



***Complementary Solutions for Holistic
Impact Valuation: Return on Sustainable
Investment (ROSI™) and Impact-Weighted
Accounting (IWA)***

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Introduction

Business leaders today have a growing number of constituents to consider when making decisions. With increasing coalescence around the concept of stakeholder capitalism¹, they are urged to act not only in the best interests of shareholders, but of employees, the environment, and broader society. There is an additional financial imperative for decision-makers as well, with nearly one third of investors allocating capital with an ESG or impact lens, and over two thirds of consumers reporting a strong interest in aligning their spending with their values.^{2 3}

Despite the need to balance multiple stakeholder interests, managers lack a common analytical lens through which to make evidence-based decisions. This article describes how two complementary impact monetization methodologies can be used together to provide managers with a comprehensive assessment of financial, social, and environmental impact using the common language of currency.

Internalities or business impact can be effectively monetized using the Return on Sustainability Investment (ROSI™) framework⁴, while Impact-Weighted Accounting (IWA)⁵ is a tool to demonstrate monetary value created (or eroded) for employees, the environment, and consumers.

Used together, ROSI™ and IWA produce financial data for managers to incorporate into decision-making discussions.

¹ What is stakeholder Capitalism, [World Economic Forum](#).

² Bloomberg Intelligence, 2021. ESG assets may hit \$53 trillion by 2025, a third of global AUM. [Bloomberg News](#).

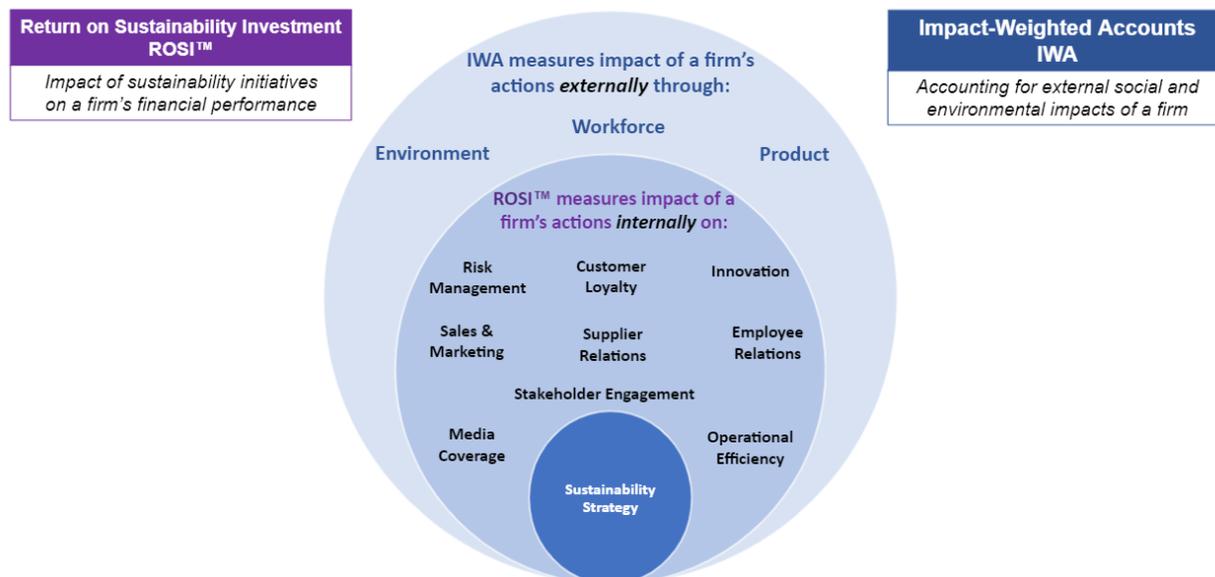
³ Nielsen IQ, 2015. The Sustainability Imperative. [Nielsen IQ](#).

⁴ The New York University Stern Center for Sustainable Business (CSB) has developed the [Return on Sustainability Investment \(ROSI™\)](#) framework. Corporations embedding this type of analysis into decision making will be better positioned to assess the full range of costs and benefits associated with proposed sustainability activities. Investors will be able to identify where relative value exists in corporate strategies and gain a better understanding of financial performance driven by ESG strategies.

