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(RE)DEFINING CORPORATE SOLVENCY FOR SUSTAINABILITY

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Yue Ang and Tineke Lambooy[1]

1. INTRODUCTION

This paper seeks to advance the role of corporate solvency law in contributing to the transition towards a circular economy and the realisation of sustainable development. We explore the question of how the financial parameters that are traditionally used to determine the solvency of a corporation, can be supplemented with ecological and social parameters in order to align the concept of solvency with a circular business model and a socially healthy business.

The term 'solvency' emerges in various ways in business practice and corporate law: first, accountants and other financial experts apply this concept in the context of accountancy rules and financial ratios; second, lawyers and courts assess the (in)solvency of a corporation according to the formula's offered in insolvency laws; and third, corporate boards of directors have to consider the solvency of a corporation as part of their capital maintenance duty, which ensures that the corporation has sufficient resources before distributing funds to its investors.[2] In this article, we mainly focus on the third notion, because capital maintenance laws form part of corporate law. Sometimes, where expedient in the context, also references to insolvency laws are included.

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[2] For example, in the first approach, solvency emerges in a corporation's price earnings ratio. See J. Freedman, 'Profit and Prophets – Law and Accountancy Practice on the Timing of Receipts – Recognition under the Earnings Basis (Schedule D, Cases 1 & 2): Part 1.' (1987) 2 *British Tax Law* 61; J. Freedman, 'Profit and Prophets – Law and Accountancy Practice on the Timing of Receipts – Recognition under the Earnings Basis (Schedule D, Cases 1 and 2): Part 2' (1987) 3 *British Tax Law* 104; S. Paulo, 'The United Kingdom's Companies Act of 2006 and the Capital Asset Pricing Model: Attaining the Corporate Objective' (2010) 52 *International Journal of Law and Management* 253; G. North, 'Listed Company Disclosure and Financial Market Transparency: Is This a Battle Worth Fighting or Merely Policy and Regulatory Mantra?' [2014] *Journal of Business Law* 484.

Facing the triple threats of climate change,[3] a depleted biodiversity,[4] and the global health pandemic,[5] communicating an interest in supporting the economic transition towards a sustainable economic model has become a trending business strategy. Some businesses are pivoting towards adopting environmental, social and governance (ESG)[6] strategies, others are paying more attention towards the United Nations Sustainable Development Goals (SDGs),[7] and many state that they develop a 'sustainable economic business model'. All these strategies hinge on the idea of working towards a circular economy[8] combined with realising the social foundation as promoted by Kate Raworth (which also encompasses avoiding human rights violations and effectively attaining to labour

[3] See the 2021 IPCC report at www.ipcc.ch/report/ar6/wg1 and the 2015 Paris Agreement on Climate Change at www.unfccc.int/sites/default/files/english_paris_agreement.pdf. See also J. Rockström, 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity' (2009) 14(2) *Ecology and Society* 32; see also W. Steffen, 'Planetary Boundaries: Guiding Human Development on a Changing Planet' (2015) 347 *Science* 6223.

[4] Despite the existence of international treaties, such as the Convention on Biological Diversity [1993] and laws enacted to preserve biodiversity, the problems are immense. See the recent 2021 WWF report at www.livingplanet.panda.org/en-gb/ and the 2019 IUCN report at www.portals.iucn.org/library/node/49096, and see also V. Aigbokhaevbo, 'Bio Prospecting: Utility in Biodiversity Conservation in Nigeria' (2013) 1 *International Energy Law Review* 26. Regarding laws preventing the depletion of species, see A. Waite, 'The Quest for Environmental Law Equilibrium' (2005) 7 *Environmental Law Review* 34. Concerning legal systems that adjudicate to protect biodiversity, see C. Warnock and O. W. Pedersen, 'Environmental Adjudication: Mapping the Spectrum and Identifying the Fulcrum' (2017) Oct. *Public Law* 643.

[5] The COVID-19 pandemic has had an impact on governance, see S. Deakin and G. Meng, 'The Governance of Covid-19: Anthropogenic Risk, Evolutionary Learning, and the Future of the Social State' (2020) 49 *Industrial Law Journal* 539. On labour, see S. Deakin and T. Novitz, 'Covid-19, Labour Law, and the Renewal of the Social State' (2020) 49 *Industrial Law Journal* 493, see also K. D. Ewing and J. Hendy, 'Covid-19 and the Failure of Labour Law: Part I' (2020) 49 *Industrial Law Journal* 497. On insolvency, see A. Gurreo-Martinez, 'Insolvency Law in Times of COVID-19' (2020) 41 *Company Lawyer* 193.

[6] See S. Lovegrove, 'ESG Regulation: International Developments' (2021) 184 *Compliance Officer Bulletin* 1, I. H. Y. Chiu, 'Investor Stewardship and ESG at Companies – New Developments' (2020) 41 *Company Lawyer* 155, and S. J. Turner, 'Corporate Law, Directors' Duties and ESG Interventions: Analysing Pathways towards Positive Corporate Impacts Relating to ESG Issues' (2020) 4 *Journal of Business Law* 245.

[7] 'Sustainable Development Goals' (*UNDP*) at www.undp.org/content/undp/en/home/sustainable-development-goals.html. See also B. Sjåfjell, T. Häyhä and S. Cornell, 'A Research-Based Approach to the UN Sustainable Development Goals. A Prerequisite to Sustainable Business' (Social Science Research Network 2020) SSRN Scholarly Paper ID 3526744.

[8] 'Circular Economy Action Plan' (European Commission – European Commission) at www.ec.europa.eu/commission/presscorner/detail/en/fs. See also Ellen McArthur Foundation's definition of a circular economy at www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview. S. Thomas, 'Law and the Circular Economy' (2019) 1 *Journal of Business Law* 62; A. Murray, K. Skene and K. Haynes, 'The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context' (2017) 140 *Journal of Business Ethics* 369; F. Bonviu, 'The European Economy: From a Linear to a Circular Economy' (2014) 14 *Romanian Journal of European Affairs* 78.

standards).[9] A circular economy entails closing the loops of energy, chemicals, water, and raw resources used for products and services, and also avoiding waste streams.[10] Figure 1 below gives an illustration of the circular economy in the butterfly diagram designed by the Ellen McArthur Foundation.[11]

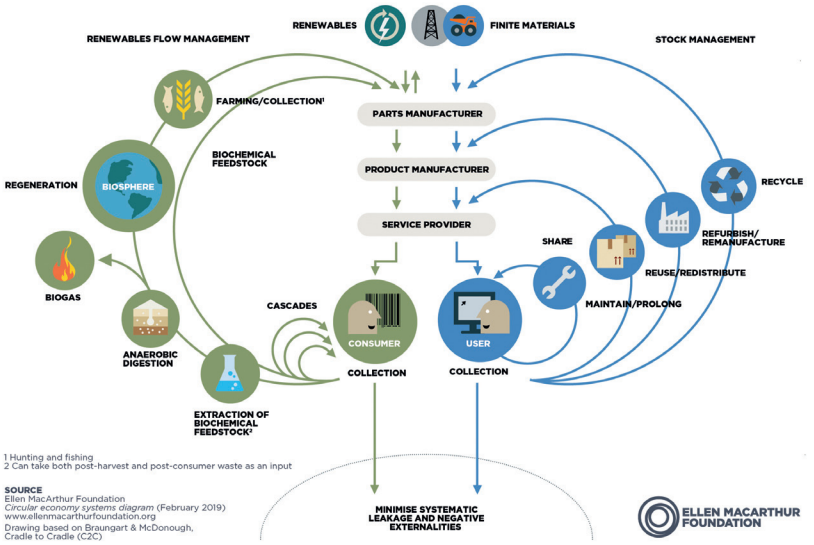

Figure 1. The circular economy

Running a solvent business is the aim of most for-profit corporations.[12] We view that the closer the alignment of solvency rules are with these ESG/SDG strategies and the circular economy business model, the more likely it is that these sustainable trends become a part of the mandatory directors' duties to keep businesses afloat. The aim of this article therefore is to develop an integrated method[13] that is capable of assessing corporate solvency taking into account a corporations' financial capital as well as its natural and social capital.[14] We propose to adopt an 'integrated

9 K. Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (Penguin 2017).
10 McArthur (n 8).
11 McArthur (n 8).
12 For example, under the UK Companies Act 2006, s172.
13 Taking the holistic view such as promoted by G. Baars and A. Spicer, *The Corporation: A Critical, Multi-Disciplinary Handbook* (Cambridge University Press 2017).
14 As we are inspired by Rockström, above (n 3) and Raworth above (n 9).

corporate capital solvency standard' and argue that only when all three forms of capital are in good shape, the corporation qualifies as a solvent corporation that can distribute excess funds to its shareholders. Such an integrated standard would create a duty for corporate boards of directors to effectively sustain not only the corporation's financial capital but also its natural and human capital. Hence, it will support corporate boards in adopting social policies as well as a circular business model for their corporations' business activities, and back them in successfully implementing their sustainability strategy.

