



Invited contribution

The double-materiality concept

Application and issues

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GRI Foreword

The double-materiality concept as ‘guiding principle’ in the GRI Standards

From climate change and biodiversity loss, to growing inequality, modern slavery, and scarcity of resources, our society and planet face the most significant challenges of all times. The task of building a sustainable future is a shared responsibility for us all. By doing business in a way that aligns long-term corporate strategies with people and the planet, companies must play their part.

For companies to contribute to sustainable development, they need to understand and manage their positive and negative impacts in a way that is transparent, trusted and objective. This understanding has led to a growing demand for sustainability reporting and a call for a global solution – one that reflects the needs of reporting companies together with the information requirements of their stakeholders, as well as those of the jurisdictions they operate in.

GRI has pioneered and led the practice of sustainability reporting since 1997. Sustainability reporting is an organization’s practice of disclosing publicly its most significant economic, environmental, and social impacts, and hence its contributions toward the goal of sustainable development. Today, the GRI Standards are the most widely used by companies, and most frequently referenced sustainability reporting standards by governments, financial market regulators and stock exchanges around the world, with more than 160 policies in 67 countries and regions.¹

In 2019, the European Commission was the first to formally describe the concept of double-materiality in the context of sustainability reporting, and the need to get a full picture of a company’s impacts. GRI fully supports this concept. We believe each direction of the notion of double-materiality needs to be considered in its own right – it is not about the convergence of the two perspectives that renders an issue as material. Impacts on the environment and society cannot be deprioritized on the basis that they are not financially material, or vice versa. Moreover, a company should start with the assessment of the outward impact component of the double-materiality principle followed by the identification of the subset of information that is financially material to the company and their stakeholders.

The GRI Standards, with a focus on the impacts of organizations on people and planet, is the only global sustainability reporting framework that captures comprehensively that outward impact.

In preparation for a high-level policy dialogue hosted in June 2021, GRI commissioned this white paper to draw on academic research that investigates how double-materiality is implemented in sustainability reporting, and the benefits and challenges of doing so.

We would like to warmly thank Professor Carol A. Adams, Abdullah Alhamood, Xinwu He, Dr Jie Tian, Le Wang and Yi Wang for their contribution to the debate around the concept.

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GRI Chief External Affairs

1. Van der Lugt, C. T., P. P. van de Wijs, & D. Petrovics. (2020). Carrots & Sticks 2020 - Sustainability reporting policy: Global trends in disclosure as the ESG agenda goes mainstream. Global Reporting Initiative (GRI) and the University of Stellenbosch Business School (USB)

Table of contents

Executive summary	4
Double-materiality - what it is	5
Benefits of applying double-materiality	6
Issues in applying double-materiality	7
References	9

Executive summary

This paper considers the appropriateness of the EU's double-materiality concept and how it can be used with the GRI approach to materiality. It draws on academic research that investigates how double-materiality and materiality in sustainability reporting are implemented and the benefits and challenges of doing so.

The key findings of academic research concerning the materiality concept and its application that are relevant to policy makers are:

1. Identification of matters that are financially material (or material to enterprise value) is incomplete unless the organisation has first identified its material impacts on sustainable development.
2. Materiality defined from the perspective of the impact of an organisation on sustainable development and stakeholders increases the focus of companies on sustainable development.
3. A focus on 'value for the organisation, society and the environment' rather than 'financial materiality' enhances an organisation's engagement with the United Nations Sustainable Development Goals.
4. The application of the materiality concept in the sustainability reporting process enhances engagement with stakeholders.
5. Corporate reports addressing material sustainable development matters serve to educate and influence broader society on sustainable development issues.
6. Approaches to conducting materiality analysis vary considerably and where they are less robust financially material issues are prioritised.
7. Lack of disclosure of the process of determining material issues reduces the perceived credibility of sustainability reports.
8. Lack of a rigorous process of determining material issues leads to reports that provide incomplete and misleading portrayals of sustainability performance.
9. Approaches to materiality and disclosure of those approaches tend not to be included in the scope of assurance engagements. Assurance engagements of sustainability information focus primarily on checking data.
10. Disclosure of material sustainable development issues is value relevant.
11. Identification and disclosure of material sustainable development issues enhances financial performance.
12. The materiality assessment process enhances investment decision making.
13. Simplified approaches and guidance would be helpful for SMEs.