⁵ Impact-weighted accounts (IWA) are line items on a financial statement, such as an income statement or a balance sheet, which are added to supplement the statement of financial health and performance by reflecting a company's positive and negative impacts on employees, customers, the environment, and the broader society. The Impact-Weighted Accounts Initiative (IWA) is a [project of Harvard Business School](#) with the goal to create accounting statements that transparently capture external impacts in a way that drives investor and managerial decision making. The initiative was co-founded by the Global Steering Group for Impact Investment and the Impact Management Project.

Overview of ROSI™ and IWA

Figure 1: Overview of ROSI™ and IWA Methodologies



Automotive Industry Case Study⁶

To better understand the complementary approaches of ROSI™⁷ and IWA, let's look at examples from the automotive industry.

Automotive Industry Project Backgrounds

In 2019, NYU Stern CSB (CSB) completed a project with a group of automotive companies to map the key strategies and practices that companies are prioritizing to drive sustainability impact, and to unpack the tangible and intangible financial benefits accruing to these companies through strategic focus areas. The [ROSI™ methodology](#) was used to quantify the impact of these activities for the companies involved.

During the same time period, the [IWA project](#) at Harvard Business School designed a methodology to monetize corporate environmental, employment, and product impact which can be applied to any industry. The methodology for product and service impact follows a standardized framework across industries, however the data and metrics used vary by industry.

⁶ Ulrich Atz, Tracy Van Holt, Elyse Douglas, and Tensie Whelan, June 2019, "The Return on Sustainability Investment (ROSI™): Monetizing Financial Benefits of Sustainability Actions in Companies", Review of Business: Interdisciplinary Journal on Risk and Society by St. John's University, Volume 39, Number 2; <https://www.stjohns.edu/sites/default/files/uploads/Review-of-Business-June-2019.pdf>

⁷ "[The Business Case for Implementing Sustainable Practices to Drive Financial Performance within the Automotive Sector](#)": NYU Stern CSB and SASB

Additional detail on each impact pillar (environment, employment, and product and service) can be found at www.hbs.edu/impact-weighted-accounts.

Finding: Reduction in recalls can significantly impact corporate financial performance under ROSI™ and are reflected in Impact-Weighted Accounting as product health and safety impact to society. Savings of over \$550 million can be achieved for auto companies, while an estimated \$675 million in negative externalities to customer health and safety could be avoided.

ROSI™: Given the high cost impact of car recalls, there are significant financial benefits to investing in reducing the number of recalls. For one company, a reduced number of recalls resulted in a savings impact of more than ~0.35% of total revenue, or more than \$550 million dollars. To arrive at this result, CSB included metrics such as average repair cost per recall, average legal & public relations costs, and expenses related to increased quality control, premium redesigned parts, and additional training. About one third of the benefit was related to repair costs, while two thirds were driven by lost revenue and legal & public relations costs.

CSB also identified innovations in company approaches to recalls that drove additional financial benefit. For one company, adopting a systems thinking approach in the manufacturing process helped reduce recalls by improving the communication on the design process amongst multiple departments and supply chain partners.

IWA: Recalls are reflected in impact-weighted accounting as product health and safety impact. Within the health and safety dimension, IWA examined whether there have been any breaches to customer health, safety, and privacy. For automobile manufacturers, IWA estimated the impact from vehicle recalls for over 15 automobile manufacturers in 2015 to 2018 by examining publicly disclosed vehicle recall volume, industry reports of vehicle-caused crash rates, and industry average cost of crash as outlined in the product impact-weighted accounting framework (Serafeim & Trinh 2020).⁸ The health and safety impact of recalls reached (\$675 million) for one auto company (2017), amounting to 0.4% of annual firm revenue.

If effectively managed, a reduction in product recalls results in internal cost savings for companies while also minimizing externality associated with breaching customer health, safety, and privacy.

Finding: Improving waste management practices reduces costs and generates additional revenues, while reducing resource consumption. These improvements are also reflected in a firm's impact-weighted accounting as more positive product and environmental

⁸ Serafeim, G. and Trinh, K., 2020. A framework for product impact-weighted accounts. *Impact-Weighted Accounts Research Report, Harvard Business School Accounting & Management Unit Working Paper*, (20-076).

impact. Benefits to the firm could reach \$235 million (0.15% of revenue), while externalities impacting customers and the environment may exceed \$995 million or 0.6% of firm revenue (for product recyclability) and (\$2.4 billion) or 6.4% of revenue (for negative environmental effects from firm operations).

