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Corporate sustainability reporting[☆]

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ABSTRACT

This is a conceptual paper that addresses fundamental questions about the emerging field of corporate sustainability reporting, including the following: What is sustainability? Why does sustainability matter to corporations and to those affected by corporate activity? What comprises sustainability reporting and how does it relate to conventional financial reporting? What is the role of reporting standards? What is a 'theory of change' by which sustainability reporting makes a difference? In addressing these questions, the paper draws from the academic literature yet is focused on policy implications and practical application, with the ambition of bringing together critical issues that call for understanding and development.

This paper asks what corporate sustainability reporting is, what form it should take, what difference it makes and what role ought to be played by reporting standards. The starting point, in Section 1, is to frame the paper in the context of what are perhaps the best known and most widely endorsed articulations of the meaning of sustainability, the 'Brundtland' definition (Brundtland, 1987) and the Sustainable Development Goals (SDGs; UN, 2015). These are argued to have particular resonance when applied to natural resources and to human rights. For natural resources, Brundtland requires that natural capital is at least maintained, and thereby bequeathed, such that future generations have the resources to enjoy at least the same standard of living as the current generation. For human rights, the SDGs include aspirational societal targets across various forms of diversity, equity and inclusion. Sustainability thus framed, Section 2 outlines a dual implication for the corporate sector. On the one hand, corporations provide the goods and services with which current and future generations meet their needs. There is therefore public interest in the ongoing financial viability (and profitability) of the corporate sector. On the other hand, and to the extent that corporate activity generates negative externalities, the private economic incentives of corporations (and their investors) are realised at the expense of sustainability goals (including at a cost to future generations). Section 3 opens the analysis of how sustainability issues relate to corporate reporting. The starting point is financial accounting, which is a measurement system that yields both (financial) capital and (net) income but that provides limited information on how sustainability-related risks and opportunities affect financial prospects. This missing disclosure – termed 'sustainability-related financial information' – is distinct from that in the financial statements in the extent to which disclosure is prospective, in reporting on resources that are not owned by the reporting entity and in the extent of non-monetary disclosure, yet it shares with the financial statements a focus on providing material information to investors. Section 4 then asks whether sustainability-related financial information can help to reconcile the conflict between a corporation's economic self-interest and the external costs that its activities impose. It can do so when a corporation's activities impact the capitals on which those activities depend. It is argued, however, that corporations do not in general have self-interest, even in the long term, in eliminating external costs. The presence of such costs is the core challenge in sustainability and it cannot easily be assumed away. The implication, followed up in Sections 5 and 6, is that – to the

[☆] The views in this paper are expressed in a personal capacity and do not represent an official position of either of these two institutions. Official positions of the ISSB are arrived at only after extensive due process and deliberation. The journal editor, Marco Trombetta, is gratefully acknowledged.

extent that corporations are accountable for actions that impact stakeholders other than investors – some form of incremental sustainability reporting is required over and above sustainability-related financial information. The paper concludes by observing complementarity between these two forms of disclosure, whereby each has a distinctive role in aligning corporate and societal interests in a collective transition to a sustainable economy.

1. What is Sustainability?

Perhaps the two most widely accepted articulations of the meaning of ‘sustainability’ are those of the United Nations (UN). In 1987, the UN’s Brundtland Commission defined sustainability as the constraint of ‘meeting the needs of the present without compromising the ability of future generations to meet their own needs.’ More recently, the UN’s Sustainable Development Goals (SDGs) set out broad aspirations with respect to planetary health and social equity (see Table 1). The SDGs can be understood as an aspirational state, ‘sustainable’ in the sense of being a normative expression of what society ‘should’ aim to achieve and maintain, which is grounded in human rights to such things as equality and a minimum standard of living.

Brundtland’s definition lends itself to the dual accounting concept of a stock of capital and a flow of (net) income. For example, the state of nature can be understood as a stock of resource (‘natural capital’), which provides an ongoing stream of benefits (‘ecosystem services’) in the forms of freshwater, agricultural produce, and so on (Schumacher, 1973; Helm, 2015; NCC, 2016; TNCD, 2023).¹ The provision of something as basic as food requires land, water and other natural resources (natural capital), labour (human capital), machinery (manufactured capital), know-how (intellectual capital), institutions such as markets and legal systems (social capital) and funding (financial capital); see Table 2 for an illustrative set of definitions of capitals (IIRC, 2013). Consistent with Hicks (1946), Brundtland allows the needs of the present to be met by consuming as much as the whole of the income that is generated by the deployment of capital, yet it precludes that capital becoming depleted.² The idea is that future generations should be bequeathed with (at least) the same starting point as generations that have gone before.

Brundtland does not contain an obligation on the present generation to *increase* capitals but instead *not to decrease* them. This is consistent with sustainability targets being set at zero (such as zero waste to landfill or (net) zero GHG emissions or biodiversity impact). It is also consistent with the associated use of asymmetric language that focuses on avoiding damage rather than promoting benefit, such as impact *mitigation*, *conservation* science and *protection* of human rights. This is not ‘do good’ but instead ‘do no harm.’

Brundtland’s focus on capital maintenance directs our attention towards natural capital, which is already in a critical state of depletion, not just with respect to global warming (Stern, 2006; IPCC, 2022) but also across other natural resources (Rockström et al., 2009; Steffen et al., 2015).³ The problem is particularly urgent because of positive feedback loops that can accelerate depletion beyond human control, coupled with tipping points beyond which ecosystems can collapse (Helm, 2015). These historical and prospective depletions arise from limitations in economic and political institutions in the context of the systemic properties of natural capital. This can be understood as market failure, whereby individual incentives lead to economic activity that imposes external costs on society as a whole (Heal, 2016). The context is the familiar one that, while a finite planet cannot support unlimited growth in consumption (Meadows et al., 1972), market incentives operate as if this was not the case. While natural resources could once have been considered public goods, available in abundance to all, the effect of economic growth is that consumption has become increasingly rival.⁴ In the absence of an effective constraint on over-consumption by the current generation, there is reduced potential for consumption by future generations. This is a ‘tragedy of the commons’ whereby the (rational, unconstrained) pursuit of economic self-interest in the present leads to collective ruin in the future (Hardin, 1968). To illustrate, nearly 50 % of irrigated farmland in the Great Plains of the United States is supplied by the Ogallala Aquifer, which has been systematically drained at a rate faster than it is replenished, because farmers benefit privately from drawing water while mechanisms to prevent excessive withdrawal have been ineffective. The Ogallala Aquifer is expected to have become approximately 70 % depleted by 2060 (Steward et al., 2013).

Natural capital is the foundation from which all other capitals are created and its depletion is therefore especially critical.⁵ Nature alone provides the fundamentals of life – air, food, water, materials and other essentials – for which other capitals ultimately offer no substitute. The deployment of human, social, intellectual and physical capital *to* natural capital enables consumption in the present and growth in capitals over time. Excessive depletion of natural capital therefore undermines the system as a whole. The market failure is that economic growth has historically depleted natural capital, at a rate that is now dangerously unsustainable.

Most striking is the risk to social capital. Not least, there is the prospect of mass migration as a consequence of rising sea levels, depleted sources of freshwater, crop failure, extreme weather events and life-threatening temperatures (IOM, 2009). Such things disproportionately affect the poorest in global society, in part because of relatively high geographic exposure to climate change and in part because of limited access to mitigating financial resource (Islam and Winkel, 2017). While nations such as Bangladesh and the island states of Oceania have pressing concerns across all capitals, the ultimate capital depletion is that rising sea levels threaten their

¹ Note the anthropocentric perspective that nature ‘serves’ the interests of humans.

² Depletion of any specific capital can be understood as gross or (via offset/substitution) as net.

³ Much of this depletion has taken place since Brundtland (1987) was published. Nature targets are increasingly – and necessarily – expressed as ‘net positive’ (CBD, 2022).

⁴ A public good exists when consumption is both ‘non-excludable’ (accessible by anybody) and ‘non-rival’ (consumption by one person has no appreciable impact on consumption available to others). If access remains open, but consumption becomes rival, then overconsumption is a risk. This is an externality because consumption by the current generation precludes consumption by future generations.

⁵ Human capital is of course ‘natural’ yet it is also conceptually distinct.

Table 1
United Nations' Sustainable Development Goals (UN, 2015; abbreviated).

Goal 1: No poverty	End poverty in all its forms everywhere.
Goal 2: Zero hunger	End hunger, achieve food security ...
Goal 3: Good Health and Well-being	Ensure healthy lives ... for all at all ages.
Goal 4: Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
Goal 5: Gender equality	Achieve gender equality and empower all women and girls.
Goal 6: Clean water and sanitation	Ensure ... water and sanitation for all.
Goal 7: Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all.
Goal 8: Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
Goal 9: Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
Goal 10: Reduced inequality	Reduce income inequality within and among countries.
Goal 11: Sustainable cities and communities	Make cities ... inclusive, safe, resilient, and sustainable.
Goal 12: Responsible consumption and production	Ensure sustainable consumption and production patterns.
Goal 13: Climate action	Take urgent action to combat climate change and its impacts ...
Goal 14: Life below water	Conserve and sustainably use the oceans, seas and marine resources ...
Goal 15: Life on land	Protect, restore ... terrestrial ecosystems ... halt and reverse land degradation and halt biodiversity loss
Goal 16: Peace, justice and strong institutions	Promote peaceful and inclusive societies ... provide access to justice for all ...
Goal 17: Partnership for the goals	Strengthen the means of implementation ...

Table 2
Definitions of Capitals (IIRC, 2013; abbreviated).

Financial capital	The pool of funds that is available to an organization for use in the production of goods or the provision of services, obtained through financing, such as debt, equity or grants, or generated through operations or investments.
Manufactured capital	Manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services.
Intellectual capital	Organizational, knowledge-based intangibles, including intellectual property and ... organizational capital such as tacit knowledge, systems, procedures and protocols.
Human capital	People's competencies, capabilities and experience, and their motivations to innovate ... including their ability to lead, manage and collaborate.
Social and relationship capital	The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being ... (including) shared norms, and common values and behaviours ... intangibles associated with the brand and reputation that an organization has developed ... (and) an organization's social licence to operate.
Natural capital	All renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes air, water, land, minerals and forests, biodiversity and ecosystem health.

very existence (IPCC, 2022). In this sense, the breaching of 'planetary boundaries' is the very essence of failing to meet the Brundtland definition of sustainability (Rockström et al., 2009; Steffen et al., 2015).⁶

In contrast with natural capital, the application of Brundtland does not direct attention to intellectual and manufactured capitals. Intellectual capital can largely be understood as cumulative over time. It is intangible and not depleted through use. It can generally be assumed to grow alongside growth in economic activity and its use is therefore on the whole positively related to the possibility of consumption by future generations; applying Brundtland's definition, it is the opposite of a sustainability concern because meeting current needs increases capability to meet future needs.⁷ Manufactured capital has a similarly positive relationship with economic growth. While consumption of its services implies depletion of its capital, this depreciation is more than offset in a healthy economy by new infrastructure investment. Not all the capitals are therefore equally relevant to sustainability.

While Brundtland can help draw these insights with respect to natural, intellectual and manufactured capitals, it has less to offer in the cases of human and social capital. This is for two reasons. First, our aim as a society is to enhance human and social capital, not just maintain them; they are not just a means to an end but instead an end in themselves. Brundtland's definition addresses actions that benefit current generations at the expense of future generations.⁸ It is therefore focused on absolute levels of wellbeing and is satisfied simply by maintaining the status quo, whatever the current level of inequity or exclusion.⁹ The concept of depletion remains relevant,

⁶ Addressing social capital might be an effective route to avoid depletion of natural capital, for example through education that enables more resilient agricultural practice.

⁷ An exception is intellectual capital developed to address natural capital depletion, for example technologies relating to carbon capture or precision irrigation.

⁸ Human needs, both present and future, are not met if there is inequity or exclusion, and in this sense Brundtland does address a deficit in social capital. Yet the notion of 'without compromising' points to trade-off, to activities that harm the future in relation to the present.

⁹ An absolute maintenance of capital implies a per capita reduction in the presence of population growth.

for example greater economic inequality is both undesirable in itself and likely also a constraint on the feasibility of decarbonising the economy (Dixson-Declève et al., 2023).¹⁰ Yet the avoidance of depletion is a low hurdle and it stands in contrast with the SDGs, which are concerned not with capital maintenance but instead with progression towards social goals, closing the gap between where we are as a society and where the SDGs would have us be.¹¹ This is important not least because variation in social capital is associated with persistent variation in economic wellbeing among nations, since economic opportunities are largely determined at the societal level (North, 1990).

