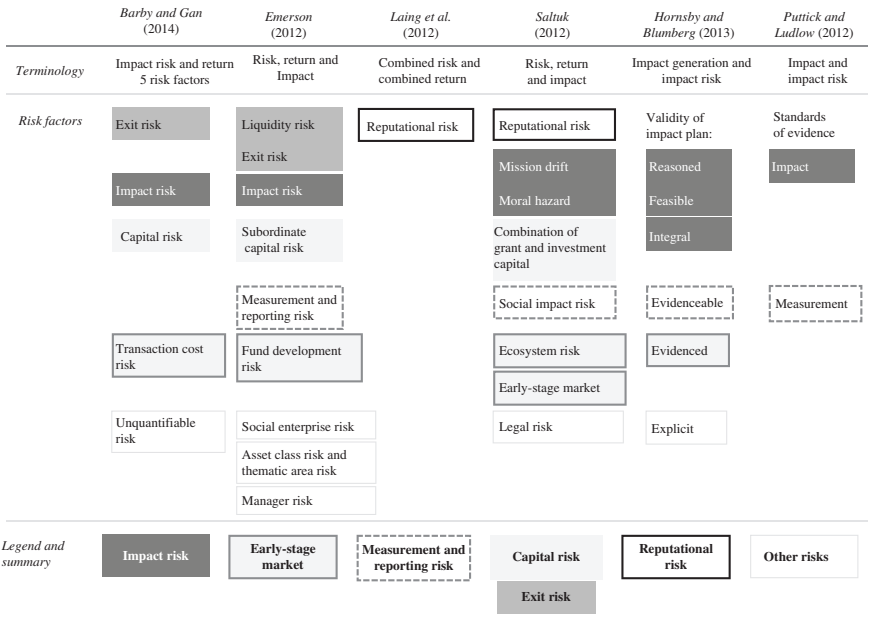

Figure 2: A comparison of risk factors in practice, compiled from the above-mentioned reports (source: authors).

dependent on the particular author's or institution's inherent perspective on the market (see Figure 2). Performance metrics are either three or four dimensional (social and financial risk separate or together), and the chosen set of factors is highly influenced by practicability rather than completeness.

Concerning the social return, Hornsby and Blumberg (2013) as well as Puttick and Ludlow (2012) define *impact*, in particular, *impact generation* in Hornsby and Blumberg (2013), as the effect of *outputs on outcomes* and address the potential for real change presented by the organization and investment opportunity together. Compared to traditional investments, impact generation is equivalent to the prospective financial return.

Both reports are using the term *impact risk* to describe a measure of uncertainty that an organization will deliver on its proposed impact. By considering six key qualities that help to assess the social risk, Hornsby and Blumberg (2013), for example, focus the evaluation particularly on the validity of the impact plan. The starting point for any structured and rational treatment of impact is to check whether the impact plan is explicit in all particulars. Second, attention has to be focused on how well reasoned and compelling the theory of

change is presented. Third, a potential tension within the organization may arise between its impact-generating and revenue-generating activities. In order to reduce this risk, the generation of impact should be integral to the organization's business strategy, operations and revenue model. Fourth, the feasibility of the impact plan has to be assessed concerning the necessary resources, capacity, skills and relevant experience besides its operational and financial strengths. Fifth, some kind of evidence has to be found which supports the impact plan's approach to impact generation. Sources of evidence may include track records, precedents, research or control groups. Finally, the impact plan has to be evidenceable to ensure that carrying out the plan will produce sufficient evidence to demonstrate the impact and prove the approach.

Puttick and Ludlow (2012) on the other hand refer – in terms of risk – to *Standards of Evidence* which consist of five levels representing different stages of how impact evidence is gathered, interpreted and assessed. At the lowest level, the organization, respectively, the venture's manager can give an account of impact by using existing data to provide a set of logical reasons why products or services could have impact on the intended outcomes. At the highest level, the product or service could be operated up by someone else, somewhere else and be scaled-up while continuously achieving a positive and direct impact on the outcome. In general, a higher level of evidence suggests a lower level of risk.

While the two already mentioned reports see social and financial risk as two independent parameters, three other publications describe only one aggregated measure of risk. Emerson (2012) and Saltuk (2012) use a three-dimensional framework consisting of *risk*, *return* and *impact*.