These findings are discussed in more detail below, but first we consider the development and meaning of the term 'double-materiality'.

Double-materiality - what it is

The concept of 'double-materiality' was first formally proposed by the European Commission (European Commission, 2019) in Guidelines on Non-financial Reporting: Supplement on Reporting Climate-related Information published in June 2019. It encourages a company to judge materiality from two perspectives (European Commission, 2019, p.6): 1) "the extent necessary for an understanding of the company's development, performance and position" and "in the broad sense of affecting the value of the company"; 2) environmental and social impact of the company's activities on a broad range of stakeholders. The concept also implies the need to assess the interconnectivity of the two. The second component of double-materiality has been defined and applied in different ways long before the term 'double-materiality' was introduced. Examples of current thinking on this follow.

1. GRI revised its definition of materiality in an exposure draft (GRI, 2020, p.8) to: "the organization prioritizes reporting on those topics that reflect its most significant impacts on the economy, environment, and people, including impacts on human rights".
2. The European Financial Reporting Advisory Group (EFRAG) defines double-materiality from the perspective of both 'financial materiality' and 'impact materiality' where impact materiality involves (EFRAG, 2021, p8): "Identifying sustainability matters that are material in terms of the impacts of the reporting entity's own operations and its value chain (impact materiality), based on: (i) the severity (scale, scope and remediability) and, when appropriate, likelihood of actual and potential negative impacts on people and the environment; (ii) the scale, scope and likelihood of actual positive impacts on people and the environment connected with companies' operations and value chains; (iii) the urgency derived from social or environmental public policy goals and planetary boundaries."
3. To reflect both the impact of sustainable development on the organisation and the impact of the organisation on sustainable development, the Sustainable Development Goal Disclosure (SDGD) Recommendations (Adams et al, 2020, p9) define material sustainable development information as "any information that is reasonably capable of making a difference to the conclusions drawn by: stakeholders concerning the positive and negative impacts of the organisation on global achievement of the SDGs, and; providers of finance concerning the ability of the organisation to create long term value for the organisation and society."

These definitions can facilitate a shift from a traditional focus on monetary amounts to consideration of the opportunities and challenges of sustainable development (Brown, 2009; Gray, 2002; Puroila and Mäkelä, 2019; Spence, 2007). In this regard, the reference to 'value creation for organisations and society' in the SDGD Recommendations as one side of double-materiality has greater transformational potential than the EFRAG reference to 'financial' materiality. This is supported by case study findings that organisations that think of sustainability in terms of their impact on sustainable development and set strategy to create value for the organisation, society and the environment have engaged more deeply with the United Nations Sustainable Development Goals (Adams and Abhayawansa, 2021).

The research findings discussed below emphasise the importance of considering material impacts of the organisation on sustainable development prior to considering the implications of sustainable development issues on enterprise value or the financial statements. Privileging the latter risks not casting the net wide enough and of maintaining the tendency to privilege short term profit implications. This is detrimental to both long term financial performance and sustainable development.

Benefits of applying double-materiality

The practical application of double-materiality as it concerns sustainability reporting enhances stakeholder engagement (Puroila and Mäkelä, 2019). It requires wider and more direct stakeholder engagement to gain a comprehensive understanding of what is material in complex corporate settings, as different stakeholders have various, sometimes conflicting, views on material sustainable topics (Brown, 2009; Brown and Dillard, 2013; Brown and Tregidga, 2017; Puroila and Mäkelä, 2019). The enhanced stakeholder engagement required by the double-materiality analysis contributes to diverse and reciprocal accountability relationships between the organisations, their stakeholders, and the wider society and enables discussions and evaluations on sustainable development (Cooper and Morgan, 2013; Brown and Dillard, 2015; Puroila and Mäkelä, 2019).

Materiality is a socio-economic and political, rather than a technical, phenomenon (Carpenter et al., 1994; Lai et al., 2017), which shapes a broader societal understanding of sustainable development through corporate communication (Brown and Dillard, 2014; Puroila and Mäkelä, 2019). As organisations continuously define, manage, and communicate their identities, activities, and impacts in relation to sustainability through their double-materiality analysis, the conception of sustainable development is gradually shaped and reshaped (Puroila and Mäkelä, 2019; Tregidga and Milne, 2006).

