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# Think impact investing

Optimizing for impact with private equity and real assets: A guide to integrating impact into financial analysis of alternative assets

August 2021

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optimizing impact

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# Embracing change, optimizing impact

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Expectations of investor behavior are changing. As societies around the world deal with the challenges of climate change, a global pandemic, social upheaval and in some cases unrest, institutional investors are being asked to take a much more expansive view of risk than many traditional investment models currently account for.

Investors must weigh the potential positive and negative outcomes of their investments and assess how those outcomes could affect long-term value.

According to Nuveen's annual survey of institutional investors, over 70% agree that ESG is about fully integrating material environmental, social and governance factors into investment decision-making. This can help them better understand the full range of possible outcomes and improve decision-making. With this holistic view, investors can pursue the stability, diversification, financial performance and positive real-world benefits that underpin long-term value growth.

Fortunately, accounting for positive and negative impact externalities in the investment process is much more accessible than many realize. Common responsible investing frameworks and impact measurement tools can be adapted and combined into a uniform approach to assess net impact, making evaluating and managing positive and negative outcomes more systematic.

With almost 70% of investors indicating that they plan to seek out more ESG-oriented alternative investments in the near term, we are implementing a novel impact-augmented standard mean variance portfolio optimization model. Integrating impact into financial analysis helps us identify opportunities to increase impact, notably in areas aligned with the United Nations' Sustainable Development Goals (SDGs), without compromising on risk-adjusted financial returns. And we can identify optimal portfolios to meet other client goals too, such as net zero carbon targets.

This paper demonstrates how investors can leverage existing industry frameworks to develop a holistic approach for considering positive and negative impacts in any investment or portfolio. It also shows how investors can leverage traditional portfolio analysis tools – such as the standard mean variance portfolio optimization model – to plot the most efficient path to achieving impact objectives. Examples are drawn from Nuveen's global impact private equity strategy and private real assets platform, which includes farmland, timberland and infrastructure assets.



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# 01 Defining impact

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A useful first step is to select a framework that helps define the type of impact or outcome investors intend to create or avoid. The UN Sustainable Development Goals (UN SDGs) and the EU Sustainable Finance Taxonomy (EU Taxonomy) are two frameworks commonly used by investors and businesses. Both identify priority impact objectives across a breadth of environmental and social issues and define indicators or criteria to help measure progress toward their achievement.

They differ in several important respects. The EU Taxonomy is oriented toward an investor audience, and its application is increasingly

required as part of sustainable finance risk disclosure in the EU. The UN SDGs are written from the perspective of national governments and civil society, and are used by investors on a voluntary basis to signal and contextualize impact. As such, many industry associations and investors (including Nuveen) have developed proprietary UN SDG taxonomies to help translate the global goals into a more investable framework.

To date, most investors have used these frameworks to define the positive social or environmental outcomes realized through a sustainable or impact investing strategy. However, these frameworks are also useful

for defining categories of potentially negative or adverse impact. Using the frameworks in this way aligns with more traditional approaches to ESG investing of exclusion or integration, which focus on mitigating nonfinancial risks that may be material to investment performance.

Many of these nonfinancial risks can be viewed as impact externalities. Carbon emissions are a good example. They pose a material ESG risk for carbon-intensive businesses in the form of increased operating costs, but they also serve as an indicator of positive climate impact when reduced or removed from the atmosphere.

**The UN SDGs are written from the perspective of national governments and civil society, and are used by investors on a voluntary basis to signal and contextualize impact.**



# 02 Measuring impact

Within any given framework, key performance indicators (KPIs) help to measure positive or negative impact and progress toward social or environmental objectives. In the case of carbon emissions, metric tons of CO<sub>2</sub>e per year is a frequently used indicator of climate impact, as is average carbon intensity (MT CO<sub>2</sub>e/\$MM invested). The EU Taxonomy and the UN SDGs both offer KPIs for tracking performance, and investors can opt to use these as well as other indicators provided by industry organizations, like the GIIN's IRIS+ catalog. These metric sets tend to be most useful when supporting an impact investing strategy where impact measurement and management are fully integrated into the investment process, yielding robust data on impact performance.

Where impact performance data is not available, it can be useful to leverage appropriate proxy indicators that are more qualitative in nature, such as the presence or absence of a climate policy or an ESG rating. For example, a qualitative indicator such as robust energy management practices can serve as a proxy for positive impact externalities in relation to UN SDG 13: Climate Action, whereas rising energy consumption can serve as a quantitative indicator of negative impact externalities in relation to UN SDG 13.

**Impact can be assessed using standard impact taxonomies and quantitative social or environmental performance metrics, as well as proxy indicators such as ESG ratings.**

## Adapting for net zero carbon commitments

Impact investments and portfolios aligned to the UN SDGs are the focus of this paper. However, the approach can be adapted for other impact objectives such as policy commitments to net zero carbon targets.

Later in the paper, we specify an optimization model for portfolios aligned with the UN SDGs. This standard mean variance optimization model can also be used to solve for metrics such as carbon intensity to establish optimal net zero carbon portfolios.

Carbon intensity (MT CO<sub>2</sub>e/\$MM) is an estimate of carbon emissions per USD million invested. It is frequently used as an indicator of climate impact or exposure to carbon-intensive investments.