The second limitation of capitals in a human and social context is that, relative to natural, manufactured, intellectual and financial capitals, the concept of capital is itself inherently less useful. In the case of social capital, it is challenging to describe and define a concept of capital that captures the range of issues that are within scope for the SDGs – poverty, hunger, equality, water, sanitation, health, education, quality of work, etc. In contrast, while the concept of human capital is more tractable, it is also less directly relevant to sustainability. Human capital is an economic concept, concerned with factors (such as education and training) that affect the productivity of the workforce (Becker, 1964). It is directly analogous to other factors of production, such as the intellectual or manufactured capitals on which corporations rely to generate value, and it is no more relevant to sustainability than these other factors. What is missing here is that humans differ from intellectual property or machinery because they are not just factors of production. They also have rights. The management of an entity's workforce is simultaneously the management of productive capacity and of respect for human rights, and it is the latter category that includes SDG-related issues such as diversity, equity and inclusion (DEI), health and safety, living wage, forced labour and modern slavery. It is the lens of rights, and not of capital, that allows us to see the market failures whereby – analogous to the case of natural capital – the economic incentives of the corporate sector are misaligned with the (current and future) interests of society.

For individual and social sustainability issues, the concept of universal access to human rights therefore provides a more workable foundation than a capitals approach (see, for example, the UN's Guiding Principles on Business and Human Rights; Ruggie, 2011).¹² To illustrate, what makes serious injury to an employee a sustainability issue is not the economic loss of that person's productive input (i. e. not a loss of human capital) but instead the effect of failing to uphold that person's right to a safe working environment. While there might be an economic consequence for the employer in such a case (e.g. a loss of social license to operate, or a compensation payment or regulatory fine), the issue is sustainability-related in the first place because it concerns an infringement of human rights and therefore a failure to protect society and progress the SDGs.

A conclusion here is that 'sustainability' is best understood not as one thing but as (albeit related) two. The first is concerned with the maintenance of natural capital, and so with environmental sustainability. The second is concerned with respect for human rights, and so with progression towards societal goals.¹³

There remains one of the capitals on which little has so far been said; this is financial capital. The discussion has also not yet addressed that economic growth is itself a component of the SDGs, both directly in SDG 8 (Decent work and economic growth) and SDG 9 (Industry, Innovation and Infrastructure) and indirectly in so far as goals relating to such things as health and education require the availability of economic resource. These omissions are addressed in the next section.

2. The corporation in a sustainable economy

Corporations can be understood as both contributing to and detracting from sustainability, a duality that will be central to the analysis in this paper.

Corporations provide the goods and services with which society meets its needs, as well as being a source of employment, training, taxation and other social contributions. These provide direct benefits to the current generation, while the corporate sector is itself part of the capital bequeathed to future generations. The institutions of capitalism, including the legal structure of the corporation, can be understood as components of social capital, designed to enable an efficient allocation of financial capital, which in turns enables consumption and growth (North, 1990).

In order to continue to provide goods and services, corporations must be financially viable. They do not survive in the absence of maintaining financial capital and they do not attract investment and thrive without the prospect of financial return. In turn, this sustainability of corporate financial performance depends upon the ongoing availability of capitals, because these are the resources and relationships needed by business as inputs to value creation. In these respects, corporate profitability is not in conflict with a public

¹⁰ For example, if transition is not 'just' then it risks triggering social unrest and political polarisation, which in turn make transition more difficult to achieve (Dixson-Declève et al., 2023).

¹¹ Social capital is intangible and therefore immune to physical depletion, while its networked nature makes it more valuable the more it is employed; in general, it has a positive relationship with economic growth.

¹² As with natural capital, sustainability-related issues can arise when markets fail. Markets enable mutually beneficial exchange between those with the capacity to trade. They are silent on how that capacity is owned and controlled, not least on the societal issue of inequality of wealth or of other forms of economic exclusion. In such cases social capital shares with natural capital the systemic problem of collective action.

¹³ The difference can be seen as one of direction of travel. We once enjoyed a 'golden age' of natural capital, of pristine wilderness before the impacts of economic activity. Depletion has occurred over time and the sustainability concern is (at a minimum) to halt further loss so that natural capital is at least maintained. In contrast, the 'golden age' of social capital is aspirational, a state of equity and inclusion that has never existed but that is hoped for. While natural capital's focus is one of halting depletion, the focus of human and social capital is one of promoting accretion. The concept of sustainability embraces both of these aims.

interest in sustainability. The implications of this, in terms of reporting to investors, will be discussed in [Section 3](#).

It is also the case, however, that the profitable provision of goods and services can serve investors' private interests at the cost of externalities imposed on other members of society ([Unerman et al., 2018](#)). Take the example of transportation. If a demand for carbon-neutral cars replaces those powered by internal combustion engines, then the financially viable activities of auto makers will switch accordingly, thereby aligning with the wider public interest to mitigate global warming. In this way, from the perspective of future generations, the auto industry will have evolved to meet transportation needs in a sustainable way. Yet, the private economic incentives of investors in corporations might not be so aligned. If there remains a demand for cars that are not carbon-neutral, and if that demand can be met profitably, then the industry is likely to continue to meet the needs of the current generation in a way that contributes to global warming and so imposes external costs on future generations. Similarly, if it is more profitable to sell luxury cars than to develop the market in a way that increases access to transportation, social inequality might be widened rather than reduced by corporate activity. The reporting implications of this will be discussed in [Section 4](#).

Corporations can therefore have both a synergistic and a conflicting relationship with society's sustainability aspirations. Building on this observation, and on [Section 1](#), the implication is that sustainability makes three demands on the corporate sector.

First, corporations should continue to deliver goods, services and other economic benefits. In turn, this requires that they are attractive to investors, which makes corporate financial viability and profitability a necessary condition for meeting sustainability goals.¹⁴

Second, corporate activity should not deplete natural capital. To do so would meet the needs of the current generation by compromising the quality of life of future generations. This is a necessary constraint in meeting sustainability goals because all human activity depends ultimately on a 'healthy' natural environment.

Third, corporate activity should progress societal aspirations, as espoused in the SDGs. While in part this can be understood as a constraint (i.e. to operate without violating human rights), it is also aspirational.

The remainder of the paper evaluates corporate reporting in the light of these three demands.

3. Information for investors – financial accounting and sustainability-related financial disclosure

Reporting on the financial viability of corporations has long been anchored in financial accounting. Consistent with the capital maintenance concept implicit in Brundtland, the financial statements provide a measure of financial capital (equity) and thereby of the net income (profit) earned in a reporting period. This income can be consumed without depleting capital.

The structure of financial accounting reflects the legal status of shareholders as residual owners of net assets, with the income statement summarising performance in those terms.¹⁵ Common in financial analysis is to also include debt as a component of financial capital ([Penman, 2013](#)). Accordingly, International Financial Reporting Standards (IFRS) define investors (shareholders and debt-holders) as the 'primary users' of financial reports, for whom 'information is material if omitting, misstating or obscuring it could reasonably be expected to influence investor decisions' ([IFRS, 2024](#)). IFRS disclosure thereby includes entity-specific information that might be useful to investors, while it also excludes information that is extraneous and which might thereby obscure disclosures that are material ([IFRS, 2017](#)). Acknowledging that the investment community is heterogeneous, the specific focus is on information needs that investors have in common. As investors have in common that they are providers of finance, they all have an interest in financial returns. IFRS reporting to them is accordingly termed 'financial reporting'.

A corporation's financial statements are not designed to provide all available information that is material to investors. While assets and liabilities are defined and measured with respect to future economic benefits, recognition is conditional upon the occurrence of a past event ([IFRS, 2024](#)). By thereby anchoring recognition in events that have happened, and that are thereby in principle verifiable, IFRS precludes the recognition of future events, on which information is unavoidably subjective ([Watts, 2003](#); [Basu and Waymire, 2007](#)). While the financial statements thereby inform on whether financial capital has been maintained historically, they are not designed to answer the question of whether it will be maintained in the future. Yet, while financial statement information is in this sense *ex post*, investment decisions are made *ex ante*, and there is therefore unmet investor demand for information.

An entity is likely, however, to currently hold (or be able to acquire) information that is not in the financial statements but that, if disclosed, could be useful in evaluating future financial performance. To illustrate, consider that a corporation's activities rely upon the resources of finance, materials, labour, knowledge, and social and physical infrastructure, that its profitability depends upon how effectively it utilises these capitals in providing goods and services, and that the state of these capitals is subject to change. If, for example, a business currently operates in a coastal area, and if climate science predicts rising sea levels and/or storms that would force closure of the operation, then simple extrapolation of past profit would be an unreliable guide to expected future profit, while disclosing the expected effects of climate change (and the company's planned responses to those effects) would provide material information to investors. Such disclosure – termed 'sustainability-related financial information' ([IFRS, 2023](#)) – relates to (uncertain) future outcomes, which give rise to current risks and opportunities for investors. An example of a risk is that the continuation of profitable operations in the coastal region might depend upon global warming remaining within two degrees. An opportunity arises in relation to a possible new source of financial return, perhaps to a company that provides advisory services to troubled coastal

¹⁴ Which goods and services society 'needs' is of course a highly subjective question.

¹⁵ This does not imply that shareholders 'own' corporations or that corporations do not also serve the interests of other stakeholders. The corporation is better understood as a legal entity that owns itself, with shareholders ceding ownership and control in exchange for economic benefit ([Stout, 2012](#); [Mayer \(2013\)](#)).

operations.

These sustainability-related financial disclosures on risks and opportunities can be contrasted with information in the financial statements. Six areas of difference can be identified.

First, while the recognition criteria in financial statements condition the reporting of historical financial performance and current financial position on the occurrence of past events, a sustainability report also anticipates future events, including for example disclosure not just of actual greenhouse gas emissions during the reporting period but also of plans to reduce those emissions.¹⁶

Second, in order to accommodate the reality that (in contrast with historical performance) the future is inherently uncertain, sustainability reporting calls for a different type of disclosure, concerning how an entity is preparing currently for the unknown future.¹⁷ This includes information relating to (TFCD, 2017; IFRS, 2023): governance (oversight); strategy (how an entity has identified risks and opportunities and how it plans to respond to them, over the short, medium and long term); risk management (the processes by which the entity seeks to understand its resilience); and metrics and targets (the performance criteria by which it sets expectations and evaluates performance). Within scope for these disclosures are the possible effects of future events on the entity's business model, the entity's use of scenario analysis in thinking through plausible transition pathways, and the 'translation' of planned activities into anticipated financial outcomes (or 'financial effects').¹⁸ Each of these disclosures is grounded in what the entity is thinking and doing right now, observable activities that are relevant to investors' estimation of the future, including their evaluation of such things as the credibility of management commitments and the extent to which the entity's funding is resilient.

Third, sustainability reporting is broader than financial accounting with respect to the resources upon which disclosures are made. Equity (financial capital) in the financial statements is explicitly defined and measured with respect to the net assets controlled by the reporting entity at the reporting date. Yet financial prospects depend not just upon the entity's own assets (such as PP&E) but also on resources elsewhere in its value chain that it does not control (but which affect its costs, supply chain resiliency, market opportunities, and so on). There is no automatic relationship between the carrying amount of assets in an entity's balance sheet and the annual profit it can earn from those assets. Instead, what matters is the vitality of all of the capitals on which the entity's activities depend, coupled with the effectiveness of the entity's strategy and operations in generating value from those capitals. It is information on these factors that is the essence of investor-oriented sustainability reporting. While there is some overlap here with financial accounting (for example, resource scarcity might be evident in higher operating expenses in the current reporting period), information that is material to investors extends beyond transactions and events that are recognised (or otherwise reported) in the financial statements.

Fourth, sustainability-related financial disclosures are inherently more heterogeneous than financial accounting. The financial statements are essentially universal in format and in defined content, with information on such things as profit or debt being material for all companies. In contrast, different industries have different drivers of material sustainability-related information. The consumption of freshwater is important in industries such as agriculture, clothing and mining, less so in entertainment, transportation or professional services. It follows that sustainability reporting norms should be both thematic and industry-based (e.g. water consumption is a thematic issue that should be applied consistently, yet specific metrics and other disclosures attach to individual industries). These norms are still evolving and (in contrast with financial accounting) they are not yet subject to consensus. While it is inarguable that debt belongs on a balance sheet, issues such as data privacy, employee training, brand value or bribery and corruption might – or might not – be argued to be within scope for sustainability-related financial disclosure.