Our point of departure is UK corporate law and its capital maintenance standard, but we conduct the discussion in a broader perspective and have therefore included perspectives of the European Union (EU), Dutch, United States (US) federal law and Australian law. Our aim is not to provide a comparative legal analysis but to use these legal sources in order to portray the current legal situation and to present our proposal in line therewith.

In establishing this argument, section 2 of this article situates corporations at the intersection of financial, natural, and human capital. Section 3 reveals the limitations of corporate capital maintenance laws in the five selected jurisdictions. Since natural and human capital play no role in the assessments of corporate solvency in current laws, businesses are not encouraged to disclose those forms of capital in their balance sheets. Section 4 explores how an interconnection between the financial, natural and human capital in corporate reporting could be established. Section 5 introduces our proposal for an integrated corporate capital solvency standard. Section 6 concludes.

2. NATURE'S RAGE AGAINST THE CORPORATE MACHINE

The triple threats of climate change, a depleting biodiversity, and the global health pandemic have caused disruptions to commercial activities. Climate change disrupts the flow in the global value and supply chains.[15] A depleting biodiversity threatens food sources and food supplies,[16] and the global health pandemic decreases global efficiency in production,[17] thus disrupting the supply chain and putting the workforce's financial,

[15] See sources above, IPCC (n. 3) and COVID-19 impact on Labour (n. 5).

[16] A. Grear, 'Reflections on Biodiversity and Food Supply: From the Nano to the Macro-Political.' (2011) 2 Journal of Human Rights and the Environment 131. Aigbokhaevbo, 'Bio Prospecting', 26 (n. 4)

[17] S. Bin, 'The Impact of COVID-19 on Global Value Chains and Its Policy Implications WTO and COVID-19' (2020) 10 *Journal of WTO and China* 16.

health, and mental well-being at risk.[18] We argue that the reconciliation between nature's rage and the corporate machine lies in corporate capital maintenance law. In this section, we demonstrate that businesses operate at the intersection of financial, natural, and human capital. Only when they collect the relevant information on all three forms of capital, disclose it, and integrate that into their solvency calculations, can they reconcile the existences of these three forms of capital.

2.1 The financial capital

It is a ubiquitous understanding that a business is dependent on and in first instance created by its financial capital of either money,[19] or money's worth.[20] Taking the example of a UK corporation with a limited liability shield:[21] investors such as shareholders or members appoint a board of directors who steer for them. The limited liability setup entrusts the board of directors with the mandatory duties owed to the corporation as a whole.[22] Predominantly, they are entrusted to keep the business afloat and to show that the corporation can pay its debts as they fall due. When a corporation cannot pay its debts and its dire financial status has reached the point of no return, it is deemed insolvent according to the UK Insolvency Act 1986[23] and the court.[24]

Section 3 of this article shows that the current corporate capital maintenance rules of the five selected jurisdictions steer the board of directors to protect the financial capital of the corporation. Directors' duties however are much more malleable towards integrating the trends of ESGs and SDGs into their strategies, and implementing a circular economic model in their business operations.[25] For example, s172 UK Companies Act promotes the success of the corporation through the balancing of the interests of employees, creditors, business partners, consumers, the community, and the environment. The wide scope of this duty allows the board to define corporate successes which integrate social and environmental concerns alongside promoting sustainable

[18] A. Pozzer, 'Regional and Global Contributions of Air Pollution to Risk of Death from COVID-19' (2020) 116 *Cardiovascular Research* 2247; R. G. White, 'Mental Wellbeing in the Anthropocene: Socio-Ecological Approaches to Capability Enhancement' (2018) 57(1) *Transcultural Psychiatry* 44.

[19] For corporations limited by shares in which these investors are shareholders.

[20] For corporations limited by guarantee in which these investors are members.

[21] *Salomon v Salomon & Co Ltd* (1999) 1 BCLC 433 (HL).

[22] *Greenhalgh v Arderne Cinemas Ltd* [1950] Ch 286 (CA); UK Companies Act 2006 ch 46, s172.

[23] UK Insolvency Act 1986 ch 45, s123.

[24] *BNY Corporate Trustee Services Ltd v Eurosail-UK 2007-3BL Plc* [2013] UKSC 28 28 (UKSC).

[25] Turner, 'Corporate Law, Directors' Duties and ESG Interventions' p.245. (n. 6).

development for the communities.[26] Hence, UK law offers flexibility to the board to also invest in the natural and human capital of the business.[27]

2.2 The natural capital

Similar to financial capital, businesses cannot function without the existence of natural capital.[28] Natural capital comprises the resources in the Earth, soil, and water as well as the resources provided by nature in the form of ecosystem services.[29] All these resources enable the global production and consumption of products and services. Businesses have been efficient in turning natural capital into raw materials, water, energy, fuel, food, beverages, services, goods, transportation, and infrastructure. Global advancements in technology, communication, movement of people, goods and services have led to increases in standards of living, health, and life expectancy. These advancements are the positive impacts of utilising natural capital. In contrast, the adverse effects of exploiting natural capital comprise climate change, a rapidly decreasing biodiversity worldwide, resource depletion and increasing pollution. Irresponsible business behaviour has led to environmental externalities which are generally not accounted for in the business models. Laws also fail in this respect. For example, environmental protection laws are generally not connected to corporate law, hence there are flaws in the description of directors' duties and capital maintenance standards. The result is that directors are not inclined to fully account for the environmental externalities caused by the corporation nor to repair them.[30] With these

[26] L. Benjamin and S. Andreadakis, 'Corporate Governance and Climate Change: Smoothing Temporal Dissonance to a Phased Approach' (2019) 40 *Business Law Review* 146.

[27] C. Mayer, *Prosperity* (Oxford University Press 2018); Raworth, Doughnut Economics p. 94; John Elkington, *Green Swans* (Fast Company Press 2020); Rebecca Henderson, *Reimagining Capitalism in a World on Fire* (Public Affairs 2020).

[28] See F. Capra and U. Mattei, *The Ecology of Law* (Berret-Koehler Publishers 2015) 111; S. Harlett, *The Efficiency Trap* (Prometheus Books 2013).

[29] T. Lambooy, K. Maas, S. van 't Foort, and R. van Tilburg, 'Biodiversity and natural capital: investor influence on company reporting and performance'(2018) 8(1) *Journal of Sustainable Finance & Investment* 1–27. Rockström, 'Planetary Boundaries' (n. 3); Steffen, 'Planetary Boundaries' (n. 3).

[30] Regarding a state being reluctant in surrendering its sovereignty over environmental issues, see T. Madebwe, 'Re-Visiting Old Ideas in Order to Craft an Effective Modern International Environmental Law Regulatory Framework' (2015) 17 *Environmental Law Review* 100. And the complexities of multiple forums for access to environmental justice, see I. Antonopoulos, 'The Day after: Protecting the Human Rights Affected by Environmental Challenges after the EU Accession to the European Convention on Human Rights' (2018) 20 *Environmental Law Review* 213. And the heavy cost to local authority, see B. Christman, 'Aarhus Convention Compliance Committee: 2020 Findings about Protective Expenses Orders in Scotland' (2020) 198 *Scottish Planning and Environmental Law* 33.

kinds of legislation disjointedness, the linkage between natural capital and the business's financial capital is a tenuous one.

2.3 The human capital

Businesses can also not function without people, i.e. consumers, customers, communities, and the workforce.[31] Kraakman *et al.* distinguish between the internal constituencies of the corporation, such as its investors and its board of directors,[32] and the external constituencies.[33] The latter comprises the corporation's employees and gig workers, and also its business partners in the global value chains and their employees. In other corporate law theories, such as the European continental ones, a corporation's employees, as stakeholders, are considered among the internal constituencies,[34] but in this article, we will follow Kraakman's categories of internal and external stakeholders.

In many jurisdictions, the internal constituents' interests are covered by corporate law provisions and closely tied to the performance of the corporation's financial capital. Investors receive dividends and can exercise voting rights in the general meeting. The manner, in which the members of the board of directors will be remunerated, is also provided for in corporate law.

The protection of the external constituencies however falls under various other laws. For example, employees are governed by employment law.[35] Gig workers are governed by a variety of legislation and case law.[36] Foreign business partners in international value chains and their employees are governed by legislation such as the UK Modern Slavery Act,[37] the French

[31] As recognised in the 'European Commission Action Plan: Financing Sustainable Growth' at www.eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0097&from=EN.

[32] R. Kraakman and others, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (Oxford University Press 2017).

[33] L. Enriques, 'The Basic Governance Structure: Minority Shareholders and Non-Shareholder Constituencies', *The Anatomy of Corporate Law* (Third, 2017).

[34] E.g. the Dutch stakeholder model is embedded in corporate law and employee co-determination laws.

[35] For example, the UK Employment Rights Act 1996 Ch18.

[36] For example, UK Employment Rights Act 1996, s230(3b), UK Small Business, Enterprises and Employment Act 2015 c.26 Part 11, s149(3) and UK Agency Workers Regulations 2010, reg3. Case law such as *Nadeem v Shell UK* [2014] EWCH 4664 (QB), *Autoclenz Ltd v Belcher* [2011] UKSC 41, *Hollis v Vabu* (2001) 207 CLR 21, and *Uber BV v Aslam* [2021] 2021 UKSC 5 (Supreme Court). See Y. S. Ang, 'Partners in Social Entrepreneurship: A UK Approach to Buyer's Risk-Externalities' (2017) 12 *International and Comparative Corporate Law Journal* 12; S. Fredman and D. D. Toit, 'One Small Step towards Decent Work: Uber v Aslam in the Court of Appeal' (2019) 48 *Industrial Law Journal* 260.

