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Article

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CESifo Forum

Provided in Cooperation with:
Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Rouen, Ethan; Serafeim, George (2021) : Impact-Weighted Financial Accounts: A Paradigm Shif, CESifo Forum, ISSN 2190-717X, ifo Institut - Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 22, Iss. 03, pp. 20-25

This Version is available at:
https://hdl.handle.net/10419/250918

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Impact-Weighted Financial Accounts: A Paradigm Shift

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The last decade has seen an exponential increase in corporate sustainability activities and efforts by investors to use these activities in their portfolio formation, valuation, and stewardship activities. According to the UN Sustainable Stock Exchanges, 44 exchanges around the world have released ESG disclosure guidance for their listed companies. Numerous nonfinancial regulations, including one at the European Union level, have promoted the disclosure of environmental, social, and governance (ESG) data (Grewal, Rield, and Serafeim 2019), and several not-for-profit organizations, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), have created disclosure standards that identify the ESG metrics that organizations should disclose. Figure 1 examines the assets under management of signatories of the Principles for Responsible Investing from 2013 to 2020, the value of total sustainable debt issuances by companies, and the volume of corporate ESG disclosures, as calculated by Bloomberg.

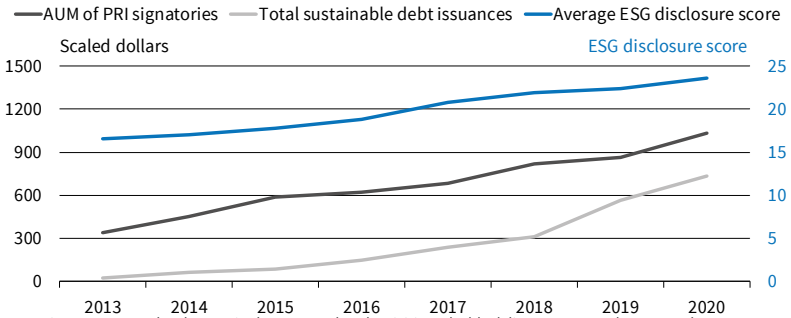
Figure 1 reports the changes in three ESG-related activities. The black line reports total assets under management (hundreds of billions USD) of signatories to the Principles for Responsible Investing. The grey line reports total sustainable debt issuance (in billions USD) (Bullard 2021). The blue line is the average ESG disclosure score for all companies, as calculated by Bloomberg.

One consequence of these activities has been the fundamentally different landscape surrounding what is measured and disclosed by companies, and what information is being used by investors to allocate capital. On that latter point, the exponential increase in sustainability-linked debt represents an example of how traditional contractual terms — the payment of loan interest rate or bond coupons — is now becoming a function of ESG metrics. It might well be the case that in future, all financial instruments will be outcome-based, where their covenants or payment terms will be a function of ESG metrics. Contracting on ESG is also happening in executive compensation, where an increasing number of companies are tying incentives to ESG targets (Flammer, Hong, and Minor 2019).

Given that achieving environmental and social outcomes can be positive, neutral, or negative to financial performance, depending on the types of activities pursued, the quality of management, and the change in competitive dynamics, this shift in measurement and disclosure has also given rise to an active search for opportunities to better manage and deploy resources. More broadly, it has opened up the discussion about the role of the corporation in society and whether this extends beyond profit maximization (Mayer 2018). The discussion on the purpose of the corporation in society goes hand in hand with that on what evolution of the accounting system can provide the necessary accountability for the effective deployment of firm resources and the impact of corporations on the environment and society.

Figure 1

Changes in ESG Activites and Disclosures



Note: Figure 1 reports the changes in three ESG-related activities. The black line reports total assets under management (AUM in hundreds of billions USD) of signatories to the Principles for Responsible Investing. The grey line reports total sustainable debt issuance (in billions USD). The blue line is the average ESG disclosure score for all companies.

Source: Bullard (2021) and Bloomberg.

A PARADIGM SHIFT

In his book "The Structure of Scientific Revolutions" (1962), Thomas Kuhn outlines how science progresses through periods of 'normal science,' whose conceptual continuity and cumulative progress are disrupted by revolutionary science and a paradigm shift. It is this paradigm shift that is currently taking place in the field of accounting.

Financial accounting, traditionally thought of as a system of measuring economic resources, liabilities and periodic performance based on changes over time, has emerged as one of the most important management and accountability tools of modern history (Soll 2014). While a financial accounting system has

existed for thousands of years (Macve 2015), it is only in the last one hundred years that it has been widely practiced and adopted, since financial reporting has been mandated for firms with access to public capital markets and even firms that have remained private. Within this timeframe, accounting standards experienced significant changes with regard to leases, pensions, liabilities, and revenue recognition practices. However big these changes might seem, they happened within the same intellectual paradigm. This paradigm measures assets, liabilities, revenues, and expenses, resulting in financial profit but ignoring any impacts that the organization has on employees, customers, or the environment. Within this paradigm, the addressees of accounting statements are the capital providers, and their information needs are satisfied by the current accounting framework.