Fifth, the unit of measurement in financial accounting is that with which investors are directly concerned. Market transactions enable the (relatively) straightforward monetary measurement of transactions and events, which are aggregated in the reporting of net assets and profit. From an investors' perspective, sustainability-related financial disclosure is also concerned ultimately with the entity's financial performance and prospects, yet measurement is indirect. Data on carbon emissions, for example, are neither monetary nor directly of interest to investors but instead they are an indicator of the challenge and risk associated with transition to a low-carbon business model. What investors want to know is the capital expenditure required for transition, the expected effects on revenue and operating cost, the likely resilience of financial performance, and so on. The disclosure of these financial effects is a secondary step in sustainability-related financial disclosure rather than, in the case financial accounting, the direct object of measurement. The complexity associated with this is compounded by the relative paucity of reporting experience and data systems.¹⁹

Sixth, there is less of an imperative for accuracy in sustainability-related financial disclosure. In financial accounting, every double entry directly affects the aggregate measurement of assets and liabilities, and thereby the measurement of profit. In contrast, sustainability metrics are largely independent and they do not come together in a single measure of sustainability performance; there is no aggregate measure of carbon emissions, freshwater consumption, toxic waste, workplace safety and gender equality (Wagenhofer, 2024).²⁰ Moreover, and because investors are anyway not directly interested in (for example) carbon emissions but instead in the financial effects associated with those emissions, precision is less important than a reasonable estimate of how large the emissions are, where they arise in the value chain and how intractable they are likely to be. Moreover, what is not called for is a measurement of the

¹⁶ Data on actual greenhouse gas emissions are in turn useful to investors in evaluating the credibility of (previously disclosed) emissions targets.

¹⁷ This is not to imply that historical performance is not also subject to measurement uncertainty. Not least, while recognition is conditional upon the occurrence of a past event, measurement requires anticipation of future economic benefits.

¹⁸ While uncertain, these projections are grounded in science-based targets for reductions in GHG emissions. Conventional business forecasts have no such anchor.

¹⁹ Challenges such as the quality and availability of Scope 3 emissions can be regarded as transitory; market practice is likely to evolve quickly.

²⁰ The point here is that the metrics themselves are independent. There are likely, in practice, to be many interactions among underlying sustainability-related activities, for example between changing land use and climate change.

value of capitals, because – in contrast with financial capital – they are of not of direct interest in themselves. Instead, the need is to report on capitals to the extent that they are indirectly important to the evaluation of the risks and opportunities that affect an entity's expected capacity to generate (risk-adjusted) cash flows.²¹

On balance, these differences imply that sustainability-related financial disclosure is more challenging than financial accounting. Yet these challenges are not unfamiliar in current reporting practice. It is common, for example, for companies to communicate with investors on the uncertain payoff from investment in R&D or marketing, or on changes in senior management, for which the financial statements have always provided limited information, and on which the job of estimating future financial returns and valuing the business is left to the analyst.²² So, too, the role of making sense of sustainability-related information belongs as much to the user as to the preparer. Moreover, such information is reportable only if material. It therefore comprises only high-level information of direct concern to the economics of the business, which should anyway be information that a corporate board's fiduciary duty obliges it to have in hand and which, in service of lowering its cost of capital, it has self interest in reporting transparently to investors.

4. Is reporting to investors sufficient?

The discussion in Section 3 focused on financial returns for investors, and therefore on whether an entity's (current or prospective) financial capital is affected by the resources and relationships available to it; this is the lens of 'dependency'.²³ Sometimes referred to as an 'outside-in' perspective, the issue at stake is whether the economic prospects of the corporation are affected by sustainability-related concerns, for example by natural capital depletion that leads to resource scarcity or to supply chain disruption. An alternative lens is that of 'impact', which concerns changes to capitals that result from the activities of the entity. This 'inside-out' perspective is concerned with how the activities of the corporation affect others. Each lens corresponds, respectively, to the concepts of adaptation and mitigation. Take the example of climate change. Adaptation is action taken by an entity to reduce its exposure to climate change, for example by lowering its dependency upon an area at risk from extreme weather events. The concern here is how best to protect the interests of investors, ensuring the maintenance (and growth) of financial capital as an end in itself. Mitigation is action taken by an entity to reduce its carbon emissions, which in turn reduces its contribution to global warming and to the consequences of climate change, helping to protect the interests of any party affected by climate change, current or future.²⁴

The lenses of dependency and impact are not independent of one another because a corporation's impacts might themselves affect the capitals on which the corporation depends. They might do so directly or indirectly. An example of a direct effect would be the depletion of an underground aquifer that results largely from the entity's own activities, compromising directly its ability to rely upon this resource in the future. Mitigation would in this case be a response to the challenge of adaptation. An example of an indirect effect is carbon emissions, where the emissions of any entity are a negligible contributor to global warming but where – for example by means of changing consumer demand, tightening regulation or the entity's own net zero commitment – these emissions nevertheless affect the entity's financial prospects. While the emissions do not (as in the case of the underground aquifer) directly affect the natural resources on which the business depends, the entity's carbon footprint nevertheless exposes it to various forms of transition risk.²⁵ Investors will want to know how management plans to create value in the future while transitioning to a different way of doing business. While the (financial) interest is not emissions themselves, such information is material to investors if it affects the financial prospects of the business. This holds true regardless of whether the emissions occur in extracting and processing materials at the start of the entity's value chain, or within its own operational control, or in recycling or disposing at the end of the value chain. For example, the existing technology for producing steel for auto bodies is highly carbon intensive. Whether the steel-making facilities are owned by the auto manufacturer or by its supplier is irrelevant to the reality that these carbon emissions are inherent to the auto maker's business model. The entity's own emissions and those of its suppliers are equivalent components of its carbon footprint, in much the same way that, in measuring profit, the entity's own employment costs are equivalent to those initially incurred by its suppliers and then passed on in the entity's purchase of the suppliers' goods or services (Kaplan and Ramanna, 2022).²⁶ The logic applies equally to corporate impacts on people, which might take various forms, ranging from increasing the inequality of income and wealth, to tolerating human rights abuses in a supply chain or profiting from misleading advertising. These might affect the corporation's license to operate, for example because consumers might be less likely to buy from a business that 'earns' a reputation for poor treatment of vulnerable stakeholders. In turn, this might affect financial returns, giving rise to investor demand for information about corporate impact. Again, investors' concern is not directly with the impact but instead indirectly with its financial implications. These relationships are

²¹ Financial capital is a credit on the balance sheet. It is not a 'real' resource, has no independent substance and is a 'capital' in the opposite sense that the term is used for such things as PP&E (Nobes, 2015).

²² Similarly, corporations have always been concerned about relationships with stakeholders, not least customers, suppliers and employees, for the simple reason that these directly affect value creation.

²³ The terms 'dependency' and 'impact' have become widely used, albeit without there being a single, authoritative source; see, for example, NCC (2016).

²⁴ Consistent with the discussion in Section 1, mitigation is an asymmetric concept, being concerned with avoiding the depletion of capital, while adaptation is symmetric, being as relevant to economic gain as to loss.

²⁵ Transition risks include policy, legal, technological, market and reputational risks, for example an entity's financial performance could be affected by reduced social tolerance for a given externality, leading to tighter regulation and so changes in market conditions.

²⁶ With neither carbon emissions nor employment costs is there double counting because the emissions (or employment costs) are relevant in determining the carbon footprint (or profit) of both the reporting entity and its suppliers. The difference is that information about emissions is not passed on via the price mechanism.

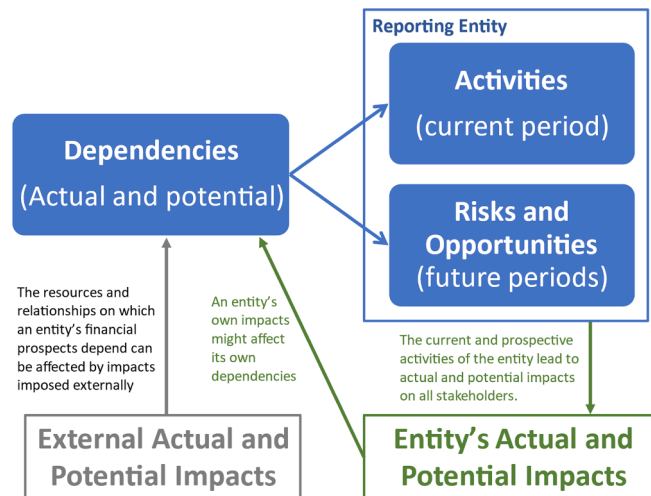


Fig. 1. Impacts and dependencies.

illustrated in Fig. 1.

Starting at the top left of Fig. 1 the dependencies box represents the resources and relationships available to the reporting entity. In example just given, these include the corporation's license to operate, on which its financial prospects partly depend. These dependencies are linked by arrows to the current activities of the reporting entity (hence also to current financial performance) and to the risks and opportunities that comprise the entity's financial prospects. In turn, and following the arrow down, the entity's current and prospective activities give rise to actual and potential impacts of the entity on stakeholders other than investors. There will in turn be feedback from some of these impacts to affect the entity's dependencies, which will also be affected by the impacts of other, external entities. And so we come full circle. Financial performance and prospects result from dependencies. Business activities give rise to the entity's impacts which, in combination with the impacts of other entities, affect the resources and relationships on which business performance depends.

It should not be surprising that information about impact can be material to investors in this way. The corporate sector is a major part of most economies and so there is a certain inevitability that corporate economic prospects cannot be insulated from the wellbeing of the economy at large. It might be assumed, therefore, that the interests of investors are largely aligned with those of society as a whole. If so, sustainability reporting need only be designed to address an investor audience, because this would provide the information with which (in the light of investors' economic self-interest) the sustainability needs of all stakeholders are addressed. This 'argument for alignment' is a contemporary take on the notion of the 'invisible hand' that leads to social benefits from private market transactions (Smith, 1776). The argument leads to the increasingly prevalent notion that 'good' or 'responsible' business is ultimately financially rewarding (Porter and Kramer, 2011; Polman and Winston, 2022) or, alternatively stated, that if a business imposes negative impacts on others, its own best interests will be served by addressing and eliminating these impacts over time. Formally, the argument goes something like this:

Premise 1: the corporate sector earns profit by serving the interests of society;

Premise 2: the interests of society are served by business activity that does not harm nature or people;

Conclusion: the corporate sector earns profit by business activity that does not harm nature or people.

This argument is often qualified by referring to the 'long term', in a way that acknowledges current trade-offs, yet maintains that societal interests are ultimately not in conflict with the profit motive of corporations and their investors (for example, Barton and Wiseman, 2014).

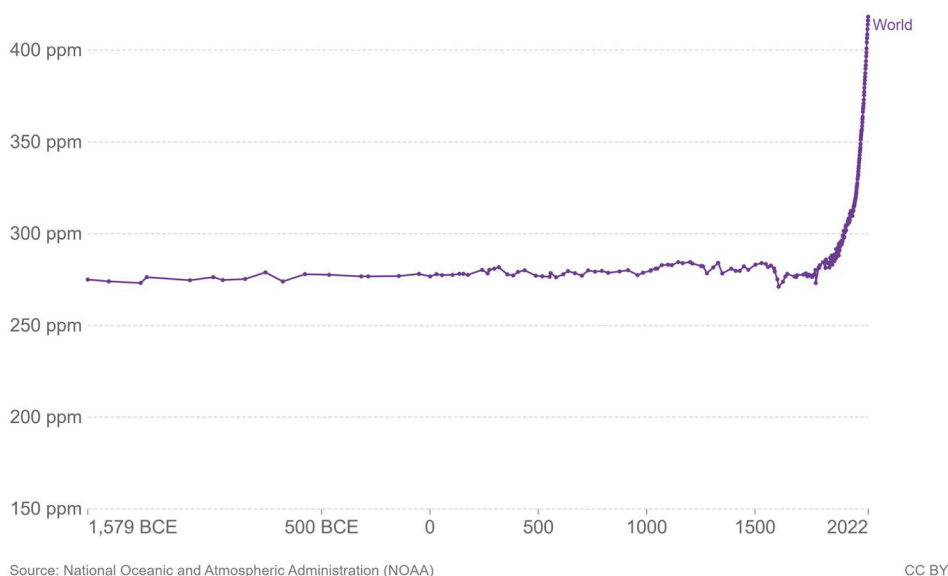
The argument is flawed. That the interests of investors *might* be aligned with those of all other stakeholders does not mean that they are, nor that they will be. Instead, and as will be argued below, a more plausible assumption is that of a degree of conflict. If correct, it follows that comprehensive corporate accountability for sustainability performance cannot be met by investor-oriented sustainability reporting alone, because this would exclude some of the impacts that affect stakeholders other than investors. On this view, the first premise in the above argument should be corrected, as follows: while the corporate sector earns profit by serving the interests of some members of society, it does so while also imposing costs on others. If the first premise is adjusted in this way, the above conclusion of the argument can no longer be deduced or defended.