Saltuk (2012) uses the three dimensions to map a profile of each investment. The *impact* assessment consists of a due diligence to come to a view on the intent and the impact of the proposed investment opportunity. After the analysis, they assign a ranking from one to five on questions regarding the people, products or processes through which the impact will be delivered. Summarizing the results of each scorecard gives a weighted average ranking between 1 and 5 for each investment. The scorecards are used to quantify impact relative to the investor's mission. In a second step, the *return* of the portfolio is assessed on a blended basis including the aggregate financial return and social impact. In practice this means that impact objectives can outweigh returns below the usually required threshold. The *risk* parameter within the framework comprises several risk factors which are analyzed from a traditional finance and a specific impact perspective. In addition to the risks of traditional investments, they consider further aspects listed in the following Table 1.

In the first report published by J.P. Morgan (O'Donohoe, Leijonhufvud, and Saltuk 2010), the Rockefeller Foundation and GIIN state that the risks of impact

Table 1: Risk factors compiled by the authors from Saltuk (2012) and O'Donohoe, Leijonhufvud, and Saltuk (2010).

Risk factor	Description
Early stage of the market	Risks might arise from the market's small size, the short track record of performance, small portfolio and deal sizes and fund managers little experienced with dual return objectives.
Ecosystem risk	The impact investment market depends on infrastructure, e.g. policy support and measurement systems, which adds risk.
Mission drift	Investees might drift away from the intended mission without the approval of investors.
Combination of investment capital	Impact investments combine grant and investment capital. This combination risks not achieving the expectations and intentions of the respective funders.
Moral hazard	Similar to traditional investment, but extended by the failure of not delivering on the impact mission. Additionally, funders aim at helping the investee but also have to maintain rigor with respect to loss recognition.
Legal risk	In addition to legal and regulatory challenges at the beginning of a business, there may also be changes to different regimes over time or changes to transferring the business as it grows. Difficulties in scaling the business or changing ownership will introduce a challenge to the growth of impact investments, but with the help of local management teams it will be easier to maneuver within local regimes.
Reputational risk	An impact investment must constantly balance the dual imperative of generating positive social impact and profit. However, these two objectives can also create tensions. In pursuit of more profit a business may be inclined to target relatively better-off customers, raise prices to take advantage of the lack of competition or take cash out of the business rather than invest in innovation to enable even broader customer reach.

investments are similar to those for venture capital or high yield debt instruments. Besides typical risks associated with early-stage companies and small scales, the report focuses particularly on legal and reputational risks that arise especially when operating in emerging markets and with vulnerable populations. Besides these explicitly mentioned risks, another section concentrates on social impact risk, which refers to difficulties regarding standardized performance measurement and reporting. (O'Donohoe, Leijonhufvud, and Saltuk 2010) These further risk factors are added in Table 1. From a forward-thinking view, the report also takes asset class and thematic area risk into consideration

because the type of investment vehicle and the particular vehicle's thematic area effect the assessment of an investment's real risk. Beyond these aspects the report further differentiates between perceived and real risk, since new investments often seem more risky than they really are.

Similar to Saltuk (2012), the two-dimensional metrics of Laing et al. (2012) expand the traditional risk/return framework with *combined risks* and *combined returns*. The combined return accounts for both the investment's financial return and any social return that is relevant to the investor's objectives. While the combined risk incorporates the financial risk measured by an investment's volatility, the social risk only refers to a reputational risk through which an institution's investments might alienate key stakeholders and compromise the values of the organization.

Finally, the report by Barby and Gan (2014) focuses exclusively on impact investments' risks. In general, the approach is based on the assumption that risk is multi-factored since poor performance can be driven by a range of factors and risk is subjective and always relative to the expectations of a particular investor. Beyond the traditional risk factors, such as market risk, operational risk and currency risk, which are obviously equally relevant for impact investments, they discovered five further idiosyncratic factors, quite similar to those reported above (see Figure 2).

Although the considered risk factors seem diverse, the comparison in Figure 2 shows that there are several conceptual overlappings. In this figure, the authors present a snapshot of "risks in focus" at various institutions, building the comparison based on underlying assumptions rather than on the individually applied terminology. As indicated by the formatting, many definitions overlap. The legend at the bottom of the figure simultaneously represents a summary of resulting risk categories, which are arranged in an order representing their frequency of occurrence.