As part of Nuveen's ESG reporting and metrics for real assets, we have estimates of annual carbon intensity and net CO<sub>2</sub> flux across strategies and within each asset class. These metrics are valuable in our annual reporting and as an input to portfolio design that aligns with climate targets. It allows for comparison across asset classes and aids portfolio allocation decisions.

# 03 Managing for impact across the responsible investing spectrum

Having defined the type(s) of positive and negative impact that may result from investments and chosen metrics to track their progress, it is important to articulate the approaches through which investment teams will manage that impact. This includes mitigating negative impacts and enhancing positive ones.

The traditional responsible investing spectrum that starts with ESG exclusions and ends with impact investing is useful here (see Figure 1). It specifies how impact externalities are considered in the investment process and whether they are a binding selection criteria, meaning one of the specified criteria for labeling an investment ESG-focused. Another version of the spectrum can be extrapolated from the EU’s Sustainable Finance Disclosure Regulation (SFDR), which classifies

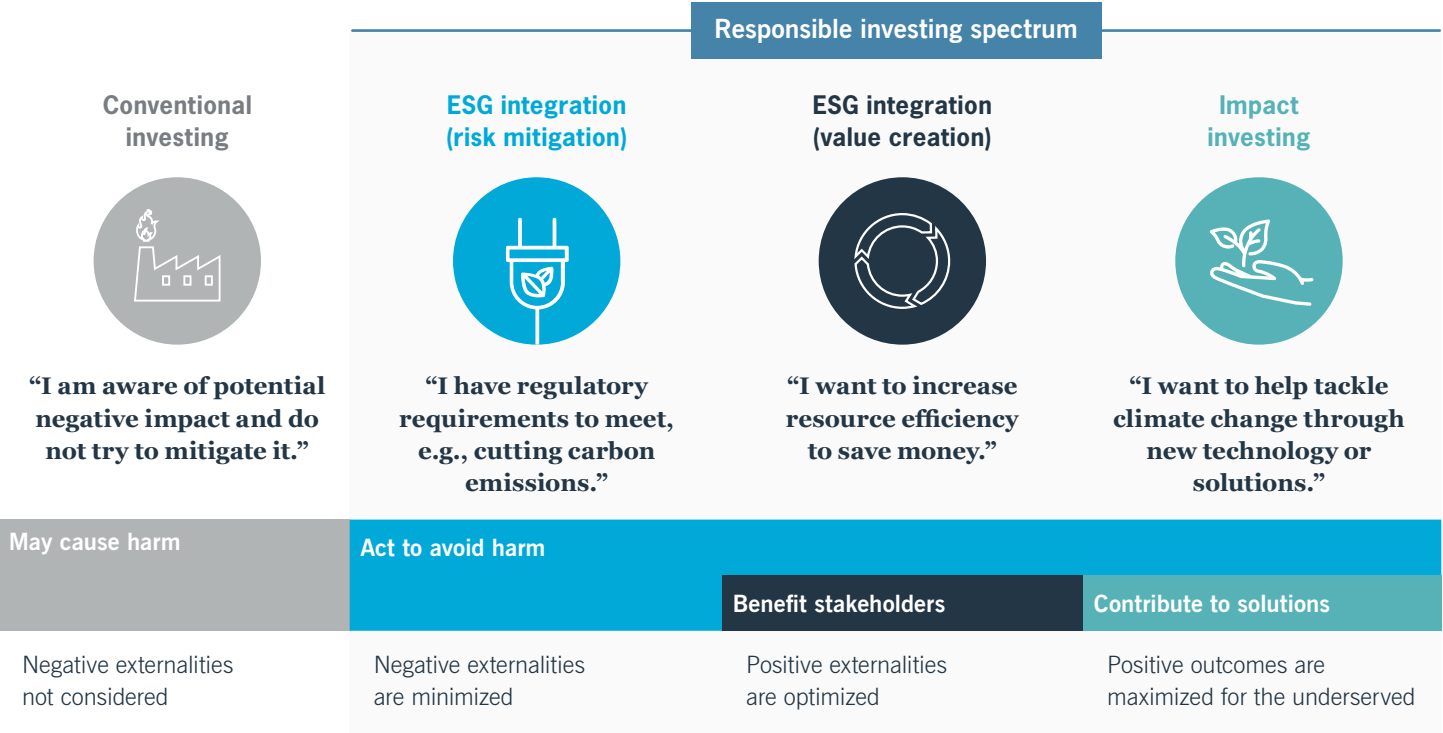
investment strategies based on their approach to mitigating or promoting environmental and social characteristics.

A third framework, which Nuveen has adapted for its net impact scoring tool, is the A-B-C approach from the Impact Management Project (IMP) for classifying enterprise contribution. According to the IMP, A is for avoid harm, B is for benefit stakeholders (including people and the planet) and C is for contribute to solutions. While the original application of this framework is meant for a specific investment, it is possible to elevate it to the strategy or portfolio level, as Nuveen has done. To this end, Nuveen defines portfolios that integrate ESG factors (as defined by UN Principles for Responsible Investment) as avoiding harm or benefiting stakeholders, and strategies

or portfolios marketed as impact investing (as defined by the GIIN and the Operating Principles for Impact Management) as contributing to solutions.