To frame this issue (and its importance), consider the evidence in Fig. 2, which shows (very) long-term correlation between growth in economic activity and in carbon emissions.

Until the start of the Industrial Revolution, in around 1750, human activity had relatively little effect on global warming and so a stable climate was passed on, sustainably, from one generation to the next. During this time GDP was also relatively stable, and very low. Once revolutions were triggered in agricultural practice, and then in industry and in science, GDP took off, and so too population

Global atmospheric CO₂ concentration

Atmospheric carbon dioxide (CO₂) concentration is measured in parts per million (ppm). Long-term trends in CO₂ concentrations can be measured at high-resolution using preserved air samples from ice cores.



World GDP over the last two millennia

Total output of the world economy; adjusted for inflation and expressed in international-\$ in 2011 prices.

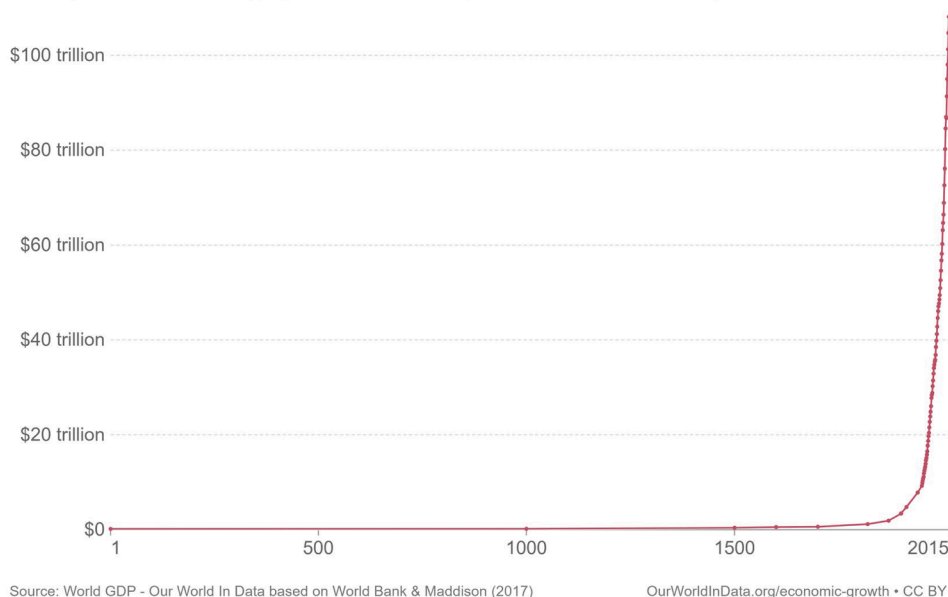


Fig. 2. (Very) long-term growth in atmospheric CO₂ concentration and in global GDP.

growth (Broadberry and O'Rourke, 2010). Along the way, the modern structure of the corporation came into being and with it the growth of 'big business' and mass consumption (Chandler, 1977). In turn, and mostly through fossil fuel burning and change in land use, this growth has had many and varied adverse impacts on natural capital, including water cycle disruption, sea level rise, ocean acidification, species invasion, flooding, heatwaves, wildfires, drought, decline in agricultural yield and loss of both marine and

terrestrial biodiversity (WWW, 2022). In turn, and reinforced by positive feedback loops, coupled with existential threats from exceeding tipping points, the likely (mostly future) human effects include economic loss, famine, migration, greater inequality, social unrest and an increased risk of armed conflict over access to freshwater and other natural resources.²⁷

At the least, these unprecedented, existential external costs are worthy of careful attention. They should not be overlooked by simply assuming that corporate and social interests are aligned and that, in this regard, the future will be different from the past.

A specific example can help to focus the issue and perhaps the best illustration is the livestock industry, in particular beef, which captures a range of adverse, avoidable natural capital impacts across both GHG emissions and changing land use (see Fig. 3).

The livestock industry pushes at most of the planetary boundaries beyond which natural systems are unsustainable (Rockström et al., 2009; Steffen et al., 2015; Poore and Nemecek, 2018). Meat and dairy (including arable land used to feed livestock) accounts for 77 % of agricultural land use (Fig. 3a), yet it provides only 18 % of global calories (EAT-Lancet, 2019). This is because it is highly inefficient to grow crops to feed animals and then to eat animal product (97 % of calories are wasted; Ritchie, 2024). This extravagance is costly in several ways. Beef cattle generate approximately 50 kg of GHG emissions for every 100 g of protein produced, in contrast with only 1 kg for beans (Fig. 3b). The industry also imposes similarly exceptional impacts via freshwater consumption and pollution from phosphate and other agricultural waste (Monbiot, 2023). In addition, beef is the primary cause of tropical deforestation (Fig. 3c), a result of which is that the Amazon is nearing a tipping point, a level of depletion at which the forest cannot sustain itself and there is irreversible and complete change to savannah grassland (Nobre et al., 1991). Even though a simple change in human consumption decisions could remedy these impacts, beef consumption continues to grow, especially so as wealth increases globally (Fig. 3d).

From a Brundtland perspective, this is madness.²⁸ Yet the private economic incentives are clear, and it is not hard to picture companies throughout the global value chain, from farm to fork, that stimulate and profit from this industry. Such are the incentives of the market and the ‘effectiveness’ of the corporate sector in responding to them.²⁹ Extending the example, it is hard to think of a single corporation (current or historical) that has not enjoyed financial benefit from imposing costs externally, for example by not remedying the cost of carbon emissions or of other waste. And yet the ‘argument for alignment’ posits that this will change. While economic growth has progressed hand in hand with natural capital depletion in the past, it is wishfully (and largely blindly) assumed that the future will somehow be different.

The counter argument is that corporations are the servants of markets. The relentlessly competitive nature of markets and the necessity of profit for economic viability, coupled with directors’ fiduciary duty to their investors, leads inexorably to corporate (and investor) behaviour responding to economic self-interest; it cannot do otherwise (Bakan, 2004). It is not realistic to expect that business leaders can ‘do the right thing’ when there is no commercial case for doing so, nor even that they should (Friedman, 1970). In the aviation industry, for example, the absence of technologically feasible and/or economically viable options to avoid externalities gives corporations a stark choice, either to operate in a way that imposes external costs or else to exit the business. In any event, and in any industry, if the leaders of one corporation ‘fail’ to exploit externalities, then those of another will instead take the money that is left on the table. In this context, it is unhelpful to stigmatise leaders in oil and gas, aviation or the beef and dairy industries, while hailing as ‘brave’ or ‘responsible’ leaders in sectors where there happens to be a stronger business case for sustainability transition.

These pernicious effects of externalities cannot simply be assumed to go away ‘in the long term.’ This assumption does not bear scrutiny. The reality is that corporations are not designed primarily with longevity in mind. More important is the maximisation of economic value creation for however long this proves to be achievable. Consider the case of the coal industry, the economic viability of which is increasingly challenged by the transition to net zero, yet where the incentives to mine coal remain for as long as it is (privately) valuable to do so, even if the net social value is negative. In this way, decades of profitability have already passed and some further years remain. Ultimately, and in the absence of a technological breakthrough on carbon capture, operations will be shut down. By then, the damage will have been done. It is simply not the case that the coal industry has acted to internalise its contributions to global warming and that ‘in the long term’ these externalities have come back to bite. Why would they? Instead, profits have already been earned, dividends have already been distributed and it will soon be time to close up and go home. A similar story applies to the oil and gas industry, albeit that it will remain economically viable for much longer. That the fossil fuel industry will cease to be viable *in the end* is not much consolation to those affected by its external impacts between now and whenever ‘the end’ might eventually be. Worse, the industry has economic self-interest in postponing the end, for example by reinvesting earnings in lobbying activities (Mann, 2021). Worse still, when the end does come, bankruptcy can serve to offload remaining private costs so that they become external, for example those of asset decommissioning and environmental restoration.

These examples might seem to be special cases. They are not. It does not matter whether the externality in question is GHG emissions or any other form of natural resource depletion or adverse social impact. In pursuit of value creation, corporations will over-consume resources for which they are not paying the full cost. And if those resources are rival, the effect is a tragedy of the commons. Over time, as common pool resources are depleted, the companies that survive (or are newly created) can adapt to whatever economic

²⁷ These outcomes are not inevitable, as argued and evidenced in Ritchie (2024), yet the point remains that alleviating their worst effects requires fundamental transition from business as usual.

²⁸ So, too, from a human health perspective, though this is not explored here.

²⁹ There have been five mass extinction episodes in the 500 million years of life on earth, most recently that of the dinosaurs. The sixth mass extinction is currently taking place, caused by human activity (Kolbert, 2019).

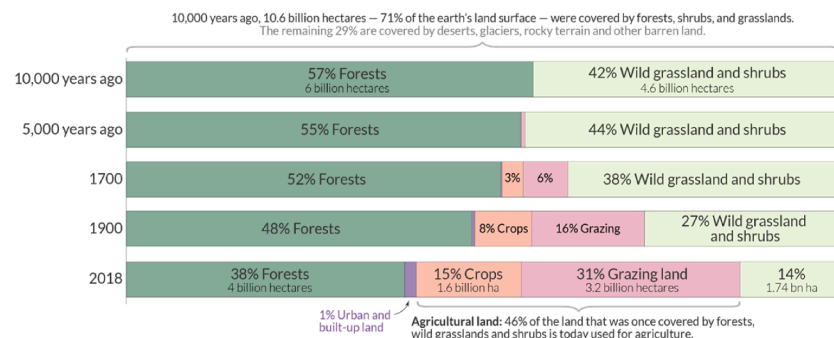
Figure 3a: Biodiversity impact

Change in land use is the primary driver of biodiversity loss and a significant contributor to the breaching of several planetary boundaries. In turn, livestock farming is the primary driver of the change in land use.

Humanity destroyed one third of the world's forests by expanding agricultural land

Agriculture is by far the largest driver of deforestation. To bring deforestation to an end humanity has to find ways to produce more food on less land.

Our World
in Data



Data: Historical data on forests from Williams (2003) – Deforesting the Earth. Historical data on agriculture from The History Database of Global Environment (HYDE). Modern data from the FAO. OurWorldinData.org – Research and data to make progress against the world's largest problems. Licensed under CC-BY by the authors Hannah Ritchie and Max Roser.

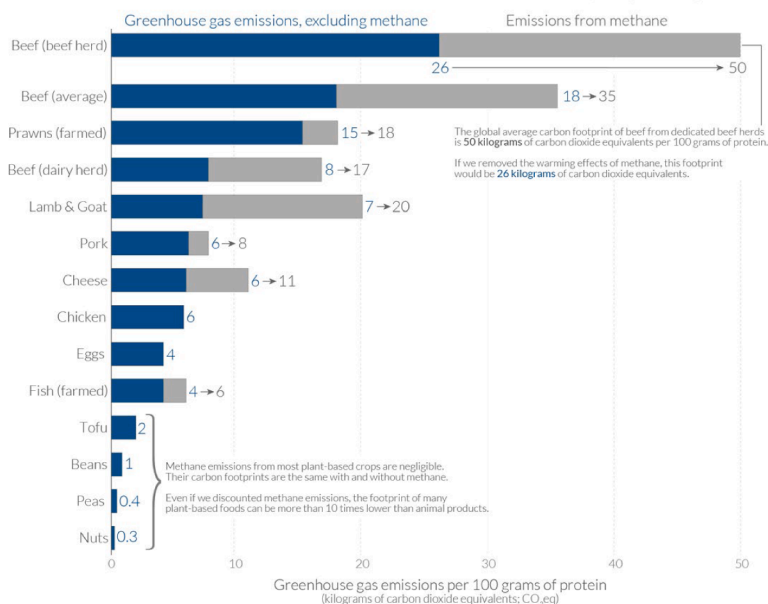
Figure 3b: Global warming

The beef cattle industry is particularly intensive contributor to global warming (as well as to their natural capital depletions), in part because the global warming potential of methane is approximately thirty times that of carbon dioxide (and much higher still in the short term).