Based on the findings in the document analysis, the overall perception of practitioners is that impact investments face a multifaceted set of interdependent risks and further research is desperately needed to define risk factors and empirically analyze interdependencies between those risks and their effects on financial and social return. These interdependencies would form the basis for the building of efficient portfolios. In accordance with the proposed definition of performance parameters, the evaluated reports propose different approaches concerning portfolio building.

From a practical perspective, Laing et al. (2012) recommend the integration approach for investors focused on minimizing social risk and the carve-out approach for investors looking to maximize social impact.

As opposed to the previously explained portfolio frameworks following a more or less conventional approach, Bridges Ventures (2013) developed a four-

dimensional *Bridges IMPACT Radar*, which plots impact risk and impact return of each of the four criteria: "Target outcome," "Additionality," "Alignment" and "ESG," which are evaluated from a return as well as a risk perspective based on a scoring model.

Besides their internally used methodology, Bridges Ventures also look at the entire market applying a risk lens. The interviews conducted by Barby and Gan (2014) suggest that a significant portion of asset owners simply cannot participate in the market today because of a variety of risk factors. In an attempt to broaden the market, the range of lower risk opportunities available for investors needs to grow. However, reducing risk is not a one-size-fits-all approach as the relevance of risk factors differs considerably depending on the target investor and performance expectations. One of the proposed possibilities to reduce capital as well as transaction cost risk is to use portfolio diversification and bundling. A traditional fund structure for example offers investors the opportunity to buy a single product that comprises different underlying investments and consequently spreads the risk. Beyond that, sufficiently dissimilar products can be bundled to provide diversification. The financial and impact exposure can either be spread across asset classes or different sectors and geographies. Since diversification is only possible if the respective products are available, the report encourages asset owners to challenge intermediaries to bring opportunities forward that match their needs and preferences.

Although Hornsby and Blumberg (2013) describe the relationship between the four performance measures of financial risk and return as well as impact generation and risk, they do not provide a systematic framework for selecting a portfolio. Besides pointing out that a certain balance among the investments should be maintained, they highlight the importance of paying attention to the anticipated development of investments.

Combining financial and social risk into one risk figure constitutes difficulties since social risk is not easily quantifiable. For that reason Laing et al. (2012) recommend increasing the combined risk if a relevant social risk is identified so that it is meaningfully higher than the financial risk measure. With this approach they attempt to imply that a strategy with exposure to social risk is less attractive from a risk/return standpoint than an investment disregarding social risk.

Although the report by Emerson (2012) neither deals with the relationship between the defined parameters of risk, return and impact in detail, he postulates the creation of a New Efficient Frontier that is not bifurcated, but rather spherical.

Concerning the expected return, however, it is mentioned that over the past 5 years impact investors have changed their perception of return. Consequently,

they no longer ask what the market may deem as an appropriate financial return, but rather define a level of financial performance integrated with measurable social and environmental value creation. With the created slogan "I AM the market" it is expressed that the investor will determine an appropriate rate of return. Further, investors perceive blended financial and social returns not only acceptable but a significant driver for their investment decisions.

Saltuk (2012) discusses the debate in the impact investment market whether there needs to be trade-off in financial returns in order to gain impact or not. From their point of view we should not aim to describe the diverse set of assets with one overall statement about the relationship between return and impact. To characterize such a broad universe of opportunities with just an average seems to have little meaning. For that reason investors are encouraged to assess each opportunity individually and let the economics of the intervention determine the return profile.

Looking at the issue from a practical perspective, the fund described by Puttick and Ludlow (2012) aims at investing in early-stage innovations where potential impact and impact risk are both high. Through the investment, they believe to be able to reduce the impact risk and deliver public benefit by scaling-up output. Besides, increasing impact performance will eventually lead to an increase in financial value.

To a certain extent all approaches are based on the traditional model of risk and return and are predominately adjusted by an additional subjective evaluation. However, none of the reports describe how the parameters are concretely evaluated, measured or systematically embedded into a portfolio allocation framework. In addition, an impact portfolio can be interpreted either with or without traditional assets.

Following the lead from the practitioners' voices, the authors are currently working on a model to operationalize the concepts and allow for rational decision making based upon a verifiable mathematical theory.

