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r3.0 White Paper No. 1

From Monocapitalism to Multicapitalism: 21st Century System Value Creation

December 2020

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Baue, B. (2020):
From Monocapitalism to Multicapitalism: 21st Century System Value Creation. r3.0

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Bill Baue, Brendan Leblanc, Ralph Thurm

Dedicated to Brendan LeBlanc, who passed away unexpectedly just before this White Paper was released. Brendan was a close friend and colleague who we remember for his keen intelligence and wicked good sense of humor. As a r3.0 Steering Board Member, he championed this White Paper in particular (you wouldn't have it in your hands now without Brendan's tireless advocacy) and the work of r3.0 more broadly — particularly our work on Sustainability Context and the Carrying Capacities of the Capitals. Brendan's fingerprints are all over the famous Paragraph 58 in the International Integrated Reporting Council's Background Paper on Value Creation, which integrates carrying capacity and thresholds & allocations prominently, and we remember him for his most memorable quote: "The only thing more dangerous than no progress is the illusion of progress." But ultimately, we remember Brendan for the deep belly laughter he inspired every time we were together. The world is a much better place for his having been here.

0. FOREWORDS

0.1. CHARLES TILLEY | CEO | INTERNATIONAL INTEGRATED REPORTING COUNCIL

The issues challenging the world today are stark and wide ranging. The International Integrated Reporting Framework identifies six key drivers of value that a business uses and effects to create, preserve or destroy value, which we call capitals. In mapping these capitals to the global megatrends prevalent in the world today, it is clear that these issues are bigger than any one business. But business and investors are recognizing the increasing role they must play in addressing the issues that are vital to the long-term sustainability of society and our planet.

Given the current climate crisis, natural capital is an obvious place to start. The urgency that comes with the risk posed to us all by climate change is clear and action is needed now, by every business, government, investor and individual, to tackle it.

The economic implications of the Covid-19 pandemic will have wide-ranging and lasting implications for the management of financial capital. The response by governments around the world is likely to affect this and future generations.

Covid-19 is also pushing the global inequality gap further in the wrong direction, as human capital considerations become increasingly vital for businesses to take into account in the way they think, plan and report.

In recent years, the G20 has shone a spotlight on a growing infrastructure gap, with the mobilization of private resources needed around the world to ensure physical and digital access to economic opportunities, demonstrating the need for many organizations to reassess their approach to reporting manufactured capital, taking into account not just the assets they own, but access to public infrastructure that they use and affect.

The Sustainable Development Goals (SDGs) paint a clear picture of the need for a comprehensive approach to social and relationship capital, so that together as a society we can achieve “a better and more sustainable future for all”.

And finally, with automation and digitalization prompting new risks and opportunities about the future of the workforce and the way we interact with the businesses we use; stakeholders are going to be looking for further clarity about an organization’s intellectual capital and its approach to knowledge-based intangibles.

The capitals touch on the megatrends in society today and how we respond to them now will affect our future. It is obvious that we cannot continue with a primary focus on financial capital, we must shift towards a multi-capital outlook.

The awakening to these issues, and the role businesses must play in tackling them, has been both widespread and positive over recent years. Over 2,500 businesses in more than 70 countries have started using the <IR> Framework’s multi-capital model.

However, the changes we need to see are both to the way companies report and the way they behave, develop their strategy and its implementation through their business model.

We need to have some challenging conversations about how we ensure this happens universally around the world – to really drive changes to the way our markets operate.

The ideas that r3.0 have put forward in this White Paper fall in to the 'challenging' bucket – the best thought leadership often is. For some, it will be an uncomfortable read about the changes r3.0 perceive as necessary to embed multi-capitalism. Indeed, the IIRC will not, as a broad coalition, be advocating for all of the ideas put forward. However, it is important that we have these discussions and understand the history, realities and future needs of multi-capitalism.

We commend r3.0 for the insight and foresight set out in this White Paper.

Charles Tilley OBE
CEO | International Integrated Reporting Council (IIRC)

0.2. RICHARD HOWITT | FORMER CEO | INTERNATIONAL INTEGRATED REPORTING COUNCIL

When I first encountered the concept of 'human capital', some years ago, I recoiled. How could human beings be reduced to being described, in just the same way as units of the economy?

But I came to learn, that in a world of multi-capitals, it is financial capital which is considered to be just one unit of the world - a world in which all of its resources are valued.

It was also essential in this world of finite resources, depleting fast, that we are able to measure business impact on the capitals, in order to save them for future generations.

The phrase *'do no harm'*, simply cannot apply in the complex world of business. Attributed to the Greek physician Hippocrates, it is actually hypocritical for any corporate to ignore his or her responsibility to analyse and manage the company's use of external resources - capitals - on which every business and every person depends.

The apparent indifference of some in business to this responsibility, has fostered the anti-capitalist movement: Occupy Wall Street, the 'gilets jaune' and Extinction Rebellion.

These movements have a legitimate role in free societies, but have not spawned any convincing alternative to capitalism, which does not itself risk impinging our broader freedoms.

Capitalism needs to be transformed, not overthrown.

That is the importance of the concept of 'Multicapitalism', on which this paper is the culmination of a two-year project.

This White Paper is the most comprehensive study of the theoretical underpinnings of Multicapitalism, a lucid description of its methodologies, and an illustration of how the concept has been applied in companies and - in the case of New Zealand - a whole economy.

It certainly builds on visionary thinking from E.F. Schumacher to John Elkington, from Adam Smith in history to Kate Raworth in the modern day.

The project had its roots during the period when I had the honour of leading the International Integrated Reporting Council and reflects the commitment to the 'Sustainability Context' principle that sets the conceptual foundations of Sustainability and Integrated Reporting. The research has been expertly undertaken by the incredible network of people and ideas generated by the think-tank r3.0 and its own vision of a transformation journey, and written by the inestimable Bill Baue.

At this project's launch in 2018, I argued that, just as we have now come to accept the idea of planetary boundaries which we are over-shooting, that there is a boundary to social acceptance of the current economic model, which is jeopardised by rights violations, rising inequality, persistent poverty and exclusion. This was a variant of the idea of a social foundation, which many argue is already deeply breached, to argue that the well-known 'social licence to operate' is endangered not simply for companies, but for the entire economic system.

This White Paper presents Multicapitalism as the new paradigm for business and economic decision-making: to inspire, to educate, to provide key thought-leadership on how reform of capitalism can be achieved and applied.

It does so by challenging us all to move from incremental to transformational thinking, to understand that it is possible not simply to conserve but to regenerate the capitals, to embrace the truth that individual and collective action is only meaningful, if it can be linked to the system and to system change.

The White Paper provides a pathway to how Multicapitalism can become the norm and a call to action, to invite each of us to tread that path.

It answers anti-capitalist notions, by adopting the ethics of co-dependence, mutuality, respect for human rights and for the entire ecosystem.

It shows thinking which has been supported from the Nobel Prize for Economic Science, to the recommendations of two United Nations bodies, in the context of application of the Sustainable Development Goals.

In a debate which is about thresholds, perhaps the publication of From Monocapitalism to Multicapitalism will itself come to be seen as a new threshold in the evolution of business thinking, in the years to come.

I am sure readers will have encountered some or many of these terms in debates over past years.

I believe this White Paper will help you think again, make connections between the ideas, and - most important – make the connection to your own work.

Congratulations to everyone involved in this project and please enjoy reading what follows.

Richard Howitt
Former CEO | International Integrated Reporting Council (2016-2019)
Steering Board Member | r3.0

0.3. DELPHINE GIBASSIER | DIRECTOR | MULTI-CAPITAL INTEGRATED PERFORMANCE RESEARCH CENTRE | AUDENCIA BUSINESS SCHOOL

I have decided to see life as a glass half full, rather than half empty. While there is much to do to bring business organizations into the "doughnut" that Kate Raworth quantified in 2017, I follow weak signals that demonstrate how companies are progressively but rapidly integrated sustainability science into their work.[1] This year, Microsoft hired a Sustainability Science Global Lead (in a team that "coordinates overall science-based, measurable, and scalable sustainability investments and outcomes across the company"), and according to the Datamaran database, 20 companies have already embraced the "planetary boundaries" concept.[2] L'Oréal, in their 2030 plan, worked with the Stockholm Resilience Centre to develop targets compatible with the planetary boundaries.[3] While clearly, this is not a majority (not even close to the 10% tipping point that we sometimes hear about), these are signals that the thought leadership that is described in this report is becoming – and will be – the mainstream thinking of tomorrow.

Neoclassical economics is based on linear assumptions and created the term "externalities". It is in complete opposition to the complexity of living systems, and, despite developments in economic thinking recently by thought leaders such as Kate Raworth, Esther Duflo and Mariana Mazzucato, mainstream economics is still engrained into much of our business schools and financial institutions. It is completely ill-adapted to complex systems thinking and the necessity to take into account feedback loops, cocktails effects, and tipping points. As author Bill Baue points out, consequently, financial growth has been closely correlated with ecological degeneration, but also, to rampant inequalities.

The current situation leads to a paradox, where "irrational exuberance", as a core feature of humanity's current operations system (as discussed in an early section of the paper), leads to an exponential borrowing from other capitals through outsourcing and externalizing negative effects. The current pandemic of Covid 19 has accentuated the paradox by leading to even more poverty, while protecting the "ever more" rich among us. Today "incomes beyond satiation are associated with lower life evaluations," the paper points out. This leads to the need to move from Monocapitalism to Multicapitalism.

I commend the historical work performed in this report to bring to life the thinking around carrying capacities and thresholds. Multicapitalism to many might seems too radical, could I say "too new"? However, today, it is the only possible thinking to maintain earth and humanity in harmony. It is defined as "maintaining the carrying capacities of all vital capitals respecting normative thresholds", seeking dynamic balance between capitals rather than prioritizing the maximization of one (financial) at the expense of others.

To enable this Multicapitalism to come to life, Baue builds a network of thought leading organizations that you will all now have no excuse not to follow. Even better, he gives you examples of organizations that have been able to develop this thinking in practice. There is one simple formula for this: the Sustainability Quotient.[4] As early as 2006, Ben & Jerry piloted a science-based assessment of their corporate GHG emissions.[5]

So no, it is not impossible, not too radical, not too new for us, in business schools, in organizations, in institutions, and in governments to step forward and do better, by using this Multicapitalism thinking in our day-to-day work. Many examples of organizations and countries have been cited as exemplary to follow in this report, and many more are to come. Rob Gray and Jan Bebbington, as early as 1993, said about accounting for sustainable development "a sustainable organization is one which leaves the biosphere at the end of the accounting period no worse off than it was at the beginning of the accounting period" – this multi-capitalism report will guide you through to become "a sustainable organization", that is, a leader in tomorrow's world.[6]

Delphine Gibassier
Director | Multi-Capital Integrated Performance Research Centre,
Audencia Business School
Steering Board Member | r3.0

0.4. AUTHOR'S FOREWORD

It's been a long time comin'
It's goin' to be a long time gone
And it appears to be a long night
Before the dawn
David Crosby 1969

This paper has been a long time coming. This fact itself tells an integral part of the story that this paper conveys.

The seeds got planted at the 2017 r3.0 Conference at KPMG's glassy headquarters in Amsterdam, where then-Markets Director Sarah Grey and then-Managing Director Neil Stevenson of the International Integrated Reporting Council (IIRC) each keynoted different sessions. IIRC had integrated the multiple capitals into its International Integrated Reporting Framework in 2013,[7] the same year r3.0 launched with an embrace of the carrying capacities of the capitals concept that r3.0 Advocation Partner Mark McElroy had established a half-decade earlier.[8]

Over the next year, whenever he found himself at gatherings with IIRC folk, r3.0 Steering Board Member Brendan LeBlanc of EY (and an IIRC Ambassador) socialized the idea of a collaboration between r3.0 and IIRC around Multicapitalism, the concept McElroy conceived with his colleague Martin Thomas (a former Unilever finance executive) as a logical extension of the carrying capacities of the capitals notion.[9] In Spring 2018 in Boston, LeBlanc set up a meeting between me and then-IIRC CEO Richard Howitt, who commenced the meeting saying: "You don't need to convince me, Bill: I'm already sold!"

Howitt announced the partnership and Multicapitalism White Paper project in his keynote at the 2018 r3.0 Conference at KPMG in Amsterdam (again), accompanied by an article by Howitt and r3.0 Managing Director Ralph Thurm on *Thomson Reuters*.[10] Now, we just needed to raise a modest amount of funding to support the project.

This is where the timeline expands. It took a full half-year for r3.0 to secure the first third of the budget: a lunch at Pershing Square across from Grand Central Station in New York City with Institute of Management Accountants (IMA) Board Member Brad Monterio led to support from IMA CEO Jeff Thomson. We thank Brad, Jeff, and IMA for their generous support! The remaining two-thirds of the budget proved impossible for IIRC to raise externally, so when Howitt again spoke at the r3.0 Conference about the project in 2019, he committed internal IIRC funds to support it.

This aspect of the storyline is significant. Images of the Stockholm Resilience Centre's Planetary Boundaries and Kate Raworth's Doughnut Economics (examples of carrying capacity thresholds in ecological and social systems) routinely showed up in presentations and reports by leaders and funders in the field, but apparently, they were reluctant to put their money where their mouth is. Either Multicapitalism was a really stupid idea, unworthy of support, or it was *too good* an idea – perhaps because it reveals shortcomings of existing practices in the field – or maybe there was some other unseen problem. I'll let you judge what's true after reading this White Paper.

Now, after holding space for writing the paper for an entire year, we at r3.0 had "filled up our dance card" with other funded commitments for the coming year, so we had to squeeze work on this paper into the cracks. I finished a first draft at the turn of the year, and a final draft half-way through the year, when I sent it over to IIRC. Two months ago, IIRC came back to us with their feedback:

> It's a very important – *and very provocative* – paper.

So provocative, in fact, that IIRC determined it could not release the paper under its name. We at r3.0 are thankful that IIRC recognized that asking us for revisions that would make the paper politically palatable to IIRC's more conservative base would risk hollowing out the core message, so they stepped away instead. This demonstrated integrity.

It also demonstrates the very conundrum at the core of this inquiry, addressed late in the paper (consider this incentive to get there): the gulf between political possibilities on the one hand, and thermodynamic realities and ethical imperatives on the other hand.

You could say that the fields of corporate sustainability and sustainable investing, integrated reporting, ESG (environmental, social and governance considerations), impact management, etc… all "live in the political world" (with a head-nod to Bob Dylan), as they all pursue incremental progress as the boundary of what's politically possible.[11] But is incremental progress sufficient, given the challenges we face in the Anthropocene?

No, we believe not. We prefer to "live in the material world" (with head-nods to Madonna and George Harrison) governed by thermodynamic realities and ethical imperatives as guides to human solutions.[12] You could say that existing initiatives are heading toward Multicapitalism but they can't make it there so long as their ambition is politically bounded by the demands of Monocapitalism. Achieving Multicapitalism requires embracing a normative vision that's aligned with the demands of the material world, as we best understand them – political feasibility is, at best, a secondary strategic consideration.

With this epic struggle between the political and material worlds, it is perhaps unsurprising that we as a society remain in the "long night" of this Foreword's epigraph. Our hope is that this White Paper starts to shed dawning light.

Bill Baue
Senior Director | r3.0

1. EXECUTIVE SUMMARY

The paradigm shift from Monocapitalism to Multicapitalism is necessary, inevitable, and already well underway. This White Paper lays out the fatal flaws of the existing Monocapitalism paradigm, then outlines the historical, conceptual, and practical foundations of Multicapitalism in order to understand how this emerging paradigm not only resolves these fatal flaws, but also opens the door to creating sustainable, regenerative, and thriveable business models and economic systems.[13]

This White Paper defines Monocapitalism and Multicapitalism as follows:

- **Monocapitalism**: capitalism designed to grow and concentrate one form of vital capital – financial capital – very often at the expense of the ongoing viability of other capitals;
- **Multicapitalism**: capitalism designed to maintain the carrying capacities of *all* vital capitals (natural, human, social, intellectual, constructed, and financial) respecting normative thresholds.[14]

The promised progress of the Monocapitalist paradigm, predicated on Economic Growth Theory, actually generates *decapitalization*,[15] whereby increases in one capital (financial) come at a cost to other capitals (natural, human, social, intellectual, and constructed), resulting in overall *devaluation* that not only destroys System Value, but also aggregates to create systemic risks – and ultimately existential risks.

After identifying the shortcomings of Monocapitalism (its sole focus on financial capital, and its "irrationally exuberant" fixation on economic growth and concentration, primarily through privatization), this White Paper lays out the case for Multicapitalism. The promise embedded in the emerging Multicapitalist paradigm rests on its transformative nature: in addition to its comprehensive scope (across all six capitals), Multicapitalism also calls for respecting the **carrying capacities of the capitals** as a means of creating **System Value** – or value that accrues in dynamic balance across *all* capitals, and the systems associated with them.[16]

In other words, Multicapitalism does not seek to continual growth of any single capital, but rather seeks to dynamically balance all capitals, as measured with respect to their carrying capacities. The seminal 1972 Club of Rome *Limits to Growth* report brought into our collective consciousness the concept of carrying capacity, which distinguishes sustainable and regenerative systems on the one hand, from unsustainable systems that trigger **overshoot-and-collapse** dynamics on the other hand.[17] The carrying capacity concept applies to both ecological and social sustainability thresholds, which can be allocated to the sub-system levels – such as the company, portfolio, or national level – hence the notion of **thresholds and allocations**.[18]

The carrying capacities of the capitals can be measured and assessed by applying the **Sustainability Quotient**, which holds that S=A/N, or Sustainability = Actual Impacts (on the carrying capacities of the capitals) / Normative Impacts (on the carrying capacities of the capitals).[19] Attempts to transcend Mono-capitalism have been hampered by focusing only on the numerator, seeking incremental improvements on actual impacts; actualizing Multicapitalism requires adding the normative denominator to guide these actual impacts into the "Safe and Just Operating Space" of *bona fide* sustainability.[20]

After a **Survey of Existing Initiatives** that address 1) the multiple capitals, 2) carrying capacity thresholds, and 3) the carrying capacities of the capitals, this White Paper provides **Case Studies** of Multicapitalism applied at three levels of scale:

- **Micro (Company) Level**
  - Griffith Foods
  - Agri-Mark / Cabot Creamery Cooperative
  - Tourism Holdings Limited (thl)
  - Novo Nordisk
- **Meso (Portfolio) Level**
  - Asset Owner Integrated Reporting and Threshold Investing
- **Macro (National) Level**
  - EY MultiCapital Scorecard implementation
  - Wellbeing Economy Governments (WEGo) Alliance

The White Paper ends with a set of Proposed Pathways to spur the emergence of Multicapitalism, starting from the need for a paradigm shift from current incrementalism, hampered as it is by considerations of the political world, to normative mindset focused on the carrying capacity thresholds of what's required by the material world of thermodynamic reality. Global Reporting Initiative Co-Founder Allen White calls this approach (which has been prevalent for the past two decades) "Numeration" as it only assesses the numerator of the Sustainability Quotient. White notes that a paradigm shift to Multicapitalism requires an embrace of "Denomination," or the integration of carrying capacity thresholds into the assessment of our impacts on the multiple capitals.

The Pathways explored cover the corporate, investment, economic, and policy realms.

- On the **corporate front**, the Pathways address the specific areas of:
  - Performance Accounting;
  - Management Practices and Principles;
  - Data Flows and Information System Architecture;
  - Reporting Standards;
  - Business Model Design; and
  - Transformation Triggering.
- On the **investment front**, the Pathways traverse from asset owner integrated reporting to more comprehensive application of Threshold Investing as a means of applying Multicapitalist thinking.
- On the **economic front,** support must shift from Economic Growth Theory to Post Growth and De-growth doctrines,[21] and economic system design must shift from a supply and demand orientation to align with resource thresholds and population allocations and thereby design economies as ecosystems.[23]
- On the **policy front**, global governance needs to adopt policy orientation toward a carrying capacity regime. This will entail abandoning Gross Domestic Product as the global benchmark of progress, and embracing instead measures aligned with ecological and social thresholds. It will also entail abandoning the mindset of progress through economic growth, and embracing an ethic of abundance through sufficiency for all.

These Pathways set the foundation for a final **Call to Action**, which returns to the core first principles of Multicapitalism:

- First, entities need to identify the vital capital resources they impact;
- Second, they need to identify the rightsholders who also rely on those resources for their well-being;
- Third, they need to identify where their impacts fall in regards to the carrying capacities of those vital capital resources.

In the paradigm of Monocapitalism, these considerations are absent from consideration, and therefore, impacts inevitably transgress carrying capacities, at the organizational and, in aggregate, at the collective level, resulting in systemic risks that have coalesced into existential risks. Monocapitalism is literally killing us.

Multicapitalism, by contrast, assesses the carrying capacities of the capitals, and thereby enables organizations to manage their impacts sustainably, enabling us to manage our collective impacts in ways that respect and uphold these carrying capacities. Multicapitalism, therefore, is our route to sustainability, regeneration, and thriveability.

2. INTRODUCTION

Suddenly everyone was saying capitalism had failed. We started worrying about pitchforks.
Anonymous Wall Street chief executive, 2019[24]

Worldview. Paradigm. Frame. These are cousin concepts. What matters more than the one you choose to use is to realise that you have one in the first place, because then you have the power to question and change it…
Kate Raworth, 2017[25]

The difficulty lies not in the new ideas, but in the old ones which ramify, for those of us brought up as most of us have been, into the very corners of our minds.
John Maynard Keynes, 1936[26]

Misperception is the problem to be overcome by a paradigm shift, and only a paradigm shift can overcome it. Misperception will tend to motivate efforts to pursue ostensible "solutions" that will, when the circumstances are so much different from what people suppose them to be, make matters worse instead of better.
William Catton, 1980[27]

You could say paradigms are harder to change than anything else about a system… But there's nothing physical or expensive or even slow in the process of paradigm change. In a single individual, it can happen in a millisecond. All it takes is a click in the mind, a falling of scales from eyes, a new way of seeing.
Donella Meadows, 1999[28]

"Does capitalism need saving from itself?" asked a late-2019 *Financial Times* headline to a column by Editorial Board Chair Gillian Tett.[29] This sentiment encapsulates the zeitgeist of our time – when even the staunchest of pro-capitalist institutions questions whether capitalism is a dying paradigm, in need of replacement with a new paradigm better suited to meet the challenges of our epoch (having shifted from the Holocene to the Anthropocene.)[30]

Indeed, in the face of a climate emergency burning continents[31] and threatening to hurtle us into a "hothouse earth,"[32] a species extinction rate a thousand-fold higher than the background rate,[33] a global pandemic,[34] rising global economic inequality that "can lead to various sorts of political, economic, and social catastrophes,"[35] and a host of other systemic dysfunctions, even mainstream capitalists increasingly embrace the idea that capitalism needs transformation.[36] Many believe that capitalism, *as currently practiced*, is the root cause humanity's predicament – which extends as far as the existential risk of civilization collapses and even possible extinction.[37] At the same time, if the constructive elements of capitalism can be configured properly, its power to operate at the proper pace, scale, and scope shows promise to serve as a savior.