Greenhouse gas emissions from protein-rich foods, short vs. long-lived greenhouse gases

Greenhouse gas emissions are measured in carbon dioxide-equivalents (CO₂eq) based on their 100-year global warming potential (GWP). Global mean emissions for each food are shown with and without the inclusion of methane – a short-lived but potent greenhouse gas.

Our World
in Data



Note: Greenhouse gas emissions are given as global average values based on data across 38,700 commercially viable farms in 119 countries. Data source: Poore & Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Science. OurWorldinData.org – Research and data to make progress against the world's largest problems. Licensed under CC-BY by the authors Joseph Poore & Hannah Ritchie.

Fig. 3. Environmental impact of beef cattle.

Figure 3c: Deforestation

The beef cattle industry is the primary driver of biodiversity loss in the world's richest ecosystem, which is now at risk of catastrophic collapse.

What are the drivers of tropical deforestation?

Nearly all of global deforestation occurs in tropical and subtropical countries. 70% to 80% is driven by conversion of primary forest to agriculture or tree plantations. Shown is the breakdown of these drivers averaged over the years 2005 to 2013. Further observations since 2013 suggest that drivers have not changed substantially over this period.

Our World
in Data

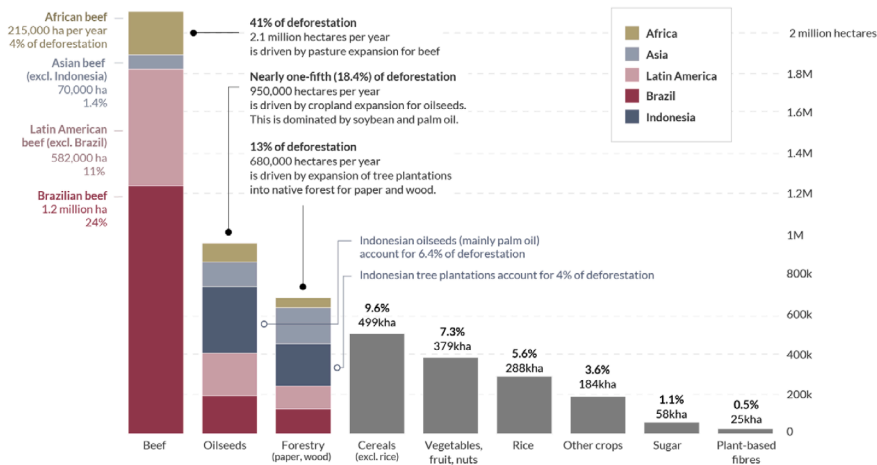


Figure 3d: Rising market demand

Global market demand for beef rises with income, reaching a peak only in high-income countries. The market-based incentive is to invest financial capital to meet this rising demand.

Beef production, 1961 to 2020

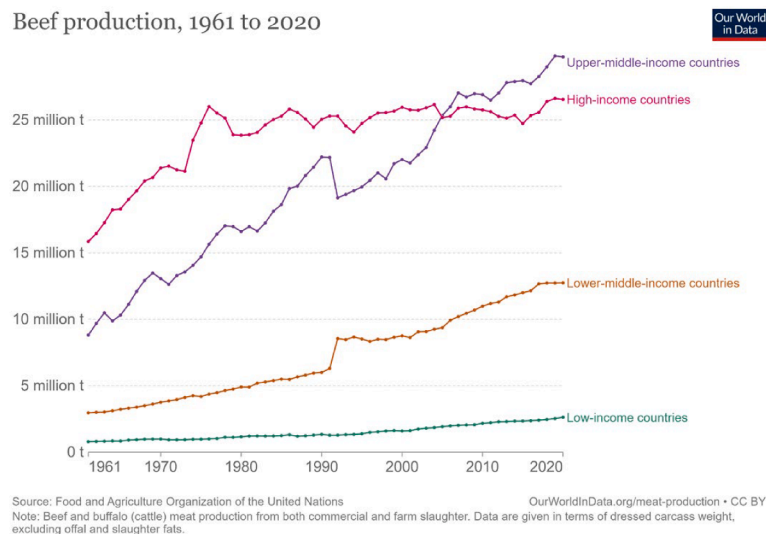


Fig. 3. (continued).

opportunity remains, but there is nothing to guarantee sustainability in its broadest sense.³⁰ An appeal to the long term does not fix this problem.

This discussion applies as much to investors as to the companies in which they are invested, notwithstanding that, if the portfolio covers the market as a whole (the ‘universal owner’), then corporate external costs are (to an extent) internalised within the portfolio. While an argument can be made that this gives the investor economic incentives that align with the interests of society as a whole, the argument runs into trouble when confronted with the reality of capital market structures and incentives.

Consider that, even in primary markets, investors don’t invest in ‘the market’ but in individual companies. An investment portfolio is not a vehicle for collective action. It is an aggregation of (typically small shares of) the value of individual companies and not a single, controlled economic entity. Investment in the real economy is made by companies, not by their investors, and each of those companies retains its economic benefit from not paying for external costs.³¹ Since they act individually and not as components of a portfolio, the tragedy of the commons described earlier is not averted. This effect is even more stark in secondary markets, where investors trade only ownership claims and in the process of this ‘investment’ they are engaged in nothing more than a zero-sum game that is divorced from real-world investment in mitigation. The game is not to ensure the maintenance (and growth) of financial capital as an end in itself but instead to reduce investors’ relative exposure to (for example) climate change.

Critical is that capital markets are liquid, with the effect that investors can trade holdings, thereby varying their respective exposures to underlying, real-world investments. As a result, investors are not incentivised by whatever the value of the fund will be in (say) thirty years from now but instead their performance is measured in terms of periodic financial returns in comparison with the index or some other risk-adjusted benchmark (Keynes, 1936).³² Long-term investment horizons are not even implied when the investor (e.g. a pension fund) has long-term obligations. This is because market liquidity allows the investor to create a long-term outcome for the fund that is a composition of any number of short-term investment decisions. The long-term obligation is to pay cash. If, in the short term, the value of the fund is maximised by first buying into oil and gas and in due course selling those stocks to invest in something else, then this is the way to maximise long-term returns (and so long-term capacity to distribute cash). In the extreme, oil and gas stocks could be held throughout the life of the fund, without contradiction. What is actually claimed in asserting that ‘long-term investment pays’ is market inefficiency, that sustainable investments will outperform because they are currently underpriced. At best, this is optimistic. At worst, it is untenable for investors in general and anyway (and ironically) unsustainable over time as prices adjust.

Neither is active ownership a solution to this problem. This is in part because of limited rights of control but also because active ownership is itself a problem of collective action. Engagement is costly yet its benefits are shared with other investors, who have an incentive to free ride; it is therefore a public good and it can be expected to be under-provided.

The internalisation of cost at portfolio level is anyway only partial, even for the universal owner. Financial markets are ‘incomplete’ in that they do not price all societal interests. Future generations do not participate in current markets and their interests (along with those with limited wealth) are at best incompletely represented in the market’s allocation of economic resources (Arrow and Debreu, 1954). In market valuation practice, for example, the consumption of non-renewable natural resources is typically discounted at the same rate as other costs. From a sustainability perspective it should instead not be discounted at all because to do so is to give priority in consumption to the current generation (Broome, 1999). Or, to pick up an earlier example, if the current generation is not excluded from consuming water from an aquifer, and if there is profit from consumption and if the resource is thereby depleted, then the consequence of market incentives is not long-term sustainability but instead the opposite. Carney (2015) refers to this problem as the ‘tragedy of the horizons,’ while Broome (1999) strikes at the heart of the issue: ‘it is only the disenfranchisement of future generations that gives us the share of the world’s resources that we have.’ In short, future generations (and those currently without the wealth to have market voice) might ask why it is reasonable to assume that market forces will fix the problem that those same forces created. If this hasn’t worked in the past, why is now somehow different? A credible answer to this question requires addressing the challenge of external costs directly and – within the scope of this paper – exploring the role of sustainability reporting in that regard.

5. Implications for standard setting

This paper has identified a demand for (investor-oriented) sustainability-related financial disclosure, while it has also been argued that the interests of investors are imperfectly aligned with those of society as a whole. The implication is that sustainability-related financial disclosure satisfies only a subset of a broader societal demand for sustainability reporting.

In this section of the paper, these themes are discussed in terms of implications for standard setting and for the role that standards might be expected to play. The discussion is grounded in the practical steps that are taken in collecting data on sustainability-related issues and disclosing information on these to investors and to other stakeholders. These steps are outlined in Fig. 4.

Consider first how these practical steps apply to financial reporting, for the benefit of investors. The ‘impacts and dependencies’

³⁰ It can, of course, be assumed that technology will come to the rescue. For example, the economics of solar and wind are displacing those of oil and gas. But there is nothing to ensure that new technology is a solution, nor that it doesn’t also create new external costs of its own (for which an extreme example is the nascent market for space tourism).

³¹ Not all companies require external finance anyway. Any company that generates positive free cash flow is on balance returning financial capital into financial markets, rather than the other way around.

³² Keynes argues that expectations of future value creation are impounded in current prices, such that relative outperformance means ‘beating the gun’ on expected variation in stock prices, which is an unreliable foundation for capturing intrinsic value and so for long term investment (Keynes, 1936, chp 12).

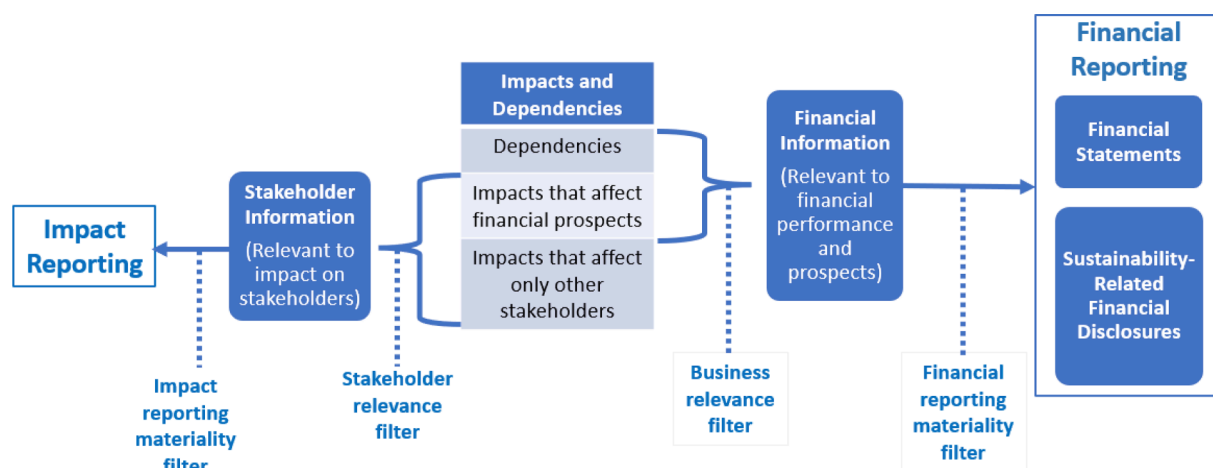


Fig. 4. The reporting system.

box, at the centre of Fig. 4, represents data available to the reporting entity, which could come from sources ranging from the entity's own transactions data to direct engagement with stakeholders. Different data could be gathered in response to the question 'which resources do we depend upon?' than in response to 'which stakeholders do we have an impact upon?' In practice, however, while either lens could provide a starting point for data collection, both are likely to operate in parallel and require similar processes; for example, answering the (dependency-oriented) question of supply chain resiliency will require engaging with stakeholders and external data sources, as will the (impact-oriented) question of external costs arising in supply chain processes.

In determining which data are collected and reported, financial reporting proceeds through two filters. The first asks whether gathering information about impacts and dependencies is relevant to business decisions, in other words whether such information (which is termed ‘financial information’ in Fig. 4) is required to measure and manage financial position, performance and prospects. The second asks what subset of this information would reasonably be expected to affect investment decisions and should therefore be disclosed in a financial report.³³ The outcome of this process is a financial report to investors in two (connected) parts, the financial statements and sustainability-related financial disclosures.