4 A proposed model for portfolio optimization

Drawing from current hurdles that investors face when approaching the impact investment market, the authors are working on an approach that incorporates social investments' specific parameters alongside financial values into the traditional logic of portfolio optimization, based on risk and return. To do so, social measures are quantified and included in an adapted optimization process based on the BL approach as depicted in Figure 3. The authors remodeled the investors view perspective Q to allow for an operationalization of social and impact

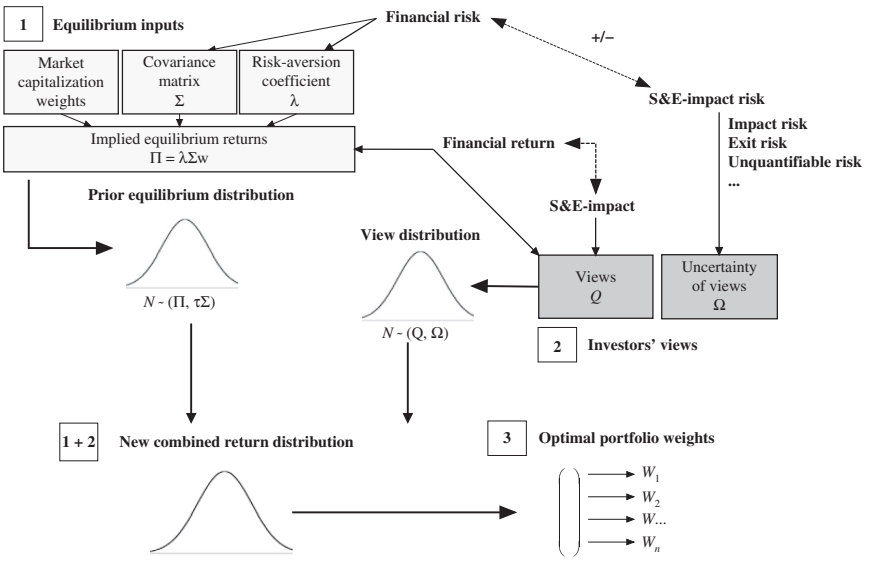

Figure 3: The proposed model, including social risks and returns in previously optimized portfolios (source: authors).

considerations based upon expert panels and subsequent Monte Carlo computations.

The S&E-impact score (S&E-I) describes an investment's social and environmental contribution by looking at the antecedents of impact. S&E-impact risk (S&E-IR) on the other hand, represents the risk of successfully generating the intended positive impact as a deviation of the S&E-I score.

To include the S&E perspective in the traditional optimization logic, these two measures are derived from investor-specific expectations and standardized evaluation processes (Monte Carlo simulations based upon expert panels and scoring models). Since each social investment generates different outcomes and investors have different objectives, a holistic approach ensuring both comparability and enabling rational decision making is required.

Figure 4 shows how the concept quantifies and determines financial and S&E input parameters before applying a re-balancing based on the traditional BL model. According to the numbering in Figure 4, the following section breaks the entire process down into four major steps whereby the first three explain how the measures are derived and the last aligns both perspectives to arrive at optimized weights.

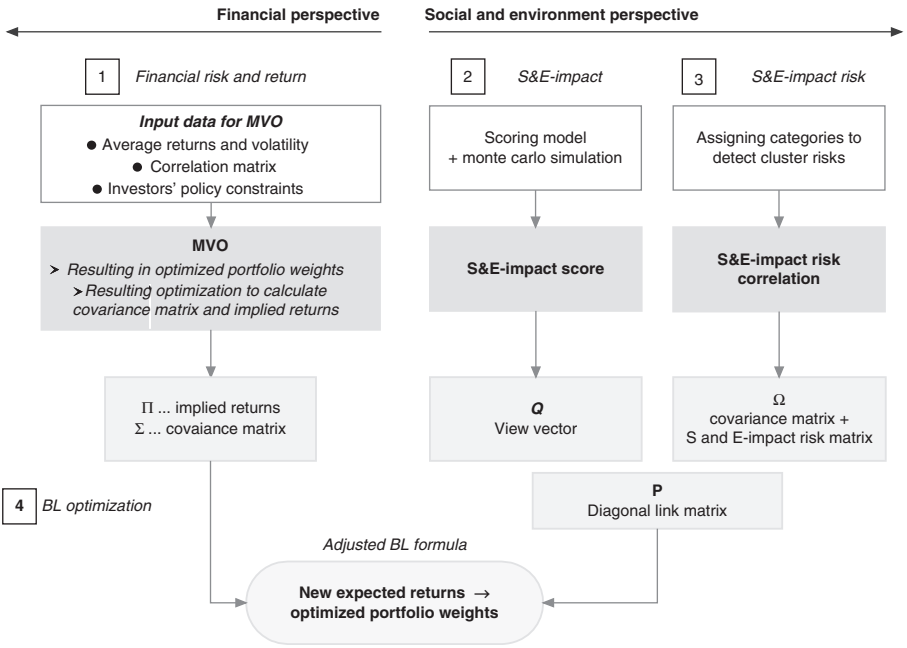

Figure 4: Explaining the streams of logic in the BL model leading to optimized portfolio weights based on social and financial inputs (source: authors).