Recently though, societal developments such as environmental degradation, increasing inequality, and the degradation of trust in institutions, have called into question whether financial accounting statements are fit for purpose in the 21st century (Eccles and Krzus 2010). The challenge in the paradigm manifests itself in three forms. We will describe these challenges conceptually, beginning with their weakest form and moving on to their strongest form. By weak or strong we do not mean their intellectual strengths but rather how far they deviate from the current paradigm.

The 'weak form' of challenge to the paradigm is that the audience to which financial accounting statements are addressed are still the capital providers, but these capital providers now require information about an organization's impact on society and the environment. This is because these impacts can be financially material. Although the emphasis is on the disclosure of nonfinancial metrics outside of the context of accounting statements, the work of SASB is aligned with this challenge.

The 'semi-strong' form of challenge to the paradigm is that the audience of the accounting statements are also still the capital providers, but these capital providers now require information independent of financial materiality about an organization's impact on society and the environment, because capital providers wish to base their decisions not only on risk and return considerations but also considering their impact (Hart and Zingales 2017). Although not focused on accounting statements, the work of impact investment organizations such as the Global Impact Investment Network (GIIN) and the Global Steering Group for impact investing (GSG) are conceptually aligned with this challenge, as impact investors need impact information to be optimized alongside risk and return.

The 'strong form' of challenge is when the accounting statements' audience extends beyond capital providers to include other stakeholders and society at large, and these impacts need to be accounted for as they are directly relevant to those stakeholders. Although the emphasis is on the disclosure of ESG-nonfinancial metrics outside of the context of accounting statements, conceptually the work of GRI is aligned with this challenge. These challenges to the status quo are presented in Table 1.

In turn, the measurement, recognition, and disclosure of impact-weighted financial accounts, which reflect an organization's environmental and social impact as well as its financial performance, have resulted in the diffusion of a new management prac-

Table 1

Challenges to The Current Accounting Paradigm

	Status Quo	Weak form of challenge	Semi-strong form of challenge	Strong form of challenge
Audience	Capital providers	Capital providers	Capital providers	Stakeholders
Audience's Cares	Risk and return	Risk and return	Risk, return, and impact	Risk and return, or risk, return and impact
Needs of Audience	Financially material information	Financially material information	Financially and societally material impact information	Financially and societally material impact information
Legacy Financial Information	Yes	Yes	Yes	Yes
Financially Material Environmental and Social Impact Information		Yes	Yes	Yes
Environmental and Social Impact Information Independent of Financial Materiality			Yes	Yes
Change From Status Quo		Some environmental and social impact information is financially material	Capital providers include impact investors that need impact information that is independent of financial materiality	Audience is broader than capital providers

Source: Authors' illustration.

tice across companies and investors. By 2019, several large organizations around the world, such as Novartis, Syngenta, Tata, Safaricom, Roche, Cemento Argos, Lafarge Holcim, and ABN-Amro, had done some form of IWA (Serafeim, Zochowski, and Downing 2019). This diffusion has been accelerated by the creation of the Impact-Weighted Accounts Initiative (IWAI) and company-led member organizations, such as the Value Balancing Alliance (VBA), as well as by accounting firms developing monetary impact measurement methods (PwC 2013).

RESISTANCE TO THE NEW PARADIGM

Kuhn (1962) suggested that all paradigm shifts face strong resistance because the existing paradigm is at risk, and the shift to impact-weighted financial accounts is no exception. Skeptics raise two main concerns: It cannot be done, and it should not be done.

For historical context, it is important to note that the same criticisms were leveled before the establishment of financial accounting standards through the Securities Exchange Act during the Great Depression in the United States. The proposed Generally Accepted Accounting Principles (GAAP) were criticized on the basis that every organization is unique, and that accounting is art rather than science. The GAAP were derided as imposing substantial costs on companies and thereby threatening growth and capitalism. Of course, hindsight has proven the critics wrong. First, financial accounting standards now exist in every country in the world, guided by International Financial Reporting Standards (IFRS) in more than 140 jurisdictions and by the US GAAP in the United States. Second, the creation of financial accounting standards was a necessary condition for the creation of large-scale capital markets that have fueled access to finance, growth, and job creation around the world.

Resistance to the weak form used to rest on the argument that investors do not need this information, as it is not financially material. Two developments have settled this argument. The first is evidence that some impacts in some industries can be financially material and price-relevant (Khan, Serafeim, and Yoon 2016; Grewal, Riedl, and Serafeim 2019, Grewal, Hauptmann, and Serafeim 2020; Cheema-Fox et al. 2020). The second is that investors with trillions of dollars to invest directly ask for this information because they believe it is financially material (Amel-Zadeh and Serafeim 2018).