Investment in sustainability can be costly in the short-term, but can benefit the business in the long-term (Oh & Chang, 2011). Materiality analysis can inform investment decision-making through the identification of key stakeholders and sustainability issues as well as relevant risks and opportunities. Empirical findings reveal that investment in material sustainability issues can enhance firm financial performance while investments on non-material issues have no impact on firm financial performance (Khan et al. 2016).

Several studies investigate how materiality in sustainability reporting influences analyst forecast accuracy, financial performance stock price informativeness (Khan et al., 2016; Grewal et al., 2020; Martinez, 2016; van Heijningen, 2019). Martinez (2016) adopted the GRI guidelines as a framework to select material social and environmental issues to test their impact on analyst forecast accuracy. He finds that analysts perceive sustainability disclosures on material issues as a signal of good performance in environmental and social issues, enhanced transparency and lower uncertainty resulting in more accurate forecasts. Grewal et al. (2020) find that material sustainability information is value-relevant and firm-specific.

These studies reveal the importance of identifying and disclosing material sustainability issues from the perspective of different stakeholder groups. A narrow focus on investors may be detrimental to goals of enhancing investor returns.

Issues in applying double-materiality

Research has identified a number of issues in applying double-materiality. These include: poor disclosure of the process of determining material sustainability issues; variation in the approach used by organisations to apply the GRI concept of materiality; stakeholder engagement is used to increase transparency and accountability but also to manage risks by reducing materiality attached to reporting information; organisations often lack skills to apply materiality to sustainability issues; assessment of materiality favours short-term financial interests; and, the materiality assessment process often falls outside the scope of sustainability assurance engagements.

Research finds that disclosure of the process of determining material sustainability issues is inadequate. This brings into question the credibility of sustainability reports and can lead to an inaccurate portrayal of sustainability performance (Adams, 2004; Guix et al., 2018; Knebel et al., 2015; Machado et al., 2020; Moneva et al., 2006). Companies tend to disclose good performance, ignore poor performance, twist the science and use sustainability reports to legitimate their actions and even mislead their stakeholders (Adams, 2004; Beske et al., 2020; Knebel et al., 2015).

Machado et al. (2020) examined 140 sustainability reports and found that the process of materiality assessment was unclear and not explicit. Reporting organisations thus have room to manipulate their prioritisation of sustainability issues according to their values and political priorities (Machado et al., 2020; Unerman and Zappettini, 2014). In examining sustainability reports issued by the 50 largest hotel groups worldwide in 2015, Guix et al. (2018) found a lack of experience in conducting materiality analysis and a heterogeneity of materiality definitions, guidelines, and applications. Further, Puroila and Mäkelä (2019) found that when doing a materiality assessment, organisations tend to prioritise financial issues over sustainability issues.

The GRI concept of materiality has been widely adopted in approaches to sustainability disclosure (Puroila and Mäkelä, 2019). However, the approach to implementation varies in practice (Moroney and Trotman, 2016). Organisations incorporate stakeholder engagement into the materiality assessment process with an aim to increase reporting transparency and accountability (Farooq and de Villiers, 2019). On the other hand, stakeholder engagement is also used as a tool to manage legitimate risks which result in reduced materiality attached to reported information and lower credibility of the reports (Hess, 2008).

Without a clear understanding of the material issues for different stakeholders, organisations are unable to address the needs of stakeholders (Font et al., 2016). The low quality of reporting in some organisations is partly due to their limited knowledge about materiality, and consultants are often engaged to fill the gap between the conception and application of materiality (Guix et al., 2019). The concept of materiality contains a certain degree of flexibility and it is regarded as a management opinion rather than a mechanical process (Edgley, 2014). Concerns about the subjectivity of materiality analysis are fuelled by findings that companies disclose only a small amount of information related to their materiality analysis and that disclosure of approaches to identify stakeholders and materiality topics is limited (Beske et al., 2020).