First, an investments' financial perspective includes financial values for risk and return, which are inferred from a mean–variance–optimum. Based on historical data and individual portfolio constraints, equilibrium market weights are computed. These in turn serve as a starting point for a reverse optimization to come up with a vector of implied expected financial returns and the covariance matrix. This approach makes use of the traditional BL model, while BL's feature of formulating and incorporating investor's individual views has been reworked to include the S&E perspectives.

Second, the next step aims at calculating an S&E-I score that ensures comparability and an objective evaluation of an investment's impact. In order to evaluate each investment's performance in accordance with the investor's unique set of mission targets, the authors propose a weighted scoring model that can be filled with different S&E criteria and corresponding weights. By asking independent experts carrying out due diligence to evaluate investments based on these predefined categories, investors have the opportunity to express motivations and preferences while still collecting objective opinions. The list of ex-ante criteria may differ among investors and be either broadly or narrowly

defined. It should however be compatible to a standard framework of reporting social impact (such as GIIRS) to allow for back-testing and validity reviews. After collecting experts' views, the S&E scores serve as input for a Monte Carlo simulation to generate expected average scores that are randomly distributed. To get reasonably optimized returns which are proportional to and comparable with the implied financial returns, the scores need to be normalized to arrive at the S&E-I.

Third, the S&E-IR is derived by comparing individual investments' characteristics within a portfolio to detected cluster risks. As argued before, risk within impact investing is multifaceted and cannot be easily summarized and quantified. However, cluster risks within a portfolio can be determined by comparing different objective settings such as group of beneficiaries, geographical area or service provider. Classifying each investment into predefined categories and assigning each category with individual weights expresses the investor's attitude toward different risk factors and results in a S&E-IR covariance matrix.

Fourth, after computing the parameters for the financial and the S&E perspective (via matrix algebraic operations), these isolated values serve as input for the BL re-balancing process (see formulas I and II) at an assumed estimation error Tau to arrive at likewise financially and socially optimized returns. The underlying logic would also allow for further individual constraints to comprise investors' preferences. By assigning a risk-aversion coefficient Lambda, investors are also able to operationalize their risk appetite, and the "social-value ratio" describes the desired (policy determined) trade-off between the financial and the S&E perspective.

$$E[R] = \left[(\tau\Sigma)^{-1} + P'\Omega^{-1}P\right]^{-1}\left[(\tau\Sigma)^{-1}\Pi + P'\Omega^{-1}Q\right] \quad \text{(I)}$$

$$\Sigma_p = \Sigma + ((\tau\Sigma)^{-1} + p^T\Omega^{-1}P)^{-1} \quad \text{(II)}$$

Finally, BL-optimized weights are computed in formula III (the authors chose an 100% investment constraint, yet individual investment policies concerning leverage can be implemented).

$$w = \frac{\Sigma^{-1}I}{I^T\Sigma^{-1}I} + \frac{1}{\lambda}\Sigma^{-1} * \left(R - \frac{I^T\Sigma^{-1}R}{I^T\Sigma^{-1}I} * I\right) \quad \text{(III)}$$

The streams of logic and the variable names are explained in Figure 4.

Applying this optimization concept, the authors suspect that such portfolios provide slightly lower financial returns while generating a positive S&E-I within the planned range. At the same time volatility typically decreases because of the low correlation between social investments and traditional investment alternatives. In several simulations based upon available data these assumptions were

valid; however, in terms of the overall suggested concept and model, further efforts are needed to validate the model with real data, and underlying assumptions of normality and regression will need to be carefully considered to understand the models' constraints. We therefore invite the community to contact us and work together. A very early simulation (with rather steep differences in social impact scores to exemplify) is displayed in Table 2. Computations for A1–A3 are based on real world data from Bloomberg and A4–A5 (proposed social projects) are based on business plans. Social impact potential was estimated by experts. Details on the Monte Carlo simulations and social covariances are omitted because of space restrictions.