Managing for impact is different from measuring impact. It is not the amount of impact created or avoided that is important. What matters is the way in which impact is integrated and managed in the investment process and the degree to which impact is systematically considered alongside other fundamental drivers. For ESG integration strategies, impact may be considered only if material to investment performance and to mitigate risk, while impact investing approaches consider impact systematically alongside financial performance with the goal of maximizing both.

Figure 1: How Nuveen’s framework fits on the responsible investing spectrum



# 04 Scoring impact

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An impact scoring or ratings approach is useful to understand impact alongside ESG factors, especially when impact is nuanced across social and environmental dimensions or UN SDGs. Impact scoring allows investors to consider potential positive and negative externalities together and compare investments across sectors, strategies and asset classes. It is applicable to all investments, including those without a specific impact objective.

For Nuveen's global impact private equity strategy and private real assets portfolio (which includes farmland, timberland, agribusiness, infrastructure and energy investment strategies), we are piloting a score-based approach, which serves as a management tool to understand and compare investments based on their net effects on people and the planet, and their alignment with the UN SDGs.

Investments are scored for potential positive or negative alignment with each of the first 15 UN SDGs. (We do not align investments

with SDG 16 or 17, as we do not consider these goals to be investable.) Investments gain more or less points based on whether the impact is managed intentionally (i.e., impact investing) or as an unintentional externality (i.e., ESG integration), as Figure 2 explains. The sum of each SDG-score is the investment's net impact score, and the portfolio level score is the AUM-weighted average of all investments' net impact scores. Whereas many UN SDG classification approaches focus on directionality or alignment, Nuveen's net impact score incorporates intentionality, by attributing higher scores to goals with more intentional management practices and evidence of impact.

For private equity and real assets investments, the score-based approach is most applicable during the holding period (as opposed to preinvestment due diligence), given its usefulness as a management tool, rather than as a measure of expected or realized impact. The information is used alongside relevant ESG and impact

assessments, which provide investment teams with additional relevant social and environmental performance or proxy information.

Annually updating the net impact score helps monitor change over time. Companies can improve scores in specific UN SDGs by enhancing ESG management practices, obtaining better evidence of impact and, most importantly, improving performance relative to target indicators. In the same way, a company's score could decline if ESG or impact performance deteriorates, providing key management information for investors. Depending on the strategy, investors may decide to set a threshold or other criteria based on the net impact score to inform investment and portfolio management decisions. Nuveen does not currently use the scoring tool in this way.

To give a sense of how the technique works in practice, we present an example of both net impact scoring at an individual company level and at a portfolio level.

## Figure 2: Measuring alignment with the UN SDGs

A score-based approach to net impact focuses on magnitude of UN SDG alignment, accounting for different pathways to achieving positive and negative impact.

### Methodology

1. Individual investments are scored for alignment with UN SDGs 1 to 15, with up to three SDGs eligible for contribution.
2. Net impact score calculated as the sum of all scores for UN SDGs 1 to 15.
3. Portfolio net impact score calculated as the allocation weighted sum of individual investment scores.



Not aligned				
Directionally inconsistent or potential negative contribution	-2	May cause harm "Conventional investing"	0	Not applicable No externalities expected or not material
Aligned				
Directionally consistent or conceptually linked	+1	Act to avoid harm "ESG risk mitigation"	+2	Benefit stakeholders "ESG value creation"
Aligned				
Clear and direct positive contribution	+3	Contribute to solutions "Impact investing"		

Source: Nuveen, 2021

### Analyzing impact at company level: Samunnati

Samunnati is an Indian nonbank financial company held in Nuveen's global impact private equity portfolio. It provides lending and working capital solutions to various actors in the agricultural value chain, including smallholder farmer-producer organizations and agri-enterprises, both of which have struggled historically to obtain financing.

Samunnati's activities are scored for each of the UN SDGs considered to be material to the investment strategy (highlighted in Figure 3).

- A score of 1 is given for actions that avoid negative externalities with regard to

specific UN SDGs as a result of integrating ESG practices. For example, we look for evidence of strong environmental and social lending policies and practices that prohibit lending to businesses that may have a negative impact on the environment or displacement of people.

- A score of 2 is given for actions that create positive externalities for people or the planet. These could include energy efficiency initiatives, employee benefit programs and a diverse customer base (in this case, women).
- A maximum score of 3 is awarded where actions deliver substantial positive changes as a result of the company's specific intention to create that positive impact.