The form and content of actual disclosure in a financial report could, in principle, be determined entirely by the reporting entity, though it might also be guided by reporting standards. These might be voluntarily adopted or instead mandatory. If the latter, an economic question is whether the incremental informational benefits of standards exceed the various costs associated with mandating their use.³⁴ The ‘incremental’ is important. Taking the step of mandating standards requires a presumption that market forces alone will not (in the words of the SEC Chair) lead to “full, fair and truthful disclosure about material risks” (Gensler, 2023). One reason for this presumption is that standards are a public good that neither investors nor companies have the economic incentive to provide (Bromwich, 1985). For example, comparability is an important qualitative characteristic of reported information, because it lowers costs for investors in choosing among alternative investments, yet comparability is not entity-specific and so is a positive externality that is likely to be under-provided in the absence of standards. In general, standardisation can be argued to reduce transaction cost from preparing, auditing, using and enforcing information (Williamson, 1979), which in turn improves price revelation, reduces cost of capital and increases market liquidity (Leuz et al., 2021). The argument is strengthened if the standard setter is a vehicle for pooling collective expertise, ensuring that standards embody best practice. Further, the case for standards being mandatory (rather than voluntary) is strengthened by considerations of agency and of the selective, self-serving disclosure that would otherwise occur – ‘greenwashing’ in the case of sustainability reporting.

What about reporting to stakeholders other than investors? Such ‘impact reporting’ also proceeds through two filters. The first asks what information can be gathered about how the activities of the business create impacts on stakeholders. The second asks what subset of this information would reasonably be expected to affect stakeholders’ decisions and should therefore be disclosed in an impact report.³⁵

Fig. 4 highlights reasons why a financial report might not include disclosure of information that is material to stakeholders other than investors. The financial report and the impact report ultimately both draw on the same pool of data relating to impacts and dependencies, yet the business relevance filter excludes information that is extraneous to the purpose of managing business

³³ The reporting of financial effects can only come after the entity has evaluated the risks and opportunities arising from its dependencies and impacts.

³⁴ Relatively easy to determine are the costs of standard setting, compliance, assurance and enforcement, while the benefits for investors are challenging to estimate. Other public interest considerations include whether the standard setter is independent of stakeholders' interests and whether there is effective enforcement of the standards.

³⁵ Also in parallel, the resulting report to stakeholders could in principle be in in two (connected) parts, a financial statement presenting the cost of externalities and a corresponding set of sustainability disclosures. In practice, though, the former is overlooked (Barker and Maver, 2024).

performance and prospects, while the materiality filter further excludes information not reasonably expected to affect decisions by the typical investor. Either of these two filters creates the possibility that (investor-oriented) sustainability-related financial disclosure does not meet the information needs of stakeholders other than investors. The shortfall is information relating to current and future externalities that is not reasonably expected to affect investors' financial decisions.³⁶

With respect to the first filter (and returning to the 'argument for alignment' in Section 4), it might be assumed that the business case filter would let through *all* impacts of business activity. All that seems to be required, after all, is that management considers it possible that an impact on stakeholders *might* ultimately impact the business. It would be unrealistic, however, to interpret the filter in this way. Business decisions involve allocating scarce resources and prioritising competing demands. To that end, it is unlikely that wide-ranging data would be collected simply because there is the possibility that one day it might be useful. There might not, for example, be an immediately obvious business case for considering various social impacts, in other words no discernible effect on financial performance and prospects, whether direct or indirect.³⁷ There will also be situations, as discussed in Section 4, where a business case dominates consideration of societal outcomes. A company operating within the law might have little incentive to investigate resulting external costs. For example, a residential building project might degrade the natural environment, while also increasing demands on limited freshwater supplies and elevating the risk of flooding, yet the effects might fall on future generations, and thereby outside the developer's private economic calculation over a finite construction horizon. Or, to take a bigger picture example, if there is consensus in the business community that the Paris target of 1.5 degrees global warming will not be achieved, it is the expected higher level of global warming that is relevant for business planning and associated data capture, not the hypothetical target on which it would be in the public interest to hold business activity to account.

The issue here is not just whether, in its own interests, a business factors stakeholder impact into its decision making but also whether the information it gathers for that purpose is the same as that which stakeholders themselves would find most useful. A monetary focus lies behind management information demands because it provides a measure of the purchasing power with which investors are ultimately concerned. Yet other stakeholders are instead more directly concerned with how the impacts of corporate activity are actually experienced, whether that be through freshwater shortage, gender inequality or air pollution. These are not monetary issues.³⁸ Take a simple example in which, somewhere in a company's supply chain, employees routinely work under inhumane conditions and the local community is despoiled with toxic waste. For investors, the (indirect, financial) issues concern such things as reputational risk, or the potential cost of litigation. For employees and those in the local community, the (direct, non-monetary) issues concern health and wellbeing.³⁹ In this regard, while all investors have a common interest in financial return, stakeholders' informational interests are instead more heterogeneous.⁴⁰ Stakeholder groups such as employees, local communities and environmental NGOs might demand different disclosures relating (for example) to pollution and waste, because each of those groups is impacted in a different way.

This demand for a different type of information maps onto the distinction, made in Section 2, between thematic and industry-based sustainability reporting. Stakeholders are concerned with what the impact actually is; after all, they are the ones impacted. In contrast, investor demand is for information that 'translates' the impact into risks and opportunities for the business. It is not the impact itself that matters but instead how it affects the company. And because an impact of a given type can affect different industries in different ways, there is industry-specificity in this translation. Impact data and sustainability-related financial disclosure are therefore each better aligned, respectively, with thematic and industry-based reporting standards. The distinction is similar to that between classifying expenses by 'nature' or by 'function' in an income statement, whereby the former categorises expenses as inputs (labour, material etc) and the latter allocates those expenses to their function within the business (cost of goods sold, marketing etc). While every business has much the same types of input, functional use varies by business model. So, too, the fact that CO₂ emissions cause global warming is invariant across industries, yet the function served by the CO₂-emitting activities is industry-specific, and so too therefore is the information needed by investors to understand the associated risks and opportunities. It follows that there should be thematic standards for impacts such as climate and pollution, where measurement is universal, while industry-based standards for specific functions, activities and metrics that vary by industry. An illustration is that the notion of a 'circular economy' varies in application across different business models (Braungart and McDonough, 2009), which increases the relative importance in this context of industry-based disclosure.

³⁶ Whether the shortfall is greater for positive or for negative externalities is an open question. For the former stakeholders have a negative right not to be harmed, which corresponds to a corporate obligation not to cause harm, while in contrast, there is no corporate obligation to generate positive externality and therefore no need for an accountability mechanism in this regard. This suggests a relative under-reporting of positive externalities. On the other hand, there is likely greater corporate self-interest in the relative over-reporting of positive externalities.

³⁷ It is also possible that there is a business case but not one that is evaluated and understood, perhaps because business activity is conventionally framed to overlook the issue.

³⁸ Monetary calculation is nevertheless relevant because a company's incentives to mitigate impacts rest on a financial calculation. While investor-oriented reporting views this calculation through a business case lens (perhaps including effects on other companies in the portfolio), a stakeholder-oriented view addresses what the company 'ought' to do if acting without imposing externality. The relevant financial calculation here would be the cost to restore damage done in the period to natural capital which, if deducted from accounting profit, would yield 'full cost' profit (Barker and Mayer, 2024).

³⁹ Impacts are inherently incommensurable, in that they are subjectively evaluated and weighted differently by different stakeholders, in different geographies or sectors, applying different value judgements (including moral absolutes).

⁴⁰ This is true to a degree for other stakeholders. For example, all are likely to have interest in an entity's system of governance for ensuring oversight of its impacts.

Even for impact data that do make it through the business case filter, the application of the financial reporting materiality filter might further reduce stakeholder access to information that they would find useful. Investors are primarily interested in information aggregated at the level of the company as whole, not in information disaggregated at whatever level individual stakeholder groups are affected by the impacts that occur.⁴¹ Information is therefore lost to stakeholders in this process of aggregating through a financial reporting materiality filter.

The conclusion here is that, when it comes to reporting to stakeholders other than investors, it cannot be assumed that comprehensive information on impacts will be captured in management information, nor that (even if collected) it will be disclosed to investors. Yet there is stakeholder interest in reporting on these impacts.⁴²

In meeting this demand, the need for (mandatory) reporting standards is arguably greater for impact reporting than was outlined above for sustainability-related financial disclosures. Both types of reporting are likely to be underprovided in the absence of standards, which enable the disclosure of information as a public good, thereby correcting a market failure. There is also, however, a second rationale for impact reporting standards, which is that they address a second market failure (discussed in Section 4), that markets are incomplete in capturing the optimal societal (and intertemporal) allocation of economic resources (Arrow and Debreu, 1954). Sustainability reporting in this regard is not designed to serve capital markets but instead to address the societal consequence of those markets failing to achieve efficient resource allocations. It follows that such reporting should be grounded in public policy targets, for example national commitments embedded in legislation or multilateral agreements, science-based targets for natural capital conservation⁴³ and targets such as the SDGs on equity, diversity and inclusion.

For this impact reporting, an additional question needs to be asked: who are the users of the report and what decisions are they assumed to be making? The answer to this question is well established for the users of financial reports yet not for impact reports, which are typically characterised by the vague notion of reporting to ‘all stakeholders.’ A focus on a single audience would instead increase the quality of reporting and reduce cost. The reason is that multistakeholder reporting is inherently overwhelming. Without a focused audience in mind, it becomes unavoidable that any given impact is presumably likely to be material to at least one stakeholder, possibly in a variety of different ways to different stakeholders, such that the only way to ‘satisfy’ the demand for reporting is to disclose at least something about ‘everything’. By this process, reporting becomes a ‘laundry list’ with the aim of providing satisfactory disclosure in the least costly way, in other words a compliance exercise that is devoid of meaningful communication because there is no identified counterparty on the other end of reporting process.

A practical expedient here is that government can be viewed as the primary information user of an impact report. This would be beneficial for two reasons. First, it is government’s role to balance competing stakeholder demands, making it the only primary user that can consolidate the otherwise implausible requirement of ‘reporting to all stakeholders.’ By this mechanism, each stakeholder group would receive a level of disclosure consistent with the relative social priority of impacts on that group. Such disclosure is likely to vary by jurisdiction, given that each has different social priorities and norms. Second, and because all externalities have in common market failure, there is a *prima facie* case for government intervention whenever there is significant impact on any given stakeholder group. Impact reporting does not aim to serve capital markets but instead to address a failure of those markets. In this context, it falls to governments to regulate, tax or subsidise to change economic incentives, for which it requires information by means of disclosure standards. Such reporting should be grounded in the public policy targets for which the government itself is accountable. In this way, while reporting on these public policy issues is in part an issue of corporate accountability, it is perhaps better understood as a mechanism for providing information by which governments and regulators can themselves be held to account. It has been argued that corporations cannot pursue sustainability as an end in itself because they are constrained by the imperative of financial performance, this being a necessary condition for survival in competitive markets. The mitigation of a corporation’s external impacts is therefore realistic only in so far as this in turn affect the risks and opportunities that arise from the corporation’s dependencies. While such change might occur as a result of market mechanisms, for example from behaviour changes of consumers, employees or suppliers, or through innovation in creating sustainable products and services, the residual responsibility for aligning the interests of society with those of companies and capital markets falls to government, which can use regulation, taxation, subsidy or other means to shape the rules of the game and so to change economic incentives. In this way, accountability in a competitive, market economy rests not just with the players but also with the rule makers. And if those rule makers are to have the information that they need to formulate policy objectives, they must set and enforce appropriate standards that require the disclosure of that information, and do so with the rigour of aligning with public policy targets.

An important caveat is that this role for government arises because it cannot be assumed that companies ‘should’ (voluntarily)

⁴¹ This holds notwithstanding the possibility that ‘impact investors’ might be willing to compromise financial returns rather than invest in companies that impose environmental and social external costs. To the extent that such investors exist, their interests are best understood conceptually as a hybrid of investors and other stakeholders. In the former capacity, they can be understood, by definition, to be motivated by financial returns because it is only in this respect that their information needs are shared with other investors and thereby satisfied by the financial materiality filter. In the latter capacity, their interests are better understood as being aligned with those of other stakeholders, and thereby better served by impact reporting. Classifying impact investors together with all other investors therefore unhelpfully blurs the conceptual distinction between economic incentives in capital markets and wider social interests. Moreover, the importance of ‘impact investors’ can be overstated, for example sovereign wealth funds are typically run on the same ‘commercial’ basis as any other institutional investor, notwithstanding the long-term social interest they serve.

⁴² Hence the concept of ‘double materiality’ whereby two distinct audiences implies two different sets of useful information.

⁴³ <https://sciencebasedtargets.org/>.

provide disclosures for the benefit of stakeholders other than investors. To make that case would require invoking a notion of corporate accountability that is distinct from the fiduciary duty to shareholders. The need for such an accountability arises only when legal or economic incentives are insufficient to prevent externalities, making it contestable whether the corporation should accept any responsibility for them. The Friedman perspective is that it should not; they are not the 'business of business' (Friedman, 1970). An alternative view is that corporate directors have duties beyond those that are instrumental to shareholders' interests. That debate will not be resolved here. Instead, a narrower argument is being made, that – from the perspective of society as a whole – corporate sustainability reporting is incomplete (and requires a public policy solution) if investors are the sole audience and if their interests differ from those of other stakeholders. Whether governments choose to fill that void is a matter for them and not for companies or investors.