Table 2: Simulation on five assets with risk aversion parameter Lambda of 1. (% change of individual component weights after BL optimization in italic)

Asset	Fin.-returns mean (%)	Fin.-Std. dev. (%)	Markowitz Sharpe ratio optimized portfolio weights	Social impact score (antecedent)	BL optimized portfolio weights	*Delta*
A1	18.20%	23.16%	11.33%	0.90	6.54%	*−42.27%*
A2	23.00%	26.00%	18.40%	1.82	10.05%	*−45.38%*
A3	13.69%	14.97%	31.59%	0.60	21.68%	*−31.37%*
A4	7.00%	12.70%	20.21%	6.60	33.44%	*+65.46%*
A5	8.00%	14.29%	18.46%	7.40	28.30%	*+53.30%*
	Portfolio return	Markowitz:	13.51%	BL Opt.:	11.07%	*−18.05%*
	Volatility	Markowitz:	9.96%	BL Opt.:	8.76%	*−11.97%*
	Social impact score	Markowitz:	3.32%	BL Opt.:	4.67%	*+40.47%*

What can be seen in this early simulation is that a BL rebalancing reduces the financial return by 18.05% (from 13.51% to 11.70%). it also reduces volatility by 11.97% and strongly improves on the potential social impact of this portfolio by 40.47%. The assumptions were a 20% social impact orientation, a 5% estimation error and a risk-policy parameter Lambda of 1. Overall, despite a quite significant rebalancing toward the social projects, a stable financial return was achieved, while overall risk was reduced and a vastly higher social impact potential was created through the investments.

Several issues need to be addressed by the authors in the near future before the whole model can be presented to the public: amongst the topic of severely restricted liquidity of social projects, leading to potential re-balancing problems, problematic differences in investment sizes in the market, and other, more mathematically relevant factors such as parametric sensitivity issues, distributional assumptions and model constraints. Yet this conceptualization provides a

universe for experimentation and a common ground to start a discussion with investors.

5 Future outlook and ideas

Over the last couple of years impact investing has advanced from being a niche within the social investment spectrum to a promising investment philosophy blending financial and social values. What became clear in the authors' journey is that when striving to unlock the market's untapped social and financial potential, participants are still facing a number of hurdles – among them the leap from diffuse and idiosyncratic concepts to operationalized practical instruments guiding rational decision making. While the landscape of investors and intermediaries is continuously growing, large institutional investors such as pension funds, insurance companies or hedge funds have limited tools and metrics at hand that would provide a solid basis for their decision making and are therefore still reluctant when it comes to entering the market. A vicious circle, because without a market such tools will inevitably be severely limited in practice because of liquidity problems.

Future research may also need to look at possible correlations between financial and social returns as well as between the respective risks. Early voices argue that positive social investments are often little correlated to mainstream market investments, thus leading to the possibility of attractive diversification strategies and additional risk mitigation strategies. Much work lies ahead. Besides further validating and back-testing the proposed model in this paper, the authors will embark on a journey to mathematically model a multivariate formula that incorporates the intercorrelation between financial and social risks for further inclusion into the portfolio building tool. In order to unlock the potential of social innovation at large and of impact investments in a narrower sense, future activities will necessarily require an intense collaboration across sectors, countries and organizations. Exchanging perspectives and experiences from various fields might not only accelerate the growth of the impact sector but also provide room for reflection on traditional finance and investments.

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References

Antadze, N., and F. R. Westley. 2012. "Impact Metrics for Social Innovation: Barriers or Bridges to Radical Change?" *Journal of Social Entrepreneurship* 3 (2):133–50. doi:10.1080/19420676.2012.726005.

Barby, C., and J. Gan. 2014. Shifting the Lens.

Berry, T. C., and J. C. Junkus. 2012. "Socially Responsible Investing: An Investor Perspective." *Journal of Business Ethics* 112 (4):707–20. doi:10.1007/s10551-012-1567-0.

Bevan, A., and K. Winkelmann. 1998. "Using the Black-Litterman Global Asset Allocation Model: Three Years of Practical Experience." In *Fixed Income Research – Goldman Sachs*, edited by Ronald A. Krieger, 1–15. New York: Goldman Sachs.

Bishop, M., and M. Green. 2010. "The Capital Curve for a Better World." *Innovations: Technology, Governance, Globalization* 5 (1):25–33.