ROSI™: For waste management, monetized benefits included revenue from selling recycled materials, savings from using recycled water, reduced cost from traditional waste disposal, and savings from using recovered waste versus virgin materials. This strategy resulted in an annual earnings benefit of ~0.15% of revenue for one company (approximately \$235 million), with a large portion attributable to savings from using recovered waste (as opposed to virgin materials) and revenue from selling recycled materials. Additionally, research found that the success of waste management is closely tied to the implementation of a systems thinking approach for the manufacturing process. By maximizing the upside of recovering and recycling materials from end-of-life vehicles, there are significant savings that can be unlocked.

IWA: Improvements to emissions as a result of operational waste management efforts would be reflected in impact-weighted accounting as a part of the company's annual total environmental impact. In 2018, the average environmental intensity (total environmental impact scaled by sales) was as large as -6.4%, reflecting a negative externality of (\$971 million). The greatest absolute value eroded by a single company in the same study year was (\$2.4 billion), in this case representing 0.9% of sales.

Waste, recycled, and recovered material from vehicle end of life is reflected in impact-weighted accounting as product end-of-life impact. IWA estimates the impact from vehicle end-of-life for over 15 automobile manufacturers in 2015 to 2018 by examining publicly disclosed vehicle recyclability and recoverability, estimates of vehicle curb weight from Richmond Global Sciences, and estimates of the cost associated with a ton of waste, recycled, and recovered material as outlined in the product impact-weighted accounting framework (Serafeim & Trinh 2020). In 2018, the best performing auto company created \$226 million in positive impact through recyclability (0.6% of revenue). In the same year, the highest positive value estimated for an auto company reached \$995 million in positive impact (amounting to 0.36% of revenue). In contrast, the lowest performer in the sample produced only 0.08% of revenue in positive impact from recyclability, representing a significant missed opportunity for value creation.

Finding: Reduction in VOC emissions can increase workplace safety and impact financial performance, with potential business savings of \$92 million or 0.06% of revenue and avoided negative employment and environmental externalities of \$122 million or up to 0.1% of revenue.

ROSI™: CSB found that a reduction in VOC emissions resulted in several benefits, such as savings from reducing / recycling solvent, savings from using substitutes for solvent, and savings from avoided solvent waste treatment costs, among others. This strategy resulted in a savings impact of ~\$92 million or 0.06% of revenue for one company. An additional benefit to consider in future studies is savings related to worker compensation claims, or lost productivity due to days away from work, since VOC emissions can pose a health issue for employees.

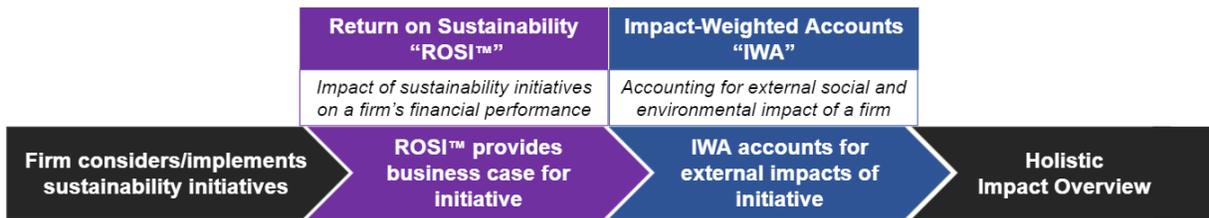
IWA: There is a clear positive impact for a firm's workforce in reducing VOC emissions. Impact-weighted accounting statements include a monetized value for the cost of workplace injury and illness. In 2018, one automobile company eroded an estimated (\$13.6 million) through workplace illness, calculated as the sum of all direct and indirect costs from poor workplace conditions.⁹ This impact is approximately .01% of the firm's annual North America-based revenue. While this negative externality could be reduced by cutting VOC emissions (which negatively impact human health outcomes according to the CDC), data is currently unavailable to discern what portion of reported workplace illness is related to VOC. Additional impacts on workers through reduced VOC emissions may also be reflected in a company's employment impact-weighted accounting statement through monetization of subjective wellbeing (SWB).¹⁰

In addition to positive contributions to employment impact, the firm would also reduce environmental damage with lower VOC emissions. While VOC emissions as a percentage of automobile firms' total environmental impact averages only 3%, the damage is still sizable. In 2018, VOC emissions from operations at the poorest performing auto company created a negative impact equal to 0.1% of revenue. The company with the greatest dollar value of environmental damage through VOC destroyed (\$122 million) through this type of emission.