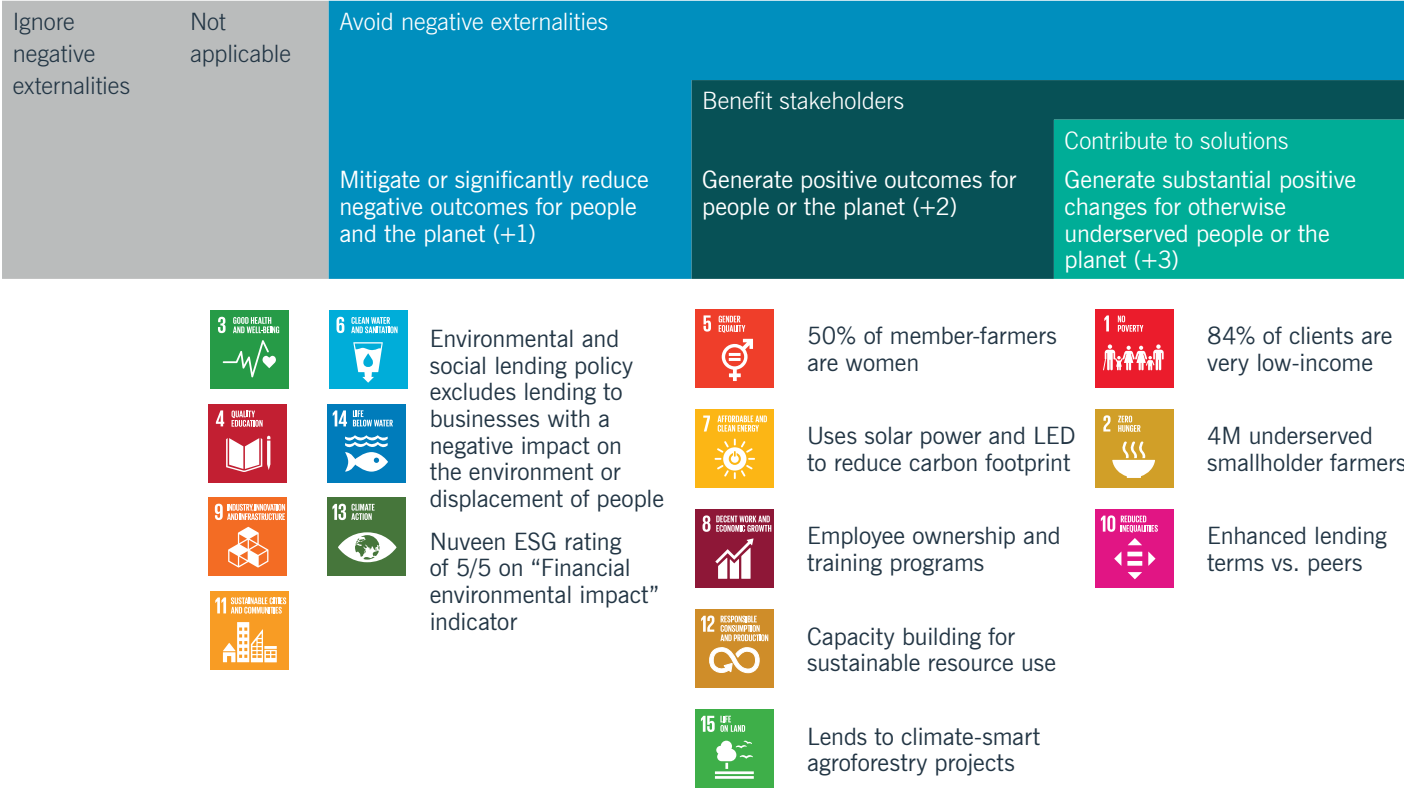
In this instance, we look for evidence of impact on the underserved as well as growth in impact over time, such as the share of low-income or rural clients, affordable lending terms or reduction in loan processing time.

- Negative scores have not been assigned to Samunnati and are not common among impact investments at Nuveen, given our minimum ESG screening criteria.

As Figure 4 shows, these scores are then summed to give Samunnati an aggregate net impact score of 22.

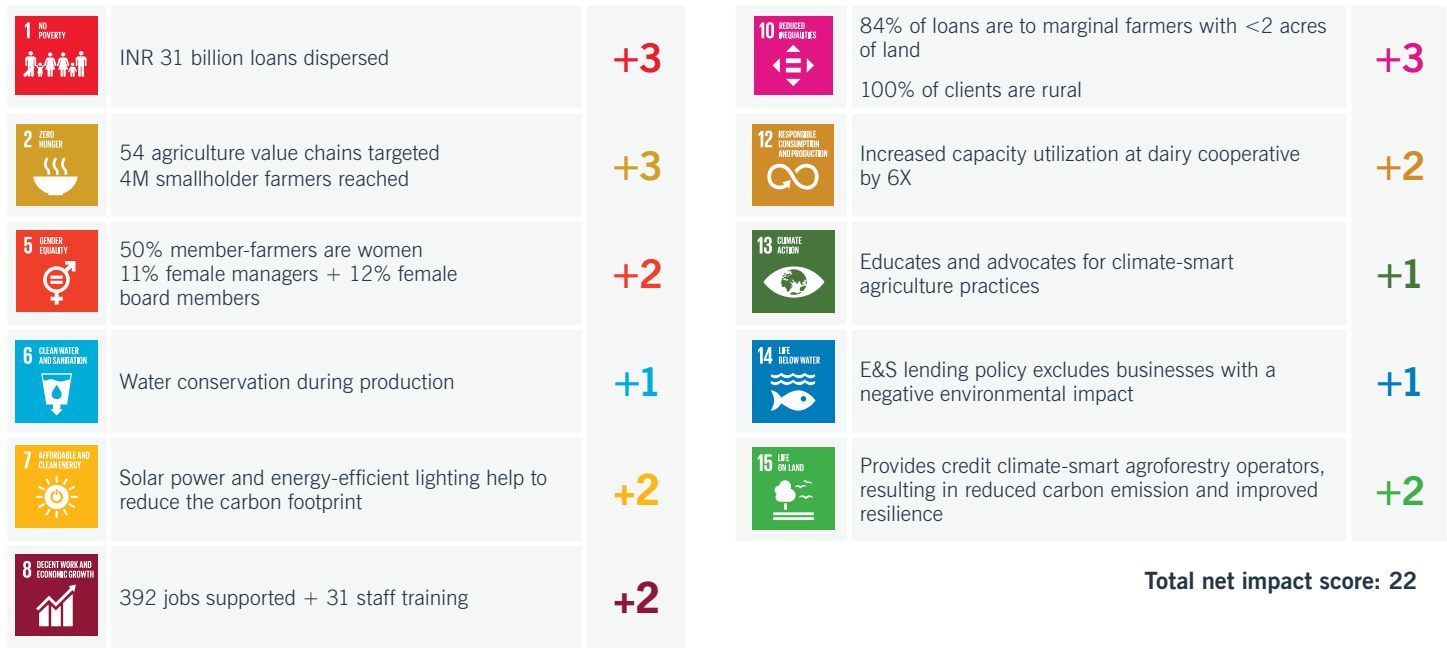
This score becomes significant when compared to other companies in the same portfolio or across multiple portfolios (as demonstrated in the next section).