"As currently practiced" is the key variable. In current practice, capitalism focuses monolithically on **financial growth**, hewing to the assumption that this is the most efficient engine of progress. But is that actually true – does economic growth lead inexorably to progress? The research suggests otherwise. Financial growth that exacerbates income and wealth disparity, for example, ends up undermining the wellbeing of both the poor *and* the rich.[38] Researchers propose instead a kind of "spirit level" of balance when it comes to material distribution. (See **Figure 1** below)

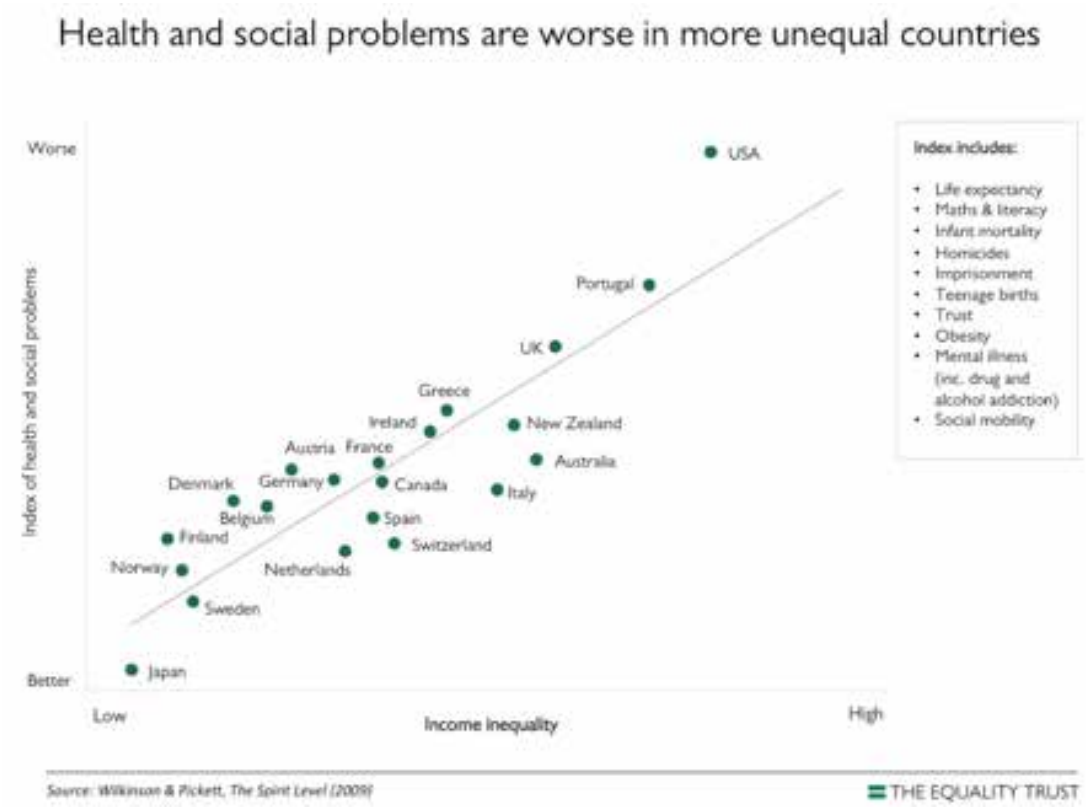
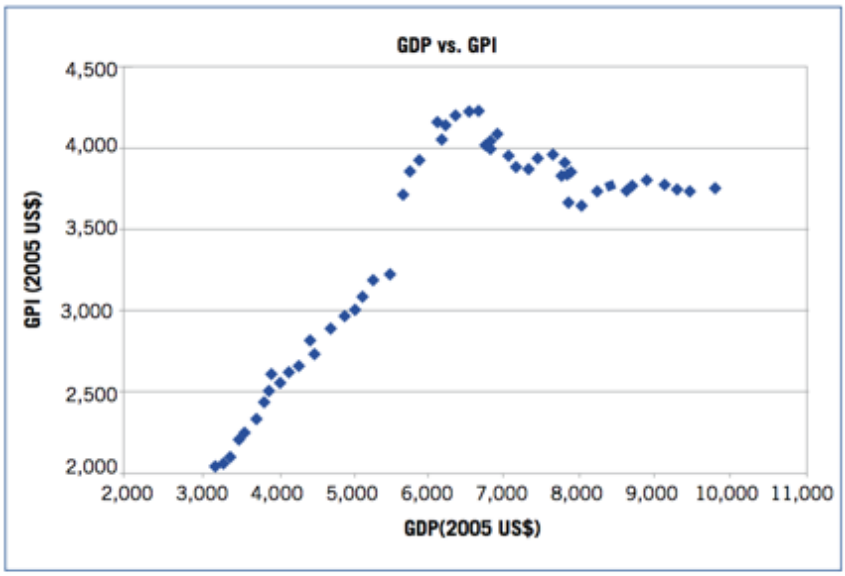


Figure 1: Wilkinson & Pickett 2009[39]

Other research shows how Gross Domestic Product (GDP – which primarily measures economic growth) and Genuine Progress Indicators (GPI – which measures well-being more broadly, inclusive of economic growth) rise in tandem until about $7k per capita, when the correlation plateaus, before falling – suggesting limits to benefits of economic growth.[40] (See **Figure 2** below)



Note: GDP per capita and GPI per capita are positively correlated (R^2=0.98) until GDP of roughly US$7000 after which they are negatively correlated (R^2=0.61). Source: Kubiszewski et al. (2013)

Figure 2: Berik 2018

Personal income studies find a similar Hubbert Curve-like rise-peak-fall dynamic.[41] A 2019 study finds alignment between rising income and greater emotional wellbeing until a kind of "peak happiness" level of $75k a year, which the researchers call "satiation." Broadly speaking, "incomes beyond satiation are associated with lower life evaluations," the researchers say. In other words, when our primary economic needs and wants have been satisfied, richer is actually worse – yet another limit to economic growth as an unalloyed "good."[42]

In addition to these socioeconomic problems, financial growth also closely correlates with ecological degeneration, which likewise ultimately undermines the wellbeing of both rich and poor. The Great Acceleration graphs for earth system (and socioeconomic) trends parallel global GDP growth graphs – they all resemble hockey sticks, with unsustainable upward trajectories.[43] As the old saying goes: *what goes up must come down*. (See **Figures 3 and 4** below.)

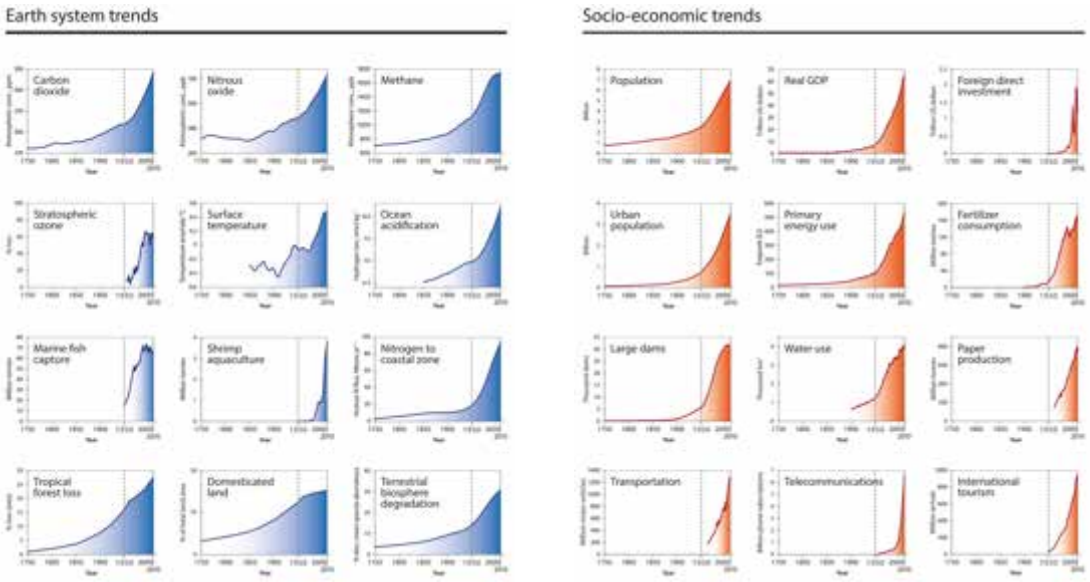


Figure 3: Steffen et al. 2015[44]

Figure 4: Roser 2018[45]

Perhaps the fatal flaw is not capitalism *per se*, but rather its *current practice* – its monolithic focus on financial growth. In other words, perhaps the problem is Monocapitalism. And following the next logical step, perhaps the solution is Multicapitalism. These two terms were coined in 2014 by Mark McElroy and Martin Thomas, drawing on the long history of capital theory.[46] With subsequent refinements, the terms are defined as follows:

Monocapitalism: capitalism designed to grow and concentrate one form of vital capital – financial capital – very often at the expense of the ongoing viability of other capitals;
Multicapitalism: capitalism designed to maintain the carrying capacities of all vital capitals (natural, human, social, intellectual, constructed, and financial) respecting normative thresholds.[47]

The definition of Multicapitalism begs the question: what are "normative thresholds" that define the "carrying capacities" of the vital capitals? It is perhaps easiest to explain in the context of the Coronavirus pandemic.

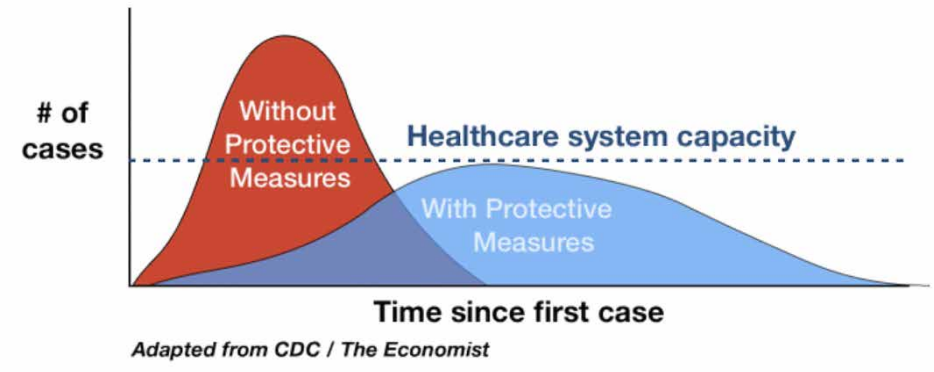


Figure 5: Harris 2020[48]

The meme in Figure 5 "went viral" in March 2020 as a visual demonstration of the importance of taking precautionary measures (such as social distancing and mask-wearing) to "flatten the curve" of COVID-19 cases, in order to prevent an exponential rise that surpasses the carrying capacity of the healthcare system. This system, after all, is comprised of the constructed capital of hospitals, beds, ventilators, etc… combined with the human capital of medical knowledge held by doctors, nurses, first responders, etc…, woven together through the social capital of emergency room and intensive care unit team work and administrative protocols, etc…

Interestingly, versions of this graphic had been produced by the US Centers for Disease Control and Prevention more than a decade before,[49] but it wasn't until the dotted line was added that understanding of their significance really took hold.[50] The dotted line represents a normative threshold of the carrying capacity of the healthcare system: below the line, the system can handle the Covid cases; above the line, the system becomes overwhelmed, like an overloaded ship taking on water.

Multicapitalism holds that such carrying capacity thresholds apply across all of the capitals.[51] These thresholds distinguish healthy capital resource stocks, which can continue to generate healthy flows, from unhealthy stocks, too compromised to produce healthy flows.

This White Paper lays out the case for a societal transition – a paradigm shift – from Monocapitalism to Multicapitalism. It also identifies the existing trends creating momentum in this direction.

The foundations for integrated reporting are firmly established on the multiple capitals, as demonstrated in its 2013 *International Integrated Reporting Framework*:

> "An integrated report aims to provide insight about the resources and relationships used and affected by an organization – these are collectively referred to as "**the capitals**" in this Framework. It also seeks to explain how the organization interacts with the external environment and the capitals to create value over the short, medium, and long term.
>
> The **capitals are stocks of value** that are increased, decreased, or transformed through the activities and outputs of the organization. They are categorized in this Framework as **financial, manufactured, intellectual, human, social and relationship, and natural capital**…" [emphasis added][52]

The *<IR> Framework* also grounds itself in the notion that "integrated thinking" – or cognition of the interdependencies of the multiple capitals – is a next logical maturation step in the evolution of collective consciousness and societal adaptation to increasing complexities and challenges. Accordingly, a next step for integrated reporting is to embed the more developed thinking on the multiple capitals exhibited by the doctrine of Multicapitalism.

We at r3.0 believe that the shift from Monocapitalism to Multicapitalism carries profound implications, far beyond the realm of reporting, encompassing the necessary macro-level transformations in economic system design to confront today's "super wicked problems."[53]

Stepping back for this broader perspective, Monocapitalism and Multicapitalism represent competing paradigms, in the sense of the term established by Thomas Kuhn in his seminal 1962 book, *The Structure of Scientific Revolutions*. In it, he stated that the "significance of crises is the indication they provide that an occasion for retooling has arrived."[54] Humanity is now navigating multiple intertwining crises, providing an occasion for "retooling" the current Monocapitalist paradigm, which is thus ripe for being transcended by a new Multicapitalist paradigm.

This is precisely the point made by *Limits to Growth* Co-Author Dana Meadows in her influential 1999 essay, *Leverage Points: Places to Intervene in a System*. She places paradigms atop her list of twelve such leverage points: the mindset or paradigm out of which the system … arises.[55]

> Whole societies … resist challenges to their paradigm harder than they resist anything else. So how do you change paradigms? In a nutshell, you keep pointing at the anomalies and failures in the old paradigm, you keep coming yourself, and loudly and with assurance from the new one, you insert people with the new paradigm in places of public visibility and power. You don't waste time with reactionaries; rather you work with active change agents and with the vast middle ground of people who are open-minded.[56]

Meadows' focus on mindset change as the avenue for paradigm change aligns perfectly with the IIRC's emphasis on "integrated thinking" – and its close cousin, "multicapitalist thinking." The goal of this White Paper is to present the systemic, structural, strategic, and ethical shortcomings of Monocapitalism, as well as the strong case for Multicapitalism as a paradigm that transcends these shortcomings in ways that inspire new mindsets for you, the reader, to live into. We firmly believe that Multicapitalism represents the best way for capitalism to "save itself," and ideally help save humanity by replacing the strangling primacy of the shareholder value paradigm with the regenerative and distributive paradigm of system value creation.

2.1. SHORTCOMINGS OF MONOCAPITALISM

As suggested above, the shortcomings of Monocapitalism are essentially two-fold:

- its limited purview of financial capital alone; and
- its fixation on economic growth, and the concomitant concentration of financial capital.

This second point encompasses a subsidiary aspect – namely, financial capital concentration is often achieved through enclosure (or privatization) of the Commons. Nobel Laureate Elinor Ostrom defined the Commons more precisely as "common pool resources" – namely, the vital capital resources that exist in the world that we share for the common good, in order to meet the needs of all.[57] While Monocapitalism is predicated on private ownership, Multicapitalism is not thus burdened, as it recognizes that many of the capitals can be categorized as Common Capitals,[58] and thus require an economic doctrine predicated not only on private ownership but also on collective and cooperative stewardship that transcends the notion of ownership.

To set firm foundations for this White Paper, we explore each of these limitations, in turn, here at the outset.

2.1.1. CAPITAL: SINGULAR OR PLURAL?

The other worde, the Italians call the Capitall, that is to saie, the Stocke or principall that
the Marchant began with all.... And it is at your pleasure whether ye will use
this worde Stocke in Englishe, or Capitale.
Jan Ympyn Christoffels, 1547[59]

A stock of wealth existing at any instant of time is called capital.
A flow of services through a period of time is called income.
Irving Fisher, 1906[60]

The essential measure of the success of the economy is not production and consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including in this the state of human bodies and minds included in the system.
Kenneth Boulding, 1966[61]

[A] more functional definition of capital [is] 'a stock that yields a flow of valuable goods and services into the future.'
Bob Costanza & Herman Daly, 1992[62]

Extending the definition of capital to natural, human, and social capital could provide an easily understood base for calculating and integrating [sustainable development].
Dana Meadows, 1998

Vital capital is a stock of anything that yields a flow of valuable goods or services important to human well-being.
Mark McElroy & Jo van Engelen, 2012[63]

While common consciousness conflates capital with cash, the term applies more broadly, as we can see by tracing back to its origins. Double-entry bookkeeping, which dates back to Roman and Egyptian antiquity, was first codified in Franciscan friar Luca Pacioli's 1494 treatise, *Summa de arithmetica, geometria, proportioni et proportionalità*.[64] In Jan Ympyn Christoffels' first English translation of this seminal text a half-century later, he proposed that the term "capital" could be considered synonymous with "stock":

> The other worde, the Italians call the Capitall, that is to saie, the Stocke or principall that the Marchant began with all.... And it is at your pleasure whether ye will use this worde Stocke in Englishe, or Capitale.[65]

This etymology has important implications, as the term "stock" carries very broad denotations and connotations, stemming from the Old English notion of the "trunk" (of a tree) and developed in late Middle English from the notion of "growth from a central stem."[66] The fundamental point is that the term "capital" has *never* carried a singular, exclusively financial denotation, but has always carried much wider application associated with the "firm foundation" of "stock" from which growth flows.

This "stocks" and "flows" notion of "capital," which serves as a foundation of Multicapitalism (as we will explore in more depth in later chapters), was enshrined in the pioneering 1906 work of Irving Fisher, *The Nature of Capital and Income*. Here, he defined capital as a

> *stock of wealth* existing at any *instant* of time.[67]

Fisher paired this concept directly with his definition of income as a

> *flow of services* through a period of time.[68]

Note that common consciousness often conflates "wealth" with financial wherewithal, but the term is by no means limited to this lens. The *Oxford* dictionary defines wealth as "abundance of valuable possessions" and even "plentiful supplies of a particular resource," and traces its etymological roots back to "well-being," from "weal" or the "pattern of health."[69] This last connection is vitally important, as we shall shortly see.

In 1949, economist Kenneth Boulding diversified the definition of capital beyond finance quite explicitly, naming four types of non-financial capital: human capital, cultural capital, intellectual capital, and geological capital (a subset of what we now call natural capital).[70] Several key figures advanced this multiple capital definition, including:

- In 1992, Paul Ekins published "A four-capital model of wealth creation" in which he proposed "environmental," "human," "physically produced," and "social/organizational" capitals.[71]
- In 1997, in his book *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, John Elkington coined the term "Triple Bottom Line," which focuses on "economic prosperity, environmental quality, and – the element which business has preferred to overlook – social justice" by integrating "a better understanding not only of financial and physical forms of capital, but also of natural, human, and social capital."[72]
- In 1998, in her seminal *Indictators and Information Systems for Sustainable Development* report, Dana Meadows explicitly called for "extending the definition of capital to natural, human, and social capital" to "provide an easily understood base for calculating and integrating the Daly Triangle" – a visual representation of a causal relationship between the capitals, with natural capital representing the "ultimate means," built and human capital representing the "intermediate means," human and social (and financial) capital as the "intermediate ends," and well-being (not a capital itself, but the physical, emotional, psychological, and spiritual result of capital "appreciation") as the "ultimate ends."[73] (See **Figure 6** below)
- In 2005, in his book *Capitalism as if the World Mattered*, Jonathon Porritt proposed a "five capitals framework," consisting of natural, human, social, manufactured, and financial capitals.[74] Forum for the Future, the not-for-profit sustainability think tank he founded in 1996, popularized this framework through a graphical meme that represents financial and manufactured capitals nested within social and human capital, which are all nested within natural capital.[75] (See **Figure 7** below.)

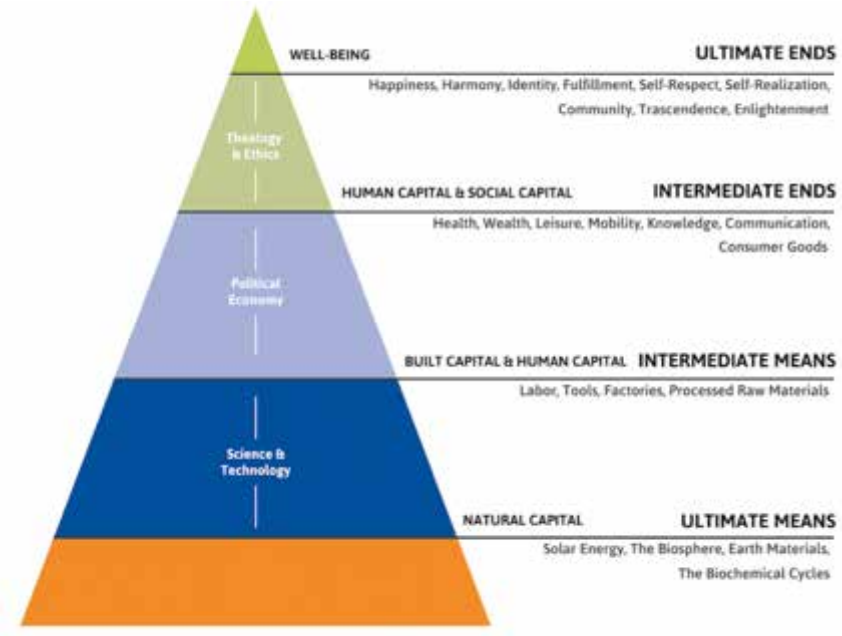


Figure 6: "Daly Triangle" Meadows 1998[76]

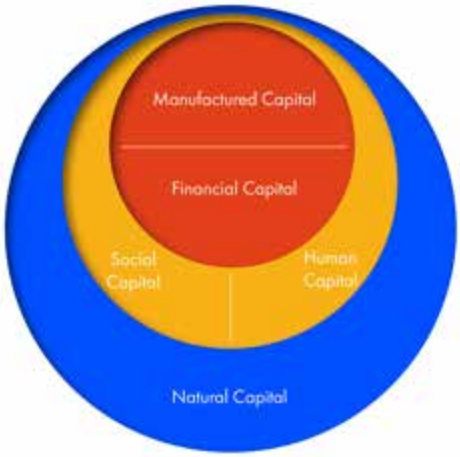


Figure 7: Forum for the Future[77]

In his book, Porritt defined "capital" as

> a stock of anything that has the capacity to generate a flow of benefits which are valued by humans.[78]

This definition brings us back to Boulding, who much earlier embraced and advanced a stocks-and-flows take on the capitals, as evidenced in one of his best-known essays, "The Economics of the Coming Spaceship Earth." Published in 1966, the essay contrasts the "open system" of the illimitable "cowboy economy" with the "closed system" of a bounded "spaceman economy." The density and artistry warrant quotation at length:

> For the sake of picturesqueness, I am tempted to call the open economy the "cowboy economy," the cowboy being symbolic of the illimitable plains and also associated with reckless, exploitative, romantic, and violent behavior, which is characteristic of open societies. The closed economy of the future might similarly be called the "spaceman" economy, in which the earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy.
>
> The difference between the two types of economy becomes most apparent in the attitude towards consumption. In the cowboy economy, consumption is regarded as a good thing and production likewise; and the success of the economy is measured by the amount of the throughput from the "factors of production," a part of which, at any rate, is extracted from the reservoirs of raw materials and noneconomic objects, and another part of which is output into the reservoirs of pollution. If there are infinite reservoirs from which material can be obtained and into which effluvia can be deposited, then the throughput is at least a plausible measure of the success of the economy…
>
> By contrast, in the spaceman economy, throughput is by no means a desideratum, and is indeed to be regarded as something to be minimized rather than maximized. The essential measure of the success of the economy is not production and consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including in this the state of human bodies and minds included in the system. In the spaceman economy, what we are primarily concerned with is stock maintenance, and any technological change which results in the maintenance of a given total stock with a lessened throughput (that is, less production and consumption) is clearly a gain. This idea that both production and consumption are bad things rather than good things is very strange to economists, who have been obsessed with the income-flow concepts to the exclusion, almost, of capital-stock concepts.[79]

Fast-forwarding back toward the present: in 1992 World Bank Economist Herman Daly (originator of the Triangle that bears his name), along with his Ecological Economics Co-Founder Bob Costanza, proposed a "more functional definition of capital," generalized beyond finance, as "a stock that yields a flow of valuable goods and services into the future."[80]

In their 2012 book *Corporate Sustainability Management*, Mark McElroy and Jo van Engelen distill all of these definitions to their essence:

Vital capital is a stock of anything that yields a flow of valuable goods or services important to human well-being.[81]

Importantly, they tied the term back to the roots of vitality and health (established a Century earlier by Fisher). By commencing the definition with the term "vital" and ending with the notion of "well-being," McElroy and van Engelen stress that these capital resources are not mere trifles for idle consideration, but rather *necessary* for humanity's sustenance and welfare.

Clearly, financial capital fits this definition, but not exclusively – natural, social, human, manufactured, and intellectual capital (among many others, as we will see later) fit this definition just as clearly. And this exposes the first shortcoming of Monocapitalism: its singular focus on the lone capital of finance. This is an arbitrary boundary that excludes diverse forms of value that are inextricably embedded in the value creation process, which capitalism is supposed to advance. In this sense, Monocapitalism fails to live up to the richness embedded in the much broader cornucopia of capitals.

2.1.2. ECONOMIC GROWTH THEORY: DISCOUNTING THE FUTURE

In [William Nordhaus'] model, the welfare of future generations is given less weight than the current generation's welfare [...] given that future generations will be much richer than those now living.
Hal Varian, 2006[82]

[W]e must then ask whether we can candidly acknowledge that general affluence simply cannot last in the face of a carrying capacity deficit. That fact is perhaps only a trifle less repugnant than the idea that the buried remains of the Carboniferous period must not be taken as fuels.
William Catton, 1980

The goal of perpetual economic growth would be seen as nonsensical, partly because the finite material base cannot sustain it, partly because human fulfillment does not demand it.
Dana Meadows, 1998[83]

In late 2018, Yale Professor William Nordhaus won the Nobel Prize in Economics for addressing "the question of how we can achieve sustained and sustainable global economic growth" in his four-decade career on the economics of climate change.[84] His Dynamic Integrated model of Climate and the Economy (DICE) model, which "views climate change in the framework of economic growth theory," pivots on the question of time discount rates, asking if it's wiser to spend now, or later, to combat climate change.[85]

His answer? Later.