Black, F., and R. Litterman. 1992. "Global Portfolio Optimization." *Financial Analysts Journal* 48 (5):28–43.

Bridges Ventures. 2013. "Bridges IMPACT Report – A Spotlight on Our Methodology." 1–27. London: Bridges Ventures.

Brown, A., and A. Swersky. 2012. "The First Billion: A Forecast of Social Investment Demand." 1–32. London: Big Society Capital.

Buckland, L. 2014. "Social Impact Strategies for Banks – Venture Philanthropy and Social Investment." 1–109. London: EVPA. ISBN 9789081907071.

Canadian Task Force on Social Finance. 2010. "Mobilizing Private Capital for Public Good." 1–38. Toronto: Canadian Task Force on Social Finance.

Clark, C., J. Emerson, and B. Thornley. 2013. "Impact Investing 2.0 – The Way Forward – Insight from 12 Outstanding Firms." 1–41. Durham, US: Duke University, Fuqua School of Business.

Cohen, R. 2014. "Revolutionising Philanthropy – Impact Investment." 1–11. London: Social Impact Investment Taskforce.

Desjardins, S. 2011. "The Need for a Smarter Funding Ecosystem." *Innovations: Technology, Governance, Globalization* 6 (3):85–92.

Doherty, B., H. Haugh, and F. Lyon. 2014. "Social Enterprises as Hybrid Organizations: A Review and Research Agenda." *International Journal of Management Reviews* 16 (4): 417–36.

Emerson, J. 2012. "Risk, Return and Impact: Understanding Diversification and Performance Within an Impact Investing Portfolio." 1–14. Bethesda, US: Impact Assets.

Florin, J., and E. Schmidt. 2011. "Creating Shared Value in the Hybrid Venture Arena: A Business Model Innovation Perspective." *Journal of Social Entrepreneurship* 2 (2):165–97. doi:10.1080/19420676.2011.614631.

Geobey, S., F. R. Westley, and O. Weber. 2012. "Enabling Social Innovation through Developmental Social Finance." *Journal of Social Entrepreneurship* 3 (2):151–65. doi: 10.1080/19420676.2012.726006.

Harji, K., and T. Hebb. 2010. "Impact Investing for Social Finance." 1–20. Carleton, Canada: Carleton Centre for Community Innovation.

Harji, K., J. Reynolds, H. Best, and M. Jeyaloganathan. 2014. "State of the Nation – Impact Investing in Canada." 1–94. Toronto, Canada: MaRS.

He, G., and R. Litterman. 1999. "The Intuition Behind Black-Litterman Model Portfolios." 1–18. New York: Goldman Sachs.

Hornsby, A., and G. Blumberg. 2013. "The Good Investor: A Book of Best Impact Practice." 1–94. London: The Good Investor.

Idzorek, T. M. 2005. "A Step-by-Step Guide to the Black-Litterman Model." 1–32. Chicago: Ibbotson Associates.

Jackson, E. T. 2013. "Interrogating the Theory of Change: Evaluating Impact Investing Where It Matters Most." *Journal of Sustainable Finance & Investment* 3 (2):95–110. doi: 10.1080/20430795.2013.776257.

Krlev, G., G. Glänzel, and G. Mildenberger. 2013. "Capitalising Social Innovation. A Short Guide to the Research for Policy Makers." 1–23. Bruxelles, Belgium: TEPSIE of the European Commission.

Lai, J., M. Will, N. Joshua, and P. Raúl. 2013. "Evolution of an Impact Portfolio: From Implementation to Results." 1–68. San Francisco: Sonen Capital.

Laing, N., C. Long, A. Marcandalli, J. Matthews, A. Grahovac, and J. Featherby. 2012. "The U.K. Social Investment Market: The Current Landscape and a Framework for Investor Decision Making." 1–24. London: Cambridge Associates.

Lee, D. D., J. E. Humphrey, K. L. Benson, and J. Y. K. Ahn. 2010. "Socially Responsible Investment Fund Performance: The Impact of Screening Intensity." *Accounting & Finance* 50 (2):351–70. doi:10.1111/j.1467-629X.2009.00336.x.

Lehner, O. M. 2012. "Social Entrepreneurship Perspectives." Triangulated Approaches to Hybridity, University of Jyväskylä.