⁹ Based on Total Recordable Incident Rate as reported in General Motors Sustainability Report, 2018. The TRIR does not provide a disaggregated injury and illness rate, therefore the corresponding NAICS (Motor Vehicle Parts Manufacturing) industry average of 30% illness (and 70% injury) is used to calculate cost.

¹⁰ For additional information on the impact dimensions and methodologies for calculating employment impact, see Freiberg et al, 2020 "Accounting for Organizational Impact."

Figure 2: ROSI™ and IWA Methodologies in Practice



Leveraging practices implemented in the automotive sector, below are examples of findings using the ROSI™ and IWA methodologies

ROSI™	Methodology	IWA
Reduction in recalls had a savings impact of ~ 0.35% of revenue for one company	Product Recall	Negative health and safety impact of recalls at one company reached -0.4% of revenue in one year
Improved waste management resulted in increased annual earnings of ~ 0.15% of revenue for one company	Waste Management	A high performing company can produce positive end-of-life product impact of +0.6% of revenue through recyclability
Reduction in VOC emissions resulted in a savings impact of ~ 0.06% of revenue for one company	VOC Emissions	VOC emissions produced damage up to 0.1% of revenue at one company (a negative externality that could be reduced through sustainability efforts)

Conclusion

Adoption of sustainability practices increasingly drives better management and financial performance and companies with strong ESG performance are being rewarded by stakeholders^{11,12}. However, not all disclosure is created equal, and the risk of “impact-washing” is growing as companies race to keep up with the exponential popularity of ESG and impact. Recent research found that as ESG-related disclosure from companies increases, disagreement among ratings providers also grows, demonstrating the significant challenges to genuine impact transparency.¹³ How does the sustainability and business-minded manager proceed within this landscape?

One solution presented in this case study is the use of complementary monetization frameworks, ROSI™ and IWA. By developing frameworks that assist managers and investors to assess the financial impact of sustainability-related issues, ROSI™ and IWA help companies improve the effectiveness of their decision making and investments. Both frameworks are rooted in valuation, which is a familiar tool for managers, and creates comparable and digestible information. ROSI™ demonstrates that companies that conduct business responsibly experience financial benefits such as improved operational efficiency, risk reduction, higher sales & marketing opportunity,

¹¹ The limits of the pursuit of profit (<https://www.ft.com/content/c998cc32-d93e-11e9-8f9b-77216ebe1f17>)

¹² Regier, M. and Rouen, E., 2020. The Stock Market Valuation of Human Capital Creation. Available at SSRN 3703948.

¹³ Christensen, D.M., Serafeim, G. and Sikochi, S., 2021. Why is corporate virtue in the eye of the beholder? The case of ESG ratings. The Accounting Review, <https://doi.org/10.2308/TAR-2019-0506>.

customer and employee loyalty and heightened stakeholder relations. IWA proves that these business practices also create positive benefits for the environment, workforce, and customers.

This holistic approach can unlock significant financial value for both internal and external stakeholders. By reporting on sustainability initiatives through the lens of the ROSI™ and IWA methodologies, companies can improve internal management systems and performance as well as communicate concrete, decision-useful information to investors.

About Our Organizations

NYU Stern Center for Sustainable Business (CSB) was founded on the principle that sustainable business is good business, and is proving the value of sustainability for business management and performance at a time when people and the planet need it most. At CSB, we aim to help future and current business leaders embrace proactive and innovative mainstreaming of sustainability, resulting in competitive advantage and resiliency for their companies as well as a positive impact for society.

NYU Stern CSB developed the [ROSI™](#) framework to bridge the gap between sustainability strategies and financial performance, helping to build a better business case for the value of sustainability initiatives. We partner with companies to apply ROSI™ internally, teach students and executives how to leverage the framework, and partner with companies on internships and experiential projects leveraging ROSI™.

Harvard Business School's Impact-Weighted Accounts (IWA) Project's mission is to drive the creation of financial accounts that reflect a company's financial, social, and environmental performance. Our ambition is to create accounting statements that transparently capture external impacts in a way that drives investor and managerial decision making.