In his Nobel lecture, he presents an "optimal" scenario that employs a discount rate of about 3 percent, which would stabilize global temperature at about 3.5 degrees Celsius above pre-Industrial levels (or 3.5°C) to achieve the "ideal" balance of economic impacts against climate change impacts (see **Figure 8**).[86]

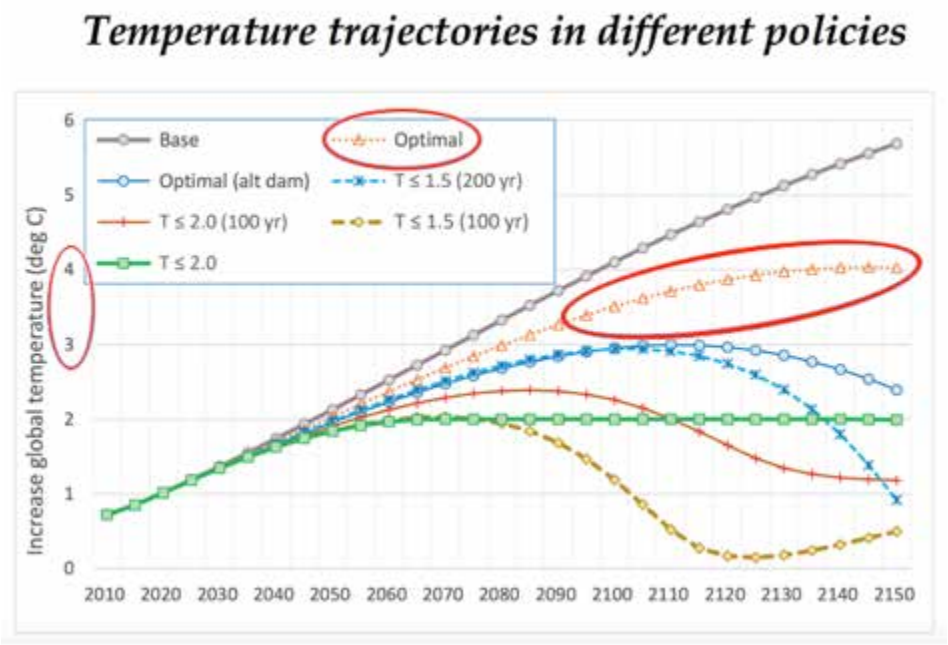


Figure 8: William Nordhaus, 2018[87] [emphasis added]

Global scientific[88] and political[89] consensus consider 1.5C to be the "safe limit" of global temperature rise, with an outer limit of 2C, suggesting a radically different interpretation of the term "optimal" from that of Prof. Nordhaus.[90]

Interestingly, Sir Nicolas Stern, who at the behest of the UK Treasury Department authored the 2006 *Stern Review of the Economics of Climate Change* – widely considered the most comprehensive review of the economics of climate change – did not receive a Nobel Prize.[91] Lord Stern proposed a discount rate of 0.1 percent, "implying almost equal weight to all generations," according to Berkeley Economist Hal Varian in a *New York Times* comparison of the Stern and Nordhaus approaches.[92]

By contrast, in Nordhaus' model, "the welfare of future generations is given less weight than the current generation's welfare [...] given that future generations will be much richer than those now living," Prof. Varian explains. The "fact" that future generations will necessarily be richer than current generations is taken as axiomatic – the notion that future generations might not be richer is not a possibility considered by economic growth theory. Prof. Nordhaus underlined this point to his Yale students on the day he learned of Nobel Prize:

> Don't let anyone distract you from the work at hand, which is economic growth.[93]

At the press conference about the Prize later that day, Yale President Peter Salovey lauded Nordhaus for "inspiring every one of us to realize Yale's mission, which is to improve the world today and for future generations through outstanding research and scholarship, education, preservation, and practice."[94]

But does Prof. Nordhaus' work (and economic growth theory more generally) actually "improve the world today *and for future generations* through … *preservation*"? The assumption underlying Nordhaus' work (and of the Nobel Prize in Economics) is that economic growth "today and for future generations" improves the world *more* than climate change deteriorates the world. This is a questionable claim, given that a healthy climatic system underpins the ability to generate economic value, much less growth – and that resources and pollution sinks are not "illimitable," in Boulding's words.

And what about "preservation"? Climate scientist James Hansen and colleagues had this to say about it in a famous 2008 paper:

> If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO2 will need to be reduced from its current 385 ppm to at most 350 ppm, but likely less than that.[95]

How does 350 ppm (parts per million atmospheric carbon dioxide concentration) compare with Prof. Nordhaus' "optimal" 3.5°C warming scenario? A 2017 publication from the Yale School of Forestry & Environmental Studies (where Dr. Nordhaus holds a professorship) has this to say:

> At the current rate of growth in CO2, levels will hit 500 ppm within 50 years, putting us on track to reach temperature boosts of perhaps more than 3 degrees C (5.4°F) — a level that climate scientists say would cause bouts of extreme weather and sea level rise that would endanger global food supplies, cause disruptive mass migrations, and even destroy the Amazon rainforest through drought and fire.[96]

The Nordhaus "optimal" 3.5°C model may project preservation of economic growth, but at the expense of preserving "a planet similar to that on which civilization developed and to which life on earth is adapted." This conflict is not lost on keen observers, such as Jason Hickel of the London School of Economic, who notes that

> Nordhaus reasons that the sectors most vulnerable to global warming—agricultural, forestry, and fishing—contribute relatively little to global GDP, only about 4 percent. So even if the entire global agricultural system were to collapse in the future, the costs, in terms of world GDP, would be minimal.
>
> These arguments obviously offend common sense. And indeed, scientists have been quick to critique them. It's absurd to believe that the global economy would just keep chugging along despite a collapse in the world's food supply. And mass extinction of species poses a very real threat to the web of life itself, on which all of human civilization depends. Plus, Nordhaus doesn't factor in the possibility of feedback loops that could kick in—Arctic methane release, ice-albedo feedback, and others we can't yet predict—pushing us way beyond 3.5 degrees. No amount of wealth would be enough to help future generations navigate such a total system collapse.[97]

This last point is fundamentally important – neoclassical economics, and economic growth theory in particular, are based on linear assumptions, and therefore do not take into account non-linear possibilities that are nonetheless abundant in living systems. As Center for Applied Cultural Evolution Executive Director Joe Brewer points out: "economics, as a scientific endeavor, got its beginning by studying dead matter – not living matter."

> In the late eighteen-hundreds, the best science available was statistical physics or thermodynamics, the study of the state of a piece of some matter like a liquid or a gas where you can have mathematical tools to tell you things like temperature, pressure, and density, all of which are bulk measures of the statistical properties for trillions and trillions of atoms or molecules. The mathematics they had back then required them to add up the average values for these different molecules assuming that they were at equilibrium because they didn't have any way of doing the calculations in any other way at the time.[98]

Despite developments in non-equilibrium thermodynamics, evolutionary biology, systems science, and complexity science (among many other disciplines), economics remains stuck in equilibrium (or linear) mathematics, and thus is unable to account for complex adaptive systems, which exhibit non-linear developments when stressed past tipping points. As pointed out earlier, such non-linear developments include civilization collapses, climate catastrophe, and existential risk of human extinction (to accompany the unprecedented species extinction unfolding currently).

In this sense, Prof. Nordhaus' 3 percent discount rate (tied to an "optimal" 3.5°C scenario) amounts to systemic infanticide. Locking in catastrophic climate change in the present, on the presumption of future economic growth that would ostensibly better "afford" the cleanup costs, essentially guarantees mass mortality for future generations (given that climate change is already causing thousands of premature deaths at its present level of severity).[99] When individuals postpone solving their own problems, assuming they can better afford to do so in an undetermined future, we call them irrational; when global leaders advocate such decisions that seal the fate of untold numbers of our descendants, the more appropriate term is intergenerational genocide.

2.1.3. THE AGE OF (IRRATIONAL) EXUBERANCE

The concept of irrational exuberance came to me in the bathtub
one morning as I was writing a speech.
Alan Greenspan, 2007[100]

Human population, organized into industrial societies and blind to the temporariness of carrying capacity supplements based on exhaustible resource dependence, responded by increasing more exuberantly than ever, even though this meant overshooting the number our planet could permanently support. Something akin to bankruptcy was the inevitable sequel.
William Catton, *Overshoot*, 1980[101]

US Federal Reserve Chair Alan Greenspan delivered a "shot heard round the world" speech in December 1996 when he posed the rhetorical question, "how do we know when irrational exuberance has unduly escalated asset values"?[102] In other words, are stock prices ballooning toward an inevitable pop? It took another three-plus years for the market bubble, driven by enthusiasm over "dot-com" stocks, to burst. But burst it did, on March 10, 2000 – as did the predatory mortgage bubble later that decade.

In the Greenspan neoliberal vision, "irrational exuberance" is an aberration from the norm of perpetual economic growth (or "rational exuberance," one must assume). In his 1980 masterwork *Overshoot*, Washington State University Sociology Professor William Catton characterizes human exuberance in much different terms, spanning a much longer historical arc:

> The past four centuries of magnificent progress were made possible by two non-repeatable achievements: (a) discovery of a second hemisphere, and (b) development of ways to exploit the planet's energy savings deposits, the fossil fuels. The resulting opportunities for economic and demographic exuberance convinced people that it was natural for the future to be better than the past. For a while that belief was a workable premise for our lives and institutions. But when the New World became more populated than the Old World had been, and when resource depletion became significant, the future had to be seen through different lenses.[103]

Prof. Catton defines the "Age of Exuberance" commencing with the discovery of the "New World," which (temporarily) relieved population (or more accurately, carrying capacity) pressures. However,

> the world reentered an age of population pressure. Its characteristics had to resemble, in certain ways, the basic features of the Old World of pre-Columbian times. Except that now there were ever so many more human beings, all parts of the planet were in touch with each other, per capita impact on the biosphere had become enormously amplified by technology, depletion of many of the earth's non-renewable resources was already far advanced – and the inhabitants of this post-exuberant world had acquired from the Age of Exuberance expectations of a perpetually expansive life.[104]

According to Catton, the paradigm of economic growth is a core tenet of the "Age of Exuberance," which humanity has since transcended to enter a "post-exuberant" era when we reap the consequences of our culture of carrying capacity overshoot. (Catton defines "carrying capacity" as "maximum permanently supportable load" and "overshoot" as "growth beyond an area's carrying capacity, leading to crash and die-off," as we will explore in more depth later. To illustrate these concepts, he cites the common example of yeast in a wine vat, which exuberantly consume the abundant stock of sugars until they "eventually die from the accumulation of alcohol and carbon dioxide they produce."[105]) As if presaging the Nordhaus Nobel some four decades later, Catton opined:

> The idea that mankind could encounter hardships that simply will not go away was unthinkable in the Age of Exuberance. This idea must be faced in the post-exuberant world.[106]

Applying Catton's logic, "irrational exuberance" is not an anomaly, but rather a core feature embedded in humanity's operating system for more than half a millennium. During the Age of Exuberance, humanity navigated a series of successions of transcending carrying capacity, and each time managed to postpone collapse by artificially enlarging localized carrying capacity through "borrowing" capacity from elsewhere in the system (e.g. outsourcing, among other processes). This, we call "progress" through technological innovation and other "developments" (chasing efficiency gains, outsourcing and globalization, externalizing negative effects, etc…)

While such substitutions and successions can occur in open systems (which externalize their effluvia outside the system), Boulding reminds us that closed systems (such as the earth we're a part of) do not abide such progression. So, our task is to recognize this exuberance for what it is, and to align with our post-exuberant reality by reconciling our operating system (namely, our economy) with our planet's carrying capacity. The best way to do this is to shift *post haste* from a Monocapitalist to a Multicapitalist paradigm.

2.2. THE CASE FOR MULTICAPITALISM

We need to move beyond incrementalist 'numeration' indicators and add 'denomination' indicators tied to upper (ecological ceilings) and lower (social foundations) thresholds.
Allen White, Global Reporting Initiative Co-Founder, 2019[107]

From a common-sense perspective, the case for Multicapitalism is self-evident: it is a comprehensive and holistic doctrine that mirrors the dynamics of complex self-regulating living systems. In other words, Multicapitalism aligns and integrates with material reality, as it is most accurately understood as of now. This distinguishes Multicapitalism from Monocapitalism, in that the latter is a partial and exclusionary economic doctrine, predicated on the assumption of perpetual growth that is found nowhere in nature – wine vats included.

Importantly, Multicapitalism also distinguishes itself from other partial doctrines, including Corporate Social Responsibility (CSR), Corporate "Sustainability" (i.e., as currently practiced), Environment, Social & Governance (ESG), Impact Investing, Impact Valuation, Circular Economy, Conscious Capitalism, Inclusive Capitalism, Stakeholder Capitalism, etc..., which are all incrementalist in nature (more on this distinction below.)

Regenerative Capitalism, as defined by John Fullerton of the Capital Institute in his 2015 paper by this name, is the economic doctrine most closely aligned with Multicapitalism, as it similarly seeks dynamic balance between capitals instead of prioritizing maximizing one capital at the expense of others. For example, to illustrate the Principle of "Views Wealth Holistically" (one of eight Principles of a Regenerative Economy), Fullerton states:

> Once financial and material capital are sufficient to meet basic human needs, creating social capital within community and restoring natural capital in the world are valued above acquiring more financial capital.[108]

The best way to better understand the case for Multicapitalism is to explore its conceptual foundations. In a 2015 journal article, concept originators Mark McElroy and Martin Thomas (a former Unilever finance executive) lay out the ontology of Multicapitalism as comprising:

> (1) stocks and flows of vital capitals in the world;
> (2) organizations and their impacts on the capitals;
> (3) other parties (i.e. stakeholders) whose well-being depends on the capitals; and
> (4) norms, standards or thresholds for what organizations' impacts on the capitals must be, or not be, to be sufficient, sustainable and duly supportive of stakeholder well-being.[109]

The first and third elements have already been discussed earlier, and the second element is self-explanatory: organizations make use of the multiple capitals in their business models, and thus have impacts upon them, both negative (degenerative) and positive (regenerative).

The fourth element is what truly distinguishes Multicapitalism, which acknowledges real-world limits and thus the need for normative measures to guide operation within those limits. Such limits tend to be invisible when systems are operating well within them; they start to make themselves known when we begin to transgress limits.

For example, it wasn't until we began exhausting our forests that we conceived of the need to preserve them. The modern concept of "sustainability" can be traced back to 1713, when the Saxon mining minister Hans Carl von Carlowitz introduced the term ("Nachhaltende" in German) in his book *Sylvicultura Oeconomica*, which addressed Saxony's over-harvesting of timber that devastated its silver mining and metallurgy industries.

Therefore, the highest level of art, science, industry, and institutions in this country will have to make every effort to achieve conservation and cultivation of wood for continuous and sustained utilization, because it is an indispensable matter, without which a country cannot continue in its *esse*.[110]

Fast forward two-and-a-half centuries, and these localized limit-breaches began to make themselves known at the global level. At about the same time that humanity began to overshoot our Ecological Footprint (circa 1970 – see **Figure 9** below), Donella Meadows and her colleagues (including her then-husband Dennis Meadows, Jørgen Randers, and William Behrens) published *Limits to Growth*, the first computer simulation (World3) of vital resource trajectories globally that raised alarm bells on depletion trends leading to carrying capacity "overshoot and collapse."[111] (see **Figure 10**)

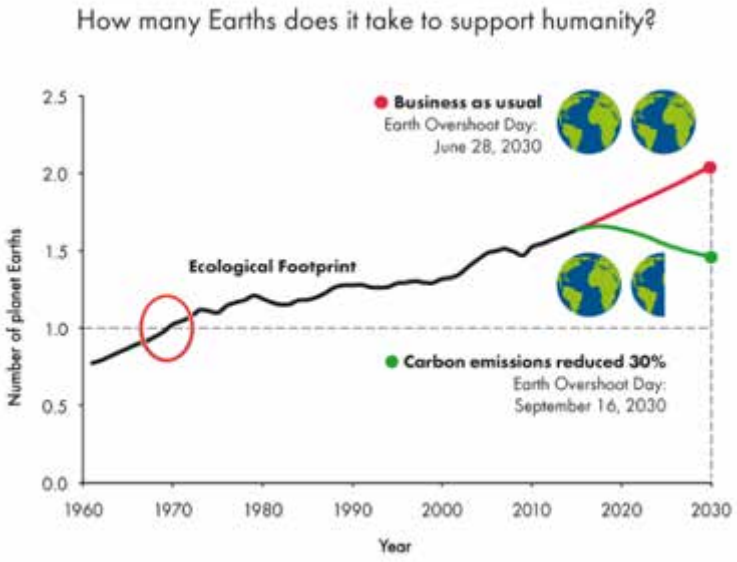


Figure 9: Global Footprint Network[112] [emphasis added]

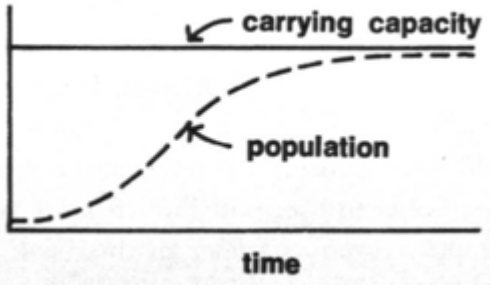


Figure 35 WORLD MODEL STANDARD RUN

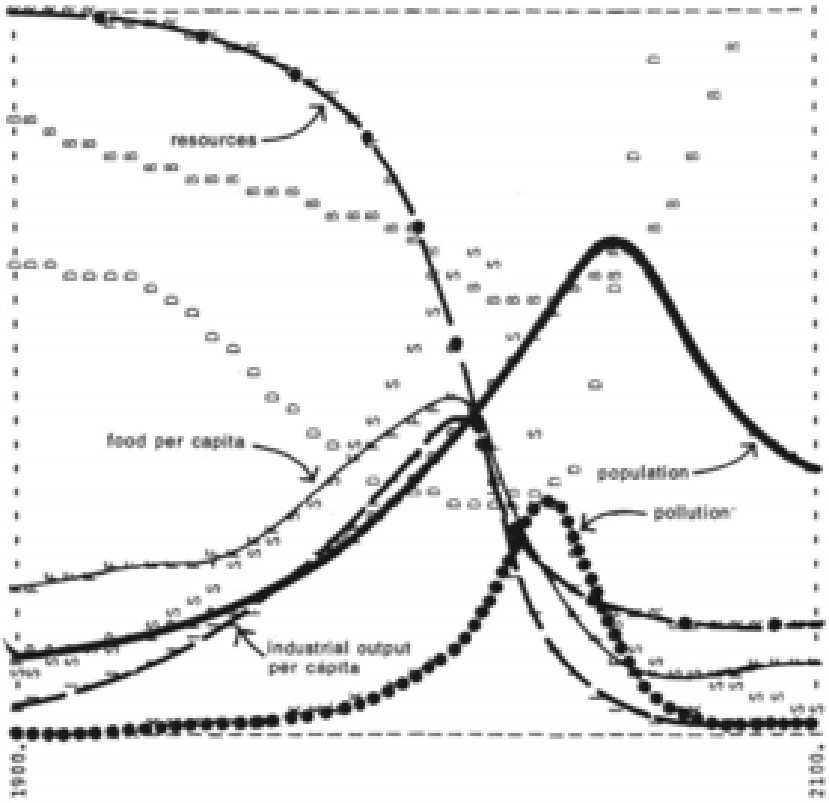


Figure 10: Meadows et al., 1972[113]

Fast forward three decades, to 2002 when the Global Reporting Initiative enshrined limits in its Second Generation of *Sustainability Reporting Guidelines*. There, it introduced the *Sustainability Context Principle*, which holds that

sustainability reporting draws significant meaning from the larger context of how performance at the organisational level affects **economic, environmental, and social capital formation and depletion** at a local, regional, or global level… reporting organisations should consider their individual performance in the … context of the **limits and demands** placed on economic, environmental, or social resources at a macro-level.[114] [emphasis added]

At about that same time, Dana Meadows was also starting to contemplate how to allocate these macro-level limits to micro-level organizations, along with Mark McElroy, Board Chair of the Sustainability Institute that she had established in the mid-1990s. After Dana's untimely death in 2001, Dr. McElroy continued their line of inquiry, crystallized by the GRI *Sustainability Context Principle*, and after about a decade of development, he introduced the concept of Context-Based Sustainability as a framework enabling implementation of the Context Principle – specifically, measuring organizational performance in the context of the limits to growth.[115]

Dr. McElroy introduced the Sustainability Quotient as a general specification for applying sustainability limits and thresholds. According to the Quotient, Sustainability (S) equals Actual Impacts (A) over Normative Impacts (N) on the Carrying Capacities of Capitals.[116] (see **Figure 11**)

Figure 11: McElroy, 2008[117]

In essence, the Sustainability Quotient encapsulates the world as-it-is (actual impacts in the numerator) compared to the world as-it-should-be (normative impacts in the denominator). The goal is for the world to *be* as it *should* be – namely, sustainable. The Sustainability Quotient enables us to discern if performance is as it should be (i.e. sustainable) – or not, in which case corrective measures are in order.

The United Nations Research Institute on Social Development (UNRISD) recently codified the Sustainability Quotient into a Three-Tiered Typology for its 4-year project on Sustainable Development Performance Indicators, as follows:

UNRISD Three-Tiered Typology of Sustainable Development Performance Indicators

- **Tier One:** ***Incrementalist Numeration***
  Numeration indicators focus on actual impacts, which include absolute indicators as well as "intensity" indicators that describe performance relative to a non-normative counterpart (such as unit of production), and are therefore incrementalist by definition.

- **Tier Two:** ***Contextualized Denomination***
  Denomination indicators contextualize actual impacts against normative impacts. Also known as "Context-Based" indicators, denominator indicators take into account sustainability thresholds in ecological, social, and economic systems, as well as allocations of those thresholds to organizations and other sub-system entities such as sectors, portfolios, or bioregional habitats.

- **Tier Three:** ***Activating Transformation***
  Transformation indicators add transcontextual elements of implementation practices and policies (as well as more ephemeral emergence) to normative indicators in order to instantiate sufficient change within complex adaptive systems.

Box 1: Baue, UNRISD, 2019[118]

This Typology applies more broadly than just to indicators; it also enables distinction between doctrines and frameworks that remain in the incrementalist (Tier One) realm, thus (by definition) advancing partial solutions, and those that identify the threshold delineating sustainable from unsustainable impacts (Tier Two). In this sense, all of the doctrines mentioned above (CSR, ESG, etc…) are Tier One (which are important in providing impact-level information for the numerator in the Sustainability Quotient), while Multicapitalism is Tier Two, as it takes a normative approach to operating within the carrying capacities of the capitals. Multicapitalism is also Tier Three, as it represents a significant transformation from the existing doctrine of Monocapitalism.

Global Reporting Initiative Co-Founder Allen White keynoted the UNRISD Conference where this Three-Tiered Typology was first introduced, and summarized the significance of the developments thus, starting off by quoting former Unilever CEO Paul Polman:

> **"Running publicly traded companies myopically for shareholders doesn't make damn sense. Why should the citizens of this world keep companies around whose sole purpose is the enrichment of a few people?... why do [companies] destroy the ability to live on this wonderful planet for future generations**, why do you treat people in a value chain the way you don't want to treat yourself or your own children, why do you use scarce resources which we don't have enough of, why do we refuse to take externalities into account into your business models and not take the responsibilities for the consequences, air pollution alone killing eight million people a year, it's a crime against humanity…"

Are the prevailing business models built on the domination of shareholder primacy, profit maximization, and limitless growth intrinsically antithetical to the sustainability agenda that most enlightened corporations claim to support? **Rigorous, systems-based sustainability measurement is not an option, but a necessity,** if companies are to dramatically elevate their contribution to reversing the multiple crises facing the planet. **The challenge before us, then, is not simply to refine the metrics we already use, but instead to rethink the scope and assumptions underlying prevailing practices.**

To meet this challenge, **next-generation measurement points to advancement beyond absolute metrics, so-called "numerators"** such as kilograms and liters, wages and workplace injuries, diversity and human rights — **to those that capture performance relative to scientific, economic, and social boundaries, benchmarks, and norms. Absent such "denomination," we will continue to move blindly forward, hoping that the collective impact of thousands of enterprises all "doing better" will avoid violation of the upper and lower boundaries.** Overshooting upper limits and undershooting minimum standards and norms is antithetical to building a just and livable world. **In other words, continuing to design measurement in what might be called a "context vacuum" is a fool's errand.**

Beyond such contextualization, we must attend to the full range of capitals—natural, social, human, intellectual, finance and built—that collectively constitute the stocks and flows of resources integral to building a thriving world. Preservation and enrichment of all these capitals is the litmus test of an enterprise's commitment to a truly sustainable strategy. **Strategies that undermine or drain one form of capital for enrichment of another—e.g., reducing R&D and worker benefits for purposes of bolstering short-term profits, dividends, and stock buybacks— runs counter to a robust, long term multi-capital strategy.**

Context and multi-capitalism are critical to this endeavor, as are generally accepted mechanisms for allocating responsibility for adherence to boundary conditions that define ecological ceilings and social floors.[119]

2.3. ETHICAL IMPERATIVE MEETS BUSINESS CASE

"There is therefore but one categorical imperative, namely, this: Act only on that maxim whereby you can at the same time will that it become a universal law."
Immanuel Kant, 1785[120]

Human self-restraint may serve human purposes better than human dominance of the biosphere can. Mankind derives benefits from ecosystems not dominated by man, benefits that may be unavailable from ecosystems man does dominate.
William Catton, 1980[121]

Anchoring Multicapitalism in the definition of "capital" grounded in the "ultimate end"[122] of well-being ("vital capital is a stock of anything that yields a flow of valuable goods or services important to human well-being"[123]) establishes an ethical underpinning to the doctrine. Furthermore, the third element of the Multicapitalism ontology ("other parties (i.e. stakeholders) whose well-being depends on the capitals") introduces explicit accountability for how business impacts capitals – *and others who rely on those capitals*. Finally, the normative directive of managing organizational impacts on capitals in ways that preserve those capitals for use by other stakeholders who rely on them for their well-being (or what r3.0 calls "rightsholders," as they have the fundamental right to well-being) further deepens the ethical foundations of Multicapitalism.