Figure 3: Assessing Samunnati’s alignment with UN SDGs



Source: Nuveen, 2021

Figure 4: Scoring Samunnati’s net impact



The net impact score is a management tool that helps us to classify any investment based on its positive or negative impact externalities. We use it together with social and environmental performance data to manage for impact over the life of the investment. Note that this net impact analysis represents the score utilizing our tool, and that the company itself may utilize different tools to measure its impact.

Source: Nuveen, 2021



## Making comparisons

When companies operate in different sectors and have different impact objectives, it can be difficult to compare ESG and impact performance. The net impact score, however, allows for this comparison. Why does this matter? First, it identifies investments that are above or below a certain threshold in relation to delivering impact, potentially aiding decisions about where to invest (though Nuveen does not currently use the score during due diligence). It also reveals where changes may need to be made, highlighting scope for improvements in companies where scores can be increased, or where best practices can be shared if a company is a consistently high scorer. Finally, it opens the possibility of understanding net impact

alongside traditional operating metrics like revenue, EBITDA or book value, and provides a common quantitative unit of impact to drive analysis between impact and financial performance.

## Analyzing impact at the portfolio level


With the ability to compare diverse investments or strategies based on impact with the net impact score, we can aggregate impact at the portfolio level.

Figure 5 presents the net impact score for select real assets strategies within Nuveen's private real assets platform, all of which integrate ESG factors into the investment process and some of which also can be considered impact investing (like the previous Samunnati example).

Implicit in this exercise is the assumption that not all investments are created equal when it comes to impact. Instead, they exist along a spectrum, with a wide range of social and environmental externalities. Conventional investments or strategies that are managed without explicit integration of ESG factors will generate a lower net impact score than more sustainable or impact-focused investments or strategies where impact is core to the investment thesis.

**Not all investments are created equal when it comes to impact.**

**Figure 5: Comparing net impact at the strategy level**

	Timberland portfolio		Farmland portfolio		Infrastructure portfolio	
						
UN SDG scores	SDG 1	+1	SDG 1	+1	SDG 6	+1
	SDG 6	+3	SDG 2	+3	SDG 7	+2
	SDG 8	+2	SDG 6	+2	SDG 9	+1
	SDG 13	+3	SDG 13	+1		
	SDG 15	+2	SDG 15	+2		
Average net impact score	<b>+11</b>		<b>+9</b>		<b>+4</b>	

Source: Nuveen, 2021

# 05 Optimizing for impact across multiple portfolios

Recognizing that the spectrum exists, with a wide range of social and environmental externalities, also makes it possible to include exposure to more conventional real assets strategies while still pursuing specific social and environmental outcomes. This is important for investors for whom traditional impact investing strategies may not meet risk, return or scale requirements on their own.

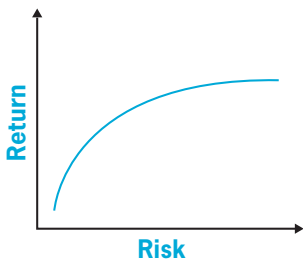
A portfolio optimization framework can help investors understand the trade-offs between risk, return and impact across different investment types, and can also be applied to the total portfolio. To guide analysis, Nuveen piloted the Impact Frontiers approach on a subset of our private real assets portfolios. Impact Frontiers, an initiative of the Impact Management Project, is a learning and innovation collaboration of investors

dedicated to advancing the integration of impact into financial frameworks, processes and decision-making.

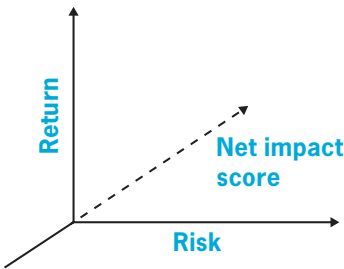
Nuveen's Impact Frontiers approach adapts the standard mean variance portfolio model to allow the incorporation of impact. This can be a single impact metric like carbon intensity or an aggregate SDG impact score like Nuveen's net impact score. This is illustrated in Figure 6.