[37] 2015 ch. 30.

Loi de Vigilance,[38] the Swiss Responsible Business Initiatives,[39] the Dutch Child Labour Due Diligence Law,[40] and the forthcoming EU Corporate Due Diligence and Corporate Accountability legislation.[41] The latter set of laws ensure that businesses conduct due diligence in their value chains in order to minimise violations of human rights and labour standards.[42] The protection of these external constituencies' human capital is not covered by corporate law nor in capital maintenance standards, and thus seems disjointed. This allows for unprotected gaps to materialise and thus weakens the prevention of violations.[43]

2.4 The interconnectedness of all three capitals

The circular economy model connects the natural and financial capital of a business. In a circular economy business model, all core activities and streams of materials take place in a circular way. They form part of the core business model, and thus are to be reflected in that way in the operational budgets and financial statements. Even so, the implementation of the social foundation requires a full integration of human rights and social norms into the business model and its core operations, and this is also promoted by the SDGs.

The intrusion of the triple threats on businesses also highlights the interconnectedness of the three forms of capital. Climate change impedes day-to-day business activities and in turn adds cost to the business for repairing incurred damage. For instance, Storm Uri, considered as having been exacerbated by climate change, hit Texas in 2021[44] and demonstrated how extreme weather patterns disrupt food supplies, freshwater sources, power supplies, and transportation.[45] Climate change impact – in the form of extreme heat on agriculture – disproportionately affects racial ethnic minorities who constitute the majority of migrant and seasonal

[38] Loi no. 2017-399 du 27 Mars 2017 relative au devoir de vigilance des sociétés mères et des entreprises donneuses d'ordre.

[39] Chancellerie fédérale, Initiative populaire fédérale "Entreprises responsables – pour protéger l'être humain et l'environnement' at www.bk.admin.ch/ch/f/pore/vi/vis462t.html.

[40] Wet zorgplicht kinderarbeid 2019.

[41] See www.oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2020/2129(INL); Resolution of the European Parliament dated 10 March 2021 at www.europarl.europa.eu/doceo/document/TA-9-2021-0073_EN.html.

[42] N. Bueno and C. Bright, 'Implementing Human Rights Due Diligence through Corporate Civil Liability' (2020) 69 *International & Comparative Law Quarterly* 789; R. Ireland, 'Rights and Modern Slavery: The Obligations of States and Corporations in Relation to Forced Labour in Global Supply Chains' (2017) 6 *UCL Journal of Law and Jurisprudence* 100.

[43] See Ireland (n 42).

[44] J. Doss-Gollin, 'How Unprecedented Was the February 2021 Texas Cold Snap?' [2021] *Environmental Research Letters* 16.

[45] A. Jacobson, 'Extreme Winter Weather Causes Texas Risk Crises' (2021) 68 *Risk Management* 4, 6.

workers.[46] Negative impacts on human capital in agriculture can disrupt the food industry. Damaged ecosystems threaten fresh water supply, and food production,[47] which in turn adversely affects business operations. A depleting biodiverse ecosystem leads to resource extractions encroaching into vulnerable biodiverse areas as well as indigenous people areas.[48] The global health pandemic amplifies and exposes the inherent inequalities between the workforce within the corporate structures.[49] We have also seen the recent combined effects of climate change and the global health pandemic affecting agricultural production[50] and in some cases impeding communities' recovery from weather destruction,[51] their livelihoods and economic activities. [52]

From a different angle, the planetary boundaries introduced by Rockström *et al*[53] – demarcating a 'safe operating space for humanity' – show the elements which support our life on Earth and how such boundaries are also interconnected. The ocean's acidity, the atmospheric aerosols, the biosphere integrity, and the land utility do affect one another. Pushing the boundaries of one can tip the rest off-balance. Exceeding these planetary boundaries also negatively affects the health and quality of living in certain parts of the global community more than in other parts, as Raworth shows in her social foundation model.[54] The triple threats exemplify the proximities in the interconnectedness between the communities and the environment in which one of these triple threats can severely disrupt communities' livelihoods and (their) businesses. These intricacies of the financial, natural, and human systems are ever

[46] K. Zhang, 'Heat Effects among Migrant and Seasonal Farmworkers: A Case Study in Colorado' (2016) 73 *Occupational and Environmental Medicine* 324.

[47] Aigbokhaevbo, 'Bio Prospecting' p. 26; Grear, 'Reflections on Biodiversity and Food Supply,' p. 131.

[48] S. D. Bachmann and I. P. Ugwu, 'Hardin's "Tragedy of the Commons": Indigenous Peoples' Rights and Environmental Protection: Moving towards an Emerging Norm of Indigenous Rights Protection?' (2020) 6 *ONE J: Oil and Gas, Natural Resources, and Energy Journal* 547; K. Bork, 'Governing Nature: Bambi Law in a Wall-E World' (2021) 62 *Boston College Law Review* 155.

[49] As the UK Public Health report hinted in 'COVID-19: Understanding the Impact on BAME Communities' (*GOV.UK*, 2020) at www.gov.uk/government/publications/covid-19-understanding-the-impact-on-bame-communities.

[50] B. Harris and C. Pulice, 'Worst Drought in a Century Hits Brazil as It Fights to Overcome Covid' *Financial Times*. (19 June 2021) at www.ft.com/content/958e313a-c474-4b0a-80c5-2679ee4bb307 accessed 20 June 2021.

[51] C. Riotta, 'Puerto Rico and US Virgin Islands Brace for Tropical Storm Karen' *The Independent* (23 September 2019) at www.independent.co.uk/news/world/americas/tropical-storm-karen-floods-path-latest-puerto-rico-us-virgin-islands-a9117146.html.

[52] S. M. Mance, 'Estimating State and Local Employment in Recent Disasters—from Hurricane Harvey to the COVID-19 Pandemic' [2021] *Monthly Labor Review* 1.

[53] Rockström (n 3).

[54] Raworth (n 9).

more prominent and there is a need for embedding resiliencies within all three systems.[55]

2.5 The corporation as actor between the three capitals

A corporation lies at the intersection of the three capitals: it capitalises the utility of the workforce for the extraction of natural resources and it turns them into profitable products, services, and experiences. Figure 2 visualises this interconnection.

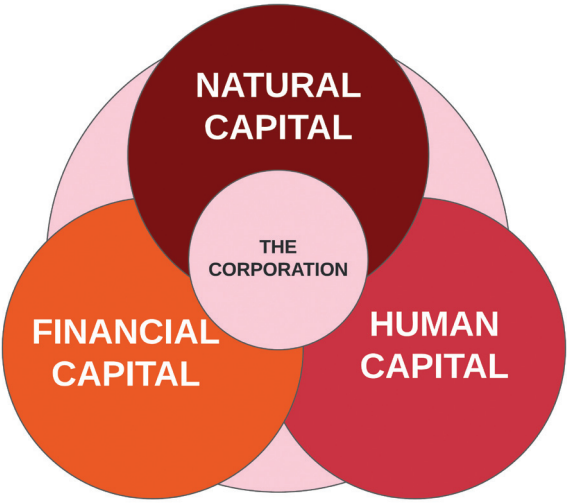

Figure 2. The corporation in the centre of Financial, Natural and Human Capitals

History teaches that the long-term existence of a corporation is closely linked to its capability to avoid causing environmental damages combined with respecting human rights and complying with labour standards. Royal Dutch Shell, for example, was ordered on 26 May 2021 by a Dutch court to redesign its business model and activities, and to reduce 45% of its CO2 emissions by 2030.[56] The decision highlights that causing CO2 emissions in Shell's operations in its upstream as well as its downstream activities constitutes a material contribution to the risk that

[55] Above n 27, Raworth (n 9), Harlett (n 28), see also Tim Jackson, *Prosperity without Growth: Foundations for the Economy of Tomorrow* (2nd edn, Routledge 2017).

[56] The verdict is available in English at ECLI:NL:RBDHA:2021:5339, Rechtbank Den Haag, C/09/571932 / HA ZA 19-379 (English version) (rechtspraak.nl). See C. Clement-Davies, 'The Shell Emissions Case at The Hague; Landmark Judgment or Legal Revolution?' [2021] International Energy Law Review 31; Shearman & Sterling, 'Vereniging Milieudefensie v Royal Dutch Shell Plc.' [2021] Environmental Law Monthly 6.

climate change effects lead to violations of human rights.[57] Also, several large pension funds and asset managers withdrew their investments from the fossil fuels sector over the last years.[58] In addition, the G7 decided in the Nature Compact of June 2021 that governments should no longer facilitate traditional energy production in view of climate change, and that they must invest in biodiversity regeneration.[59] These current events clearly reveal the links between environmental and human rights risks on the one hand and the financial health and future perspectives of a corporation on the other hand.