And seemingly paradoxically, ethical approaches actually advance a strong business case better than approaches that neglect to integrate ethical considerations. In *Overshoot*, William Catton points out that self-restraint advances self-interest, as it may be necessary "to protect the human species by curbing human dominance."[124] Monocapitalism is predicated on the dominance of financial growth over all other considerations – including the broader well-being of rightsholders and the biosphere. (Remember William Nordhaus' dictum: "Don't let anyone distract you from the work at hand, which is economic growth"!)

Multicapitalism, on the other hand, is predicated not on dominance, but on mutual consideration, applied not only on human-to-human interactions, but also on human interactions with other living species and non-living entities in the biosphere. While it's tempting to prioritize financial gain in the present, figuring it can buy well-being in the future, this formula ignores that well-being requires the very resources that near-term financial prioritization often undercuts. In common parlance, this "kicking the can down the road" is also called "shooting yourself in the foot." The stronger business case is to pursue financial gain precisely by supporting the ongoing health and viability of the vital capital resources business models depend on to remain "ongoing concerns."

Furthermore, supporting the ongoing viability of vital capital resources that the business – and its rightsholders – rely on for their well-being is wiser than overusing those resources, as adverse impacts on rightsholders also exert adverse impacts on the business, through reputation risks (of negative perception) and market risks (of lost consumer confidence), not to mention the physical risks (of resource depletion), etc…

Ultimately, Multicapitalism takes a "mass balance" approach,[125] grounded in Kant's Categorical Imperative:

> "There is therefore but one categorical imperative, namely, this: *Act only on that maxim whereby you can at the same time will that it become a universal law*."[126]

In other words, Kant asks us to ask ourselves, *if everyone does as I do, will the outcome be just for all? If everyone consumes resources like I do, will there still be resources enough for all*? Or *am I exceeding my fair-share "slice of the pie" – which would require that someone else get less than their fair share – or that we need more than one pie*. Mass balancing introduces discipline in recognizing that in closed systems (such as the earth), we have only one "pie," suggesting we must share it fairly. Monocapitalism systemically encourages concentration of resources, whereas Multicapitalism systemically encourages preservation of resources for continued use by all who have a rightful claim to them.

In its simplest formulation, Multicapitalism applies the ethic of Aesop's "goose that lays the golden egg" – or Shel Silverstein's *The Giving Tree* or Dr. Seuss' *The Lorax*: taking care of our resources and relationships in the present is the best guarantee of future benefits from "ongoing concern."[127]

2.4. THE ULTIMATE END: SYSTEM VALUE CREATION

Ultimately, value is to be interpreted by reference to thresholds and parameters established through stakeholder engagement and evidence about the carrying capacity and limits of resources on which stakeholders and companies rely for wellbeing and profit…
EY / IIRC, 2013[128]

A business model designed to maximize financial capital will not necessarily create the greatest value. From a value perspective, if a business model transforms capitals with a greater value (work capacity) than money into money, the transformation is inefficient. The result is more money but less value. In practical terms, this means the business model is producing less capacity to do work in the future. This paradox is at the root of neoclassical economics. Rather that capitalize resources it leads to an overall decapitalisation. More money but less capacity to bring about positive change. A paradox that eventually leads to a value crisis.

Peter Tunjic, 2018[129]

The intersection between impact measurement / management and value creation is like a busy crossroads that's continually under construction, with the solution of an efficient and effective intersection seeming ever elusive. To shift metaphors, the attention seems focused on seeing the trees more clearly, and losing perspective on the forest as a whole.

The IIRC spearheaded recent efforts helping to provide greater clarity. In its 2013 International <IR> Framework, IIRC introduced a graphic endearingly called the "Octopus" (though in reality the "creature" has not eight but twelves tentacles!) that maps how business models transform the multiple capitals from inputs to outputs that produce outcomes, resulting in value creation (and diminution) over time.[130] (see **Figure 12**) This flowchart (similar to Sankey diagrams of material flows[131]) helped visually crystallize the role of the multiple capitals and organizational business models in the value creation process.

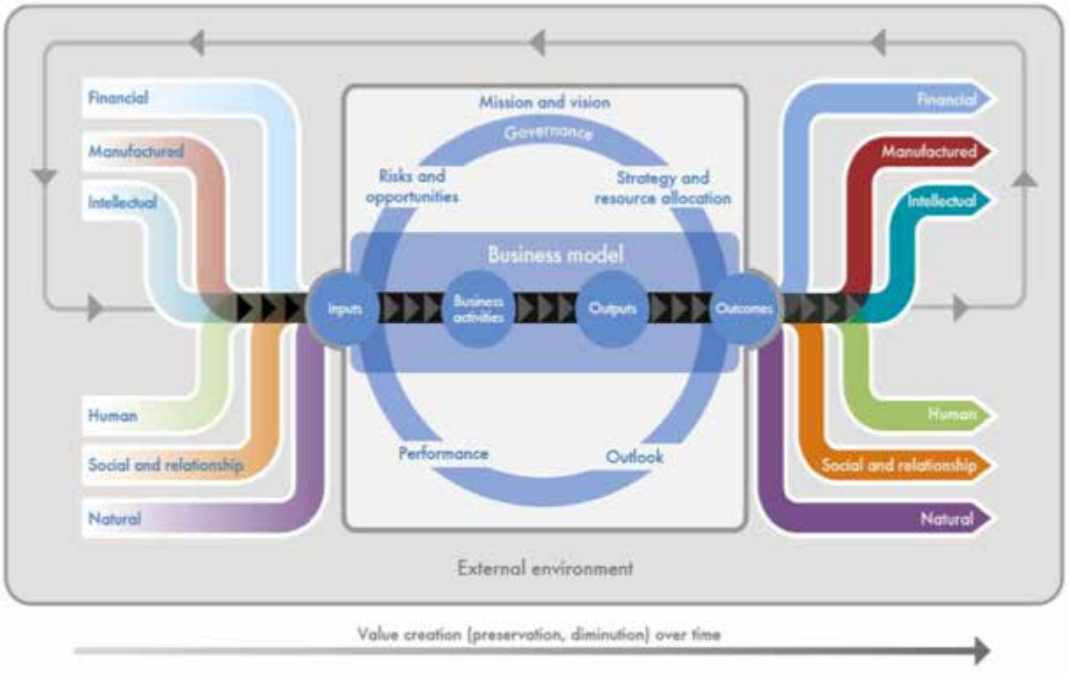


Figure 12: IIRC 2013[132]

Subsequent work has extended this flowchart in useful ways. Work by the German chemical company BASF expanded from "outcomes" to "impacts," a step that essentially introduces the question of attribution: "how much of the outcome would not have happened otherwise" (i.e. without the contribution of the organization in question). BASF also introduced a next step of "Value-to-Society" – in other words, what are the costs and benefits of these impacts to society at-large?[133] (See **Figure 13**)

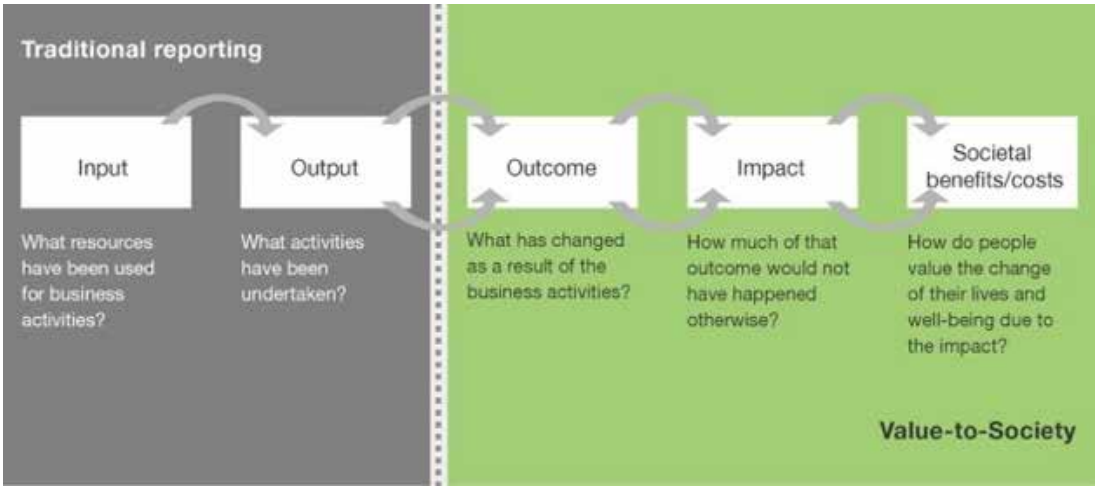


Figure 13: BASF 2018[134]

This approach has gained significant traction in the field. The Impact Valuation Roundtable (BASF plus a dozen other big companies, collaborating under the umbrella of the World Business Council for Sustainable Development) embraced the BASF Value-to-Society approach. (See **Figure 14**) The naming of the roundtable spotlights the fact that the approach applies a "valuation" approach, employing monetization to express the impacts in terms that are both "fungible" and readily understood by market actors.

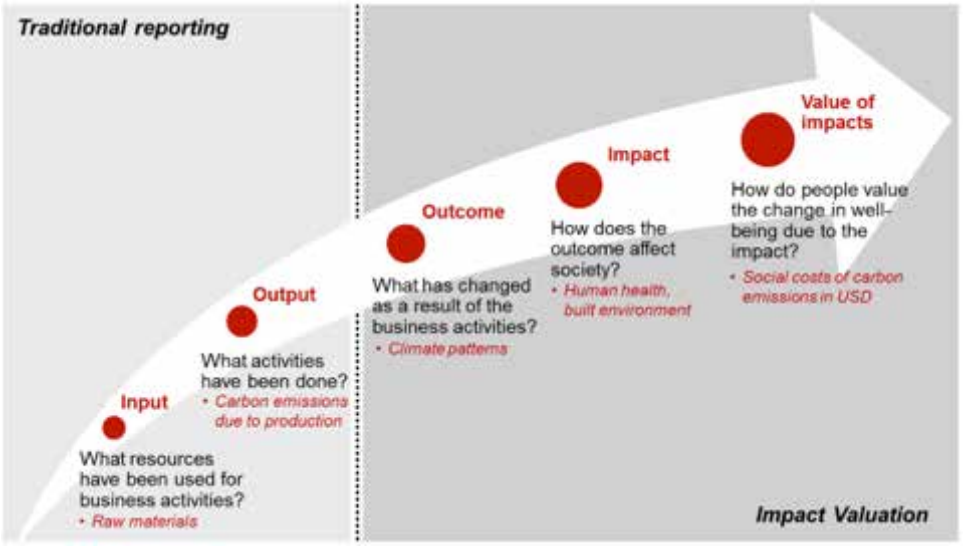


Figure 14: Impact Valuation Roundtable 2017[135]

How does one place a valuation on impacts? For its part, BASF measures all its impacts (positive and negative), and puts a price on them (i.e. "monetizes" or "valuates" them) in order to be able to compare them in common terms.[136]

Figure 15: Christian Heller (BASF) 2019[137]

Note that all of BASF's social and economic impacts are positive, whereas all its environmental impacts are negative. The Value-to-Society approach then "nets out" the impacts, enabling the company to claim that the positive social and economic impacts can offset (or "off-net") negative ecological impacts.

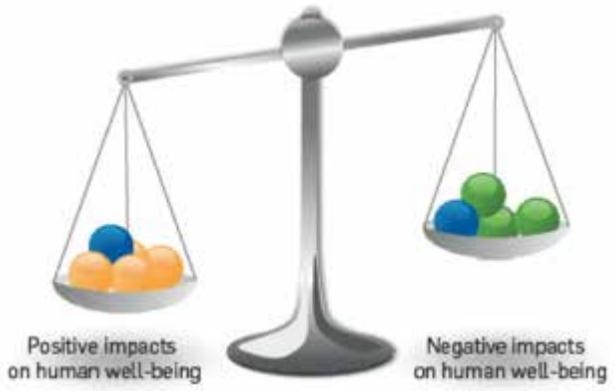


Figure 16: Christian Heller (BASF) 2019[138]

In technical terms, BASF's Value-to-Society methodology applies a "weak sustainability" approach that allows off-setting impacts on capitals (for example, degenerating natural capital to generate manufactured and social capital), instead of a "strong sustainability" approach that holds incommensurability and hence non-substitutability between capitals (natural capital cannot be "replaced" by social capital), and so precludes such capital offsetting.[139]

Despite this fundamental flaw, the Impact Valuation approach was sufficiently successful to enable its primary architect, Christian Heller of BASF, to spin it off into an independent initiative called the Value Balancing Alliance, which "aims to create a standardized model for measuring and disclosing the environmental, human, social and financial value companies provide to society."[140] Heller explained the overall value of this kind of approach thus:

> Moving from the traditional shareholder value concept to a "system value" approach, we truly value the impacts and interdependencies of society and business in a comprehensive system. This system serves as our foundation for shaping the future.[141]

This use of the term "system value" differs significantly from its origins. The concept was coined by Future-Fit Foundation Co-Founder and CEO Geoff Kendall, defining it broadly on the continuum from Shareholder Value (which prioritizes financial returns to shareholders) through Shared Value (which prioritizes financial gain that promotes social good, without accounting for social harm) to Systems Value (which views value holistically, aligning business value with social and ecological value).[142]

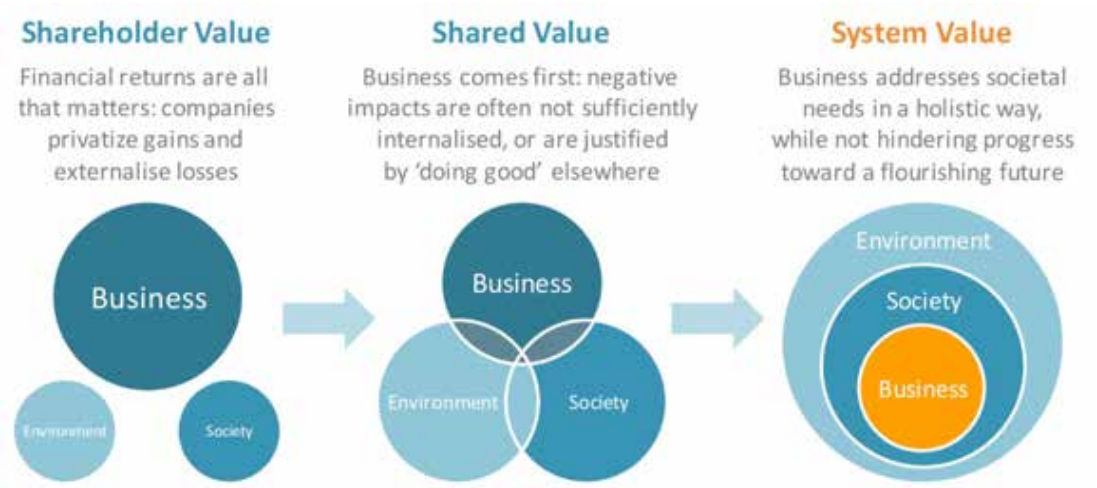


Figure 17: Future Fit 2017

The Future-Fit Foundation promulgates the Future Fit Business Benchmark, a framework that calls for companies to reach "a set of environmental and social thresholds that constitute the extra-financial break-even point for value creation, across the Triple Bottom Line." As suggested in the graphic, this falls within a "Requirement for Society" that constitutes "System Conditions defining the thresholds within which society must operate to protect the possibility of a flourishing future."[143]

In other words, creating System Value requires operating (at the micro / company level *and* the macro / systems levels) within ecological, social, and economic thresholds. System Value is therefore explicitly distinct from Impact Valuation, which operates without any reference to ecological, social, and economic thresholds.

In the real world, human benefit does not erase adverse environmental impact; quite the opposite: human thriving often comes at the cost of the environment, so *true* thriving must be redefined to align with vibrant environmental viability. Viewed through this lens, unabated environmental erosion (as is evidenced by the five-year results from BASF) eats away the future foundation that social benefit is built upon, undermining the system.

Creating System Value thus requires that systems thrive in healthy cycles of resource regeneration. Well-functioning systems create value from sufficiently abundant capital stocks to generate ongoing resource flows. So, System Value creation requires cycling resources within their carrying capacities.

The shortcomings of Impact Valuation (and similar doctrines and regimes) are two-fold, when it comes to *bona fide* value creation (i.e. taking a systemic perspective):

1. They do not attend to normative thresholds of the carrying capacities of capitals; and
2. Their application of monetization, intended to create comparability, actually distorts accurate perception of the non-fungibility of the capitals. Or, perhaps more accurately, that the transmission of value between and amongst the multiple capitals is not as simplistic as monetization captures.

Peter Tunjic, an Australian corporate lawyer who applies thermodynamic principles to corporate flows of energy and value, has formulated a theory of "capital dynamics," which he defines as

> the study of energy in its social form – value. The field examines the relationship between value, work, the forms of capital in which value accumulates, the entropic and other qualities of each form of capital and the conversion of value between different forms.[144]

Mr. Tunjic holds that "value is stored in capital … [it] is the energetic potential of a capital to do … the work of change." He continues:

> Value is created when one form of capital is transformed into another with greater potential value. This is called "capitalization." Put simply, the output capital could do more work than the input capital (after the costs of transformation).[145]

> A business model designed to maximize financial capital will not necessarily create the greatest value. From a value perspective, if a business models transforms capitals with a greater value (work capacity) than money into money, the transformation is inefficient. The result is more money but less value. In practical terms, this means the business model is producing less capacity to do work in the future.[146]

This false assumption – that transformation of non-financial capitals into financial capital represents a net-sum creation of value – represents an Achilles Heel of Monocapitalism. Mr. Tunjic continues:

> This paradox is at the root of neoclassical economics. Rather than capitalize resources, it leads to an overall decapitalisation. More money but less capacity to bring about positive change. A paradox that eventually leads to a value crisis.[147]

If "capitalization" exists, so too must "decapitalization," Mr. Tunjic reasons, as he explains in more depth thus:

> Decapitalisation results from an inefficient conversion of capitals that decreases net value calculated across all capitals. A theory of capitalism based on neo-classical economic assumptions is a recipe for the growth of financial capital and the decline of other capitals [because] … there is less value available to do the work of positive change. Capitalism cannot defy the second law of thermodynamics…
>
> For if the other … capitals invested for [financial] profit hold greater value than the resulting financial capital, there is no capitalisation or increase in value. The net effect is logically a reduction in total value or "decapitalisation". Decapitalist efficiency turns out to be a highly inefficient way to allocate the worlds limited resources. Exchanging the worth-more for the worth-less is fool's alchemy.[148]

Mr. Tunjic's notions support the idea of System Value Creation in transcapital terms, in the sense of optimizing the overall capital stocks and flows – instead of creating illusory value through overall capital stock and flow depletion for the sake of propping up growth of a singular (financial) capital. This "capital dynamics" approach complements a thresholds-and-allocations-based carrying capacities of the capitals approach to System Value Creation.

One of the stronger definitions of System Value Creation doesn't even mention systems! In the build-up to its 2013 *<IR> Framework*, IIRC enlisted partners to produce a set of background papers through a multistakeholder engagement process. EY pulled together a *Background Paper on Value Creation* that ended with the following final paragraph (the famous "Paragraph 58," as it's known in the Multicapitalism community):

Ultimately, value is to be interpreted by reference to **thresholds** and parameters established through stakeholder engagement and evidence about the **carrying capacity** and **limits of resources** on which **stakeholders and companies rely for wellbeing and profit**... Interconnections between corporate activity, society and the environment and the purpose of the corporation should therefore be understood in terms of what the corporation, society and the environment can tolerate and still survive – *that will be the main determinant of value*. **The challenges will be to reach agreement at corporate, national and international levels on what those thresholds and limits are, how the resources within those limits should be allocated, and what action is needed to keep activity within those limits so that value can continue to be created over time.**[149] [emphasis added]

This systemic interpretation of value creation was potentially too far ahead of its time in 2013, as the *<IR> Framework* integrated the multiple capitals *without* grounding in thresholds, allocations, carrying capacities, resource limits, and well-being (as articulated in this paragraph).[150] Indeed, as comprehensive as this paragraph is on elements of Multicapitalism, it actually doesn't make reference to the capitals. Multicapitalism thus builds on the strong foundation of Paragraph 58, and extends it further.

r3.0 produced a visual representation of System Value Creation in its Transformation Journey Blueprint, specifically addressing the question of data flows in a Multicapitalist application. Labeled the *Integral Data Flowchart*, it integrates information across the multiple capitals, from both internal and external sources (at the micro, meso, and macro levels) that assesses performance within sustainability thresholds and allocations in order to create System Value.

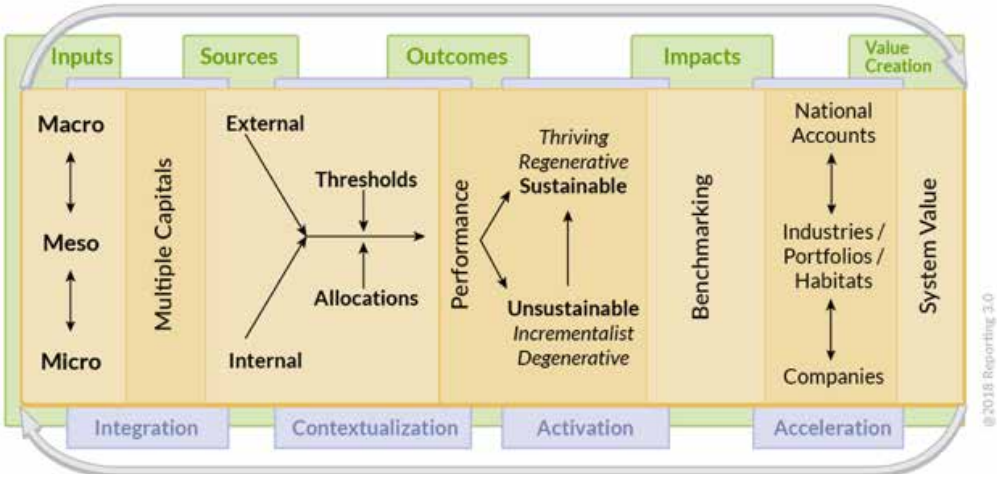


Figure 18: Baue, Thurm & van der Lugt (r3.0) 2018[151]

3. FOUNDATIONS OF THE MULTICAPITALISM CONCEPT

The seeds of Multicapitalism were planted long ago, but only now are they beginning to bear fruit. We can consider its primary progenitor to be economist Kenneth Boulding, who (as we established in the *Capital: Singular or Plural?* section earlier) first formally asserted multiple non-financial forms of capital in 1949, and in 1966 further asserted that the

> essential measure of the success of the economy is not production and consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including in this the state of human bodies and minds included in the system.[152]

Boulding continues: "throughput is by no means a desideratum, and is indeed to be regarded as something to be minimized rather than maximized… what we are primarily concerned with is stock maintenance…"[153]

In this section, we take an in-depth look at the foundations of the Multicapitalism concept.