The materiality matrix is a techno-rational tool that simplifies the inherent complexity of assessing material sustainability issues, stakeholder engagement, and the societal pursuit of sustainable development (Puroila and Mäkelä, 2019; Machado et al., 2020; Puroila and Mäkelä, 2019). It presents different stakeholders as having a unified understanding of material sustainability topics whereas in reality there are conflicts between them (Boiral, 2013; Cho et al., 2015; Eccles and Youmans, 2016; Mäkelä, 2013; Milne and Gray, 2013). Further, materiality disclosure constructs reporting content as a “true and a fair view” of corporate performance on sustainability, failing to address the temporality and situatedness of the outcome (Boiral and Henri, 2017; Brown and Dillard, 2013; Cooper and Morgan, 2013; Puroila and Mäkelä, 2019; Stirling, 2008).

Jones et al. (2016) argue that reporting organisations tend to prioritise business continuity issues including branding and marketing, acquisitions, financial tax policy, research and innovation, customer satisfaction and so on. Environmental issues such as climate change, greenhouse gas emissions, water use, waste management, and biodiversity were identified as having lower priority. This suggests that the way that companies apply materiality fails to challenge the dominant business ideology of continuing economic growth and promote more sustainable patterns of consumption (Jones et al., 2016). The assessment of materiality still favours short-term business financial interests and ignores the complexity of sustainable development (Puroila and Mäkelä, 2019). In addition, there is also a risk that organisations focus on increasing legitimacy for their most important stakeholder groups, therefore, organisations may not adopt the guidelines if it does not enhance their relationship with those favoured stakeholder groups (Nikolaeva and Bicho, 2011).

The materiality assessment process and other GRI principles are often ignored in sustainability assurance engagements (Boiral et al. 2019). Only those principles that are also applied in financial auditing, such as data accuracy, reliability, and completeness, are systematically assured (Boiral et al., 2019). Heavily influenced by approaches transferred from the financial auditing, sustainability assurance engagements are narrow in scope focussing on data checking (Boiral and Heras-Saizarbitoria, 2020; Boiral et al., 2019; Farooq and De Villiers, 2019; Gürtürk and Hahn, 2016).

Poor disclosure of the process of identifying stakeholders and engaging with them to identify material topics is allowed to continue while these disclosures are not mandatory and not externally assured. This is concerning. **Robust identification of material impacts of an organisation on sustainable development must be the starting point to determining sustainable development risks and impacts on the financial statements. Research findings are clear - organisations tend towards prioritising financial materiality.** A reporting regime that encourages this is therefore detrimental to sustainable development – and, ironically, long term financial success.

References

- Adams, C. A. (2004) The ethical, social and environmental reporting-performance portrayal gap. *Accounting, Auditing & Accountability Journal*, 17(5), 731-757.
- Adams, C. A. and Abhayawansa, S. (2021) Conceptualizing how companies engage with the Sustainable Development Goals, working paper.
- Adams, C. A., Druckman, P. B., & Picot, R. C. (2020). Sustainable Development Goal Disclosure (SDGD) Recommendations. London: Association of Chartered Certified Accountants, Chartered Accountants Australia New Zealand, Institute of Chartered Accountants Scotland, International Federation of Accountants, International Integrated Reporting Council and World Benchmarking Alliance.
- Beske, F., Haustein, E. and Lorson, P. (2020), "Materiality analysis in sustainability and integrated reports", *Sustainability Accounting, Management and Policy Journal*, Vol. 11, No. 1, pp. 162-186.
- Boiral, O. (2013), "Sustainability reports as simulacra? A counter-account of A and A+ GRI reports", *Accounting, Auditing & Accountability Journal*, Vol. 25 No. 7, pp. 1036-1071.
- Boiral, O. and Henri, J.-F. (2017), "Is sustainability performance comparable? A study of GRI reports of mining organizations", *Business & Society*, Vol. 56 No. 2, pp. 283-317.
- Boiral, O. and Heras-Saizarbitoria, I. (2020), "Sustainability reporting assurance: Creating stakeholder accountability through hyperreality?", *Journal of Cleaner Production*, Vol. 243, pp.1-17.
- Boiral, O., Heras-Saizarbitoria, I. and Brotherton, M.C. (2019), "Assessing and improving the quality of sustainability reports: the auditors' perspective", *Journal of Business Ethics*, Vol. 155, No. 3, pp.703-721.
- Brown, J. (2009), "Democracy, sustainability and dialogic accounting technologies: taking pluralism seriously", *Critical Perspectives on Accounting*, Vol. 20 No. 3, pp. 313-342.
- Brown, J. and Dillard, J. (2013), "Critical perspectives on accounting critical accounting and communicative action: on the limits of consensual deliberation", *Critical Perspectives on Accounting*, Vol. 24 No. 3, pp. 176-190.
- Brown, J. and Dillard, J. (2014), "Integrated reporting: on the need for broadening out and opening up", *Accounting, Auditing & Accountability Journal*, Vol. 27 No. 7, pp. 1120-1156
- Brown, J. and Dillard, J. (2015), "Dialogic accountings for stakeholders: on opening up and closing down participatory governance", *Journal of Management Studies*, Vol. 52 No. 7, pp. 961-985.
- Brown, J. and Tregidga, H. (2017), "Re-politicizing social and environmental accounting through Rancière: on the value of dissensus", *Accounting, Organizations and Society*, Vol. 61, pp. 1-21.
- Carpenter, B.W., Dirsmith, M.W. and Gupta, P.P. (1994), "Materiality judgments and audit firm culture: social-behavioral and political perspectives", *Accounting, Organizations and Society*, Vol. 19 Nos 4-5, pp. 355-380.
- Cho, C.H., Laine, M., Roberts, R.W. and Rodrigue, M. (2015), "Organized hypocrisy, organizational façades, and sustainability reporting", *Accounting, Organizations and Society*, Vol. 40, pp. 78-94.
- Cooper, D.J. and Morgan, W. (2013), "Meeting the evolving corporate reporting needs of government and society: arguments for a deliberative approach to accounting rule making", *Accounting and Business Research*, Vol. 43 No. 4, pp. 418-441.