Figure 6: The similarities and differences between a standard portfolio model and an impact portfolio model

## Standard portfolio model



## Impact portfolio model



Framework	Analytical framework for evaluating investment opportunities and maximizing risk-adjusted returns through optimal portfolio design
Inputs	Expected return, return variance and covariance across investment opportunities
Outputs	Risk-return-efficient portfolios of investment at every level of expected return or risk tolerance

Framework	Analytical framework for evaluating investment opportunities and maximizing <b>impact</b> and risk-adjusted returns through optimal portfolio design
Inputs	<b>Net impact score</b> (or carbon intensity), expected return, return variance and covariance across investment opportunities
Outputs	<b>Impact-risk-return-efficient</b> portfolios of investments at every level of targeted impact, expected return or risk tolerance

Source: Nuveen 2021

The traditional standard mean variance portfolio optimization model starts by defining an investable universe – the set of all possible investment opportunities one could allocate to across the capital spectrum. Inputs into the traditional portfolio optimization model are the unique investment profile for each investment opportunity, which includes expected return, return variance and its covariance with other opportunities in the universe.

The solution to the optimization problem is the efficient frontier, which describes the trade-offs between risk and return that are possible given a set of opportunities. Every point along the frontier is an optimal portfolio investment, maximizing return for a given level of risk.

The impact portfolio optimization model begins with a similar framework, but it allows us to consider trade-offs between risk, return and impact for each investment opportunity,

and also how we might maximize risk-adjusted returns alongside impact. Impact can be considered using a single metric such as carbon intensity or using an aggregated approach like the net impact score.

The investment opportunity set includes a broad range of strategies along the responsible investing spectrum, from conventional to more impact-focused strategies. The profile of every investment opportunity includes its impact value (e.g., carbon intensity or net impact score) along with the expected risk-and-return metrics of the standard model.

The solution to the impact portfolio optimization problem is also an efficient frontier, but now we are optimizing over three variables instead of two. Every point along the efficient impact frontier is an optimal portfolio investment that maximizes return for a given level of risk and impact.

## Case study

### Impact optimization in practice:

To illustrate the power of an impact optimization model, we consider private direct investment in three real asset classes: timberland, farmland and infrastructure. Investments in these asset classes span conventional and impact-oriented strategies, each strategy with a unique risk-return-impact profile — from traditional management in core sectors to natural climate solutions like forestry and regenerative agriculture to renewable energy. This case study relies on sector-level historical performance data from NCREIF and MSCI indexes and average net impact metrics representative of traditional management strategies (Figure 7).

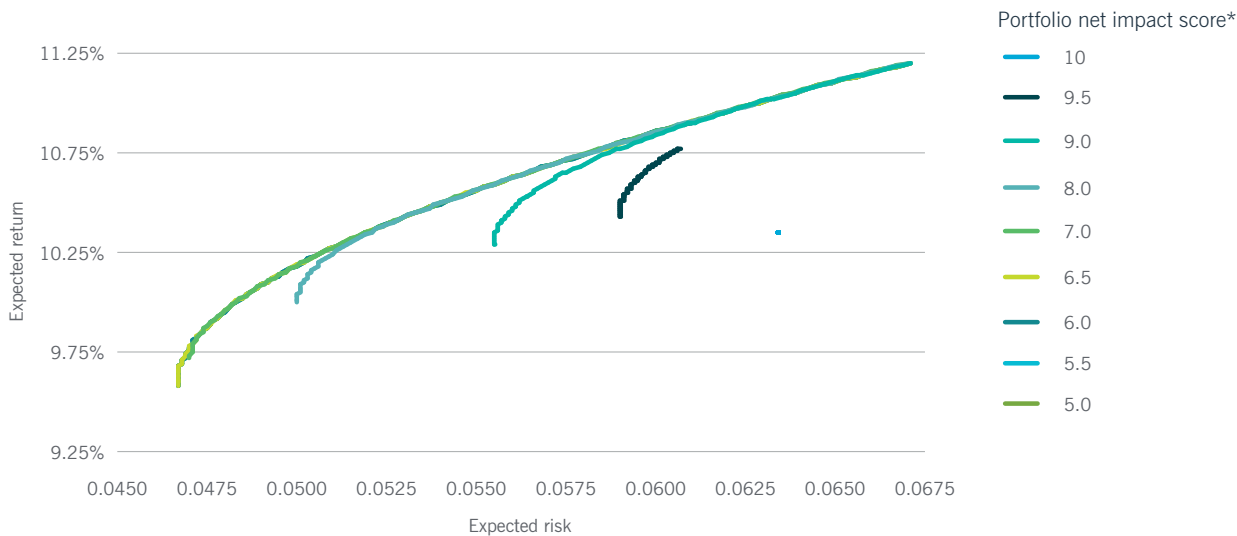
**Figure 7: Performance of real assets: financial impact**

	Timberland	Farmland	Infrastructure
Mean (%)	9.50	11.20	8.37
Standard deviation (%)	8.94	6.71	5.91
Sharpe ratio	0.75	1.26	0.95
Net impact score	+11	+9	+4

Data are based on one-year average total returns for the period 31 Mar 1991 to 31 Dec 2019 for timberland and farmland and 31 Mar 2008 to 31 Dec 2019 for infrastructure. Asset classes reflect the following indexes: U.S. timberland – NCREIF Timberland Index; U.S. farmland – NCREIF Farmland Index; and North American infrastructure – MSCI Infrastructure Index. Risk-free rate assumed to be equal to the mean 1-year U.S. Treasury constant maturity rate also for the period 31 Mar 1991 to 31 Dec 2019. Net impact score from Nuveen.