3.1. CONCEPTUAL BASIS: CAPITAL, STOCKS, FLOWS, AND LIMITS (INNER AND OUTER)

The task of a statemanship is thus to attempt to guide the nations, with all their differences in interest, power and fortune, towards a new system more capable of meeting the "inner limits" of basic human needs for all the world's people and of doing so without violating the "outer limits" of the planet's resources and environment.
Barbara Ward (UNEP), 1974[154]

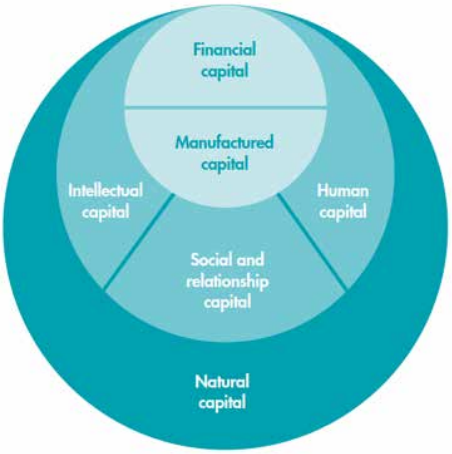
As established in the Capital: Singular or Plural? section earlier, the term "capital" has encompassed a broader purview than applying strictly to finance, dating back more than five centuries to the very codification of double-entry bookkeeping.[155] And the formal identification of multiple capitals (in addition to financial capital) dates back more than seven decades, to when Kenneth Boulding named four additional capitals: human capital, cultural capital, intellectual capital, and geological capital (a subset of what we now call natural capital).[156]

Over the years, the number of capitals proposed has ballooned: Gregory Landua and Ethan Roland propose eight capitals (social, material, financial, living, intellectual, experiential, spiritual, and cultural);[157] Sean Esbjörn-Hargens proposes ten (health, human, manufactured, financial, natural, cultural, social, knowledge, psychological, and spiritual);[158] and Peter Tunjic proposes seven (natural, human, intellectual, social, promissory, manufactured and share).[159]

Mark McElroy distilled all capitals down to two fundamental categories: capitals are either natural, created by nature, or they are anthropogenic (or "anthro"), created by humans.[160] Another common categorization is intangible capitals. The bulk of the capitals listed above are anthro / intangible capitals. And in aggregate, the most commonly mentioned capitals fall on the Forum for the Future's list of the five capitals, which amounts to the essential distilled list.

Given their inclusion in the 2013 <IR> Framework, the IIRC's six capitals has emerged as the most commonly referenced single list of capitals. To provide a concise overview of these capitals, we include below their graphical representation and definitions (see **Box 2** below) from the <IR> Framework.

The Six Capitals



Natural capital – All renewable and nonrenewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes:

- air, water, land, minerals and forests
- biodiversity and eco-system health.

Human capital – People's competencies, capabilities and experience, and their motivations to innovate, including their:

- alignment with and support for an organization's governance framework, risk management approach, and ethical values
- ability to understand, develop and implement an organization's strategy
- loyalties and motivations for improving processes, goods and services, including their ability to lead, manage and collaborate.

Social and relationship capital – The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being. Social and relationship capital includes:

- shared norms, and common values and behaviours
- key stakeholder relationships, and the trust and willingness to engage that an organization has developed and strives to build and protect with external stakeholders
- intangibles associated with the brand and reputation that an organization has developed
- an organization's social licence to operate

Intellectual capital – Organizational, knowledge-based intangibles, including:

- intellectual property, such as patents, copyrights, software, rights and licences
- "organizational capital" such as tacit knowledge, systems, procedures and protocols.

Manufactured capital – Manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services, including:

- buildings
- equipment
- infrastructure (such as roads, ports, bridges, and waste and water treatment plants)

Manufactured capital is often created by other organizations, but includes assets manufactured by the reporting organization for sale or when they are retained for its own use.

Financial capital – The pool of funds that is:

- available to an organization for use in the production of goods or the provision of services
- obtained through financing, such as debt, equity or grants, or generated through operations or investments.

Box 2: IIRC 2013[161]

In addition to its inherent multiplicity, capital's other fundamental element is its "stocks and flows" feature. Recapping from the *Capital: Singular or Plural?* section, remember that in 1906, Irving Fisher defined capital as a

> *stock of wealth* existing at any *instant* of time.[162]

Fisher paired this concept directly with his definition of income as a

> *flow of services* through a period of time.[163]

The "stocks and flows" concept is procreative in its essence: stocks beget flows, and reciprocally, flows require stocks. This conception walks us toward the question of sufficiency – clearly, there must be sufficient stocks in order to generate flows. And the question of sufficiency, extrapolated over time, leads us to the question of sustainability: can existing stocks sustain sufficient flows over time to support the well-being of the organization and its rightsholders?

Considering the sufficiency and sustainability of any given capital also begs the question, what's the dividing line between *enough* and *not enough*, between *viable* and *unviable*, between *sustainable* and *unsustainable*. Pioneering British Economist Barbara Ward, working with the United Nations Environment Programme (UNEP) in 1974, introduced a novel way to conceive of this question, looking at it from two perspectives. In the *Cocoyoc Declaration* (named after the Mexican town hosting a joint UNEP / United Nations Conference on Trade and Development (UNCTAD) Conference), Ward proposed a "new economic order" that is

> more capable of meeting the 'inner limits' of basic human needs for all the world's people and of doing so without violating the 'outer limits' of the planet's resources and environment.[164]

It would take another four-odd decades for this "inner limits" and "outer limits" concept to take shape, so to speak. And it continues to be a work-in-progress for this kind of thinking to launch a "new economic order" (such as Multicapitalism). New paradigms can take a while until they reach tipping points, after which there is no turning back…

3.2. CARRYING CAPACITIES OF THE CAPITALS: THRESHOLDS AND ALLOCATIONS

A suitable total for the number of citizens cannot be fixed without considering the land and the neighboring states. The land must be extensive enough to support a given number of people in modest comfort, and not a foot more is needed.
Plato, *Laws, Book V*, 360 BCE[165]

[W]e believe this book [Limits to Growth] will cause a growing number of people throughout the world to ask themselves in earnest whether the momentum of present growth may not overshoot the carrying capacity of this planet – and to consider the chilling alternatives such an overshoot implies for ourselves, our children, and our grandchildren.
Donella Meadows, Dennis Meadow, Jorgen Randers, William Behrens, 1972

Today mankind is locked into stealing ravenously from the future… By our sheer numbers, by the state of our technological development, and by being oblivious to differences between a method that achieved lasting increments of human carrying capacity and one that achieves only temporary supplements, we have made satisfaction of today's human aspirations dependent upon massive deprivation for posterity.
William Catton, 1980

[S]ustainability indicators should be related to carrying capacity or to threshold of danger or to targets. Tons of nutrient per year released into waterways means nothing to people. Amount released relative to the amount the waterways can absorb without becoming toxic or clogged begins to carry a message.
Donella Meadows, 1998[166]

The social foundation forms an inner boundary, below which are many dimensions of human deprivation. The environmental ceiling forms an outer boundary, beyond which are many dimensions of environmental degradation. Between the two boundaries lies an area – shaped like a doughnut – which represents an environmentally safe and socially just space for humanity to thrive in. It is also the space in which inclusive and sustainable economic development takes place.
Kate Raworth, 2012[167]

The concept of carrying capacity dates back to antiquity – as the epigraph above demonstrates, Plato discusses the essential idea as early as 360 BCE, in Book V of his *Laws*, expressing the idea of land's supportive biocapacity that has become ensconced in ecology.[168] However, it wasn't until several millennia later that the actual term "carrying capacity" appeared. In a survey of the term, Nathan Sayre traces its roots back to shipping. It was first mentioned in an 1845 letter from the US Secretary of State to the Senate discussing necessary changes to "tonnage duty" for steamships, which had been "according to register tonnage," whereas the new law would be applied to steamboats "according to their carrying capacity only." [169] As yet another shift induced by the fossil fuel age, Dr. Sayre explained thus:

> Fairness – from the point of view of steamboat proponents, at least – required levying each ship according to the amount of cargo it could convey, rather than a measure derived from the ship's overall size—a measure that had never been perfect but nonetheless sufficed when all cargo ships were wind-powered.[170]

However, shipping magnates played both sides of the fairness equation when it comes to carrying capacity, as Andrew Simms vividly relates in his 2018 book *Cancel the Apocalypse: The New Path to Prosperity*. In it, he tells the story behind the London Tube's logo – "a circle with a line crossed through it" – as a take-off on the "Plimsoll line."[171] At about the same time as the Secretary of State letter, transatlantic shipping experienced a much different kind of carrying capacity crisis, as Mr. Simms recounts:

> According to the Board of Trade, during the 1860s, of the average one thousand wrecks per year, around five hundred of them were due to overloading and unseaworthiness. Sailors called these "coffin ships." Some were merely decrepit vessels, the spongy slums of the sea that made drowning a common occupational hazard. Others were good ships, but recklessly overloaded by profit-hungry owners. Still others stemmed from shipowners' vicious insurance scams. Unseaworthy vessels were filled with junk, over-insured, and sent out to sea for the inevitable to happen…
>
> On 11 January 1866, two weeks after setting sail from the East India docks on the river Thames, a ship, the *London*, was sinking in the Bay of Biscay. In addition to its 289 passengers and crew, the London was thought to be carrying 1,200 tons of iron and 500 tons of coal. Even in common conditions, the distance between the waterline and its deck – the so-called 'freeboard' – had been just three feet six inches. It was horribly overloaded and too low in the water. When it sank, one small boat escaped but 270 people drowned.[172]

Enter Samuel Plimsoll, who decided to take on the vested interests of the shipping industry to promote common sense safety measures.

> In 1872, Samuel Plimsoll published a pamphlet called *Our Seamen*, and led a campaign to introduce a load line – a mark on the side of the boat that, when level with the water, showed that you had reached the ship's maximum safe loading capacity…
>
> It is hard to underestimate the scale of the challenge Plimsoll set himself. Britain was the dominant global power of the day, and its navy, very much including the merchant fleet, was the mechanism through which it exerted that power. Any challenge or obstacle placed in the way of the fleet's day-to-day operations was a challenge not just to shipowners but to the British economy and empire…
>
> After a decade of furious campaigning combining passion, fact, and crafted argument, Plimsoll succeeded. In 1876, the Marine Shipping Act introduced what became known as the Plimsoll line, its symbol a circle cross by a horizontal line.[173] (See **Figure 21**)

Figure 19: NOAA 2013, Assent Risk Management 2015[174]

In comparison to the Secretary of State's notion of carrying capacity (invoked for fairer levies), the Plimsoll line is a *normative* threshold: with a water level *below* the line, ships float; but when water submerges the line, ships sink – along with their cargo, including the living. This normative dimension is a key animator of the concept of carrying capacity. Mr. Simms (who coined the concept of "Earth Overshoot Day," another normative threshold delineating carrying capacity that the Global Footprint Network now marks annually),[175] makes the connection to our current conundrum clear:

> A ship overloaded is not dissimilar to an ecosystem or planetary function overburdened. Push its carrying capacity too far and it will become unstable, more vulnerable to external shocks. And warming climate or exhausted soil equate to a heavy sea. Ignore the warning signals of destabilization, and sinking or collapse become likely. How, then, can we introduce a Plimsoll line for the ship of the biosphere?[176]

This is precisely the task Dr. McElroy applied himself to, extending the "Plimsoll Line" of carrying capacity across *all* the capitals in his 2008 doctoral dissertation at the University of Groningen.[177] Up until this point, the notion of carrying capacity had only been applied to tangible capitals – natural capital (for example, an environmental habitat) and built capitals (for example, a ship) – but not to intangible capitals, such as human capital and social capital.

In his 2012 book *Corporate Sustainability Management*, Dr. McElroy and co-author Jo van Engelen established a generalized working definition of carrying capacity, linking it explicitly to vital capitals:

> Carrying capacity is therefore a measure of the size and sufficiency of valuable goods and services that flow from vital capitals.[178]

This distills Dr. McElroy's earlier introduction the carrying capacities of capitals in his 2008 dissertation, where he fleshes out the interconnection in depth:

Stocks of capital have carrying capacities, the dimensions of which are determined by the size and content of their flows. When the scale of human demands placed on such capitals exceeds the dimensions of their flows, we can say that the impact of human activity has exceeded the carrying capacities of the capitals involved. Or we could say that the carrying capacity of the capitals involved is insufficient to accommodate or support the impacts of human activities. Either way, we have a mismatch between the demand for flows and the available supply. This, in so many words, is one way of defining a state of *unsustainability*.

In the case of flows available from natural capital, humans are more or less stuck with their size and type. We can certainly leverage technology to wring increasingly more and more out of the same capital stock over time - and indeed we have - but the one thing we cannot do is create more natural capital than is already here on Earth. Nor can we recover or recycle energy already spent. Both of these principles are fairly well ensconced in the first and second laws of thermodynamics, respectively.

Anthro capital, on the other hand, has the distinctive feature of being human-made. Within reasonable (and far reaching) limits, we can always make more of it if we choose to. For example, we can invest in, and cultivate, individual knowledge, skills, and capabilities (human capital); or we can do the same for collective knowledge and capabilities (social capital). Indeed, to the extent that deficiencies in human well-being can be attributed to shortages in the supply of anthro capital, we not only have the ability to take compensatory steps, we very much ought to. Unlike natural capital, of which we have only limited supplies, we can always increase the carrying capacity of anthro capital given the will to do so. In this thesis, we take the position that that is exactly what humanity ought to do when faced with shortages, and that the persistent failure to do so is unsustainable - *socially* unsustainable, that is. Here we rely on a principle of well-being: that well-being is not only desirable, but that the absence of well-being can lead to other equally undesirable outcomes, such as civil strife, violent conflict, and political instability.[179]

In his dual application of carrying capacity to the two primary categories of capitals (natural capital on the one hand, and anthro capitals on the other), Dr. McElroy identifies their countervailing dynamics. The finite nature of natural capital stocks sets an inherent constraint on their flows to dictate their sustainability, while the need to continually regenerate anthro capital stocks creates a sustainability imperative to "take compensatory steps" when we encounter "shortages in the supply." In other words, the carrying capacities of natural capitals set "do-not-overshoot" thresholds, while the carrying capacities of anthro capitals set "do-not-undershoot" thresholds – so in essence, Dr. McElroy built upon and expanded Barbara Ward's conceptual framework of "outer" and "inner" limits by applying them to carrying capacities.

At about the same time of publication of *Corporate Sustainability Management* in 2012, Oxfam Senior Researcher Kate Raworth similarly built upon Barbara Ward's concept, crystallizing it into a graphical representation that rapidly caught on as a viral meme. In the lead-up to the United Nations Conference on Sustainable Development (Rio +20) in 2012, Oxfam released a discussion paper by Ms. Raworth that introduced a "visual conceptual framework" – the Doughnut.[180] After the agreement of the United Nations Sustainable Development Goals, negotiators told Ms. Raworth that "in the late-night meetings to hammer out the final text, the image of the Doughnut was there on the table as a reminder of the big-picture goals they were aiming for."[181]

The idea for the doughnut was borne of the graphical representation of the Planetary Boundaries, a set of nine "upper" ecological thresholds delineating a "safe operating space for humanity," beyond which tipping points could throw these systems out of whack, with catastrophic consequences.[182] The research team, anchored at the Stockholm Resilience Centre, combined ecological economics, sustainability science, and resilience research to ascertain that humanity's impacts in the Anthropocene had already transgressed three of the nine "outer" thresholds (climate change, biodiversity loss, and the nitrogen cycle) as of 2009 (an updated study published in 2015 added another threshold crossing, for land-use change[183]). (See **Figure 20** below)

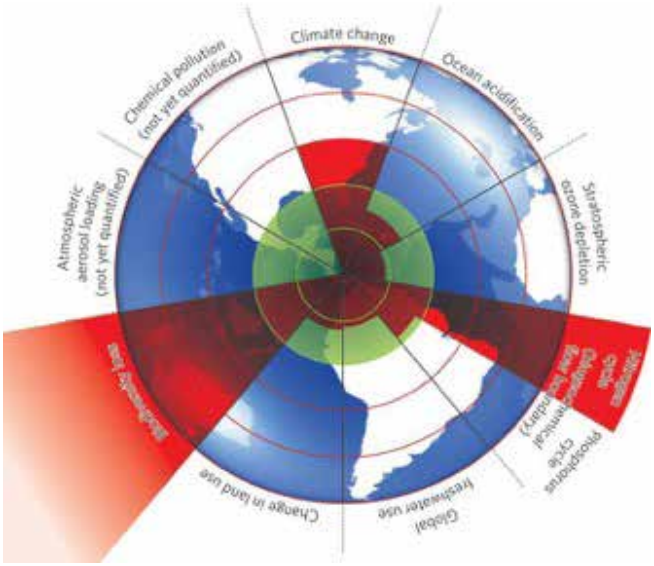


Figure 20: Rockström et al, 2009[184]

Looking at the above Planetary Boundaries graphic depicting the crossing of "ecological ceilings" (or "critical natural thresholds" of maximum ecological impact before risking systemic breakdowns), Ms. Raworth recognized the need to paint a fuller picture, with the "inner" social limits (or "social foundations" necessary for the stability of social systems to avoid "critical human deprivations") also represented. So, she overlaid these baseline social thresholds onto the graphic, and voilà, the result was the meme-ready "doughnut" ("or, if you prefer, a tyre, a bagel, or a life saver," she cheekily added) bounding the "safe and just space for humanity."[185]

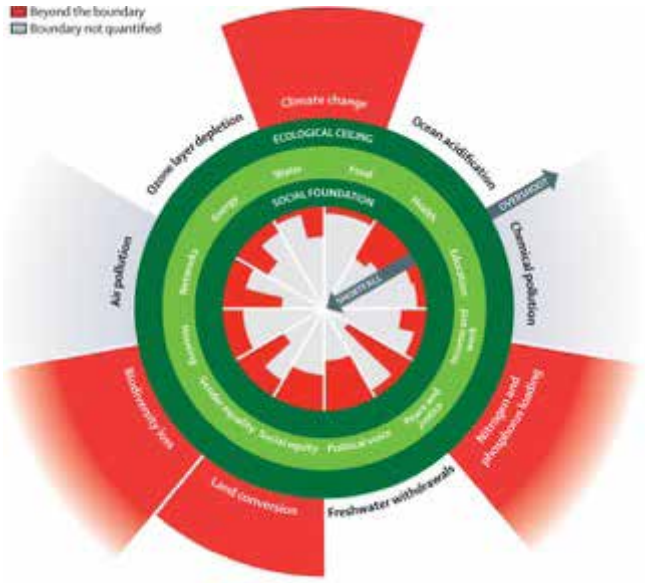


Figure 21: Raworth, 2017[186]

Just as Dr. McElroy defined "unsustainability" as exceeding the thresholds of natural capital carrying capacities and short-falling the thresholds of anthro capital carrying capacities, so too did Ms. Raworth identify the "overshoot" of "ecological ceilings" and the "shortfall" of "social foundations" as carrying humanity beyond its "safe and just operating space."

The term "overshoot" is intimately linked to the concept of carrying capacity, dating back at least to the 1972 *Limits to Growth* study (quoted earlier).[187] In the "Brief History of Human Carrying Capacity Concept" section in their 1996 book *Our Ecological Footprint*, Mathis Wackernagel and William Rees credit William Catton with "add[ing] a new dimension to the human carrying capacity debate by describing the implications of overshoot – temporarily exceeding the long-term carrying capacity – and the subsequent population crash.[188] (The cover of Dr. Catton 1980 book *Overshoot* contains a set of definitions, including "overshoot" as "growth beyond an area's carrying capacity, leading to crash [and] die-off."[189]) Shortly after that section, Drs. Wackernagel and Rees include the below graphic on carrying capacity and overshoot (**Figure 22**), which adds key elements to the similar graphics from the 1972 *Limits to Growth* study included earlier in this White Paper (see **Figure 10** above).[190]

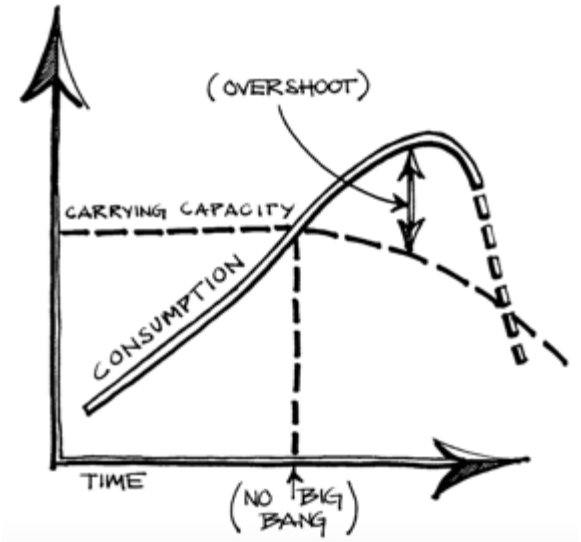


Figure 22: Wackernagel & Rees, 1996.[191]

The zone identified as *overshoot* points to a corollary concept coined by Dr. Catton – *phantom carrying capacity* – which he defines as "either the illusory or the extremely precarious capacity of an environment to support a given life form or a given way of living."[192] For example, fossil fuels have greatly expanded the earth's carrying capacity, but in an "illusory" or "extremely precarious" way, in that they have locked in humanity's infrastructure and dependence on an exhaustible resource, and are also simultaneously stressing (and imminently overshooting) the earth's capacity to assimilate the polluting greenhouse gas emissions from fossil fuel combustion.[193] So, for example, when it comes to our Ecological Footprint, the data suggests that humanity has been operating on phantom carrying capacity since 1970, when we first starting exceeding the earth's carrying capacity – or we are in overshoot with a delayed (or extended) crash (see **Figure 9** above).

Following Dr. McElroy's logic, "phantom carrying capacity" would also exist for anthro capitals, when we shortfall their thresholds. As the Doughnut research displays above, humanity is short-falling on all 12 social foundation thresholds, meaning that we are operating on phantom carrying capacity on those realms to postpone collapse. Similarly, the Planetary Boundaries research finds that humanity is overshooting four of these nine ecological ceiling thresholds, and Ecological Footprint research finds that humanity has been operating in overshoot since about 1970, so here also, humanity is precariously relying on phantom carrying capacity.

Just as ecological systems and social systems cannot operate indefinitely in carrying capacity deficits, so, too, are companies bound by this same limitation. Thus, companies that wish to be "going concerns" must respect the carrying capacities of the capitals upon which their business models (and their rightsholders) rely.

How does a given company identify its *fair share* of capitals – both entitlements for capitals (typically tangible ones) it consumes, and burdens for capitals (typically intangible ones) it produces? This is where allocations come into play. This notion of allocations (as developed by Dr. McElroy) rests on the work of political philosopher John Rawls from his seminal *A Theory of Justice*, in which

> he argues that the allocation of resources in society must be equitable, and also acceptable to the least advantaged, in order to be fair or just. To that end, he advocates for positive and negative duties. Positive duties include the moral responsibility people have to assist others in need, "provided that one can do so without excessive risk of loss to oneself" and negative duties include "the duty not to harm or injure another, and the duty not to cause unnecessary suffering."[194]

This justice-based approach to allocations plays a fundamental role in Multicapitalism. It is also ensconced in the Science Based Targets initiative (SBTi), a collaboration between CDP, United Nations Global Compact, World Resources Institute, and WWF for setting corporate GHG reduction goals in line with scientific scenarios from the Intergovernmental Panel on Climate Change (IPCC).

The earliest instance of science-based assessment of corporate GHG emissions was conducted by Ben & Jerry's in 2006, using a per capita allocation, which compared the company's workforce to the broader population to determine its fair share "slice of the pie."[195] A few years later, BT innovated an economic allocation (value add compared to GDP) methodology for its GHG emissions.[196] SBTi created its own physical allocation methodology (physical production, e.g. cement produced as a percentage of the cement market) applied to companies based on their sector.[197]

There are two initiatives launching concurrently to address thresholds and allocations by business and others:

- **Global Commons Alliance**: this initiative comprises two primary elements related to thresholds and allocations: an Earth Commission comprised of 20-30 scientists to establish thresholds across key ecological impacts; and the Science Based Targets Network, extending the SBTi allocation methodologies for businesses to account for their impacts across all ecological areas (e.g. water, biodiversity, land use change, etc)
- **Global Thresholds & Allocations Council**: r3.0 is incubating a global governance body to provide guidance on threshold and allocation determinations across all ecological, social, and economic areas, for example by spurring development of threshold determinations and allocation methodologies when needed.

The advancement of Multicapitalism will benefit from such initiatives, and will no doubt spur the development of similar initiatives when needed to support further advancement of Multicapitalism.