- Eccles, R.G. and Youmans, T. (2016), "Materiality in corporate governance: the statement of significant audiences and materiality", *Journal of Applied Corporate Finance*, Vol. 28 No. 2, pp. 39-46.
- Edgley, C. (2014), "A genealogy of accounting materiality", *Critical Perspectives on Accounting*, Vol. 25, No. 3, pp. 255-271.
- European Commission (2019), "Guidelines on non-financial reporting: supplement on reporting climate related information", available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0620\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0620(01)&from=EN) (accessed 20/02/2021).
- European Financial Reporting Advisory Group. (2021). Proposal for a Relevant and Dynamic EU Sustainability Reporting Standard-Setting. Brussels: European Reporting Lab @ European Financial Reporting Advisory Group.
- Farooq, M.B. and de Villiers, C. (2019), "Understanding how managers institutionalise sustainability reporting: Evidence from Australia and New Zealand", *Accounting, Auditing & Accountability Journal*, Vol. 32 No. 5, pp. 1240-1269.
- Farooq, M.B. and de Villiers, C. (2019), "How sustainability assurance engagement scopes are determined, and its impact on capture and credibility enhancement", *Accounting, Auditing & Accountability Journal*, Vol. 33 No. 2, pp. 417-445.
- Font, X., Guix, M. and Bonilla-Priego, M.J. (2016), "Corporate social responsibility in cruising: Using materiality analysis to create shared value", *Tourism Management*, Vol.53, pp.175-186.
- Gray, R. (2002), "The social accounting project and accounting organizations and society privileging engagement, imaginings, new accountings and pragmatism over critique?", *Accounting, Organizations and Society*, Vol. 27 No. 7, pp. 687-708.
- Grewal J, Hauptmann C, and Serafeim G. (2020), "Material sustainability information and stock price
- GRI (2020), " GRI Universal Standards: GRI 101, GRI 102, and GRI 103 – Exposure draft", available at: <https://www.globalreporting.org/standards/media/2605/universal-exposure-draft.pdf> (accessed 16/02/2021).
- Guix, M., Bonilla-Priego, M.J. and Font, X. (2018), "The process of sustainability reporting in international hotel groups: An analysis of stakeholder inclusiveness, materiality and responsiveness", *Journal of Sustainable Tourism*, Vol. 26, No. 7, pp.1063-1084.
- Guix, M., Font, X. and Bonilla-Priego, M.J. (2019), "Materiality: stakeholder accountability choices in hotels' sustainability reports", *International Journal of Contemporary Hospitality Management*. <https://doi.org/10.1108/IJCHM-05-2018-0366>.
- Gürtürk, A., and Hahn, R. (2016), "An empirical assessment of assurance statements in sustainability reports: Smoke screens or enlightening information?", *Journal of Cleaner Production*, Vol. 136, No. A, pp. 30–41.
- Hess D. (2008), "The three pillars of corporate social reporting as new governance regulation: Disclosure, dialogue, and development", *Business Ethics Quarterly*, Vol. 18, No. 4, pp. 447–482.
- Jones, P., Comfort, D. and Hillier, D. (2016), "Managing materiality: a preliminary examination of the adoption of the new GRI G4 guidelines on materiality within the business community", *Journal of Public Affairs*, Vol. 16, No.3, pp.222-230.