It is also important for the financial stability and the reputation of a corporation to avoid gaps in equal pay between workers with different gender or different levels within the organisation,[60] and ensuring decent and healthy working conditions.[61] For example, in the fast-food industry, there are considerable pay gaps between the frontline staff and cooks, and those in middle management and the board of directors. Those gaps constitute a danger for the continued existence of the corporation as one day legal claims for reparations might be awarded.[62] Moreover, a healthy and happy workforce is a crucial element of a long-term corporate strategy.[63]

An example of a corporation taking positive steps to implement a circular business model is Esquel Group, an apparel business. This corporation collects information concerning the water and power usages in its

57 T. Lambooy, 'Shell Stumbles over an Old Open Cellar Hatch' (*Nyenrode*, 29 May 2021) at www.nyenrode.nl/en/news/n/shell-stumbles, accessed 27 June 2021.

58 For examples of these divestments see: Follow This at www.follow-this.org/for-investors/; www.ey.com/en_gl/recai/how-climate-risk-is-driving-institutional-investment-in-renewables, accessed 27 June 2021.

59 At www.g7uk.org/wp-content/uploads/2021/06/G7-2030-Nature-Compact-PDF-120KB-4-pages-2.pdf, accessed 27 June 2021.

60 C. Villiers, 'Executive Pay: A Socially-Oriented Distributive Justice Framework' 37 *Company Lawyer* 139.

61 The efficacy equal pay and transparency regulations in the UK are low. See S. Smethers, 'Gender Pay Gap Reporting: An Opportunity to Boost Productivity' (2017) 1062 *IDS Employment Law Brief* 18; E. Bartlett, 'Gender Pay Gap Reporting: First Impressions' (2018) 7 *Compliance & Risk* 2; T. Heys, 'How Covid-19 Has Messed up Gender Pay Gap Statistics' (2020) 9 *Compliance & Risk* 6.

62 P. Butler and A. Hammer, 'Pay Progression in Routinised Service Sector Work: Navigating the Internal Labour Market in a Fast Food Multinational Company' (2020) 51 *Industrial Relations Journal* 351; R. W. Van Giezen, 'Occupational Wages in the Fast-Food Restaurant Industry' (1994) 117 *Monthly Labor Review* 24; J. A. Berman, 'Mandating the Supersize Option: The Legality of Government Intervention in the Fast Food Industry to Address Insufficient Wages and Close the Public Assistance Gap Comments' (2014) 23 *University of Miami Business Law Review* 177.

63 J. MacKey and R. Sisodia, *Conscious Capitalism* (Harvard Business Review Press 2014); R. Sisodia, D. Wolfe and J. Sheth, *Firms of Endearment* (Second, Pearson 2014); C. Mayer, *Prosperity* (Oxford University Press 2018).

factories. Based thereon, it knows how much resources must be returned or replenished in order to ascertain a circular business model.[64]

It can be argued that a corporation that considers environmental and social concerns as external to its business operations lacks the awareness of the interconnectedness between the three capitals it draws from. The current sustainability risks in global value chains highlight the underlying lack of awareness at a larger scale.[65] The interconnectedness is also lacking in the legal treatment of corporate capital. The publicly accessible records pertaining to a corporation's capital (and resources) mainly reflect investors' money, assets, financial liabilities, and cash flows, hence comprise purely financial information.[66] As an overview of the natural capital and human capital pertinent for a corporation is generally absent, the corporate capital is disconnected from the natural and human resources on which the corporation depends.

3. THE DISCONNECT IN CORPORATE CAPITAL MAINTENANCE & SOLVENCY STANDARDS

In this section, we examine corporate capital maintenance standards and solvency tests in various Western jurisdictions. Although we focus on corporate law, we sometimes also refer to insolvency laws and cases as they often closely interlink with the solvency concept employed in corporate law. For our examination, we selected EU, the UK, the Netherlands, US federal law and Australia, because we have access to them, and some understanding of them. Moreover, we wanted to cover a global view including countries from three Western continents with corporate capital maintenance laws.

64 'Planet | Esquel' at www.sustainability.esquel.com/planet, accessed 27 June 2021.

65 See M. Bosman, T. Lambooy, E. Oral and B. Jansen 'The chemicals between us': The use and discharge of chemicals in the life cycle of a pair of jeans – from legal theory to practice' in Mauerhofer V., Rupo D. & Tarquinio L. (Eds.), *Sustainability and Law: General and Specific Aspects* Springer (2020) (pp. 157–200). See also M. Bosman, A. Argyrou, T. Lambooy and S. Solaimani S. 'Gender (in)equality in the Bangladeshi ready-made garment sector: a systematic review' *International Comparative Corporate Law Journal* 13(3) (2019), T. Lambooy, B. Jansen and M. Bosman 'When mother earth begged for research: an indexation of social and environmental hotspots' (2019) 34 *Yuridika* 3. See also T. Lambooy, M. Bosman, S. Solaimani (2017). Sustainability Hot Spot Analysis of two readymade garments. Report by commission of the European Union. And: T. Lambooy, M. Bosman., A. Argyrou, B. Jansen, S. Begum & N. Khan (2019). The regulatory ecology of two severe sustainability hot spots in the product life cycles of a pair of jeans and a T-shirt. Report by commission of the European Union. M. Van der Velden and M. Taylor (2017). Sustainability Hotspots Analysis of the Mobile Phone Lifecycle. Report by commission of the European Union.

66 These are noted in the balance sheets.

3.1 Solvency norms in five Western jurisdictions

The EU approach to corporate capital maintenance is that a capital distribution to the shareholders is allowed when it is "less than or equal to the surplus of assets over liabilities, treating share capital as a liability."[67] This approach is generally known as the 'balance sheet test' which relies on the corporate balance sheet[68] and aims to provide a financial cushion for the creditors. Maintaining this "cushion" leaves "no room for any intermediate managerial appreciation, appraisal or adjustment of the accounting results to take account of prudential judgement."[69] This approach employs a rigid calculation of assets and liabilities, and it treats all public limited liability corporations' share capital the same regardless of their sizes. Ensuring capital maintenance through employing capital distribution norms limits the scope to present liabilities (the snapshot test).[70] It thus benefits some creditors who are the holders of presently acknowledged liabilities, but can be considered unfair to other (potential) creditors, i.e. especially the holders of as yet unacknowledged tort claims and future liabilities. An optional EU capital maintenance regime is the "looking forward test"[71] which mirrors the UK approach which will be discussed below. Moreover, natural and human capital play no role in the EU approach.

The UK approach to corporate capital maintenance is similar to the EU approach (s831 UK Companies Act 2006) while the solvency notion (s643 of the same Act) takes temporality into consideration ("the company will be able to pay (or otherwise discharge) its debts *as they fall due* during the year immediately following that date").[72] The threshold of capital

[67] J. Rickford, 'Legal Approaches to Restricting Distributions to Shareholders: Balance Sheet Tests and Solvency Tests' (2006) 7 *European Business Organization Law Review* 135. P. Santella, R. Turrini, 'Capital Maintenance in the EU: Is the Second Company Law Directive Really That Restrictive?' (2008), 9 *European Business Organization Law Review* 427–461. Article 15 of the Second Company Directive, under 1. states: (a) Except for cases of reductions of subscribed capital, no distribution to shareholders may be made when on the closing date of the last financial year the net assets as set out in the company's annual accounts are, or following such a distribution would become, lower than the amount of the subscribed capital plus those reserves which may not be distributed under the law or the statutes.

[68] As the balance sheet is part of the legal framework for accounting and corporate financial reporting.

[69] Rickford, Legal Approaches (n. 67) at 135.

[70] Santella (n. 67) at 459.

[71] Ibid.

[72] S831 concerns 'Net asset restriction on distributions by public companies' and s643 regards the 'Solvency statement' required of the directors. Section 831: (1) A public company may only make a distribution—(a) if the amount of its net assets is not less than the aggregate of its called-up share capital and undistributable reserves, and (b) if, and to the extent that, the distribution does not reduce the amount of those assets to less than that aggregate. (2) For this purpose a company's "net assets" means the aggregate of the company's assets less the aggregate of its liabilities. And Section 643: (1) A solvency

maintenance is in accordance with s123(1)(e) and s123(2) of the UK Insolvency Act 1986, although the latter sections do not limit the 'debts as they fall due' and the 'contingent and prospective liabilities' to the one-year period stated in the corporate law. In regard of the insolvency standard, the court in *BNY Corporate TS Ltd.* looked beyond the year-horizon.[73] Unlike the EU approach where current and future creditors are not uniformly protected,[74] the UK approach takes into consideration the interests of both[75] and assesses on the balance of probabilities whether the corporation is solvent or insolvent.[76] Yet, also in the UK standards, there appears to be no connection with either the natural capital or the human capital.