3.2.1. NATURAL CAPITAL: ECOLOGICAL CEILINGS

We have already touched on *impact* thresholds for natural capital – namely, the degree of degradation they can handle and still maintain resilience, before hitting a tipping point that triggers a nonlinear phase shift into systemic collapse. These are encompassed in the Planetary Boundaries framework.

Natural capital also experiences another relevant form of thresholds – namely, the literal existence of these vital capital resources, particularly in amounts that allow for their ongoing availability for use. Herman Daly (who we encountered earlier in the Triangle named after him) proposed three basic rules for sustainability:

- **Renewable resources** (fish, forests, soils, groundwaters) must be used no faster than the rate at which they regenerate;
- **Nonrenewable resources** (mineral ores, fossil fuels, fossil groundwaters) must be used no faster than renewable substitutes for them can be put into place;
- **Pollution and wastes** must be emitted no faster than natural systems can absorb them, recycle them, or render them harmless.[198]

We therefore have three forms of thresholds:

- **Renewable resource regeneration rates**: the rate of use must not exceed the rate of replenishment;
- **Replacement rates for nonrenewable resources:** depletion rates of nonrenewable resources must be counterbalanced by the rate at which renewable alternatives (with sufficient stocks themselves) can be identified; and
- **Pollution / waste assimilation rates:** pollution and waste cannot be created faster than the biosphere can safely assimilate it and regenerative it back into productive capital stocks, or otherwise render it harmless.

The Planetary Boundaries framework predominantly addresses the first (biodiversity, land use conversion, freshwater use, etc…) and third (climate change, phosphorous and nitrogen loading, etc…) thresholds. It does not in general address the second thresholds involving non-renewable resources.

This threshold is addressed by Harald Sverdrup, who has updated the World3 computer modeling system created by the Limits to Growth team over four generations to the current World7 iteration. Using this sophisticated modeling, Dr. Sverdrup projects that between "2030 and 2070, we will peak in the extraction of nearly all raw materials. From then on, the supply of natural resources will gradually decrease."[199] (See **Figure 23**)

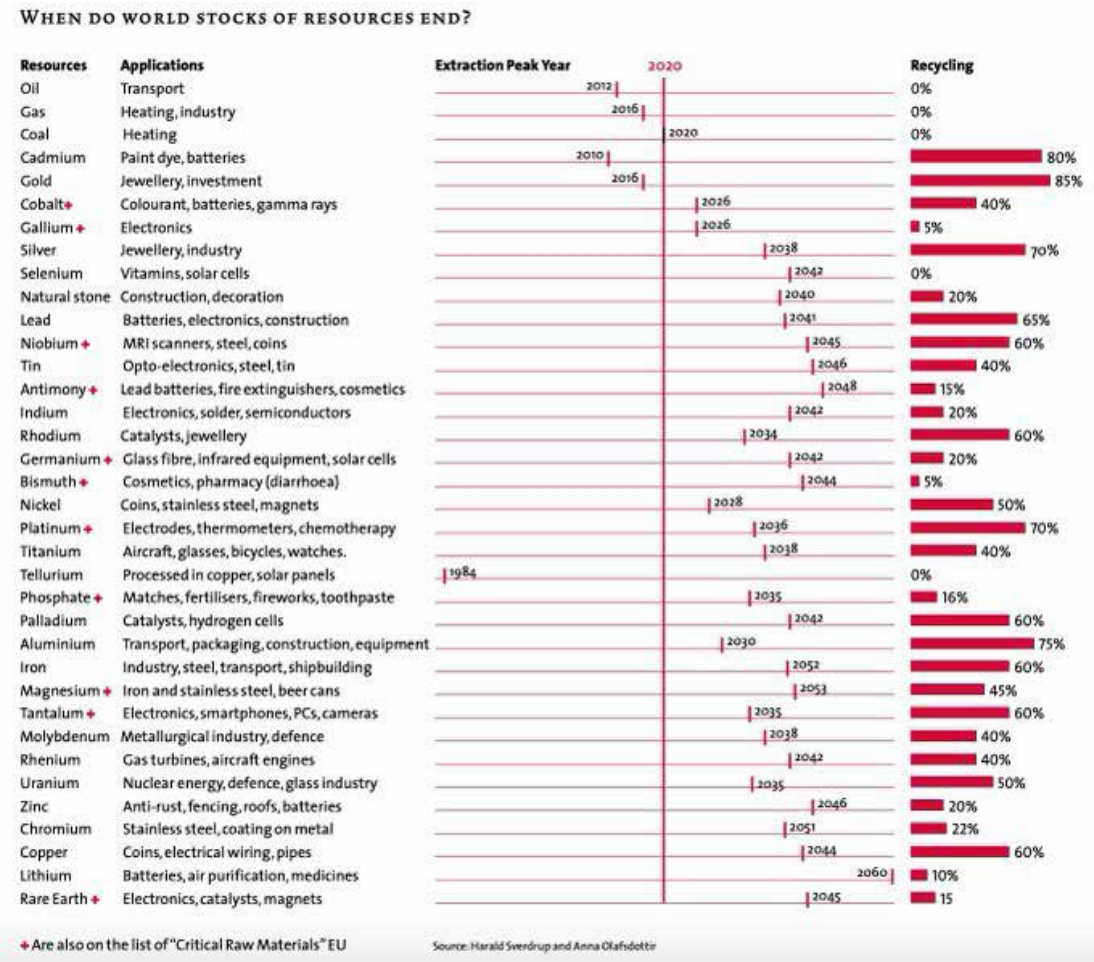


Figure 23: Sverdrup & Olafsdottir, in Groesbeek & Bom, 2020[200]

So, to manage natural capital resources within their carrying capacities, human organizations (primarily commercial enterprises) must attend to these three kinds of thresholds: renewable resource regeneration rates, nonrenewable resource replacement rates, and pollution / waste assimilation rates. Ultimately, companies can only create value for themselves and their stakeholders and rightsholders by creating system value – in other words, ensuring sustainable supplies of natural capital.

3.2.2. INTANGIBLE CAPITALS: SOCIAL FOUNDATIONS

As noted earlier, there is significant overlap between anthro capitals and intangible capitals – the only difference is that constructed capital is anthropogenic and also quite tangible. But in general, the anthro capitals tend to be intangible, as humans are capable of creating knowledge, networks, psychological resilience, etc…

As Barbara Ward stated in 1974 (and Kate Raworth's Doughnut image makes evident), the "'inner limits' of basic human needs" set a "social foundation" that humanity must remain *above* – in contrast to the "'outer limits' of the planet's resources and environment" that humanity must stay *under*. The directionality embedded in these terms translates into the mathematics of measuring their performance.

Remember the Sustainability Quotient: Sustainability = Actual Impacts / Normative Impacts (S = A / N). Clearly, sustainability is reached when actual impacts match normative impacts – mathematically, a quotient with the same numerator and denominator equates to 1.0. So, to render sustainability of ecological impacts on natural capital, the Sustainability Quotient would need to result in an equation of *less than* (or equal to) 1.0, whereas social impacts on anthro / intangible capitals would need a result *more than* (or equal to) 1.0.[201]

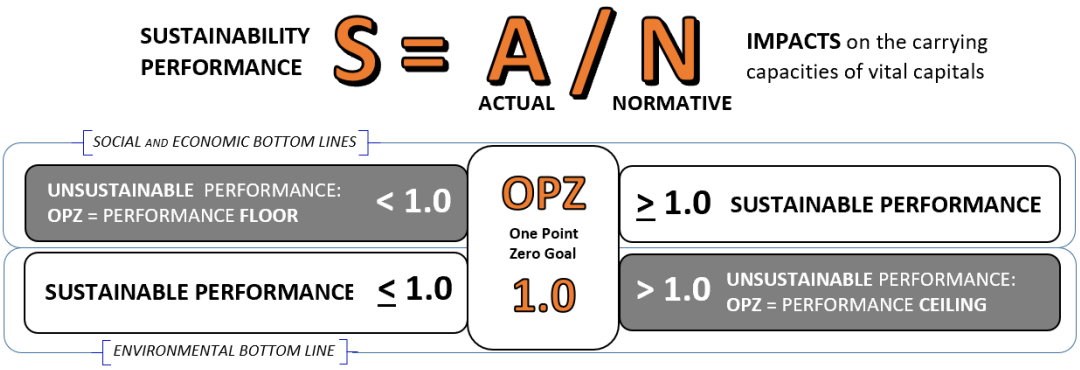


Figure 24: The Sustainability Quotient: Measuring Environmental v Social Sustainability [202]

Translating this math back into real-world implications, we see that we must constrain negative ecological impacts, while encouraging positive social impacts. The deeper implications of this for companies is that value creation that is predicated on transforming natural capital from its function of upholding ecological carrying capacities must be limited. But for value creation predicated on transforming anthro / intangible capitals in ways that grow the capital base, *the sky's the limit*, as they say.

This difference carries profound real-world implications. Essentially, business models must create value by *contracting* impacts on natural capital while *expanding* impacts on anthro and intangible capitals. This makes intuitive sense.

Business models that rely on extracting ecological capital and diverting it from its natural functioning ultimately deplete natural capital stocks and flows; instead, since natural capital cannot be created anew but only regenerated, business models need to focus on nurturing the natural regenerative capacities of ecological capital – for example by enhancing instead of depleting soil health.

Likewise, business models that *degrade* anthro and intangible capitals for the sake of maximizing financial capital are ultimately self-defeating; whereas business models that *enhance* anthro and intangible capitals ultimately generate financial capital that can continually regenerate because it's built on growing (not diminishing) anthro / intangible capital stocks.

This is such common sense that it's kind of embarrassing that humanity has predicated "progress" on an extractive, dominance-oriented Monocapitalist system for so long! Think of intellectual capital. The Monocapitalist doctrine fixates on enclosing intellectual capital into intellectual property, thereby stifling the ability for intellectual collaboration to continually enhance this capital. When intellectual capital is treated as a Commons, it benefits from the widest possible diversity of creative input to grow the capital. Instead of trademark and copyright fencing off intellectual property, Creative Commons licenses enable creators of intellectual capital to set various degrees of sharing.

The differentials in directional dynamics between natural capital / ecological impacts and anthro & intangible capitals / social impacts also carry favorable implications when it comes to tipping points, or sudden phase shifts from smooth, linear development (transition) to abrupt, non-linear transformation. Ecological tipping points tend to shift from stable natural systems that function in ways that humans have adapted to over millennia into unpredictable dynamics that are unfamiliar to human anatomy and cognition, and thus more likely to be hostile to human well-being than to be beneficial.

However, social tipping points have the potential to phase shift *out* of social dynamics with asymmetric benefits (Monocapitalism's dynamic of hyper-concentrating wealth, for example) into social systems that are more broadly beneficial (think of gay marriage, for example, which shares the institutionalized benefits of marriage across a more complete diversity of humanity.) Given the systemic and existential risks associated with ecological tipping points,[203] the potential of social tipping points to transform dysfunctional systems (such as Monocapitalism) into more functional systems (such as Multicapitalism) that avoid ecological tipping points by triggering social tipping points, for example in education systems, norms and value systems, and even in financial markets.[204]

In other words, prompt a paradigm shift from Monocapitalism to Multicapitalism.

3.3. FINANCIAL REPORTING: CENTRALITY AND LIMITS

Financial reporting is a necessary but not sufficient practice for achieving sustainability in capital markets and society more broadly. In fact, as currently practiced, it is much more likely that financial reporting is exacerbating unsustainable financial markets and societies. The primary problem with financial reporting is that it purports to paint a complete picture of the health of the organization, while systematically depriving readers information about the non-financial capitals that undergird the ability of the organization to create value – both financial value and system value – over the long term.

Clearly, financial reporting plays a fundamental role in enabling rightsholders (shareholders, stakeholders, and all whose fundamental rights are impacted by an organization's activities) to understand the organization's outputs and impacts, both financial and extra-financial. However, the exclusive focus on financial capital prevents rightsholders from being able to gain a holistic perspective on the organization. And given the innate interconnectivity between the multiple capitals, it is safe to say that rightsholders don't even gain a comprehensive view of the financial status of the organization when deprived of comprehensive information on the full suite of multiple capitals.

The key "filter" for relevant information is materiality, but the processes for determining both financial materiality and sustainability materiality are fundamentally flawed – because neither addresses the carrying capacities of the capitals, and also, neither considers the duties and obligations organizations owe for impacts on vital capitals that their rightsholders rely on for their wellbeing.[205]

3.4. BETA ACTIVISM AND SYSTEMIC & EXISTENTIAL RISK

The primary audience of financial reporting is investors (or more broadly, providers of financial capital), who are primarily influenced by Modern Portfolio Theory (MPT) since Harry Moskowitz introduced the concept in 1952.[206] The Theory has been very helpful in diversifying risk across a broad portfolio of asset classes and investments. So long as that risk remained broadly and discretely dispersed to individual securities, investors could seek "alpha" (or market outperformance) as a strategy for de-risking and generating attractive returns.

However, as the Global Financial Crisis (GFC) of 2007-8 demonstrated, just as risk can be widely and discretely dispersed, so too can it aggregate – to the systemic level. The term "Systemic Risk" emerged to describe the "risk of a breakdown of an entire system rather than simply the failure of individual parts."[207] While the term systemic risk is most often associated with breakdown of financial systems (and hence the economies they operate within), it also applies to other systems – such as the earth's climate regulation system.[208] Indeed, given that the climate regulation system is literally the earth's life support system, this risk has expanded beyond the systemic level, to the existential level. Think of existential risk as what happens when financial capital carrying capacity overshoot (which we experienced in the GFC) combines with natural capital carrying capacity overshoot (which we are already experiencing on 4 of the nine Planetary Boundaries): a fatal cocktail.

The term "Existential Risk" followed close on the heels of the term "Systemic Risk." If systemic risks actualize in the earth's key life-sustaining systems (such as the climate regulation system), then the very continuance of human existence is at significant risk. Indeed, human impacts on our biosphere have already triggered the loss of other living species at a rate one thousand times higher than the "background" rate (and heading for ten thousand times): it takes a prodigious amount of hubris (sometimes translated as "stupidity") to believe that we humans can necessarily escape the fate we're imposing on other living beings, all of us vital participants in the web of life.[209]

Jim Hawley and Jon Lukomnic believe that the emergence of systemic risk now portends the eclipsing of Modern Portfolio Theory as a blanket solution to risk, since risk can now blanket the entire market. And ironically, investors collectively had a hand in creating this systems-level risk, as they failed to attend to the risks their investments externalized onto the operating environment. The solution Hawley and Lukomnic propose is to turn MPT on its head through what they call "Beta Activism."[210]

Understanding Beta Activism requires understanding what beta is. Markowitz chose the Greek letter beta to represent the volatility of a stock portfolio as compared to a broad market index. If a portfolio has a low beta, it means it moves with the market. Most passive investing and couch-potato portfolios have low betas. If a portfolio has a high beta, it means it is more volatile than the market.[211]

In other words, beta is the real world, the operating environment, the ultimate sandbox of the broader market that all investors play in. Hawley and Lukomnic note that MPT "postulates that beta is a given and cannot be affected by individual portfolio managers," which is belied by the fact that beta is the net sum of all investment activity (in dynamic relationship with real-world developments to which market actors react), so individual portfolio managers by definition affect it. This impact is so small as to be "invisible," and it only becomes visible to the naked eye when it aggregates to the level where it impacts the overall system. Systemic risk. Existential risk.

4. MULTICAPITALISM IN PRACTICE

Multicapitalism is emergent, so it exists in the liminal space between gestation and full-fledged existence. However, the intellectual foundations for the concept run deep, as is evidenced by the preceding discussion. A robust bibliography tracing this history of Capital Theory is available, as is a graphical timeline of the historical development of the concepts of thresholds and allocations.[212] (see **Figure 25**)

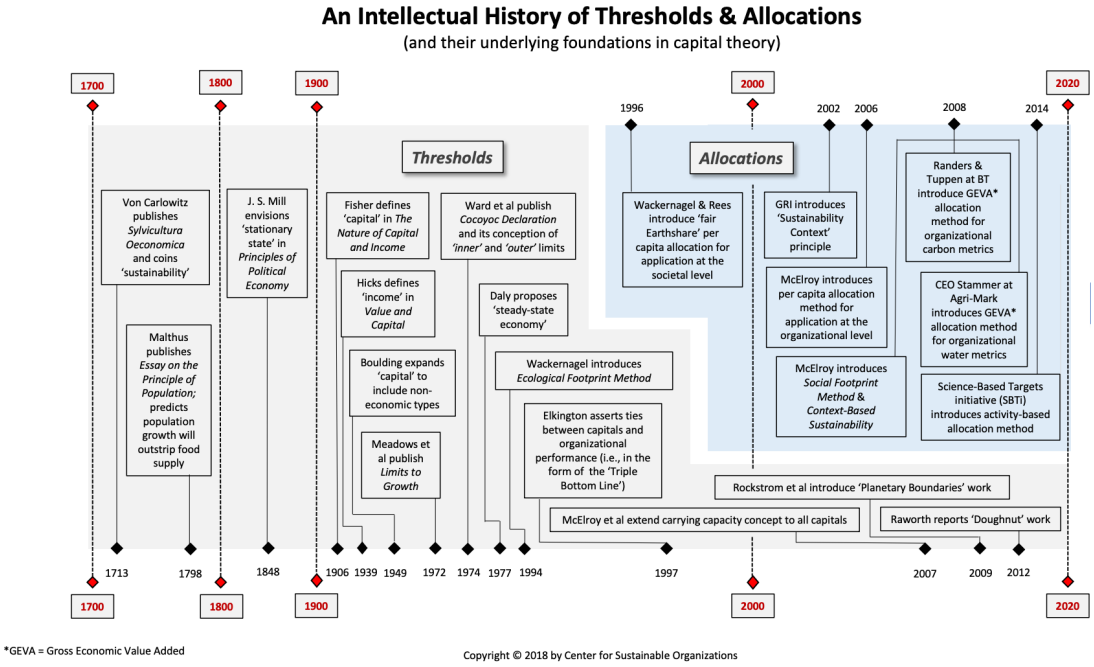


Figure 25: An Historical Timeline of the Conceptual Development of Thresholds & Allocations[213]

Building on these foundations, a plethora of initiatives have emerged that build out these concepts in practice. So, here we document this emergence by first identifying the landscape and ecosystem of initiatives aligned around the capitals and their carrying capacities, then describing specific case examples being enacted at the enterprise level, portfolio level, and national level.

4.1. ALIGNED INITIATIVES

There are a number of initiatives that align around the emergence of Multicapitalism. They fall into three broad categories:

- first are initiatives devoted to the **multiple capitals**;
- next are initiatives that advance understanding and respect for **carrying capacity thresholds**; and
- last are initiatives that embrace both the multiple capitals *and* the **carrying capacities of the capitals**.

We describe these initiatives in brief, as they pertain to the capitals and their carrying capacities, as follows.

- **Multiple Capitals**

Building on the long history of conceptual understanding of the multiple capitals (dating back to 1949 with Boulding's assertion of 4 capitals and Ekins' 1992 formalization of this line of thinking), a number of organizations and initiatives are explicitly supporting the development of the multiple capitals concept and thinking.

- **Capitals Coalition**

Foremost amongst these is the Capitals Coalition, which resulted from the January 2020 merging of the Natural Capital Coalition (which had been established in 2012 as The Economics of Ecosystems and Biodiversity (TEEB) For Business Coalition) and the Social & Human Capital Coalition, which more had been established in 2018 by WBCSD.[214] The Capitals Coalition encompasses 370+ organizations that seek to **change** *the math* **(measuring value flows),** *the conversation* **(that informs mindsets and worldviews),** *the rules* **(incentive mechanisms and standards) and** *the system* (holistic change encompassing all levels).[215] The Capitals Coalition defines capital as

> a resource or asset that stores and provides value to people. When invested in and managed responsibly, the asset creates value. If we 'draw down' on the capital stock itself we limit its ability to provide value to people and the economy, and if we degrade it too much, it can stop providing value all together.[216]

Capitals Coalition CEO Mark Gough recognizes that thresholds are

> essential – it's a bit that's often been missed out, as we haven't really known how to set the targets and the thresholds. We've come up with bottom-up processes, we've come up with policies, but it's really important we *do* start building in those targets. How do we allocate down when we're talking about some of the big questions such as biodiversity -- it's a really big challenge, and there's a lot of people working on that.[217]

While this quote reveals a leaning in the direction of addressing thresholds, the Capitals Coalition has yet to take an explicit position on the carrying capacities of the capitals.

- **International Integrated Reporting Council**

The IIRC's integration of the Six Capitals into the 2013 *<IR> Framework* has arguably done more than any other development for helping spread awareness of the multiple capitals.[218]

- **Forum for the Future**

Forum for the Future has likewise supported broad proliferation of understanding of the multiple capitals through its Five Capitals Framework, including a graphical representation (**Figure 7** above), a Landing Page on its Website, and a stand-alone report.[219]

- **Capital Institute**

The Capital Institute, founded by reformed JPMorgan banker John Fullerton in 2010, explicitly embraces a multiple capital approach. In his seminal 2015 paper *Regenerative Capitalism*, Fullerton proposes eight Principles of Regenerative Economics, which includes the Principle "Views Wealth Holistically":

> True wealth is not merely money in the bank. It must be defined and managed in terms of the well-being of the whole, achieved through the harmonization of multiple kinds of wealth or capital, including social, cultural, living, and experiential. It must also be defined by a broadly shared prosperity across all of these varied forms of capital.

The paper cites the Planetary Boundaries and Fullerton recognizes the significance of sustainability thresholds, though he is still in the process of merging his articulation of the capitals with his understanding of thresholds.

- **Sustainability Accounting Standards Board**

In its original 2013 *Conceptual Framework*, the Sustainability Accounting Standards Board (SASB) introduced the concept of "Common Capitals":

> Material sustainability issues arise in industries that rely on common capitals as a source of value creation, beyond financial or manufactured capital. Such common capitals are an essential source of value creation for companies and yet they are not owned nor controlled by these companies.
>
> Common capitals, as used in this Framework, include natural capital (defined as nature's input to the factor of production, such as water, ecosystems, and biodiversity) and human capital (employees' skills and experience and their motivations to innovate).
>
> Industries that make substantial use of common capitals are dependent on the availability and quality of those capitals for their long-term performance, even from a purely financial perspective. In addition, specific strategic considerations are necessary for the management of capitals that are not owned or controlled by companies.[220]

It is striking that SASB embraced the concept of the Commons, which had been validated a few years earlier when the 2009 Nobel Prize in Economics was awarded to Elinor Ostrom for her work on polycentric governance of what she called "common pool resources" – or resources from the Commons (i.e., the multiple capitals).[221] Ironically (but perhaps not surprisingly), SASB almost immediately dropped this important concept completely from its ongoing work, which does continue to embrace social and human capital (but oddly doesn't address natural capital, instead addressing "environment" in a conceptual limbo-land.)[222]

- **MetaIntegral Framework**

Sean Esbjörn-Hargens of MetaIntegral conducted a study of all multiple capital approaches he could find, which he synthesized into a 10-capitals approach called the MetaImpact Framework. This approach extends existing multiple capital approaches by also looking at first person (subjective), second person (intersubjective), and third person (objective) data. The Framework is organized across four bottom lines, adding "purpose" to the traditional "people," "planet" and "profit."[223] See **Figure 26** below.

Figure 26: MetaIntegral Framework: 10 Capitals, 4 Bottom Lines, 4 Impact Areas, 3 Perspectives[224]

Figure 27: 4 Quadrants of Integral Theory[225]

The MetaImpact Framework also tracks impacts across four realms (deep, clear, high, and wide) that align with the four quadrants of Integral Theory, which address the continuums between individual and collective and between interior and exterior.[226] See **Figure 27** above. The impact areas are defined as followed:

- **Deep Impact** (Upper Left – Subjective): transforming the hearts and minds of the people involved;
- **Clear Impact** (Upper Right – Objective): transforming the behaviors of the individuals involved;
- **High Impact** (Lower Left – Interobjective): transforming the various natural and social systems involved with the effort;
- **Wide Impact** (Lower Right – Intersubjective): transforming the relationships among members of the communities involved.