Past performance is no guarantee of future results.

Figure 8: Risk-return-efficient frontiers along SDG impact gradient



\*The chart plots the efficient frontiers for the net impact score portfolios detailed in the legend. Not all are visible due to overlapping.  
Source: Nuveen, 2021

Together, the three indexes’ historical performance data and Nuveen’s impact metric provide the required inputs for the mean-variance portfolio optimization:

- Expected returns
- Return variance
- Variance-covariance matrix of returns
- Impact metric (e.g., net impact score or carbon intensity)

The solutions to the SDG impact portfolio model is a set of efficient frontiers representing portfolios that maximize expected returns across the relevant range of risk budgets and for every possible level of impact. Each efficient frontier reflects a unique constraint on the portfolio-level

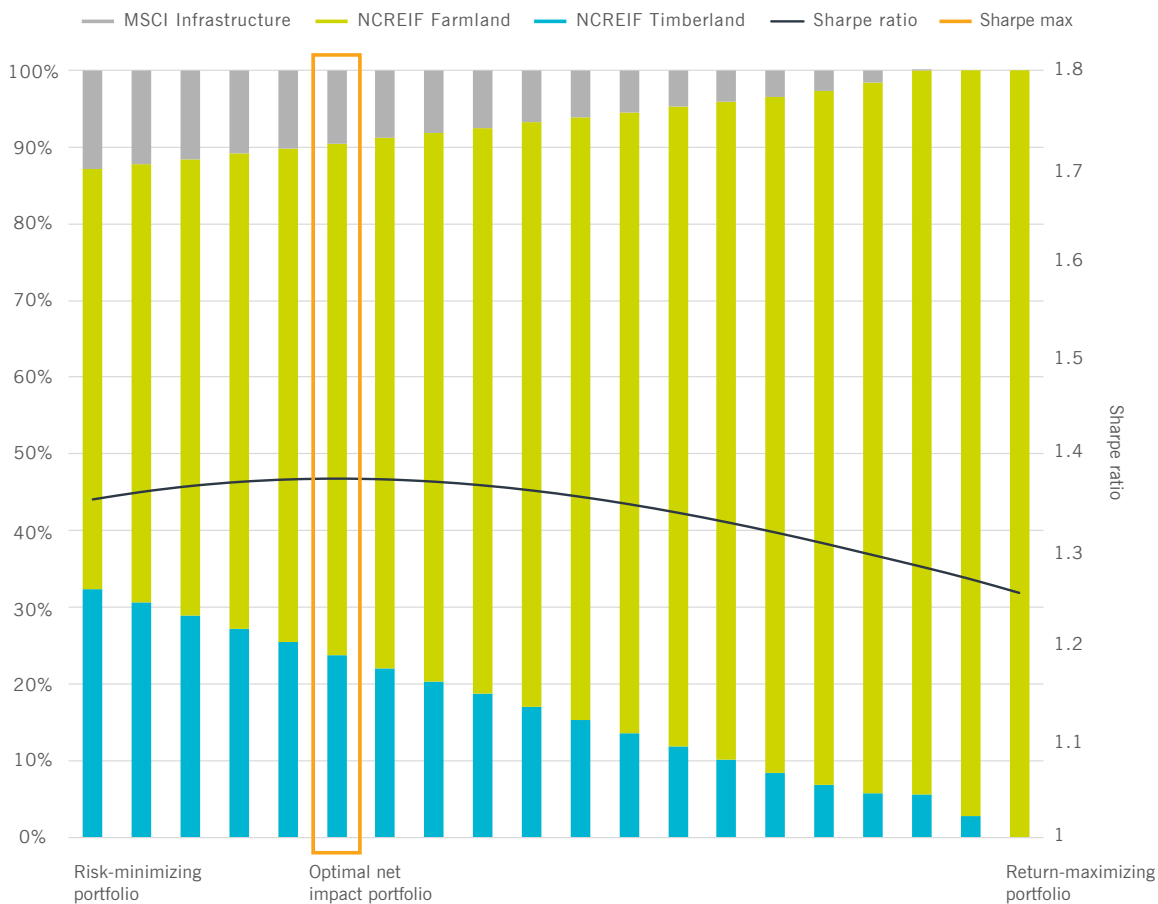
impact score and gives the set of best possible portfolios for the specified level of impact.

Figure 8 shows efficient frontiers for the SDG impact model. Frontiers on the right have the highest portfolio net impact score, and those to the left have lower scores. Moving from right to left improves risk-adjusted return, but at a certain point (beyond a portfolio average net impact score of 7), allowing for more net impact does not provide any additional net return or risk benefit. Pursuing additional net impact up to a score of 7 does not sacrifice return or incur more risk – two objections often leveled at impact investing. This tells us that portfolios with certain levels of positive net impact outperform, on a risk-return basis, less impactful portfolios. Over this range of net impact, investors can make greater contributions to the UN SDGs while also improving risk-adjusted returns.