Dutch capital maintenance standards can be found in Book 2 of the Dutch Civil Code (DCC), which contains the Dutch Company Act. Regarding a public limited liability company (*NV*), the balance sheet test for distributions to shareholders follows EU law (Article 2:105 DCC). For the privately-held limited liability company (*BV*), which is the most used corporate form in the Netherlands, Article 2:216 DCC regulates capital distributions. The BV's general meeting of shareholders[77] decides about distributions or appropriations of the profits and other distributions of assets. Subsequently, the BV's management board must approve the general meeting's decision in a separate resolution in order to make it effective. The management board must apply (i) a balance sheet test – do the assets exceed the liabilities and statutory reserves (i.e. there must be freely distributable reserves as per the accounts) and (ii) a distribution test. A refusal by the management board is only allowed if one or both tests are not satisfied. The distribution test is not fulfilled if the board knows or should reasonably know that the BV cannot pursue the payment of its due

statement is a statement that each of the directors—(a) has formed the opinion, as regards the company's situation at the date of the statement, that there is no ground on which the company could then be found to be unable to pay (or otherwise discharge) its debts; and (b) has also formed the opinion—(i) if it is intended to commence the winding up of the company within twelve months of that date, that the company will be able to pay (or otherwise discharge) its debts in full within twelve months of the commencement of the winding up; or (ii) in any other case, that the company will be able to pay (or otherwise discharge) its debts as they fall due during the year immediately following that date. (2) In forming those opinions, the directors must take into account all of the company's liabilities (including any contingent or prospective liabilities).

73 *BNY* (n. 24).

74 Rickford, Legal Approaches (n. 67) at 135.

75 In accordance with the *BNY case* (n. 24), in which case the instruments/notes (legal docs attached to currencies) were created until 2045. The court considered these instruments prospective liabilities.

76 *BNY* (n. 24), para 26; see also P. Walton, '"Inability to Pay Debts": Beyond the Point of No Return?' [2013] *Journal of Business Law* 212.

77 In the BV's articles of association, deviations are possible. E.g., this power can be attributed to the management board or the supervisory board, and/or it can be limited by stating that a certain part of the profits will have to be allocated to a reserve.

and payable debts after making the proposed distribution. The deciding factor is the actual financial situation of the BV at the moment of the distribution (payment) being made. The distribution test entails that the management board must assess the liquidity, solvability and profitability of the BV in light of the proposed distribution, taking into account all relevant facts and circumstances. Although special circumstances may occur, it is generally considered sufficient to look one year ahead. Hence, this distribution test, which is in fact a solvency test, is inherently only focusing on the short-term situation and is mostly financially-led. Since it is up to the management board to determine on which documentation its assessment will be based, the board has some freedom here to include other information.

In regard of US corporate capital maintenance standards, it is noted that every State in the United States has enacted its own Company Act which usually includes the corporate capital maintenance standards for corporations incorporated in the State.[78] Insolvency is largely governed by federal law, usually referred to as the Bankruptcy Code. In order to determine whether a corporation is solvent or insolvent, there are three dominant solvency tests applied in the US: a 'balance sheet solvency test' (whether the fair value of the assets exceed the face value of its liabilities – to be performed on either going-concern or liquidation basis), an 'ability-to-pay solvency test' (can the corporation reasonably be expected to pay its debts as they come due), and a third test, i.e. a 'capital-adequacy solvency test' (has the corporation adequate capital), which underpins the first two tests.[79] Heaton critiques that the three tests measure different things and that different tests can indicate that the same corporation is both solvent and insolvent.[80] Also, he sees two disconnects in the balance sheet test. The first is time as comparing the corporation's *present value* of assets to the *future value* of anything else is like comparing apples with oranges.[81] The second disconnect is "the possible additional discounting for risk". As corporations "pay their debts with actual cash flows, not cash flows discounted to reflect their present value given the time of their occurrence and the possible risk that the cash flow will not be realized." About the ability-to-pay test, Heaton argues that this test sounds simple in theory, but that it is quite difficult to apply in practice: "If a firm's cash flows and debt were not subject to any uncertainty at all, then it would be an easy task to verify if the stream of cash flows that will occur

[78] For an overview, see R. Booth, Capital requirements in United States corporation law; availableat:www.digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=1013&context=fac_pubs.

[79] See for (in)solvency in the context of federal insolvency proceedings the U.S. Code: Title 11 at www.law.cornell.edu/uscode/text/11.

[80] J.B. Heaton, 'Solvency Tests' (2006) 62 *Business Lawyer (ABA)* 983 at 985 and 997.

[81] Ibid at 995.

through time can be matched to the firm's maturing debt obligations." As neither cash flows nor debt obligations are certain, the test does not deliver clear results.[82] He discusses also the capital-adequacy test. Under this test, 'inadequate capital' "encompasses difficulties which are short of insolvency in any sense but are likely to lead to insolvency at some time in the future."[83] With the balance sheet test underpinned by the capital-adequacy test, the corporation's future financial projections become a focal point for determining its solvency status.[84] We note that again, these tests do not take into account the corporation's natural and human capital.

Australian corporate capital maintenance rules apply a balance sheet test, a fairness test and a solvency test (s254t Corporations Act 2001).[85] The balance sheet test states that a corporation is prohibited from paying a dividend unless it has positive net assets before and after the payment ('Net Assets Test'). Furthermore, the fairness test requires that the dividend is "fair and reasonable to the company's shareholders as a whole". Finally, the solvency test provides: "the payment of the dividend does not materially prejudice the company's ability to pay its creditors". We conclude that also the Australian approach does not take into account the corporation's natural and human capital.

82 Ibid at 989.

83 Ibid at 995/996.

84 See further: W.-G. Ringe, 'Bank Bail-in between Liquidity and Solvency' (2018) 92 *American Bankruptcy Law Journal* 299; R. J. Jr. Stearn and C. D. Kandestin, 'Delaware's Solvency Test: What Is It and Does It Make Sense - A Comparison of Solvency Tests under the Bankruptcy Code and Delaware Law' (2011) 36 *Delaware Journal of Corporate Law* 165.

85 Commonwealth Consolidated Acts; Corporations Act 2001 – Sect 254t: (1) A company must not pay a dividend unless: (a) the company's assets exceed its liabilities immediately before the dividend is declared and the excess is sufficient for the payment of the dividend; and (b) the payment of the dividend is fair and reasonable to the company's shareholders as a whole; and (c) the payment of the dividend does not materially prejudice the company's ability to pay its creditors. Note 1: as an example, the payment of a dividend would materially prejudice the company's ability to pay its creditors if the company would become insolvent as a result of the payment. Note 2: For a director's duty to prevent insolvent trading on payment of dividends, see section 588G. Available at: austlii.edu.au. For further reading: S. Quo, 'Corporate Insolvency Reform in Australia: Safe Harbour Provisions for Directors from Personal Liability for Insolvent Trading' (2018) 39 *Company Lawyer* 207. Michael Murray and Jason Harris, 'Managing the Insolvency Curve in Australia' (*Oxford Law Faculty*, 20 April 2020) www.law.ox.ac.uk/business-law-blog/blog/2020/04/managing-insolvency-curve-australia.

3.2 A comparative analysis: the disconnect between the three capitals

We found that the balance sheet test constitutes the common anchor in the five selected jurisdictions. It is often combined with an assessment of a corporation's ability to pay its debts when they are due. Together, the tests aim to sustain the financial capital of a corporation and to prevent that directors divert funds in a manner that could harm creditors or make the business insolvent. Corporations are seen as 'neutral vessels': in times of solvency, they trade in abundance in the interests of its shareholders; but in times of financial hardships, they trade with a view that their resources are finite and that capital is to be preserved in the interests of their creditors.[86] In the examined laws, the circle of interests is indeed confined to the corporation's shareholders and its creditors.

The results in section 3.1 demonstrate that almost all parameters employed in assessing corporate solvency are financial parameters. The natural capital and the social capital from which a corporation draws for its business operations and which are crucial for the continuation and survival of the corporation as we demonstrated in section 2, do not play a role in the examined corporate capital maintenance laws. We conclude that there is a disconnect between the assessment of the corporation's financial wellness on the one hand and other resources on the other hand, such as natural resources, the workforce, and communities. We assert that the conventional legal definitions are no longer viable as they lack an evaluation and appraisal of the other two capitals.

Taking the discussion one step further, we pose the question how capital maintenance standards can reflect a corporation's efforts and successes to develop and maintain a circular business model. How could a corporation that implemented such a business model, account for the level of circularity it achieves in the production of products and services and the avoidance of waste streams? Such a corporation could provide information concerning the investments made to establish and maintain mechanisms and systems capable of neutralising its use of energy, water, and raw materials and waste recycling. Only when all mechanisms and systems work adequately, can the corporation be considered as running a solvent operation. We envision a similar approach regarding human capital. Evaluating the capital maintenance standards in the five jurisdictions, we conclude that they do not integrate a circular economic

[86] D. Milman, 'Corporate Insolvency and Governance Act 2020' (2021) 34 *Insolvency Intelligence* 28; D. Milman, 'Coronavirus: Concessions Extended' (2021) 34 *Insolvency Intelligence* 49.See also W. Schon, 'Balance Sheet Tests or Solvency Tests – or Both?' (2006) 7 *European Business Organization Law Review* 181.

approach nor an approach that forces corporations to embed the social foundation in its business operations.