Lyons, T. S., and J. R. Kickul. 2013. "The Social Enterprise Financing Landscape: The Lay of the Land and New Research on the Horizon." *Entrepreneurship Research Journal* 3 (2):147–59. doi:10.1515/erj-2013-0045.

Mankert, C., and M. J. Seiler. 2011. "Mathematical Derivations and Practical Implications for the Use of the Black-Litterman Model." *Journal of Real Estate Portfolio Management* 17 (2):139–59.

Moore, M. -L., F. R. Westley, and T. Brodhead. 2012. "Social Finance Intermediaries and Social Innovation." *Journal of Social Entrepreneurship* 3 (2):184–205. doi:10.1080/19420676.2012.726020.

Nicholls, A. 2010. "The Institutionalization of Social Investment: The Interplay of Investment Logics and Investor Rationalities." *Journal of Social Entrepreneurship* 1 (1):70–100. doi:10.1080/19420671003701257.

Nicklin, S. 2012. "The Power of Advice in the UK Sustainable and Impact Investment Market." 1–72. London: Bridges Ventures.

O'Donohoe, N., C. Leijonhufvud, and Y. Saltuk. 2010. "Impact Investments: An Emerging Asset Class". 1–93. London: JPMorgan.

Pache, A. C., and F. Santos. 2012. "Inside the Hybrid Organization: Selective Coupling as a Response to Competing Institutional Logics" *Academy of Management Journal* 56 (4):972–1001. doi:10.5465/amj.2011.0405.

Puttick, R., and J. Ludlow. 2012. "Standards of Evidence for Impact Investing."

Renneboog, L., J. Ter Horst, and C. Zhang. 2008. "Socially Responsible Investments: Institutional Aspects, Performance, and Investor Behavior." *Journal of Banking & Finance* 32 (9):1723–42. doi:10.1016/j.jbankfin.2007.12.039.

Richardson, B. J. 2011. "From Fiduciary Duties to Fiduciary Relationships for Socially Responsible Investing: Responding to the Will of Beneficiaries." *Journal of Sustainable Finance & Investment* 1 (1):5–19. doi:10.3763/jsfi.2010.0002.

Rodin, J., and M. Brandenburg. 2014. *The Power of Impact Investing: Putting Markets to Work for Profit and Global Good*. Philadelphia, PA: Wharton Digital Press.

Salamon, L. M. 2014. "New Frontiers of Philanthropy: A Guide to the New Tools and New Actors That Are Reshaping Global Philanthropy and Social Investing." Oxford University Press.

Saltuk, Y. 2012. "A Portfolio Approach to Impact Investment." 1–35. London: JPMorgan.

Saltuk, Y., A. El Idrissi, A. Bouri, A. Mudaliar, and H. Schiff. 2014. "Spotlight on the Market – The Impact Investor Survey." 1–50. London: JPMorgan.

Sandberg, J., C. Juravle, T. M. Hedesström, and I. Hamilton. 2008. "The Heterogeneity of Socially Responsible Investment." *Journal of Business Ethics* 87 (4):519–33. doi:10.1007/s10551-008-9956-0.

Shiller, R. J. 2013. "Capitalism and Financial Innovation." *Financial Analysts Journal* 69 (1):21–5.

Social Investment Research Council. 2014. "New Specialist Sources of Capital for the Social Investment Market." London: City of London.

Trelstad, B., and R. Katz. 2011. "Mission, Margin, Mandate: Multiple Paths to Scale." *Innovations: Technology, Governance, Globalization* 6 (3):41–53.

Walters, J. 2014. "The Black-Litterman Model in Detail." 1–65. Available at http://ssrn.com/abstract=1314585.

Wilson, K. 2014. "New Investment Approaches for Addressing Social and Economic Challenges." In *OECD Science, Technology and Industry Policy Papers*.

Wood, D., B. Thornley, and K. Grace. 2012. "Impact at Scale – Policy Innovation for Institutional Investment with Social and Environmental Benefit." 1–34. San Francisco: Pacific Community Ventures.

Wood, D., B. Thornley, and K. Grace. 2013. "Institutional Impact Investing: Practice and Policy." *Journal of Sustainable Finance & Investment* 3 (2):75–94. doi:10.1080/20430795.2013.776256.

World Economic Forum. 2013. "From the Margins to the Mainstream: Assessment of the Impact Investment Sector and Opportunities to Engage Mainstream Investors." 1–36. New York: World Economic Forum.