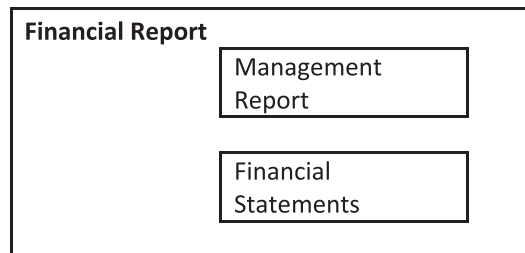
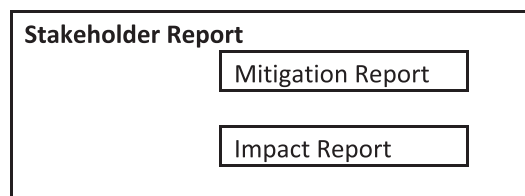
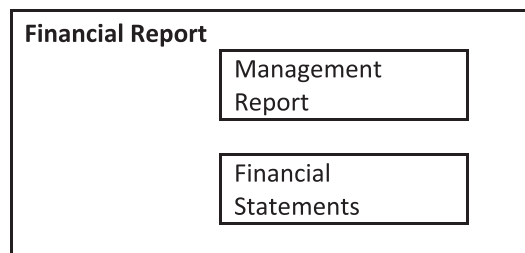
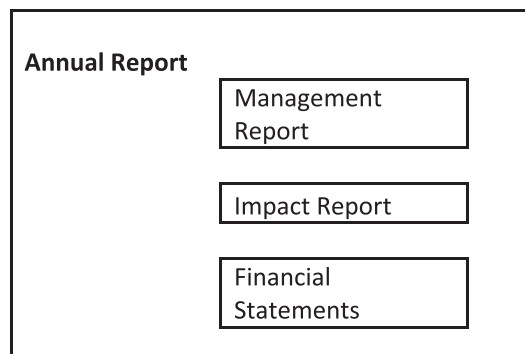
Option 1: Reporting to investors only**Option 2: Two reports****Option 3: Reporting to all stakeholders**

Fig. 5. Alternative reporting structures.

6. The reporting system — a theory of change

While, further to the argument set out in Sections 4 and 5, the information that is material to investors differs from that which is material to other stakeholders, this does not necessarily imply that the corporation should ideally produce two separate sustainability reports, one for each audience. Instead, and as will be argued in this concluding section of the paper, there are several benefits from a hybrid approach, which combines insights from both perspectives.

To compare the alternatives, consider first corporate reporting to investors, which is illustrated in Fig. 5, Option 1. The discussion in Section 3 points to a financial report to investors in two parts, the financial statements and some sort of management report, which integrates sustainability-related financial disclosures with other reporting on business strategy and performance. The design principle here is that ‘sustainability’ is not distinct from mainstream corporate reporting but instead inseparable. If, for example, an auto maker is transitioning to produce electric vehicles, it would not report separately on this aspect of its business on the grounds that it relates to sustainability. Instead, a single report would cover all aspects of governance, strategy, risk management, targets and (alongside the financial statements) metrics. There would be consistency in assumptions and estimates throughout the financial report, for example with the asset lives and decommissioning commitments in the financial statements being consistent with transition plans disclosed in the management report.

Option 2 of Fig. 5 extends Option 1 so that the entity also produces a second report, for which the audience is stakeholders other than investors. This stakeholder report would comprise a mitigation report, analogous to the management report, which would summarise for the benefit of stakeholders how management proposes to address the various impacts of the business, and an impact report, analogous to the financial statements, which would provide summary data on all of an entity’s impacts during the reporting period. There would be overlap here with information on impacts that is material to investors and that is therefore disclosed in the annual report. Disclosure of impacts in the stakeholder report would differ from that in the financial report in the two respects discussed above: either the data are not captured for the benefit of management decision making or else disclosure to investors filters out information that would be material to stakeholders.

Finally, Option 3 in Fig. 5 is a hybrid of the first two options. There would be a single corporate report, comprising the financial statements and the management report (for which investors would remain the target audience), along with an impact report (which would be the same as in Option 2).⁴⁴ The management report would likely be more concise than in Option 1 because, instead of including all impact data that is material to investors, the report could instead draw upon (and cross reference) data from the impact report to the extent that they relate to the narrative to investors. This would simply avoid duplication; the substance of the management report would be identical to Option 1.

A jurisdiction could adopt Option 1 only. Or it could additionally adopt impact reporting, in the form of Option 3. Option 1 serves the economic self-interest of capital markets, is a necessary condition for capital reallocation towards sustainability transition, is demanded by investors as a complement to the financial statements and extends the universally adopted lens of providing material information to investors. In these respects, it is foundational, aligned with existing institutional structures and incentives, and so more likely than Option 3 to be adopted on a mandatory basis. It is also naturally served by a global standard, given the global nature of capital markets, while impact reporting is more likely to vary by jurisdiction, given that each has different social priorities and norms. In this context, impact reporting is itself most likely to become mandatory if by design it fits seamlessly with financial reporting, extending a system that meets market demand by requiring additional disclosure to the meet the demands of other stakeholders. To that end, there must be definitional alignment, between financial and impact reporting, in the category of the entity’s own impacts that affect the entity’s own financial prospects. There might be different disclosures for the two audiences but the underlying definition and measurement must be aligned, otherwise the system does not form a coherent whole, in which ‘double materiality’ reporting is achieved in the most efficient way.

While, viewed practically in term of the prerequisites for achieving mandatory adoption, the societal aims associated with impact reporting thus benefit from building on a foundation of financial reporting for investors, there are also benefits in the other direction. This is because, in addition to serving other stakeholders, an impact report can provide information to investors, making Option 3 preferable to Option 1 for investors and other stakeholders alike.

First, Option 3 better meets the common information needs of investors.⁴⁵ A comparison of the impact report with the management report enables investors to test and probe management’s own version of how impacts create sustainability-related risks and opportunities, including how transparent management is in reporting these. There remains management judgement on which impacts to report to investors but without the bright line that renders other impacts otherwise invisible and which allows managerial discretion in withholding unfavourable impact information. This matters in practice because the bright line is difficult to draw; for example, even a small-scale impact on a local community might lead to reputational damage for the company as a whole. Related, a requirement for an impact report would enable investors to engage with management more comprehensively on transition plans and business resilience. Management must both address the impacts for which it sees a business case and defend why not all impacts ‘make the cut’. This rigour

⁴⁴ The absence of a mitigation report in Option 3 is consistent with the purpose of reporting being anchored in the activities of the business; the management report sets out what the company *actually plans to do*, in the best interests of investors, while a mitigation report would lack this grounding, because it would include impacts for which there is no business case for addressing.

⁴⁵ This complementarity also works the other way. For stakeholders, the financial report offers credibility (or the opposite) to business leaders’ commitments and reassurances to stakeholders, because information on an entity’s financial health, strategy, planned capital expenditures etc help to establish whether there is a business case to minimise impact.

is further enhanced to the extent that the impact report is (in principle) assurable. The impact report relates to performance during the reporting period, which is observable and which concerns not what management (subjectively) claims that it will do but instead what it has (verifiably) actually done. In this regard, the impact report is analogous to the financial statements, the information in which is both measurable and (to the benefit of investors) assurable. Subjective, forward-looking disclosure would be in the management report, as in current financial reporting.

The juxtaposition of impact and financial reports is especially valuable to investors in a context of dynamic materiality, because it draws attention to sustainability-related information that is relevant to corporate financial prospects but not yet understood as value-relevant.⁴⁶ Such effects are particularly important over the long term where, in the presence of fundamental uncertainty and future disruption, the current investment consensus can be anchored in over-reliance on extrapolation of the past and in the undervaluation of resilience in relation to current profitability (Keynes, 1936; Kay and King, 2020). The effects of global warming are only starting to be felt and the response of capital markets has been relatively recent, yet those effects had been widely predicted by climate scientists for decades, as well as understood – yet not disclosed – by several prominent corporations (The Economist, 2020). Biodiversity is currently in much the same place that climate was a decade or two ago. The unprecedented depletion of nature is visible to all, yet its impact on the resilience of aggregate economic activity feels remote to most entities; in comparison with climate, the problem is relatively unseen and poorly understood. Reporting to investors alone (Option 1) maintains this blind spot, while the supplement of an impact report (Option 3) promotes cognitive dissonance, forcing investors (and managers) to make sense of how value will continue to be created if there exist external impacts that are not factored into business decision making (Weick, 1995). In this regard, there is rigour and discipline in required disclosure in the impact report being determined by the external benchmark of impact on stakeholders, in line with public policy and by reference to science-based targets. There would not be the option of not disclosing impacts because – in management's view – those impacts do not pertain to the economics of the business (Adams et al., 2020).

Option 3 also better meets investors' common information needs by enhancing a coherent, connected relationship between the two components of financial reporting, the financial statements and sustainability-related financial disclosures. The management report is the natural home not just for sustainability-related financial disclosure but for *all* disclosure that is material to investors but that is not contained within the financial statements. It was argued in Section 1 that, when viewed through the lens of sustainability, disclosures relating to intellectual, manufactured and human capitals are low priority in relation to natural and social capital. The same is not true if the lens is an entity's financial performance and prospects more broadly, for which intellectual and human capitals are more likely to dominate. Corporate reporting standards can – arguably, *should* – address all factors that contribute to financial performance and prospects, with these being reported in a single place. Yet this is not current practice. To illustrate, it is conventional for accounting standards to address issues relating to intellectual capital (albeit generally limited to whether and how intangible assets should be recognised), while human capital falls within sustainability reporting (presumably for two reasons, first that human capital is not recognised in financial statements and so beyond scope in accounting, and second because companies manage people, not human capital, and there is an inextricable relationship between aspects of people management concerned with human capital and with (SDG-related) human rights). More coherent, given that intellectual and human capitals have similar relationships with financial performance and prospects, would be to have distinct sets of standards to address the whole of each of the three categories in Option 3: accounting standards for the financial statements, reporting standards for the management report, and sustainability standards for the impact report.

Second, Option 3 better meets the information needs of *all* investors, in other words not just those narrowly concerned with the financial performance and prospects of reporting entities but also (for example) impact investors, or universal owners for whom impact data might be sought on systemic, portfolio-level risk.⁴⁷ It is difficult in practice, in applying the financial reporting materiality filter, to determine the subset of information needs that investors have in common. And regardless of how this is done, there will be some investors whose informational needs are atypical and therefore not met. While Option 1 discloses no information on impacts deemed by management not to be material to the typical investor, Option 3 meets investor needs more broadly. There remains management judgement on which impacts meet common needs, yet there is again the benefit of not creating a bright line that renders other impacts invisible. This is valuable not least because investors typically lack alternative sources of information beyond disclosures from the company itself (Barker et al., 2012; Cascino et al. 2014).

Third, Option 3 better meets the information needs of stakeholders other than investors. Self-evidently, an impact report is designed to serve the needs of all stakeholders. In addition, a comparison of the management report with the impact report surfaces the extent to which companies can realistically (in their own self-interest) be expected to address issues of sustainability and, from a stakeholders' perspective, what complementary role must therefore fall to government policy or to other enablers of change. While the management report is in effect a business case for where the company can itself transition to a more sustainable model of value creation, such transition is likely to fall short of addressing all of the external effects that are summarised in the impact report. Data on this shortfall between 'business as usual' and 'sustainable business' is attained by comparing the management report with the impact report;

⁴⁶ The concept of 'dynamic materiality' is that impact information can become material to investors over time, as the economic consequences of those impacts begin to surface.

⁴⁷ The focus for investor action on the basis of impact data might be engagement with government, addressing for example systemic issues such as national infrastructure for transition to electric power. In this way, corporate disclosure is valuable to investors even if not relevant directly at an entity-specific level of investor-corporate interaction. Similarly, the argument in Dixon-Declève et al. (2023) is that a just transition is both a problem of collective action and a prerequisite for transition to an environmentally sustainable economy, making it critical for ongoing value creation in the corporate sector and yet grounded in systemic impact.

critically, it is not something that either report can provide alone.