- Khan, M., Serafeim, G. and Yoon, A. (2016), "Corporate sustainability: First evidence on materiality", *The Accounting Review*, Vol. 91, No.6, pp.1697-1724.
- Lai, A., Melloni, G. and Stacchezzini, R. (2017), "What does materiality mean to integrated reporting preparers? An empirical exploration", *Meditari Accountancy Research*, Vol. 25 No. 4, pp. 533-552.
- Machado, B.A.A., Dias, L.C.P. and Fonseca, A. (2020), "Transparency of materiality analysis in GRI-based sustainability reports", *Corporate Social Responsibility and Environmental Management*, pp. 1-11. DOI: 10.1002/csr.2066.
- Mäkelä, H. (2013), "On the ideological role of employee reporting", *Critical Perspectives on Accounting*, Vol. 24 No. 4-5, pp. 360-378.
- Martinez, C. (2016), "Effects of Materiality and Assurance of Environmental and Social Disclosures on Analysts' Forecast Accuracy", Available at SSRN 2872206.
- Milne, M.J. and Gray, R. (2013), "W(h)ither ecology? The triple bottom line, the global reporting initiative and corporate sustainability reporting", *Journal of Business Ethics*, Vol. 118 No. 1, pp. 13-29.
- Moneva J.M, Archel P. and Correa C. (2006), "GRI and the camouflaging of corporate sustainability", *Accounting Forum*, Vol. 39, pp. 121-137.
- Moroney, R. and Trotman, K.T. (2016), "Differences in auditors' materiality assessments when auditing financial statements and sustainability reports", *Contemporary Accounting Research*, Vol. 33, No. 2, pp. 551-575.
- Nikolaeva, R. and Bicho, M. (2011), "The role of institutional and reputational factors in the voluntary adoption of corporate social responsibility reporting standards", *Journal of the Academy of Marketing Science*, Vol. 39. No. 1, pp.136-157.
- Oh, W. Y., Chang, Y. K. and Martynov, A. (2011), "The effect of ownership structure on Corporate Social Responsibility: Empirical evidence from Korea", *Journal of Business Ethics*, Vol. 104, No. 2, pp. 283-297.
- Puroila, J. and Mäkelä, H. (2019), "Matter of opinion: Exploring the socio-political nature of materiality disclosures in sustainability reporting", *Accounting, Auditing & Accountability Journal*, Vol. 32, No. 4, pp.1043-1072.
- Spence, C. (2007), "Social and environmental reporting and hegemonic discourse", *Accounting, Auditing and Accountability Journal*, Vol. 20 No. 6, pp. 855-882.
- Stirling, A. (2008), " 'Opening up' and 'closing down': power, participation, and pluralism in the social appraisal of technology", *Science, Technology, & Human Values*, Vol. 33 No. 2, pp. 262-294.
- Tregidga, H. and Milne, M. (2006), "From sustainable management to sustainable development: a longitudinal analysis of a leading New Zealand environmental reporter", *Business, Strategy and the Environment*, Vol. 15 No. 4, pp. 219-241.
- Unerman, J., and Zappettini, F. (2014), "Incorporating materiality considerations into analyses of absence from sustainability reporting", *Social and Environmental Accountability Journal*, Vol. 34, pp. 172-186.
- Van Heijningen, K. (2019), "The impact of ESG factor materiality on stock performance of firms", *Erasmus Platform for Sustainable Value Creation working paper*.