4. THE INTEGRATED CORPORATE CAPITAL REPORTING

As demonstrated above, the integrated corporate capital is not the mainstream approach. Contributors to the law of nations such as Vitoria, Gentili, Grotius and Vattel viewed nature "as primarily a commodity, always available for appropriation and exploitation."[87] The right to engage in commerce has always been more important than the need to protect societal flourishing or the environment. Furthermore, the task of environmental protection and societal well-being are traditionally reserved for governments, international and local NGOs, civil society, and lawyers who defend the environment or human rights.[88] Corporate law mainly considers natural capital in the form of property rights useful for commercial exploitation,[89] resources for extraction, and goods for consumption.[90]

We also note that the EU corporate reporting Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups – through transposal in the EU Member States' legislation – stimulates corporations to present ESG reports (EU Directive 2014/95). The Directive's aim is to contribute to realising sustainable development. Consequently, large EU-based corporations with more than 500 employees are to include in their annual report a 'non-financial statement' reflecting on how the corporation has implemented its ESG responsibilities concerning the environment, human rights, social norms and avoiding corruption and bribery.[91]

87 These scholars are mentioned in I. Porras, 'Appropriating Nature: Commerce, Property, and the Commodification of Nature in the Law of Nations' (2014) 27 *Leiden Journal of International Law* 641.

88 S. Adelman, 'Tropical Forests and Climate Change: A Critique of Green Governmentality' (2015) 11 *International Journal of the Law in Context* 195.

89 C. Rodgers, 'Nature's Place? Property Rights, Property Rules and Environmental Stewardship.' (2009) 68 *Cambridge Law Journal* 550.

90 Porras, 'Appropriating Nature' (n. 87) 641.

91 Directive 2014/95/EU. Available at: Directive 2014/95/EU of the European Parliament and of the Council – of 22 October 2014 – amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups – (europa.eu).

4.1 The Environmental, Social, and Governance approach is risk-based

Currently, commerce, people, and environmental considerations come in the form of stewardship and ESG-led governance as promoted by Corporate Social Responsibility (CSR).[92] Although these initiatives incentivised positive corporate steps toward the reconciliation between commerce, nature, and people during the last 20 years, they have not succeeded in creating a structural change in the corporate approach regarding climate change, damaged ecosystems, lost biodiversity, and the global health pandemic. We view that many of the current stewardship models and governance employed by corporations and/or mandated by corporate law do not radically change the function, focus and purpose of corporations.[93] Often they primarily aim to minimise financial risks for the corporations themselves.[94]

Therefore, we propose to introduce a mandatory integrated approach of the assessment of a corporation's capital whereby the natural and human capital are presented as part of the corporate capital, alongside the financial capital. This goes further than the stewardship norms adopted in EU Directive 2014/95. It is our view that a holistic corporate capital calculation could strengthen the board's ESG leadership and align the corporation's purpose closely with the SDGs. We will advance this approach through first looking at the integrated reporting approach.

4.2 Integrated Reporting: holistic corporate capital calculation

The International Integrated Reporting Council (IIRC) is a global coalition which spearheads an evolution of corporate reporting.[95] Corporations in

[92] D. W. McKenzie Shene, 'Stewardship: From Rhetoric to Reality' (1999) 3 *Edinburgh Law Review* 151; N. Mohammad, 'Environment and Sustainable Development in Bangladesh: A Legal Study in the Context of International Trends' (2011) 53 *International Journal of Law and Management* 89. T. Lambooy, *Corporate Social Responsibility. Legal and semi-legal frameworks supporting CSR* (Kluwer 2010). See the 2011 EU Commission's definition of Corporate Social Responsibility at www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0681:FIN:EN:PDF#:~:text=The%20European%20Commission%20has%20previously,stakeholders%20on%20a%20voluntary%20basis%E2%80%9D.

[93] T. Lambooy, A. Argyrou and S. Tideman, 'Enabling Company Boards to Create Sustainable Companies: The Connection between Sustainability, Company Leadership and Law', *ICCLJ* 2018(2); B. Sjåfjell and C. M. Bruner, *The Cambridge Handbook of Corporate Law, Corporate Governance and Sustainability* (Cambridge University Press 2020); Henderson, Reimagining (n 27).

[94] Ibid. See also the 2017 Report of the Task Force on Climate Change related Financial Disclosures advocating for corporations to report on the climate change-related risks envisioned for their businesses in the next decades at www.fsb-tcfd.org/publications.

[95] 'The IIRC | Integrated Reporting' at www.integratedreporting.org/the-iirc-2. T. Lambooy, R. Hordijk and W. Bijveld, 'Communicating about integrating sustainability

the IIRC network exhibit varying degrees of integrated reporting.[96] A light integrated reporting shows that the corporation is putting importance on stakeholder engagement, environmental concerns, and having a long-term game plan.[97] A moderate integrated reporting shows that the corporation is reporting in accordance with ESG and also citing SDG principles as their aligned long term goals.[98] A full-bodied integrated reporting shows that the corporation is incorporating all of its capital. For example, York Timbers Ltd. includes Nature, Manufactured, Intellectual, Human, Social and Financial capital.[99] These corporations attest to the fact that the reconciliation between commerce, the environment and the society is achievable, necessary, and also profitable. We propose to adopt the full-bodied integrated capital reporting approach as the standard for corporate reporting, so that such reports can also be used for the assessments of corporate capital maintenance.

4.3 Next steps beyond Integrated Reporting: circular economy reporting

So far, in integrated reports, we do not see a circular business model approach being accounted for. In an integrated report of a corporation with a circular business model approach, the corporation would demonstrate how it has implemented all the loops shown in the butterfly diagram in Figure 1. Such a report would provide full information on the corporation's natural capital, e.g. the volumes of energy, water, raw materials used by the corporation and the volumes of waste produced by it. In addition, the report would demonstrate in which way the corporation has 'neutralised' the amounts of natural capital consumed by it through producing renewable energy, clean water, regenerating biodiversity and ecosystems, recycling products and materials, *et cetera.* Alternatively, the

in corporate strategy: motivations and regulatory environments of integrated reporting from a European and Dutch perspective,' in R. Tench, W. Sun, and B. Jones (eds), *Communicating Corporate Social Responsibility: Perspectives and Practices* (Emerald Books, 2014), 217–255.

96 Ibid.

97 For example, of the integrated reports of businesses affiliated with the IIRC network, see 'Novo Nordisk: Integrated Report 2016' at www.examples.integratedreporting.org/organisation/27; see also 'Airports Company of South Africa SOC Limited: Integrated Report 2014' at www.examples.integratedreporting.org/organisation/165.

98 For example, Tata Steel incorporates ESG into their supply chains and Asahi invests in research and development promoting biodiversity and responsible water use. See 'Tata Steel: Integrated Report 2019' at www.examples.integratedreporting.org/organisation/284; see also 'Asahi Group Holdings Ltd: Integrated Report 2014' atwww.examples.integratedreporting.org/organisation/187.

99 'York Timbers PTY LTD Integrated Report 2017' at www.examples.integratedreporting.org/recognized_report/980.

corporation could show how it compensates the use of natural capital in a way that contributes to full neutralisation.

Our proposal for the design of a natural capital balance sheet (see Figure 3 under section 5.1.) and a human capital balance sheet (Figure 4 under section 5.2.) demonstrates these neutralisations in an integrated circular economy and social foundation reporting approach. These balance sheets can be directly related to corporate capital maintenance standards and built into the legislation on corporate solvency. Hence, they would provide a certain way for a corporation to follow objective standards, thereby considering that its license to continue trading is based on its efforts to sustain its natural, human, and financial capital.

5. THE PROPOSAL FOR AN INTEGRATED CORPORATE CAPITAL SOLVENCY STANDARD

An integrated corporate capital solvency assessment dispels the misconceptions that corporate law and capital maintenance standards have a defined role which excludes societal and environmental duties and that those issues are the responsibilities of governments, charities, and international bodies.[100] With the integrated corporate capital solvency assessment, corporate law and capital maintenance tests can finally play a defining role in reconciling all aspects of the environment, the society and commerce. We propose that a corporation's legal capital shall therefore include natural, human, and financial capital, the latter of which includes the shareholders' capital, loans and other debts of a corporation as currently is the case. The capital maintenance standards need to be adapted to align therewith. Corporations will thus be mandated to internalise key externalities related to natural and human capital, and to address the triple threats of climate change, damaged ecosystems, and the global health pandemic in their decision-making to stay solvent.[101]

5.1 Natural capital balance sheet

To identify the parameters for the natural capital part of the redefined corporate solvency notion, we propose to look at the key indicators as

[100] As the legal argument currently goes in 2020 for the Heathrow runway extension in the UK at www.theguardian.com/environment/2020/oct/06/heathrow-to-challenge-third-runway-verdict-using-climate-pledge. It remains the obligation of the State to comply with the 'Paris Agreement' at www.unfccc.int/sites/default/files/english_paris_agreement.pdf.