Finally, there are arguably two mechanisms by which Option 3 offers mutual benefit to investors and to other stakeholders. These arise because the overall value of the economy is higher if, by means of aligning individual and collective corporate economic interests, a tragedy of the commons is averted.

The first mechanism results from high quality, comparable data enabling greater visibility on issues relating to social license to operate. A company that becomes known to have stronger sustainability credentials than its peers might attract more business. Greater visibility might also shape public awareness of the relative impacts of different companies and industries, in turn inducing pressure on government to regulate or otherwise influence economic incentives. In a virtuous circle, such effects would enable the corporate sector to operate in a way that is increasingly aligned with the public interest. In these respects, the informational contribution of Option 3 is greater to the extent that it highlights where there is *not* currently a business case for addressing impact. Any theory of change must be realistic in assuming that different actors and institutions will act in their economic or political self-interest. Greater transparency on what the corporate sector can (and cannot) do to address sustainability creates a more healthy, authentic basis for dialogue between private and public sectors. There is less pressure on the private sector to make greenwashed claims and instead the narrative shifts to ‘we can’t change the system alone: here’s what the corporate sector can do (within the current rules of the game) to minimise external impacts and here’s what we either need government to do (to change the rules of the game) or other stakeholders to do (to change which activities are profitable for us and which are not).’ Greater transparency in these respects is a foundation for reducing externality, whether by means of rewarding relatively sustainable companies with greater opportunities, or by otherwise creating conditions in which profitability and societal aims are more effectively aligned.

The second mechanism is that disclosure can trigger a process whereby closing the gap between private and public interests can become a self-fulfilling prophecy. There is a subtle dynamic in play here. Investment decisions are made under uncertainty. Decisions about business resilience and market opportunity are made with imperfect information about what might happen. Yet, decisions that anticipate the future are in themselves instrumental in shaping what the future actually turns out to be (Beckert, 2016). Consider the example of the auto industry. The disruptive nature of sustainability transition creates uncertainty, for example about whether and when different governments will prohibit the sale of internal combustion engines. Investment decisions are made on the expectation that consumers will no longer buy cars powered by fossil fuels, which creates a business case for moving away from selling cars that have historically been profitable yet that have also been associated with negative externalities. These expectations then become self-fulfilling. If the auto industry plans for a future of electric transport, if its R&D, marketing and production capacity are all oriented in line with this expectation, then this becomes the space in which it competes, and especially so as learning curves kick in and unit costs come down. Consumers will buy electric cars in the future, whether or not an expectation of government regulation is actually enacted. The effect is that while the industry relies currently upon the imposition of external costs, there can be economic self-interest in this not being the case in the future. This is especially important because markets are unusually powerful mechanisms for shifting resources quickly and at scale in response to economic incentives (Faber, 2023).

The implications of this discussion can be summarised briefly. Sustainability demands transition from business as usual, for which the information demands of investors can be met partially by complementing the financial statements with sustainability-related financial disclosures. Yet sustainability is a challenge of collective action, for which investors (and other stakeholders) are best served by complementing financial reporting with impact reporting in order to meet investor demand more fully. The benefits from this approach would be to: reduce the inherent subjectivity and difficulty in determining which impacts provide material information to investors and which do not; acknowledge the reality that the ‘common interests’ of investors represents only a subset of all investors’ interests; reduce the agency problem of selective managerial reporting to investors; draw attention to sustainability-related issues that are value-relevant yet currently ‘below the radar’ in investing norms; help avert the tragedy of the commons by, first, highlighting the extent to which the economic self-interest of companies must be complemented by the actions of either governments or other stakeholders and, second, helping to create conditions whereby expectations of a sustainable future economy become self-fulfilling. In all of these respects, there is potential to reduce divergence between the interests of investors and those of other stakeholders, including future generations. In this regard, and somewhat paradoxically, investors can benefit from a reporting system that looks beyond a narrow investor-oriented perspective.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

References

- Adams, C., Druckman, P., Picot, R., 2020. Sustainable Development Goal Disclosure (SDGD) Recommendations, published by ACCA. Chartered Accountants ANZ ICAS, IFAC, IIRC and WBA.
- Arrow, K., Debreu, G., 1954. Existence of an equilibrium for a competitive economy. *Econometrica* 22 (3), 265–290.
- Bakan, J., 2004. *The corporation: the pathological pursuit of profit and power*. Free Press, New York.
- Barker, R., Mayer, C., 2024. Seeing Double – Corporate Reporting through the Materiality lenses of both Investors and Nature. *Account. Forum* forthcoming.

- Barker, R., Hendry, J., Roberts, J., Sanderson, P., 2012. Can company-fund manager meetings convey informational benefits? Exploring the rationalisation of equity investment decision making by UK fund managers. *Acc. Organ. Soc.* 37 (4), 207–222.
- Barton, D., Wiseman, M., 2014. Focusing Capital on the Long Term. *Harv. Bus. Rev.*
- Basu, S., Waymire, G., 2007. Accounting is an evolved economic institution. *Foundations and Trends in Accounting* 2 (1–2), 1–174.
- Becker, G., 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press, Chicago.
- Beckert, J., 2016. *Imagined Futures: Fictional Expectations and Capitalist Dynamics*. Harvard University Press.
- Braungart, M., McDonough, W., 2009. *Cradle to cradle*. Vintage Classics.
- Broadberry, S., O'Rourke, K., 2010. *The Cambridge Economic History of Modern Europe*. Cambridge University Press, Cambridge.
- Bromwich, M., 1985. *The Economics of Accounting Standard Setting*. Prentice Hall, Englewood Cliffs, NJ.
- Broome, J., 1999. *Ethics out of Economics*. Cambridge University Press, Cambridge.
- Brundtland, G.H., 1987. *Our Common Future: Report of the World Commission on Environment and Development*. Oxford University Press, Oxford.
- Cascino, S., Clatworthy, M., Garcia, B., Gassen, J., Imam, S., Jeanjean, T., 2014. Who uses financial reports and for what purposes: Evidence from capital providers. *Account. Eur.* 11 (2), 185–209.
- CBD, 2022. *The Kunming-Montreal Global Biodiversity Framework*. Convention for Biological Diversity.
- Chandler, A.D., 1977. *The Visible Hand: The Managerial Revolution in American Business*. The Belknap Press of Harvard University Press, Boston, Mass.
- Dixon-Declevé, S., Gaffney, O., Ghosh, J., Randers, J., Rockström, J., Espen Stoknes, P., 2023. *Earth for All: a Survival Guide for Humanity*. New Society Publishers.
- EAT-Lancet, 2019. *Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems*, chaired by W. Willett. *The Lancet* 393 (10170), 447–492.
- Faber, E., 2023. Requiring materiality to extend beyond the economic realm is actually simplistic. *Le Monde* 10 October.
- Friedman, M., 1970. *The Social Responsibility of Business Is to Increase Its Profits*. *New York Times*, 13 February.
- Gensler, G., 2023. *Testimony Before the House Financial Services Committee*. <https://www.sec.gov/newsroom/speeches-statements/gensler-testimony-house-financial-services-041823>.
- Hardin, G., 1968. *The Tragedy of the Commons*. *Science* 162, 1243–1248.
- Heal, G., 2016. *Endangered Economies*. Columbia University Press, New York, NY.
- Helm, D., 2015. *Natural Capital*. Yale University Press, New Haven, CT.
- Hicks, J.R., 1946. *Value and capital: An inquiry into some fundamental principles of economic theory*, second ed. Clarendon Press, Oxford.
- IFRS, 2017. *IFRS Practice Statement 2: Making Materiality Judgements*. IFRS Foundation, London.
- IFRS, 2023. *IFRS S1 - General Requirements for Disclosure of Sustainability-related Financial Information*. IFRS Foundation, London.
- IFRS, 2024. *International financial reporting standards*. IFRS Foundation, London.
- IIRC, 2013. *The international framework. Integrated Reporting Committee*. IIRC, London.
- IOM, 2009. *Migration, Climate Change and the Environment*. International Institute of Migration, Geneva.
- IPCC, 2022. *Climate Change 2022: Mitigation of Climate Change*. Cambridge University Press, Cambridge.
- Islam, N., Winkel, J., 2017. *Climate Change and Social Inequality*, Working Paper 152, United Nations, Department of Economics and Social Affairs.
- Kaplan, R., Ramanna, K., 2022. *Accounting for Climate Change*. *Harv. Bus. Rev.*
- Kay, J., King, M., 2020. *Radical Uncertainty*. The Bridge Street Press, London.
- Keynes, J.M., 1936. *The General Theory of Employment, Interest and Money*. Macmillan, London.
- Leuz, C., Christensen, H., Hail, L., 2021. *Mandatory CSR and Sustainability Reporting: Economic Analysis and Literature Review*. *Rev. Acc. Stud.* 26, 1176–1248.
- Mann, M., 2021. *The new climate war: the fight to take back the planet*. PublicAffairs, Hachette Book Group, New York, NY.
- Meadows, D., Meadows, D., Randers, J., Behrens, W., 1972. *The limits to growth: A report for the Club of Rome's project on the predicament of mankind*. Universe Books, New York.
- Monbiot, G., 2023. *Regenesis: Feeding the World without Devouring the Planet*. Penguin.
- NCC, 2016. *Natural Capital Protocol*. Published online by the Natural Capital Coalition: www.naturalcapitalcoalition.org/protocol.
- Nobes, C., 2015. Accounting for capital: the evolution of an idea. *Account. Bus. Res.* 45 (4), 413–441.
- Nobre, C., Sellers, P., Shukla, J., 1991. Amazonian deforestation and regional climate change. *J. Clim.* 4, 957–988.
- North, D., 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press. Carney, M., 2015. *Breaking the Tragedy of the Horizon – climate change and financial stability*. London: Bank of England.
- Penman, S.H., 2013. *Financial Statement Analysis and Security Valuation* (5th ed). McGraw Hill.
- Polman, P., Winston, A., 2022. *Net Positive*. Harvard Business Review Press.
- Poore, J., Nemecek, T., 2018. Reducing food's environmental impacts through producers and consumers. *Science* 360 (6392), 987–992.
- Porter, M., Kramer, M., 2011. *Shared Value*. *Harv. Bus. Rev.*
- Ritchie, H., 2024. *Not the End of the World*. Penguin.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F.S., Lambin, E.F., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H.J., Nykvist, B., 2009. A safe operating space for humanity. *Nature* 461, 472–475.
- Ruggie, J., 2011. *The UN "Protect, Respect and Remedy". Framework for Business and Human Rights*.
- Schumacher, 1973. *Small is Beautiful: A Study of Economics As If People Mattered*. Harper Collins.
- Smith, A., 1776. *The Wealth of Nations*, edited in 2003 by Andrew Skinner. London: Penguin.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., deVries, W., deWit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., Sörlin, S., 2015. Planetary boundaries: guiding human development on a changing planet. *Science* 347, 736.
- Stern, N., 2006. *Stern review: the economics of climate change*. Cambridge University Press, Cambridge.
- Steward, D., Bruss, P., Yang, X., Staggenborg, S., Welch, S., Apley, M.D., 2013. Tapping unsustainable groundwater stores for agricultural production in the High Plains Aquifer of Kansas, projections to 2110. *Proc. Natl. Acad. Sci. USA* 110 (37), 3477–3486.
- Stout, L., 2012. *The Shareholder Value Myth*. Berrett-Koehler Publishers.
- TFCD, 2017. *Recommendations of the Task Force on Climate-related Financial Disclosures*.
- Economist, T., 2020. *Guilty by emission*, 17th September. The Economist, London.
- TNCD, 2023. *Recommendations of the Task Force on Nature-related Financial Disclosures*.
- UN, 2015. *Transforming our world: the 2030 Agenda for Sustainable Development*, A/RES/70/1, available at: <https://www.refworld.org/docid/57b6e3e44.html>.
- Unerman, J., Bebbington, J., O'Dwyer, B., 2018. Corporate reporting and accounting for externalities. *Account. Bus. Res.* 48 (5), 497–522.
- Wagenhofer, A., 2024. *Sustainability Reporting: A Financial Reporting Perspective*. *Account. Eur.* 21 (1), 1–13.
- Watts, R., 2003. *Conservatism in Accounting Part I: Explanations and Implications*. *Account. Horiz.* 17 (3), 207–221.
- Weick, K., 1995. *Sensemaking in Organizations*. Sage Publications, Thousand Oaks, CA.
- Williamson, O., 1979. *Transaction-Cost Economics: The Governance of Contractual Relations*. *J. Law Econ.* 22 (2), 233–261.
- Www, 2022. *Living Planet Report*. WWF, Woking, UK.