Impact-weighted accounts are line items designed to supplement the statement of financial health and performance by reflecting a company's positive and negative impacts on employees, customers, the environment, and broader society.

Appendix

A. ROSI™ Framework

For corporate management, ROSI™ drives better-performing business - socially, environmentally, and financially - by embedding sustainability into core business strategy, decision-making, and accounting and quantifying the full range of costs and benefits, including intangibles. For investors, ROSI™ improves decision-making, valuation, and communications - by better understanding ESG data, assessing where relative value exists in corporate strategies and investments, and better integrating, measuring, and reporting on financial performance driven by ESG strategies.

Sustainability Drivers of Financial Performance & Competitive Advantage



For project collaborations, NYU Stern CSB works with company partners to implement the five-step ROSI framework process highlighted to the right.

1

Identify Material ESG Issues & Strategies

Identify material sustainability challenges, (referencing frameworks such as SASB and GRI) and how the business is addressing associated risks and/or opportunities

2

Assess Practices

Determine which practices have been implemented to address sustainability strategies

3

Define Benefits

Define the types of economic benefits that could be expected from the changed practices through the ROSI mediating factors

4

Quantify Benefits

Estimate the magnitude of those benefits and when they could be realized

5

Monetize

Translate the benefits into economic value, stress test, and then forecast ROI

C. Impact-Weighted Accounts

The Impact-Weighted Accounts Initiative (IWA) is a joint project between the Global Steering Group of Impact Investment and the Impact Management Project incubated at Harvard Business School. IWA is committed to methodology and research transparency. All Impact-Weighted Accounts research is posted on the Impact-Weighted Accounts [website](#).

The **four key messages of IWA** are:

- Impact can be measured and compared
- Impact measurement in monetary terms reflected in financial statements (impact-weighted accounts) is a necessary condition for the creation of impact economies that optimize risk, return and impact.
- Creating impact-weighted accounts is cost-effective, scalable, and actionable.
- Analyzing impact-weighted accounts provides new important insights for business leaders and policymakers.

Methodologies

IWA measures impact across three primary pillars: environmental, employment, and product.



Environmental Impact

There are seven key data points used in IWA's core environmental impact analysis (below). The data is monetized using the Environmental Priority Strategies safeguard subjects to estimate environmental costs for working capacity (human health), fish production, crop production, meat production, abiotic resources, biodiversity, water production capacity, and wood production¹⁴. The public firm-level datasets currently include Scope 1 and 2 emissions and will be expanded to Scope 3 in Fall 2021.

- Total GHG Emissions (Thousands of Metric Tonnes)
- Total Water Withdrawal (Thousands of M³)
- Total Water Discharged (Thousands of M³)
- Sulphur Oxide Emissions (Thousands of Tonnes)
- Nitrogen Oxide Emissions (Thousands of Tonnes)
- VOC Emissions (Thousands of Tonnes)
- Carbon Offsets (Thousands of Metric Tonnes)

¹⁴ Safeguard Subjects are derived from Environmental Priority Strategy (EPS). More information available at: <https://www.lifecyclecenter.se/>. More information on EPS Monetary coefficients are also publicly available at: www.lifecyclecenter.se/publications/eps-weighting-factors-version-2020d/

In addition to the above, IWA's [Cost of Corporate Water Usage \(2020\)](#) provides an analytical framework for accounting for geographic disparities in water resources.

Product Impact

IWA defines product impact as *all impacts that occur following the sale of the product*, which is the traditional accounting boundary of the firm. The IWA product impact methodology creates an overarching framework of material elements of product impact on customers, society, and the environment. Within this framework, each sector draws on different metrics to measure product impacts, given the idiosyncratic ways in which different products impact customers. IWA often analyzes the following product impact dimensions across industries:

- Affordability
- Underserved
- Health and Safety
- Basic Need
- Effectiveness
- Optionality
- Environmental Usage
- Recyclability

Employment Impact

IWA's framework currently measures firm employment impact across four primary dimensions and two advanced dimensions:

- Location: relative impact of job creation based on local employment levels
 - Diversity: workforce representation compared to local demographics
 - Wage quality: performance against living wage, marginal utility, and equity analyses
 - Opportunity: representation of demographic groups across job functions and levels
 - Career Advancement (advanced dimension): internal mobility resulting in increased earnings, and
 - Health and Wellbeing (advanced dimension): protection and promotion of workforce health across six sub-dimensions.
-