The criticism now rests primarily on the argument that impacts cannot be measured. There is merit to this argument, as the measurement of such impacts can be notoriously difficult (Serafeim, Zochowski, and Downing 2019). For example, product impacts can be difficult to measure in some industries (Serafeim and Trinh 2020), and the measurement of well-being effects for employees can be subjective (Freiberg et al. 2020). The response to this criticism is that our ability to measure impacts with more precision is contingent on taking the first steps to measuring such impacts at all. As in the case of accounting standards, which have experienced several revisions of revenue recognition, or lease liability measurement methodologies, the measurement of impacts will improve over time. This argument, of course, applies across all three forms of the challenge.

The objection to the semi-strong form of the challenge is that investors should not care about impact and that fiduciary duties preclude investors from caring about the impact of the companies in which they invest. The validity of this objection is currently being debated among pension funds seeking to understand whether their trustees could or should consider the impact of investments on people and planet. Regardless of where the legal argument will settle, the reality is that investors have different objectives and that the impact investing market has grown significantly over time. According to GIIN, the impact investing market stood at USD 715 billion in 2019 (GIIN 2020). As the impact investing market grows, the argument that a significant part of the market will require impact information will become stronger.

The objection to the strong form of the challenge is that the audience for accounting statements should be capital providers, not other stakeholders. The problem with this argument is that it rests on normative grounds. From that perspective, the two paradigms can be incommensurable, meaning that it is not possible to understand one paradigm through the conceptual framework and terminology of the rival paradigm (Kuhn 1962). It is likely that the only way to resolve the strong form of the challenge is to first resolve the debate on corporate purpose (Hart and Zingales 2017; Grewal and Serafeim 2020). In other words, if the corporate purpose is to maximize shareholder value, then one could reject the strong form of the challenge. If corporate purpose includes other stakeholders (Stout 2012; Mayer 2018; British Academy 2019; Henderson 2020; WBCSD 2020), the strong form of the challenge is likely to be a viable paradigm guiding the purpose of accounting statements.

Another objection relates to the idea of monetizing impacts in business, a process necessary to have a common denominator and for these impacts to be reflected in financial accounts. The concern is that not everything should be monetized, as doing so might lead to the degradation of morals and human values. Our response is threefold. First, although we conceptually agree with this objection, there are many important impacts that can be measured without threatening our values. For example, impact-weighted accounts do not need to reflect the value of human life.[1]

[1] It is relevant to note that regulatory agencies, courts, and policy makers routinely make decisions based on such monetary estimates in areas of healthcare, product safety requirements, and litigation outcomes.

Reflecting the monetary impacts of lost productivity and healthcare costs are a possible alternative. There are many impacts that can be reflected in monetary terms, and advances in technology and science allow us to estimate them with improved precision.

The second response relates to effectiveness. The fact that we did not put a price on carbon, our forests, and clean oceans has not resulted in our morals playing a role in taking care of the planet. It has led to a climate catastrophe with a global average atmospheric level of carbon dioxide in 2019 of 409.8 parts per million,[2] the highest concentration in 800,000 years; the loss of 35 percent of our mangrove forests, 40 percent of our terrestrial forests, and 50 percent of wetlands (TEEB 2011); also, at least 8 million tons of plastic end up in the oceans every year (Thevenon, Carroll, and Sousa, 2014; Boucher and Friot 2017). The track record of humanity is similarly abysmal when it comes to other species. Of an estimated eight million animal and plant species, around one million face the threat of extinction (IPBES 2019), while we have already brought about the extinction of 60 percent of mammals, birds, fish, and reptiles since 1970 (WWF 2018). The lack of a price has done nothing to slow the degradation of the environment, and putting a price on the consumption of the natural world could greatly improve the decision-making process. For example, a recent study estimated that each great whale creates climate-related benefits of USD 2 million, representing a value that was previously never considered (Chami et al. 2019).

The third response, which is related to the poor track record just described, is that not measuring these impacts is a value judgement in itself. The value we assigned to them in business has been zero. What we choose to measure reflects our values on what is important and needs to be prioritized. Allowing those impacts to remain invisible creates a perception that they are not important.