The stacked bar chart in Figure 9 reflects allocations along the impact efficient frontier with a portfolio-level SDG score of 9 and highlights the portfolio that maximizes the Sharpe ratio. For an investor with a portfolio-level SDG target score of 9, the optimal impact

portfolio (designated Optimal net impact portfolio in the chart) provides the greatest return for a unit of volatility and also achieves the impact target. All other portfolios along the frontier achieve the same SDG score but come with a lower risk-adjusted return.

**Figure 9: Risk-return-efficient portfolios with UN SDG net impact score of 9**



Source: Nuveen, 2021



Figure 10 compares the optimal impact portfolio with an SDG score of 9 to the Sharpe-ratio-maximizing portfolio and portfolios fully allocated to timberland, farmland and infrastructure, respectively. The optimal impact portfolio outperforms all single-asset allocations on a risk-adjusted return basis and outperforms the Sharpe-ratio-maximizing portfolio in terms of impact. The Sharpe-ratio-maximizing portfolio, however, outperforms the optimal impact portfolio on a risk-adjusted return basis but underperforms in terms of impact.

By quantifying risk-return-impact trade-offs, we are able to do two things. The first is to identify the range of portfolio impact

that is achievable without affecting risk-return efficiency. The second is to support the design of portfolios that minimize the reduction in risk-return efficiency required to achieve a targeted level of impact. The important takeaway is that impact — in the context of the UN SDGs — needs to be evaluated and considered in the investment process with the same rigor and prudence as financial performance. By applying an increasingly robust set of impact metrics to a standard optimization modeling framework, investors can evaluate trade-offs across risk-return and impact, allowing them to construct portfolios that optimize for total performance.

Figure 10: Portfolio risk-return and impact performance

	Timberland portfolio	Farmland portfolio	Infrastructure portfolio	Maximum Sharpe ratio portfolio	Optimal net impact portfolio
Timber allocation (%)	100	0	0	7.0	24
Farmland allocation (%)	0	100	0	53	67
Infrastructure allocation (%)	0	0	100	40	10
Expected return (%)	9.5	11.2	8.4	9.9	10.5
Standard deviation (%)	9.1	6.7	5.9	4.8	5.6
Sharpe ratio	0.74	1.26	0.94	1.50	1.37
Net impact score	11	9	4	7	9

Projected return is not a prediction or guarantee of future performance and there can be no assurance that such return will be achieved. Allocations may not sum to 100 due to rounding.  
Source: Nuveen, 2021

# 06 Conclusion

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Institutional investors are identifying a desire to change, whether that is for different behaviors, for different processes or for different outcomes. As they commit capital to doing things differently, they want to understand how that difference will be made and see evidence of it. They want information that will guide investment decisions, allowing positive (and negative) impacts to be priced into those decisions as they seek a return on their capital. Identifying compelling impact investments opens up a vast and growing opportunity set for institutional investors, as the real asset examples in this paper illustrate.

We are encouraged by the efforts to deliver meaningful impact-related metrics that can be applied to broad portfolios and bespoke investment projects, and across the range of private, alternative and publicly listed assets. The ability to measure, manage and report the changes that institutional investors desire will be fundamental to their success amid growing demands for transparency and accountability. These developments improve the quality of decision-making, helping investors identify the opportunities and compare the potential results, and it may also improve communication between investors, their clients and the companies in which they invest.

As the impact sector continues to evolve, we expect that the asset management industry and investors will continue to develop their expertise and knowledge, shaping the standards for measuring the effectiveness of impact investing. Incorporating meaningful impact-related metrics into portfolio allocation models creates a cohesive framework for investors to optimize impact alongside financial performance, delivering more impactful investments without sacrificing risk-return efficiency.

# Investing with Nuveen

Nuveen offers solutions for a range of institutional investors. We provide investors access to liquid and illiquid alternative strategies, such as real estate, real assets (farmland, timber, infrastructure), private equity and debt, in addition to both traditional and fixed income assets. Access to these strategies includes pooled funds, separate accounts and co-investment opportunities. Our heritage as a pension fund means we understand the challenges other like-minded investors face. We have successfully been investing through market cycles for more than 100 years, for both ourselves and our investment partners. We work closely with our clients to understand their requirements and develop forward-thinking investment opportunities. Short-lived market cycles, evolving investor needs and sustainability pressures bring significant opportunities and challenges. We focus on three investor objectives across all of our client solutions:

- Generating income and capital growth
- Managing risk in a world of ongoing uncertainty
- Managing assets cost-effectively via optimal scale and access

**For more information, please visit [nuveen.com](https://nuveen.com).**

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## A word on risk

Investors should be aware that alternative investments including private equity and private debt are speculative, subject to substantial risks including the risks associated with limited liquidity, the potential use of leverage, potential short sales and concentrated investments and may involve complex tax structures and investment strategies. Alternative investments may be illiquid, there may be no liquid secondary market or ready purchasers for such securities, they may not be required to provide periodic pricing or valuation information to investors, there may be delays in distributing tax information to investors, they are not subject to the same regulatory requirements as other types of pooled investment vehicles, and they may be subject to high fees and expenses, which will reduce profits. Responsible investing incorporates Environmental Social Governance (ESG) factors that may affect exposure to issuers, sectors, industries, limiting the type and number of investment opportunities available, which could result in excluding investments that perform well.

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