[101] Inspirations set out by EU Commissioner Frans Timmermans and his staff in the EU Green Deal and Action Plan at www.ec.europa.eu/commission/commissioners/2019-2024/timmermans_en.

provided by the Natural Capital Coalition's guide.[102] Such key indicators ought to be integrated into a specific natural capital corporate balance sheet in corporate reports for justifying a solvent legal capital.[103] Figure 3 provides a guideline on how to incorporate such key-elements. These elements could all fit into the information that large corporations are currently required to disclose under EU Directive 2014/95. Our proposal however encompasses all corporations, small or large, and provides an adequate foundation for a new model of governance.[104] Taking the Esquel Group's business approach as an example,[105] the apparel manufacturer restores its freshwater back to the locations of its source. Esquel Group has invested in technology that enables them to recycle and to reuse water. Once the water completes Esquel's manufacturing purposes, it is cleaned through a process which reduces its acidity and then it is replenished back to its sources. On energy use, Esquel Group reduces its annual energy consumption through investing in energy efficient machinery. On emissions, the corporation invests in infrastructure that traps the dust and smoke from the factories from escaping to neighbouring communities. On its product, investments are made on researching patented techniques and technology to ensure minimal waste in the utility of its primary source which is cotton. In order to design the business operations in a circular way, the corporation applies a life-cycle-based method.[106]

102 Natural Capital Protocol at www.naturalcapitalcoalition.org/wp-content/uploads/2020/09/Biodiversity-Guidance_Application.pdf.

103 Ibid.

104 R. J. Gilson and J. Gordon, 'Board 3.0 – An Introduction' (2019) at www.scholarship.law.columbia.edu/faculty_scholarship/2294/.

105 'Planet | Esquel' (n 64).

106 P. Croes, 'Comprehensive In-Supply Chain Lifecycle Assessment of the Preventative Cost-Based Externalities of Products' (Utrecht University 2021). Beate Sjåfjell, 'Redefining Agency Theory to Internalize Environmental Product Externalities. A Tentative Proposal Based on Life-Cycle Thinking' (Social Science Research Network 2017) SSRN Scholarly Paper ID 3031788 www.papers.ssrn.com/abstract=3031788.

Figure 3. Natural Capital Balance Sheet

Assets (natural capital used by the corporation; it does not necessarily have to be reflected in financial units)		**Liabilities (where the corporation needs to invest in to maintain the natural capital; this can be reflected by providing the financial value of such investments)**	
Soil	**Investment per acre**	**Regeneration of soil**	**Investment per acre**
Farming either for crops or animals		Minerals regeneration	
		Extraction of (bio) chemicals that have entered the soil (fertilisers, animal waste, pesticides, hormones, antibiotics)	
		Responsible irrigation (to prevent drought)	
		Drainage for flood prevention	
		Erosion prevention	

Land conversion	Investment per acre	Land restoration/ preservation	Investment per acre
Land conversion which damages biodiversity in the existing habitat (flora and fauna), e.g. non-organic farming, GMO farming, mining, oil & gas extraction		Solutions need be found to bring back biodiversity to this habitat or if that is impossible to compensate such loss elsewhere, e.g. by creating new nature or protecting a piece of nature elsewhere provided that it has the same biodiversity (e.g. South African law regarding the duties to restore nature at the end of mining activities)* Ringfenced resources to mitigate adverse impacts caused by disasters (like oil spills in Nigeria, Ecuador).	
Land conversion which destroys the habitat (flora and fauna)		*Idem*	
Trees planted in damaged habitat (brown field)		Nurturing the new trees & protection against violators and fire, reforestation (from brown to green fields)	

* 'OECD Environmental Performance Reviews: South Africa 2013' (oecd-ilibrary.org) pg. 42-43 at www.read.oecd-ilibrary.org/environment/oecd-environmental-performance-reviews-south-africa-2013_9789264202887-en.

Land conversion	Investment per acre	Land restoration/ preservation	Investment per acre
Trees planted in damaged habitat (brown field)		Nurturing the new trees & protection against violators and fire, reforestation (from brown to green fields)	
Green fields or belts		Forest, wetlands, fields preservation; protection against violators and fire	

Water	Investment per unit	Regeneration of water use	Investment per unit
Volume used (for farming, manufacturing, electricity production, tertiary use)		Water recycling for reuse (if possible – depending on state of the water after use)	
		Cleaning operation of wastewater prior to reuse or discharge (if necessary, e.g. due to the addition of chemicals in textiles production industry)	
		Cooling operations (in case the water has higher temperatures than in the natural state after use, e.g. water used for electricity cooling operations warms up and needs to cool down before discharge to the river or water basin it was taken from)	
		Replenishment of volume of water used (if consumed, e.g. in beer and soft drink industry). Water can be produced by rain collection or by setting up a desalination plant which is energised by renewable energy and caters for ecologically friendly solutions to get rid of the salty residues	

Energy	**Investment per unit**	**Regenerative Energy production**	**Investment per unit**
Finite materials		Compensate the CO2 emitted due to the use of finite energy sources	
Nuclear		Regenerate soil where raw materials come from; ensure safe waste disposal solutions; ringfenced resources for disasters (like Fukushima)	
Renewables E.g. a combination of wind, water, solar, geothermal		Neutralise any adverse impact on biodiversity and ecosystems for production of energy through windmills, solar cells, water energy and geothermal energy Making sure nature retains its features	
Air	**Investment per unit**	**Air renewable**	**Investment per unit**
Any type of emissions other than CO2 from buildings and factories, farms, vehicles, ships, planes, etc.		Filters to ensure clean release of purified air and ringfenced resources for disasters Dust, carbon filters, greener insulation	
Smell		Filters and/ or negative air pressures in enclosures	

Noise	**Investment per decibel**	**Reduction of noise**	**Investment per decibel**
Buildings (plants, offices, and warehouses)		Insulation of buildings or quieter machineries	
Other infrastructure (pipelines, silos, rigs, etc)		Insulation or quieter machineries	
Transportation		Investment in noiseless vehicles that do not pollute the air	
Livestock		Insulation	
Light	**Investment per unit**	**Reduction of Light**	**Investment per unit**
Daytime light consumption		Better infrastructure for natural light	
Night-time light consumption		Investing in preventing light pollution by redesign buildings, factories, greenhouses, parking lots, gardens, etc. Ensure safety of people and animals by appropriate security	
		Take measures to prevent negative impacts on nocturnal wildlife. For example, Dark Sky Parks	

Waste management	Investment per unit	Waste management	Investment per unit
Domestic office waste		Recycling to the extent possible; bio-compostable programme	
Commercial/ Industrial waste		Recycling to the extent possible; remanufacture, green disposal programme	
Agricultural waste		Recycling to the extent possible; green disposal programme	

5.2 Human capital balance sheet

We propose that the human capital balance sheet takes Raworth's social foundation into consideration.[107] The essentials at the bare minimum include "sufficient food, clean water and decent sanitation, access to energy and clean cooking facilities, access to education and to healthcare, decent housing, a minimum income and decent work, and access to networks of information and to networks of social support."[108] As these are bare minimum norms, they do not necessarily fall within the remit or responsibility of corporations. The corporate obligation to respect human and socio-economic rights is nevertheless directly and indirectly prescribed in the UN Guiding Principles on Business and Human Rights (UNGP)[109] and other CSR norms. Corporate due diligence requirements with the purpose to avoid human rights violations have both manifested in soft laws (as in CSR initiatives) and in hard laws as in the aforementioned UK, French, Swiss and Dutch laws (section 2.3.). We can thus find legal norms on what is expected from corporations as to how to take care of human capital. Much of these expectations are touched upon in the EU Directive 2014/95. The human capital balance sheet can add onto the "disclosure of non-financial information [that] helps ... measuring, monitoring, and managing of undertakings' performance and the [corporations'] impact on society".[110] We propose that these disclosures need a layer of granular detail, especially for establishing the social license to operate within the

[107] Raworth, Doughnut Economics (n. 9) at 44.
[108] Ibid at 45.
[109] GuidingPrinciplesBusinessHR_EN.pdf (ohchr.org).
[110] Directive 2014/95/EU, Preamble (3).

community. A corporation's operational activities having a direct impact on the human rights and socio-economic rights of the community would need the expressed consent from that community of being exposed to the impacts of those corporate activities and the community's approval for the starting of the commercial operations. Figure 4 below provides a guideline on how to incorporate such key-elements.

Figure 4. Human Capital Balance Sheet

Assets (Human capital used by the corporation; it does not necessarily have to be reflected in financial units)		**Liabilities (where the corporation needs to invest in to maintain the human capital; this can be reflected by providing the financial value of such investments)**	
Internal constituencies	**Investment per unit**	**Internal constituencies**	**Investment per unit**
Shareholders		Long-term circular business model	
Institutional investors		Reinvestments into corporate activities	
Bond holders/ debenture holders		Regenerative investments	
Board of Directors*		***Board of Directors***	
Remuneration		Green/ regenerative performances	
Bonus		Diversity in the boardroom	
		Corruption detection	
		Modern slavery detection	

* In the UK, the directors are not part of the company's constitution, see: s33 CA 2006. However, as we indicated above in section 2.3. we follow the categories proposed by Kraakman's et al. (n. 32).