Esbjörn-Hargens notes that traditional "monocapitalist" indicators and metrics focus only on quantitative data about one form of capital (financial) through one perspective (objective third person); triple-bottom line indicators and metrics extend the purview to more capitals, but still limit their scope to quantitative data via objective third person measures. He advocates for a full multicapitalist approach that extends the scope of inquiry not only across all 10 capitals but also across all three perspectives (first, second, and third person) to blend both quantitative and qualitative data. (See **Figure 28**)

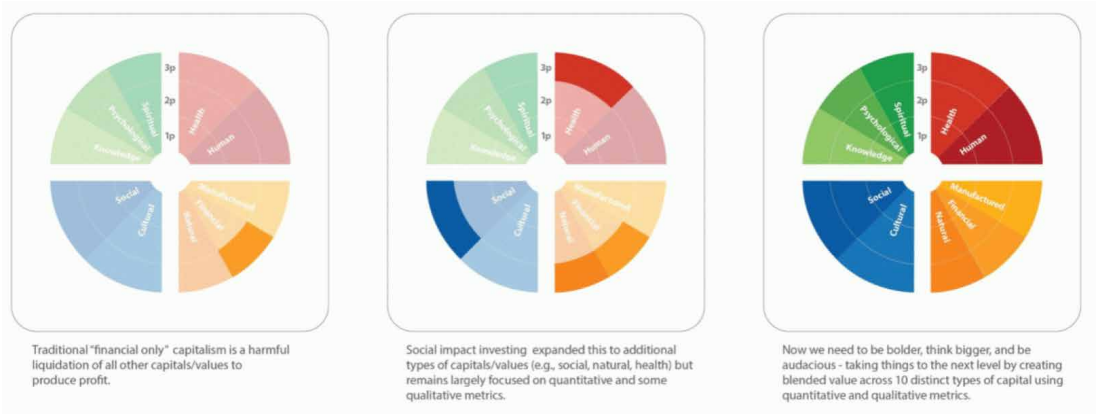


Figure 28: MetaIntegral Framework Reveals Blind Spots of Current Best Practice Approaches[227]

While the MetaImpact Framework is quite comprehensive, it does not currently address the carrying capacities of the capitals.

- **Carrying Capacity Thresholds**

This section lists frameworks and initiatives that address ecological and social thresholds, including methodologies and approaches for applying these carrying capacity thresholds in corporate and investment contexts.

  - **Planetary Boundaries**

In 2009, the Planetary Boundaries (PBs) introduced a scientifically robust conceptual framework and quantitative analysis of a set of thresholds in earth systems that, when crossed, portend ecological systems breakdowns.[228] The original study found that three of the nine Planetary Boundaries have been breached, and a follow-up study in 2015 added a fourth threshold transgression.[229]

- **Doughnut Economics**

In 2012, building off the foundation of the "ecological ceilings" of the Planetary Boundaries, Oxfam Senior Researcher Kate Raworth added a set of "social foundations" to conceive of "Doughnut Economics."[230] A half-decade later, she aggregated data from a host of sources (World Bank, United Nations, etc…) to calculate that humanity is short-falling on all 12 of these social foundations (in addition to overshooting the 4 ecological ceilings.)[231]

The brilliance of this idea was the introduction of a means of visualizing these "outer" and "inner" limits (which had first been conceptualized by Barbara Ward for a 1974 United Nations Environment Programme (UNEP) / United Nation Conference on Trade & Development (UNCTAD) Conference)[232] – and also envisioning the "safe and just operating space" of an alternative economy than the Monocapitalist regime that fuels this systemic overshooting and shortfalling.

- **Science Based Targets**

In 2012, the author of this paper pointed out to Janet Ranganathan, Vice President for Science & Research at the World Resources Institute – which serves as Secretariat (with WBCSD) for the Greenhouse Gas (GHG) Protocol – that the Protocol lacks an explicit tie-in to the climate science – in particular, the threshold of the carbon budget. This encounter, combined with other developments, led to the 2015 launch of the Science Based Targets initiative (SBTi) by WRI with CDP and WWF (and later UN Global Compact) to provide guidance and incentive for companies to set greenhouse gas emissions targets aligned with Intergovernmental Panel on Climate Change (IPCC) decarbonization scenarios aligned to global warming thresholds.[233]

Within the first five year (through July 2020), almost 1,000 companies are taking action on SBTi, and almost 500 have carbon targets approved by SBTi.

- **Global Commons Alliance**

The Global Commons Alliance builds on the foundation set by SBTi, expanding the approach to encompass ecological impacts across the board, in relation to Planetary Boundary thresholds of Earth's life support systems: climate, land, biodiversity, freshwater and oceans.[234] The Alliance encompasses four elements:

- *Earth Commission*: A body of scientists and experts focused in defining these thresholds, building on existing assessments, such as the Intergovernmental Panel on Climate Change (IPCC), Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the United Nations Environment Programme Global Environmental Outlook (GEO) reports. The Earth Commission Scientific Secretariat will be hosted by Future Earth, in collaboration with Potsdam Institute for Climate Impact Research (PIK) and International Institute for Applied Systems Analysis (IIASA).[235]
- *Science Based Targets Network*: "Building off the success of the Science Based Targets initiative and in response to business demand to set targets for the whole Earth system … the Science Based Targets Network will develop methods and resources to enable companies and cities to set science-based targets for the interrelated 'systems' of land, biodiversity, freshwater and the ocean across their value chains."[236]
- *Earth HQ*: The media arm of the alliance will serve as a basecamp and media portal for the planet, with two key aspects: an *Earth Dashboard* "to convey the big picture of how Earth Systems are performing and tracks progress towards solutions"; and *Earth News Network (ENN*), "a news feed – like a Reuters for the planet."[237]
- *System Change*: This element focuses on the transformation needed to create economic and social systems that operate within the Planetary Boundaries

- **Future Fit Business Benchmark**

The Future-Fit Business Benchmark, hosted by the Future Fit Foundation, provides a comprehensive framework for companies to measure all their social and environmental impacts in relation to 23 "Break-Even Goals" (i.e., ecological and social sustainability thresholds) and "Positive Pursuits" that surpass a company's break-even goals for its own operations, or support others in its ecosystem (suppliers, customers, consumers, etc..) to reach their own Break-Even Goals.[238]

- **The Embedding Project**

The Embedding Project is a global public-benefit research project that provides processes, tools, and resources to support companies integrate context- and thresholds-based approaches to their sustainability work.[239]

- **Carbon Tracker / Planet Tracker**

Carbon Tracker and Planet Tracker are both non-profit financial think tanks (founded by the not-for-profit umbrella organization Investor Watch) that seek to align capital markets with planetary boundaries. The founding of Carbon Tracker dates back to 2007, with the first appearance of the term "unburnable carbon" signifying the embedded carbon in fossil fuel company reserves that would exceed the carbon budget if emitted. Carbon Tracker also coined the key terms "carbon bubble" and "stranded assets" as companion contributions to the financial and environmental lexicon.[240]

Planet Tracker was founded in 2018 to extend beyond climate change, assessing impacts in relation to the Planetary Boundaries on oceans, food and land use, and materials. "Planet Tracker has a 'duty of care' to address these potential ecological resource fault lines, irrespective of their immediate financial significance."[241]

- **2° Investing Initiative**

As with Carbon Tracker, the 2° Investing Initiative (2DII) is an international, non-profit think tank working to align financial markets and regulations with the Paris Agreement goals – in particular Article 2.1c of "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."[242]

- **United Nations Guiding Principles on Business & Human Rights**

The UNGPs (as they are known) are the result of a multi-year process conducted by UN Special Representative on business & human rights John Ruggie that created a set of guidelines for states and companies to prevent, address and remedy human rights abuses committed in business operations. The UNGPs represent a norm applicable to social sustainability, an area that lags behind the ecological sphere in terms of the development of thresholds, and in particular frameworks for companies to respect these norms and thresholds.[243]

- **Carrying Capacity of Capitals**

This final section explores initiatives that integrate the multiple capitals concept with the concept of carrying capacity thresholds.

- **Global Reporting Initiative**

The Global Reporting Initiative plays a dual role in regards to the carrying capacities of the capitals, as both progenitor and executioner. GRI arguably gave birth to the notion of the carrying capacities of the capitals in the context of organizational performance, through the introduction of its *Sustainability Context* Principle in its second generation of *Sustainability Reporting Guidelines* in 2002. This is a sufficiently significant milestone to warrant reprinting the relevant text yet again:

> sustainability reporting draws significant meaning from the larger context of how performance at the organisational level affects **economic, environmental, and social capital formation and depletion** at a local, regional, or global level… reporting organisations should consider their individual performance in the … context of the **limits and demands** placed on economic, environmental, or social resources at a macro-level.[244] [emphasis added]

It is telling that, instead of continually bolstering this Principle with deeper guidance, research, and support, GRI has consistently shifted in the *opposite* direction, watering down the Principle and refusing to provide further guidance or support for allocating these real-world limits and demands at the company level.

In the third generation (G3) of its Sustainability Reporting Guidelines (2006), GRI commenced its shift from precision to generalization by dropping reference to the multiple capitals, replacing "economic, environmental, and social capital formation and depletion" with "the improvement or deterioration of economic, environmental, and social **conditions, developments, and trends.**"[245]

In the Public Comment Period in advance of its fourth generation (G4) of *Sustainability Reporting Guidelines* in 2012, a group of 66 prominent sustainability experts from the Sustainability Context Group submitted a Public Comment urging GRI to "undertake improvements to the Sustainability Context Principle in G4."[246] Signatories from the Sustainability Context Group included an Bebbington of the University of St. Andrews, Embedding Project Founder Stephanie Bertels, "Triple Bottom Line" Coiner John Elkington, Ecological Economics Co-Founder Bob Costanza, B Lab Co-Founder Bart Houlahan, *Corporate Responsibility Code Book* Author Deborah Leipziger, Former GRI Chief Operating Officer Ralph Thurm, Global Footprint Network Founder Mathis Wackernagel, GRI Co-Founder Allen White, and *Big Pivot* Author Andrew Winston, among others.

> Although GRI's Guidelines currently do advocate for the inclusion of Sustainability Context in organizational reports, they fail to provide specific guidance for how to do so… Rather than devise a specific procedure for how to implement Sustainability Context in organizational reporting, we believe GRI should provide related guidance in the form of functional specifications, or criteria, for how to do so, in keeping with its charge of providing broad, non-prescriptive direction. This would leave open the door to innovation and competing methodologies for how to apply such context – procedurally – while maintaining a high degree of control over the meaning and interpretation of the Principle itself.[247]

GRI opted against enhancing the Sustainability Context Principle in G4, and also chose not to introduce improvements in the transition from Guidelines to more stringent Standards in 2016. In 2017, r3.0 engaged with GRI to propose collaborative Research and Training on Sustainability Context, which GRI again declined to pursue, either in collaboration or on its own.

On 11 June 2020, GRI released an Exposure Draft for its Universal Standards, which appear on the surface to enhance the Sustainability Context Principle through the addition of terms such as "sustainability thresholds" and "Paris Agreement."[248] While these additions are certainly welcome, it's the quiet deletions that are extremely concerning: GRI removed the term "performance," and replaced it with the phrase "with reference to" and "relative to." The term "performance" specifies measuring with precision on organizational impacts in the context of limits and demands, while the terms "with reference to" and "relative to" introduce significant latitude for imprecision. In a word, this linguistic shift amounts to an invitation to greenwash, given that removing the term "performance" was clearly a conscious choice.

Indeed, simply mentioning the terms "Paris Agreement" or "sustainable thresholds" would suffice to comply with the revised Sustainability Context Principle, even if organizational performance fell far short of actually aligning with the Paris Agreement. So, over a period of less than two decades, GRI has had the opportunity to strengthen its guidance and support for the Sustainability Context Principle, but it has opted instead to castrate the concept.

- **Context-Based Sustainability**

The concept of Context-Based Sustainability was introduced in 2007 by Mark McElroy, Rene Jorna, and Jo van Enegelen, in the methology section of a paper in a peer-reviewed journal:

> The central problem we set out to address, then, was how to incorporate sustainability context in a sustainability report. Ultimately, the project would take the form of a design effort aimed at producing a design specification for a measurement model that would make context-based sustainability reporting possible.[249]

At about the same time, McElroy introduced the concept of the "carrying capacities of the capitals," which represents part of this "design effort at producing a design specification for a measurement model" of Sustainability Context, applicable not just to reporting but to organizational sustainability performance measurement, accounting, and management more broadly.[250] McElroy and van Engelen published a book-length exploration of the concept of Context-Based Sustainability (CBS), applied beyond reporting to corporate sustainability management broadly, in 2012.[251]

CBS serves as the foundation for Multicapitalism, as it establishes the key concept of the carrying capacities of the capitals.

- **MultiCapital Scorecard**

The MultiCapital Scorecard (MCS) builds on the foundation of CBS, embracing the carrying capacities of the capitals, while adding financial capital to its purview, thus applying a full multicapital approach across the full Triple Bottom Line. The MultiCapital Scorecard was introduced in 2015 in a peer-reviewed journal on sustainability accounting, management, and policy, and given a book-length explanation the next year, which furthered the earlier introduction of the concept of Multicapitalism as an economy-level doctrine for replacing Monocapitalism.[252] The MCS is explored in depth in the sections below, so this brief explanation here suffices for the current purposes.

- **UNEP *Raising the Bar* report**

In 2015, United Nations Environment Programme (UNEP) released a report, Raising the Bar: Advancing Environmental Disclosure In Sustainability Reporting, that explicitly endorsed the carrying capacities of the capitals.[253] In a section entitled "The Need for Context," the report advocated for applying a thresholds and allocations approach to Context-Based Sustainability, defining the terms thus:

- Thresholds that demarcate the **carrying capacities of vital capital resources** (natural, social, human, constructed, financial) and therefore divide sustainable from unsustainable performance; and
- Allocations that apportion to companies fair shares of responsibility and accountability for their **positive and negative impacts on common capital resources that are vital to stakeholder wellbeing**.[254] [Emphasis added]

The report included a number of Recommendations, including the following that bears in directly on the carrying capacities of the capitals:

> Reporting standards / guidance bodies such as GRI, IIRC, SASB, CDP, etc. should integrate Sustainability Context more explicitly into their frameworks, for example by applying the concept of **carrying capacities to multiple capitals-based frameworks**.[255] [Emphasis added]

- **UNRISD Three-Tiered Typology**

In 2019, the United Nations Research Institute for Social Development (UNRISD) released a report that introduced a Three-Tiered Typology for Sustainable Development Performance Indicators. This Three-Tiered Typology breaks down as follows:

- **Tier One: *Incrementalist Numeration***
  Numeration indicators focus on actual impacts, which include absolute indicators as well as "intensity" indicators that describe performance relative to a non-normative counterpart (such as unit of production), and are therefore incrementalist by definition.

- **Tier Two: *Contextualized Denomination***
  Denomination indicators contextualize actual impacts against normative impacts. Also known as "Context-Based" indicators, denominator indicators take into account sustainability thresholds in ecological, social, and economic systems, as well as allocations of those thresholds to organizations and other sub-system entities such as sectors, portfolios, or bioregional habitats.

- **Tier Three: *Activating Transformation***
  Transformation indicators add transcontextual elements of implementation practices and policies (as well as more ephemeral emergence) to normative indicators in order to instantiate sufficient change within complex adaptive systems.[256]

The UNRISD report echoes the UNEP *Raising the Bar* report by including a recommendation that explicitly calls for applying the carrying capacities of the capitals concept:

> Organizations with purview over reporting and accounting should embrace Context-Based mindsets by integrating **Tier Two** (*Contextualized Denomination*) indicators more explicitly into their frameworks, for example by applying the concept of carrying capacities to multiple capitals-based frameworks.[257]

- **Global Thresholds & Allocations Council**

The idea for a Global Thresholds & Allocations Council (GTAC) was seeded in about 2012 by GRI Co-Founder Allen White, in conversation with Mark McElroy and this White Paper's author, after McElroy presented on CBS at a Tellus Institute seminar. After encouraging other relevant bodies to pursue the idea, r3.0 decided to take up the gauntlet itself, and started incubating GTAC. The Mission of GTAC is threefold:

1. Identify thresholds & norms for sustaining the carrying capacities of systems-level capital resources in the commons that are vital to stakeholder wellbeing, based on a comprehensive review of research in physical and social sciences and practice in the field.
2. Design and validate allocation methodologies that apportion fair share responsibility for jointly preserving and enriching capital resources vital to stakeholder wellbeing.
3. Disseminate consensus-based thresholds/norms/allocations with "off-the-shelf" ease-of-use in mind to facilitate global mainstreaming of such practices.[258]

In this sense, its Mission overlaps with that of the Global Commons Alliance, except GTAC casts its purview beyond just the ecological sphere, to encompass the social and economic spheres as well. After pursuing a feasibility study supported by regional authorities in the Netherlands, GTAC is now expanding to encompass a network-based approach by coordinating amongst the existing players applying thresholds-and-allocations methodologies and perspectives.

The core concept for GTAC is validated in both of the UN reports listed above. The UNEP *Raising the Bar* report includes the following Recommendation:

> Multilateral organizations should collaborate to create a global governance body of scientists, academics, business practitioners, NGOs and other stakeholders to provide guidance on methodologies for determining ecological (and social) thresholds, as well as guidance on approaches to allocations, all of which are broadly applicable to the business level.[259]

The UNRISD *Three-Tiered Typology* report built on and refined this Recommendation in its own Recommendations:

> Multilateral organizations (such as UN bodies) should collaborate to create a global governance body of scientists, academics, business practitioners, NGOs and other stakeholders to provide guidance on methodologies for determining ecological and social thresholds, as well as guidance on approaches to allocations, all of which are readily and broadly applicable in practice by business, investment, and governing organizations, among others.[260]

As is evidenced by the above list, there is an abundance of activity around the carrying capacities of the capitals, both on the multiple capitals side and on the carrying capacity thresholds side, as well as on the full integration of capitals and carrying capacities. Given this robust ecosystem, undergirded by a robust history of

4.2. ENTERPRISE-LEVEL MULTICAPITALISM

Arguably the foremost applications of Multicapitalism at the enterprise level are being conducted in the food & agriculture sector by a privately-held multinational (Griffith Foods) and a regional dairy cooperative (Agri-Mark, operating as Cabot Creamery Cooperative). Many other companies are applying the multiple capitals, and some companies are applying ecological and social thresholds, so the integration of the carrying capacities of the capitals is the next logical development in the maturation trajectory of integrated reporting and integrated thinking.

The integration of Multicapitalism in measurement carries cascading implications across *all* key elements of the enterprise: its mission and vision would need to shift toward creating value across all capitals, attending to the ongoing health and vitality of those capitals;

Mission and vision, culture/values, innovation, leadership, governance, strategy, risk management, incentives and compensation, performance management and internal reporting, embedded stakeholder engagement

4.2.1. GRIFFITH FOODS

Griffith Foods was established in 1919 with the vision of "bringing science to the food industry,"[261] a legacy it is carrying on by applying the scientific orientation of Multicapitalism into its operations. A century after its founding, Griffith Chief Financial Officer Matt West presented to the Sustainable Brands New Metrics Conference on its implementation of the MultiCapital Scorecard (MCS), a "new performance accounting method" that "makes it possible to measure, manage and report Triple Bottom Line performance relative to organization-specific norms for impacts on multiple capitals."[262] According to a paper in a 2015 peer-reviewed journal, the

> MultiCapital Scorecard is transformational, in that it holds organizations and commerce writ large accountable to the limits in, and demands for, vital capitals in the world on a fair and proportionate basis. No other method does this, and yet it must be done if there is to be sustainability in the conduct of human affairs.[263]

West presented the results of the first two steps of the three-step MCS process:

> (1) Scoping and Materiality;
> (2) Areas of Impact (AOI) Development; and
> (3) Scorecard Implementation.

In MCS, materiality determinations follow a much more rigorous process than traditional financial and sustainability reporting materiality processes, as they require establishing causal chains of accountability between vital capital resources, organizational impacts on those capitals, rightsholders who rely on those resources for their wellbeing, and the carrying capacities of those capitals.

Viewed through ethical and legal lenses, companies have duties and obligations to manage their impacts on these vital capital resources within their carrying capacities, so that *all* rightsholders can continue to rely on these resources to support their wellbeing. And, not incidentally, companies can only remain "going concerns" with sustainable supplies of these vital capitals (many of which companies are beholden to produce, such as the human capital and social capital necessary for ongoing operations). Impacts that transgress the carrying capacities of those capitals put the wellbeing of rightsholders who rely on those capitals (and companies' "going concern" status) at risk. So companies have duties and obligations to manage their impacts on the multiple capitals in order to maintain their carrying capacities.

As a recent United Nations Research Institute for Social Development report on context-based materiality explains:

> Organizations that emit greenhouse gases, for example, are ethically bound, most would say, to mitigate and ultimately eliminate their emissions in light of the negative effects they can have on the climate system and on human well-being as a result. Engaging in philanthropy, by contrast, would tend to be more discretionary and therefore less subject to sustainability norms.[264]

This is the approach to materiality that Griffith Foods applied to create the following materiality determinations of its areas of impact, mapped across the multiple capitals and aggregated across the Triple Bottom Line. See **Figure 29**.

Draft -- Griffith Foods MultiCapital Scorecard - Release 1.0

Vital Capitals Legend:*

- Constructed
- Human
- External Economic – Financial
- External Economic – Non-Financial
- Internal Economic – Financial
- Internal Economic – Non-Financial
- Natural
- Social & Relationship

*Intellectual capital is embedded in most of the others.

CURRENT REALITY

BOTTOM LINE DIMENSIONS OF PERFORMANCE	AREAS OF IMPACT (AOI) CLUSTERS	AOI #	INDIVIDUAL AOIs	INDIVIDUAL CONTEXT-BASED METRICS	FUTURE	CAPITALS IMPACTED
People	Community Involvement	1.	Participation/Engagment	% OI Donated	Volunteer Hours/% particpate	
	Employee Well-Being	2.	Employee Safety	Safety Performance Rating	Yes	
		3.	Employee Fulfillment	Engagement score	Fulfillment score	
	Talent Management	4.	Talent Development	Development Plans in Place	All salaried - plans + tested	
Planet	Climate System	5.	Climate System	Greenhouse Gas (GHG) Emissions	Same	
	Solid Waste	6.	Solid Waste	Solid Waste Sent to Landfills	Same	
	Water	7.	Water	Water Consumption	Same	
	Sustainable Sourcing	8.	Raw Materials	% Raw Materials Certified	Same	
		9.	Suppliers	% Suppliers at Silver Level	Global Industry Standard	
Performance	Purpose-Driven Innovation	10.	Portfolio Transformation	% CM, $CM , by Portfolio Targets	Same	
	Financial Performance	11.	Contribution Margin	% Contribution Margin	Same	
				$ Contribution Margin	Same	
		12.	Return on Equity	EVA	Same	
	Enterprise Risk Management	13.	Food Safety	BRC Audit Score/ %GPSI	Key areas more proactive	
		14.	Business Continuity Plans (Compliance Requirements)	Plans Documented & Tested	Critical Future	

Figure 29: Griffith Foods MultiCapital Scorecard Materiality Mapping[265]

Mark McElroy explains the flexibility of the MultiCapital Scorecard application:

> Griffith Foods' implementation is quite sophisticated in the sense that it measures and reports performance not only at the enterprise level, but for each of 19 operating facilities throughout the world, which are also grouped into 6 or 7 business units. So the hierarchical form of reporting they're doing is impressive. The MCS was tailored accordingly, making it clear that the MCS can be adapted to virtually any organizational structure, no matter how complex or unique.[266]

Griffith is in the process implementing the third step of scorecard implementation.

4.2.2. AGRI-MARK / CABOT CREAMERY COOPERATIVE

Cabot Creamery Cooperative, which was also established in 1919 and merged with Agri-Mark in 1992, has a long history of applying sustainability thresholds to its performance accounting. The cooperative, best known for its aged cheddar cheese, established a full-time sustainability position in 2008, and soon thereafter embarked on assessing its water footprint in the context of water availability (at the watershed level) across its ~1000 member-owner farms and 4 processing facilities, which involved a five-step process:

> The first step is to identify renewable supplies (of water), to be defined as precipitation volumes (only) in the watersheds where Cabot does business – conservatively, no surface or groundwaters would be touched. Next would be to subtract a percentage of annual precipitation for evapotranspiration [evaporation from terrestrial surfaces and transpiration from plants], which in New England can be fifty-percent or higher. Third - allocate half the remaining supplies to ecological or non-human needs. Fourth would be to fully satisfy all household needs in the watershed. And finally, the fifth and last step is to allocate the remaining supplies – something like a quarter of what originally shows up in the form of precipitation – to organizations, including businesses, based on their proportionate contributions to GDP in the watershed.[267]

In 2012, Cabot used the same conceptual approach to assess its greenhouse gas (GHG) emissions in the context of "limits in the Earth's carrying capacity to absorb them without putting the climate system at risk."[268] The co-op compared these context-based calculations to conventional (or Tier One, in the UN-RISD Typology introduced earlier) metrics – both absolute (actual impact) and relative (actual impact relative to some other variable of interest: per unit of production, per dollar of sales, or per full-time-equivalent employees.) The analysis found that absolute and relative metrics send conflicting signals, whereas context-based metrics send signals that express authentic sustainability performance. This suggests that integrated reporting that simply references the multiple capitals may also send mixed signals (including inaccurate signals), unless contextualized to the carrying capacities of those capitals.