VALUE OF DATA AND STANDARDS

In accounting, standards are valuable because they can increase the relevance, reliability, and comparability of the reported information. As a result, IFRS and US GAAP are important institutions guiding the production of accounting statements and other important disclosures. While standards have a specific connotation in the field of accounting, we define a standard here as *"a methodology that over time becomes widely accepted and allows data to be linked with other data in a standardized way."*

Under this definition, standards can make data more decision useful and therefore more valuable. Standards empower relationships and transactions, as they allow people to agree on a set of parameters. For example, the use of Unix time allows people to arrange a time to speak, even if they are living on different continents, while the meter unit allows us to size our real estate, and SAT or GMAT scores enable an assessment of student performance. There are many standards in the environmental and social space that have increased the value of data. Some examples include measurement methodologies, such as the GHG accounting protocol, which details the methodology and taxonomy for calculating carbon emissions; certifications, such as the Forest Stewardship Council (FSC), the Rainforest Alliance (RA), or LEED Green Buildings, which detail desirable social and/or environmental practices; and industry initiatives, such as the Extractive Industries Transparency Initiative (EITI), which specify disclosures that companies and governments need to make on payments and receipts for the exploitation of natural resources.

A standard creates value because it allows data to link to other data. This makes all the linked data more valuable. Take the example of employment impact. Wages paid to the workforce are one data item. The locations of the employees, the number of employees in each location, and the level of a living wage across different locations are three more data items. Linking the four using the employment impact methodology in Freiberg et al. (2020) makes each of the data items more valuable as it enables an assessment of whether an organization pays above or below the living wage, and what total amount of wages is above or below the living wage.

It is important to realize that perfection is the enemy of standards. The reason is that the value of the standard increases exponentially with adoption, much like in Metcalfe's Law, in which the effect of a telecommunications network is proportional to the square of the number of connected users of the system. None of the standards mentioned above — the GHG protocol, FSC, RA, LEED, or EITI — are perfect and all of them have been criticized for different reasons. Building a standard that people can easily and widely adopt is more important than trying to create the perfect standard. Easiness and wide adoption are also the reasons why standards need to be open access.

Once the data are connected, using the standard as the basis, they can be analyzed. For example, an analysis of company-level environmental impact data shows that environmental impact has little correlation with commercial environmental ratings, but it also reveals that companies with a higher negative environmental impact have a lower market valuation in industries such as building products, independent power producers, industrial conglomerates, metals and mining, and chemicals (Freiberg et al. 2020). The analysis also finds that environmental impact has become more financially material over time. From

[2] As reported by NOAA (https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide).

a data science perspective, the next steps would be to form predictions with the ultimate objective of assisting with decisions.

THE FUTURE

As our ability to account for environmental and social impacts increases, so will the ability of managers and investors to make better decisions and the ability of policy makers to design better policies. Our ability to make progress requires us to solve several unresolved issues.

First, there must be a regulatory organization that defines the scope of the environmental and social impacts that need to be accounted for to mitigate *scope bias*. The European Commission is already taking steps to define scope in sustainable finance through the development of a technical expert group that seeks to create a taxonomy for the environmental impact of economic activities and a green bond standard. Importantly, missing vital impacts might positively or negatively bias the impacts that different organizations might have, depending on what is included. For example, when evaluating the impact of consumer-packaged goods companies on consumers, the exclusion of the positive health effects of calcium consumption can give rise to more negative impacts (Serafeim and Trinh 2021).

The scope of accounted impacts will define what is prioritized and valued by companies and their investors. Of course, such scoping of impacts is already common practice in the ESG investing space. It is important to recognize that any evaluation that aggregates ESG metrics using weights to arrive at an overall assessment de facto prioritizes some issues over others, thereby making judgements about their importance.

Second, different impacts have different measurement bases, such as impacts on employees relative to impacts on the environment. This can give rise to incomparable numbers across different impacts. While employees could be evaluated using wages as the measurement base, the environment might be evaluated using estimates of damage on human health and abiotic resources. Of course, this problem is not new. The financial accounting system has long faced similar problems, such as determining when to account for items at historical cost and when to do so at fair market value.

Third, an accounting treatment is needed that creates both stock and flow measures, as both could be important for accountability and contracting purposes. The former becomes part of an impact-weighted balance sheet while the latter becomes part of an impact-weighted income statement. Negative impacts can accumulate in a negative equity reserve or a liability account and positive impacts in a positive equity reserve or an asset account. For example, environmental impacts could be accumulated in an environmental liability number while positive employment impacts on a labor investments asset.

THE OPPORTUNITY

The first decade of the 21st century showed that unmeasured and unmanaged financial risks can bring the world to its knees. The second decade gave rise to a response that, due to the rapidly deteriorating environmental and social conditions, we need to build a more sustainable economy and inclusive society. The third decade represents an opportunity to create the guardrails and accountability mechanisms to make this a reality. Transparent, scalable, and comparable measurement of environmental and social impacts will be a necessary condition. In turn, the incorporation of these measures into outcome-based financing, compensation, and policies could well turn out to be a condition that is sufficient to alter our behavior in an unprecedented way.

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