External constituencies	Investment per unit	External constituencies	Investment per unit
Current employees		*Future employees or maintenance*	
Employees on the books		Recruitment, including diversity sponsorship programmes to retain staff	
Retention/ compensation/ pay		Living wage, respect, complaint and conflict resolution mechanisms for (institutional) grievances, complaints, racism, harassment, bullying Work-life balance, including childcare and pet care facilities if appropriate; flexibility to avoid rush hours; flexibility to work at home transparency and objective argumentation for salary differences Health insurance; pension entitlement Equal pay and pay scale transparency Corruption detection and avoidance	

External constituencies	Investment per unit	External constituencies	Investment per unit
Current employees		*Future employees or maintenance*	
Employee co-determination		Accommodate time, facilities and procedures for input/co-determination of worlds councils and unions	
Inclusive organisational structure and collaborative attitude of all in the corporation, among other to encourage diversity		Transformation of organisational structures for better inclusive and diverse organisational structure	
Capability and competence of employees		Operational training for security and health and safety; mental and financial well-being programmes	
Workplace sanitation and ventilation		Ensure fresh air mechanism, fresh water, sanitation, breastfeeding facilities, COVID 19-proof measures	
Staff flourishing and growing in competencies and capabilities		Ensure career pathway; education on the job and beyond-life-long learning; positive critical 360 feedback loops	

Relationship building with stakeholder community	Investment per unit	Culture with engaging with the stakeholder community	Investment per unit
Build and maintain a positive relation with stakeholders: customers, creditors, communities, local authorities, suppliers, supporting ecosystems, facilitators, and other business partners		Organise timely consultations and follow-up thereof Embed a concrete and long-term culture of institutionalising stakeholders' voice/engagement in the corporation through establishing stakeholders' representation in the board, supervisory board, advisory council(s), and/or consultation meeting(s)	
Avoidance of human rights violations in the business activities and the supply chain Good structure for circular business model/ sustainability/ ESG/ stakeholder reporting on ESG issues and supply chain management		Set up proper due diligence systems re stakeholder concerns; monitor systems, response procedures and reporting mechanism	

Relationship building with stakeholder community	Investment per unit	Culture with engaging with the stakeholder community	Investment per unit
		Measures to avoid 'just in time' practices	
		Measures to avoid 'race to the bottom' prices	
		Measures to avoid 24-hour service	
Tax	**Investment per unit**	**Tax**	**Investment per unit**
Fair share of returns and profits with all stakeholders including local tax authorities		Set up transparency mechanisms to show: minimal tax payment; shale companies disclosed and dismantle	
		Global income tax minimum	
		Regenerative investment into local communities	
		Corruption detection*	

* Croes (n. 106) discusses corruption detection methods and its price.

5.3 Illustration case

To illustrate the proposals set out in the previous two paragraphs, we could imagine, for example, a fracking corporation's social license to operate within Utopia (a fictional community). It would need specificities in the consent and approval of the activities which need to be gathered from the residents and the members[111] of Utopia. The residents and the members

[111] The individuals who might not reside in Utopia, however they contribute to the community. For example, commuters for work, logistic workers, non-local business owners or partners, consumers, seasonal migrants, or visitors, etc.

could consent to the generation of economic wealth, which the fracking corporation would bring to Utopia.[112] However, this consent is subject to the approval of the fracking corporation's activities. Negative impacts of the fracking corporation would need to be listed, such as the changing of the land utility for the infrastructure of fracking, the transportation of the extracted materials, and also the infrastructure for other amenities like staff accommodation, offices, laboratories and warehouse facilities for the equipment and vehicles. Further impacts of this land use comprise: the quality of water and air, noise and seismic pollution, the increase in traffic and the impact on the road infrastructure. On the other hand, this additional infrastructure opens up job opportunities in different levels of work (such as catering, cleaning, administration and specialists in fracking). This which would attract more talents into Utopia and thus would increase its total demand of food, fresh water. Moreover, also activities in the hospitality sectors such as cafes and restaurants would amplify as would recreational facilities such as malls, gyms, cinemas. These developments can put additional strain on housing and public services, the use of public spaces, for instance in terms of parking, noise and light pollution. Probably, the facilities for public or private education would also increase.

These series of developments can have both positive and negative impacts on the human rights and socio-economic rights of Utopia and its inhabitants. Positive impacts include attracting more investments from other sectors. The negative impacts however can be traced back to the fracking corporation's operational activities in Utopia.[113] For the approval of the fracking corporation's social license to operate, contingencies would be needed for offsetting the negative impacts on air pollution, land stability/erosion/vibration, water pollution, the strain put on Utopia's existing amenities with the influx of workers and their families. The awareness of these negative impacts gives the corporation the opportunity to repair the relationship with the community, or to start maintaining a good relationship, through seeking their approval for the solutions proposed by the corporation to be put in place in exchange for the community's approval for it to operate. For example, investments should be made in less noise, air, and water polluting methods of fracking. Vehicles used in the corporation's operations ought to be green and quiet, the offices have to be green and energy-efficient and there should be accommodation built

[112] Supposing the G20 2021 agreement on a Global Minimum on corporate income tax applies.

[113] S. Kovats, 'The Health Implications of Fracking' (2014) 383 *The Lancet* 757; D. J. Davidson, 'Evaluating the Effects of Living with Contamination from the Lens of Trauma: A Case Study of Fracking Development in Alberta, Canada' (2018) 4 *Environmental Sociology* 196; M. Xu and Y, Xu, 'Fraccidents: The Impact of Fracking on Road Traffic Deaths' (2020) 101 *Journal of Environmental Economics and Management* 102303.

to host staff and their families. Investments in public amenities can also be done to offset the additional strain in the increase in the demand because of the introduction of fracking. Furthermore, it is also advisable for the corporation to have some resources ring-fenced for the occurrence of any incidents or disasters which would adversely impact the community of Utopia. For example, for the compensation of victims of operational disasters like fracking induced earthquakes, contamination clean up, or the restoration of amenities damaged by the corporation's activities. It is only with these contingency plans being approved by the communities that the corporation would be able to gain its social licence to operate.

And ultimately, scholarships' programmes can be set up that build a closer nexus between businesses and society and the importance of the circular economy. Only a corporate attitude that aims to make reinvestments of the profits back into the workers will secure the corporation's long-term operational cycles. The monitoring of the social licence can be done through reaching agreements with the community regarding the following organisational steps and decisions, e.g.: license and monitoring assignments; compliance with the OECD Guidelines, UNGP and the ILO standards; and adhering to the G20's decision on paying locally at least 15% minimum income tax.

6. CONCLUSION

In this article, we evaluated how corporate law and capital maintenance standards could contribute to the realisation of sustainable development. At present, the corporate stewardship and governance is fixated on securing a solvent corporation by considering only its financial health. This limited focus hampers the corporation's role in achieving ESG stewardship. Consequently, we proposed to redefine corporate solvency so that it encompasses natural and human capital in addition to financial capital, because the success of a corporation is based on and is dependent on all three forms of capital. Our discussion focused on corporate boards' obligations to present, maintain, and repair the three capitals before initiating or agreeing to any corporate capital distributions to the shareholders. The integration of natural and human capital into the legal corporate capital definition is needed to align ESG leadership with the circular economy business model and the social foundation and to attain the SDGs. The implementation of a circular business model and adopting a business approach aimed at the realisation of the social foundation are essential for effectively addressing the major global challenges of our time: climate change, damaged ecosystems and lost biodiversity, and global health. Without formulating an answer to these challenges and tackling them, the SDGs, and thus sustainable development will remain

a utopian concept. Ultimately, corporations will lose their licence to operate, miss out on resources needed for their business, and will incur large problems and losses due to climate change-related disasters.

Corporate law and capital maintenance standards are the spiders in the corporate webs in the world. These rules have the power to prescribe corporations how to set up their balance sheets, organise their corporate reporting, and business models. They dictate what a solvent corporation is. As a common rule among the various selected jurisdictions, a solvent corporation is (generally) free to distribute corporate funds to its shareholders and other financial stakeholders. Our proposal aims to integrate in the corporate capital and capital maintenance standards, those actions that a corporation need to take to internalise the externalities caused by its business activities. Our proposal ensures that no adverse consequences will take place and if the likelihood of these consequences were to materialise, they can and will be neutralised. We argue that these steps ought to be taken before any money leaves the corporation to its financial investors. However, we do not consider financial investors less important than the other stakeholders. Our proposal is a reaction to the observation that ecological and social damages produced by business activities are no longer tolerated by civil society, cause natural disasters which will impact the lives of many future generations, and are increasingly regulated by law. All damages should be prevented, avoided and as a last resort, repaired. The reason is that the costs to prevent, avoid, and repair them are to be considered as the costs of pursuing business activities. All costs need to be dealt with before money can be labelled as corporate earnings. Only when all costs are provided for, including those that will come up in the future and have a relation with the current business activities, can the status of corporate solvency be attained. And only a solvent corporation in our definition of corporate solvency can distribute funds to its financial shareholders.

This article focuses on the corporation's capital maintenance. We do not consider the scenario of a corporation falling insolvent under the three-capital balance sheet test. However, with the incorporation of natural and human capital into the balance sheet, constituents under the two capitals will be afforded derivative actions like the present financial derivative actions which are afforded to the corporate investors and creditors. This discussion is however for another article.