The next logical step was to extend this context-based approach across the entire Triple Bottom Line, applying it not only to natural and social capitals, but also to financial capital. Cabot applied the MultiCapital Scorecard to all of its areas of impact, across the multiple capitals of the Triple Bottom Line. Their progress and selected results for 2018 are included in **Figure 30**.

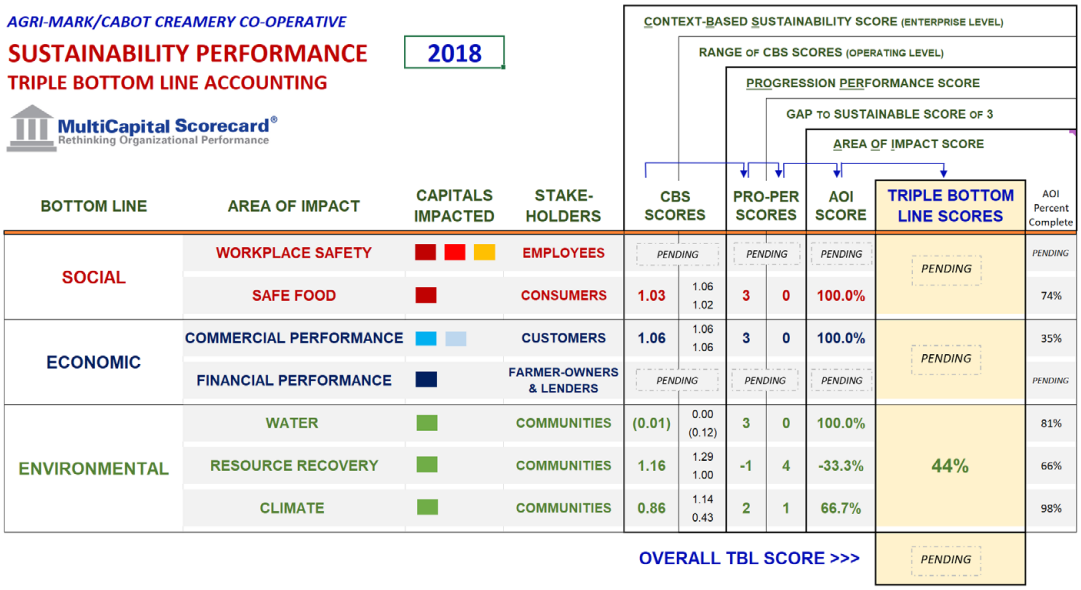


Figure 30: MultiCapital Scorecard for Agri-Mark / Cabot Creamery Cooperative, 2018

The MultiCapital Scorecard includes a number of features that warrant deeper unpacking. First, the multiple capitals:

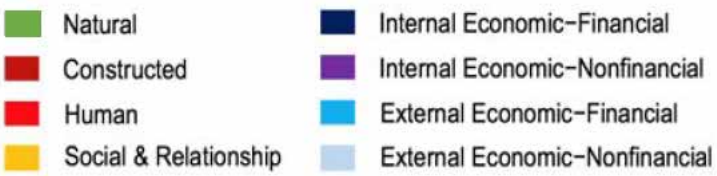


Figure 31: The Multiple Capitals of the MultiCapital Scorecard[269]

While the capitals in the left-hand column are familiar, those in the right column need further explanation. Economic Capital is divided along two axes: internal and external, and financial and nonfinancial. Economic financial capital is what is often recognized as monetized capital, which can be internal to the organization (in the Cabot case, this belongs to the farmer-owners or lenders) or external (such as the financial performance of customers due to Cabot's products). Economic nonfinancial capital is capital that has economic value that transcends financialization – for example, the intangible value of the brand. The MultiCapital Scorecard recognizes these four sub-categories of Economic Capital, while also recognizing the traditional capitals: natural, constructed, human, and social & relationship.

Also fundamentally important to Context-Based Sustainability and the MultiCapital Scorecard is the "baseline" of the scoring schematic: one point zero (1.0) or "OPZ." Recalling the Sustainability Quotient (Sustainability Performance = Actual Impacts / Normative Impacts) and basic mathematics, a quotient achieves "equilibrium" when the numerator and denominator are equivalent, resulting in a value or score of 1.0. CBS and MCS use "OPZ" as the dividing line between sustainability and unsustainability.

In addition, it is fundamentally important to remember that ecological thresholds amount to ecological "ceilings" (or "outer limits"), while anthropogenic thresholds amount to social "foundations" (or "inner limits"), resulting in inverse measures of sustainability (as we established in Section 3.2.2.). While social and economic sustainability is represented by results greater than or equal to one point zero (≥ 1.0) environmental sustainability is represented by results less than or equal to one point zero (≤ 1.0).

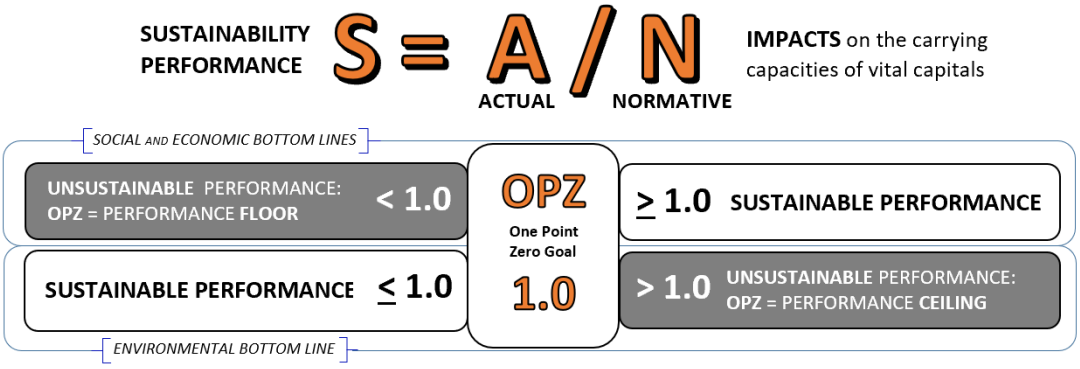


Figure 32: The Sustainability Quotient: Measuring Environmental v Social Sustainability[270]

To demonstrate this inversion, consider the examples of Cabot's *sustainable* performance that include scores of

- 1.03 (≥1.0) on Safe Food, which inhabits the Social Bottom Line dealing with Constructed Capital (prepared food) that serves the wellbeing of Consumer rightsholders;
- 1.06 (≥1.0) on Commercial Performance on the Economic Bottom Line impacting External Economic Capitals (Financial and Nonfinancial) affecting Customers; and
- -0.01 (≤1.0) on Water, which inhabits the Environmental Bottom Line impacting Natural Capital that serves the wellbeing of rightsholders in Communities.

Conversely, Cabot earned an *unsustainable* score of

- 1.16 (≥1.0) on Resource Recovery, which is on the Environmental Bottom Line impacting Natural Capital that serves the wellbeing of rightsholders in Communities.

Next, the MCS embeds assessment across a flow of time, so it encompasses trajectory targets, or what could be considered "interim goals" – stepping stones toward ultimate achievements. The MCS thereby includes what it calls "Progression Performance Scores," which reflect levels of movement in the right – or wrong – direction on a year-over-year basis. These Progression Performance Scores are expressed on a 7-point scale, from +3 (fully sustainable) down to 0 (no change) for movement in the right direction (i.e., toward sustainability), and from 0 (no change) down to -3 (three or more years of regression) for movement in the wrong direction (i.e., away from sustainability).

For example, Cabot's Progression Performance Score on climate (on the Environmental Bottom Line, concerning natural capital) is 2, as it meets or exceeds the year's trajectory target (as defined by the IPCC mitigation curves), but falls short of the sustainability norm of zero emissions. See **Figure 33** for details on this scoring regime.

Numeric Score	Score Definition
+3	Meeting or exceeding the sustainability norm for the year
+2	Meeting or exceeding the year's trajectory target, but falling short of the sustainability norm
+1	Improving upon the previous year's performance, but not meeting the year's trajectory target; or any year of improving performance while having no such targets at all (sustainability norm or trajectory target)
0	Maintaining the previous year's performance while not meeting the year's trajectory target or sustainability norm; or any year of unchanged performance while having no such targets at all (sustainability norm or trajectory target)
-1	A 1-year regression in performance while not meeting the year's trajectory target or sustainability norm; or any single year of worsening performance while having no such targets at all (sustainability norm or trajectory target)
-2	A 2-year regression in performance, while not meeting the year's trajectory target or sustainability norm; or any second consecutive year of worsening performance while having no such targets at all (sustainability norm or trajectory target)
-3	A 3-or-more-year regression in performance while not meeting the year's trajectory target; or any third-or-more consecutive year of worsening performance while having no such targets at all (sustainability norm or trajectory target)

Progression Performance Scoring Schema

Figure 33: MultiCapital Scorecard Progression Performance Schema[271]

On these Progression Performance Scores, Cabot earned the highest mark (3) by meeting / exceeding not only that year's trajectory target but also its sustainability norm on Safe Food (Social Bottom Line), Commercial Performance (Economic Bottom Line), and Water (Environmental Bottom Line). Only one Progression Performance Score showed regression: Resource Recovery (Environmental Bottom Line.)

Finally, these Progression Performance Scores combine across areas of impact within each of the three legs of the Triple Bottom Line, enabling aggregate scoring on each of the three bottom lines, as well as a single unified score for the triple bottom line as a whole. (See **Figure 34**) Cabot has completed assessment of its Environmental Bottom Line, which adds up to 44% of the way to full sustainability. Aggregated results for the other two bottom lines (Social and Economic) are pending, so Cabot is not yet in a place where it can assess its *overall* Triple Bottom Line performance.

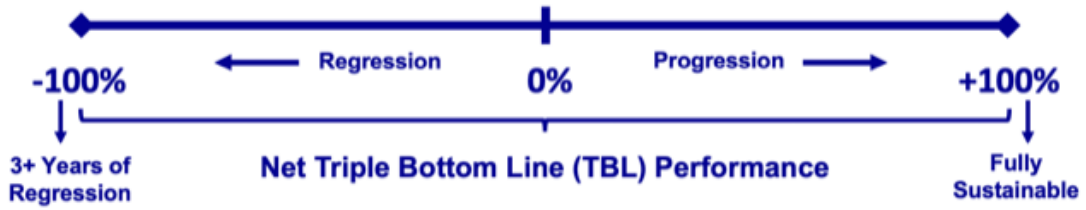


Figure 34: MultiCapical Scorecard Progression Performance Across the Full triple Bottom Line[272]

Importantly, this aggregation approach avoids the pitfalls of Impact Valuation described earlier, as it uses Progression Performance as its aggregating mechanism, instead of using the monetization of impacts on capitals – which, as we already established, are not fungible or substitutable for one another. While ecological and social impacts are clearly interconnected, this does not mean that positive performance on economic capital (paying a living wage, for example) necessarily compensates for negative performance on natural capital (overdrawing a company's fair share of water from a watershed, for example). As McElroy and his co-author Martin Thomas in their 2016 book *The MultiCapital Scorecard* explain:

> The MultiCapital Scorecard does not compensate "apples with oranges." But it does aggregate progression scores. Such aggregation does not in any way compensate for unsustainable performance … [The] single score that reports the triple bottom line performance of an organization … makes no assumption of intercapital substitution, as it is a measure of progression, not of sustainability per se.[273]

To illustrate this, note that Cabot's -33% regression on Resource Recovery significantly drags down its overall Progression Performance score on the Environment Bottom Line of 44%, which would otherwise have been 83% based on the Progression Performance Scores of 100% on Water and 66.7% on Climate.

Cabot's use of the MultiCapital Scorecard enables the coop to measure its performance with precision, identifying areas of positive performance where the cooperative can feel confident about its System Value Creation, while also tracking underperformance that helps pinpoint risks and remediation opportunities for mitigating – and ultimately eliminating – those risks.

As Cabot Director of Sustainability Jed Davis says:

> The MultiCapital Scorecard, which builds on our decade-plus implementation of Context-Based Sustainability, is emerging as a vital tool for Cabot – and our cooperative of farmer-owners – to fulfill our credo of "living within our means and ensuring the means to live." It's not only the right thing to do – it's also the smart and strategic thing to do in a world of increasing volatility where we strive to continue on our journey toward providing sustainable nutrition.[274]

4.2.3. TOURISM HOLDINGS LIMITED

Tourism Holdings Limited (or thl, as it's commonly known), a New Zealand-based company that is the largest provider of holiday vehicles for rent and sale globally, became the first listed company to produce an Integrated Annual Report that integrated the Future Fit Business Benchmark, in 2019. [275]This also represents the first time the Future Fit Business Benchmark has been applied in a multiple capitals context. The report assesses thl's positioning against the 23 Future-Fit Break-Even Goals. (See **Figure 35**)

Figure 35: thl Positioning Against Future-Fit Break-Even Goals[276]

Addressing this progress in relation to the Future-Fit Break-Even Goals, the dhl Integrated Annual Report states:

> FY20 will be used to do a full, in-depth assessment per business unit following the scientific indicators and data measure, to give an exact indication per goal of where we stand and how far we have to go. Although, right now, we don't have all the data we need to make a complete assessment, indications currently show we are around 30-40% along on our journey.
>
> For thl this only reinforces the need for urgent action. We have to improve by over 60% to become Future-Fit. There is nothing as inspiring as some real constraints and stretch goals – so we have started our journey and are looking at what these goals could mean for us specifically.[277]

The thl Integrated Annual Report also correlates five of the IIRC's Six Capitals (all save financial capital) with the Future-Fit Break-Even Goals, as well as the United Nations Sustainable Development Goals. (see **Figure 36** below)

By investing in our manufactured capital we will commit positively to achieving these Future-Fit Business and Sustainable Development Goals:

- FF04 Procurement safeguards the pursuit of Future-Fitness.
- FF05 Operational emissions do not harm people or the environment.
- FF07 Operational waste is eliminated.
- FF17 Products do not harm people or the environment.
- FF18 Products emit no greenhouse gases.
- FF19 Products can be repurposed.
- FF23 Financial assets safeguard the pursuit of Future-Fitness.

Long term, we are committed to the Future-Fit Business Goals and Sustainable Development Goals related to protecting and enhancing our natural capital. These are:

- FF01 Energy is from renewable sources.
- FF02 Water use is environmentally responsible and socially equitable.
- FF03 Natural resources are managed to respect the welfare of ecosystems, people and animals.
- FF04 Procurement safeguards the pursuit of future-fitness.
- FF05 Operational emissions do not harm people or the environment.
- FF06 Operations emit no greenhouse gases.
- FF07 Operational waste is eliminated.
- FF08 Operations do not encroach on ecosystems or communities.

By investing in our human capital we will commit positively to achieving these Future-Fit Business Benchmark (FFBB) and Sustainable Development Goals:

- FF10 Employee health is safeguarded.
- FF11 We pay employees at least a living wage.
- FF12 Employees are subject to fair employment terms.
- FF13 Employees are not subject to discrimination.
- FF14 Employees concerns are actively solicited, impartially judged and transparently addressed.

By investing in our intellectual capital we will commit positively to achieving these Future-Fit Business and Sustainable Development Goals:

- FF04 Procurement safeguards the pursuit of Future-Fitness.
- FF09 Community health is safeguarded.
- FF15 Product communications are honest, ethical, and promote responsible use.
- FF16 Product concerns are actively solicited, impartially judged and transparently addressed.
- FF17 Products do not harm people or the environment.
- FF18 Products emit no greenhouse gases.
- FF19 Products can be repurposed.
- FF20 Business is conducted ethically.
- FF21 The right tax is paid in the right place at the right time.
- FF22 Lobbying and corporate influence safeguard the pursuit of Future-Fitness.
- FF23 Financial assets safeguard the pursuit of Future-Fitness.

Figure 36: Correlating the IIRC's Six Capitals with the Future-Fit Break-Even Goals & SDGs[278]

Beyond this correlation, thl is still in various stages of maturity in terms of actually setting, applying, and holding its performance accountable to Future-Fit's Break-Even Goals. Take its work on Natural Capital, for instance. It set its FY19 goals "in line with the Paris agreement long term objective to keep the increase in global average temperatures to below 2°C, above pre-industrial levels" which translates to a 20% reduction in its absolute carbon footprint by 2025.[279] Compared to its 2016/17 baseline, dhl's operational emissions are down 14%, which would appear to put it on track to meet this goal.

However, the report acknowledges that while the company currently tracks its customer carbon footprint while driving its vehicles separately from its own operational footprint, it *should* include these emissions in its own operational calculations, since it owns the vehicles. "From FY20 onwards we intend to include these in our full stated organisational footprint."[280] Furthermore, its customer footprint is increasing due to rising customer kilometers driven, which "clearly shows the need for our focus on alternative options to our fossil fuel dependent fleet."[281]

Stepping back to look more broadly, the company states:

> We now know that globally, in order to substantially reduce the risks and effects of climate change, that the absolute maximum borderline is a 1.5°C temperature increase; we will adjust our goals accordingly. Long term, we committed to the Future-Fit Break-Even goal of zero emissions. In FY20 we will complete our assessment process, and we will then set ourselves a hard deadline for this goal. Currently, we are moving as fast as we can.[282]

Indeed, given that dhl only recently committed to applying the Future Fit Business Benchmark, it is laudable that the company is as far along as it is. The application of the Break Even Goals to the multiple capitals of integrated reporting also represents a growth opportunity for Future Fit, as it has previously framed the Benchmark without reference to the multiple capitals. Accordingly, the Future Fit Business Benchmark is not oriented toward assessing the carrying capacities of the capitals, but rather, it articulates a set of goals that are generally aligned with the science, without mechanisms for applying them directly to vital capital resources.

For example, the Future Fit Business Benchmark does not include any allocation function, making it impossible to directly contextualize impacts on vital capitals to the carrying capacities of those resources. In this sense, Future Fit takes an indirect, proxy-based approach, instead of a direct, performance-based approach. For instance, on GHG emissions reductions, Future Fit calls for setting distant targets that companies pursue along a straight line, regardless of growth or contraction of the company in the meanwhile, instead of taking an allocations approach that enables aligning directly to the IPCC scenarios whose decarbonization pathways typically don't follow straight lines, taking real-world considerations into account.

The integration of the Future Fit Business Benchmark with multicapital integrated reporting thus represents an important step in the direction of Multicapitalism, with future maturation opportunities ahead.

4.2.4. NOVO NORDISK

Novo Nordisk has played a key role in pioneering the application of the Future Fit Business Benchmark, as "the first global company to have completed a Future-Fit self-assessment and to have the results independently assured."[283] The Denmark-based producer of diabetes medicines has also played a pioneering role in advancing integrated reporting, having published "one integrated report to reflect the Novo Nordisk Triple Bottom Line business principle" through consolidated financial, environmental, and social statements since 2004.[284] Its integrated reporting thus predates Bob Eccles & Mike Krzus' 2010 One Report book that first comprehensively articulated the case for integrated reporting, as well as the 2010 founding of the International Integrated Reporting Council.

In late 2018, Novo Nordisk completed an assessment of its scores on the 23 Break-Even Goals, on a scale of 0 (worst) to 100 (best). It scored

- Between 75 and 100 on 10 Goals
- Between 25 and 75 on 6 Goals
- Between 0 and 25 on 7 Goals.[285]

"As our initial calculations showed, we do really well on some of the Break-Even Goals and not very impressive on others," the company stated.[286]

One would think that Novo Nordisk would be a leader in Multicapitalism, given its bona fides on integrated reporting and Future-Fit assessment. However, the company does not take a multiple capitals approach to its integrated reporting. A word search for the term "capital" yields 111 hits in its 99-page Annual Report 2019, but they all refer to financial capital – similar searches for "natural capital," "human capital," "social capital," etc… come up empty handed.[287] Embracing a multiple capitals approach to integrated reporting, merged with Future Fit assessment (attending to the limitations of Future Fit mentioned above) would be a logical next step for the company to take.

4.3. MESO (PORTFOLIO LEVEL) MULTICAPITALISM

At the next scale above the micro (enterprise) level, the implementation of Multicapitalism at the meso scale would apply to industry sectors, investment portfolios, and/or bioregional habitats. Given that activity is still nascent at the enterprise level, sector-level implementation is not the land of "low-hanging fruit." However, the investment portfolio is an ideal locus of application, as such portfolios cover large universes of enterprises, and the carrying capacities of the capitals can be assessed externally, using publicly available data on actual impacts (the numerator of the Sustainability Quotient). This impact data typically resides in reports prepared in accordance with the Global Reporting Initiative Guidelines and Standards, the Sustainable Accounting Standards Board Framework, company annual reports, and other publicly available data sources as well as proprietary databased that are typically accessible to investors (eg Bloomberg terminals).

4.3.1. ASSET OWNER INTEGRATED REPORTING

In his first monthly Letter of 2019, Keith Ambachtsheer – "the globe's number one knowledge broker in institutional investing … known for his 'out-of-the-box' approach to pension design, governance, and investing issues"[288] – discussed "why asset owners should use the integrated reporting framework."[289] Ambachtsheer writes:

> I welcomed the formation of the International Integrated Reporting Council (IIRC) in 2010. The more I learned about the IIRC initiative, the more I became convinced of the relevance of media guru Marshall McLuhan's dictum that 'the medium is the message.' The very act of choosing to tell its story using the medium of integrated thinking sends the message to an organization's stakeholders that it cares deeply about creating sustainable value for them…[290]

Given that his exclusive business model for several decades has been a monthly four-page *Letter* to asset owners and other institutional investors, Ambachsheer is known for getting straight to the point:

> The goal of this Letter is to help leaders in the asset owner sector see that integrated reporting is indeed a case of the medium being the message. While its original application was in the corporate sector, as asset owners are stewards, its application there is even more important. **Asset owner stewards need to be seen taking the lead in integrated reporting**.[291] [Emphasis added]

Ambachtsheer proceeds to provide a brief history of IIRC, as well as his own writings on integrated reporting (in his May 2018 and August 2014 *Letters*), before applying the seven Guiding Principles of the <IR> Framework to the case of asset owner integrated reporting. The final section of the January 2019 letter is entitled "Addressing the Elephants in the Asset Owner Board Room." The first and last of these five "elephants" bear in on asset owners adopting Multicapitalism thinking:

1. Value-creating in asset owner organizations can take place at two levels: micro and macro. It is not a matter of choosing one over the other, but of integrating both perspectives into a seamless whole.

2. Performance reporting must be directly integrated with the stated internal and external value-creating ambitions of the organization.[292]

Taken together, these two points tie in directly to Multicapitalism, via the micro-macro link of Sustainability Context and the definition of System Value as both internal and external value.

Bookending the year, Ambachtsheer focused his December 2019 *Letter* on the question, "what is 'Threshold Investing' and why should you know?"[293] It started thus:

> We live on a planet with finite social and ecological carrying capacities, and we have been overshooting those capacities for quite some time now. The question facing asset owner organizations today is how to respond to these increasingly clear realities. The answer is also increasingly clear. At a micro level 'sustainable investing' means investing in organizations that operate within explicit social and ecological thresholds, and at a macro level 'sustainable finance' means steering global economic activity to remain within social and ecological thresholds at the planetary level. The clearer these realities become, the clearer the fiduciary duty becomes to deal with them at both micro and macro levels.[294]

After establishing the concept, he ends the *Letter* focused on at the practical level:

> What does a plausible path to threshold investing look like? The [r3.0] *Sustainable Finance Blueprint Exposure Draft I* suggests starting with the Montreal Pledge taken by asset owners to calculate the carbon footprints of their asset holdings. This provides the numerator of the Sustainability Quotient (i.e., actual impact). The next step is to calculate the denominator, their fair shares of the planetary carbon budget. Over the past few years, more than 650 companies have taken this next step by calculating their Science Based Targets (SBTs).
>
> Asset owners can follow a similar path. For example, they could adopt an economic allocation (i.e., percent of GDP) approach applied across all sectors to calculate a portfolio carbon budget. This facilitates assessments if the portfolio's actual carbon footprint exceeds its calculated carbon budget, and helps identify which investee companies are causing this overshoot. The Blueprint calls for extending this carrying capacity approach across multiple capitals, including natural, social, and financial. Readers will recall that the Integrated Reporting Framework applies this multiple-capital approach at the organization level.[295]

Ambachtsheer collaborated the author of this White Paper to synthesize the thinking in these two letters into a pair of Conference Board blogs, focusing on how applying the carrying capacities of the capitals to asset owner integrated reporting is a necessary step in the transition from Monocapitalism to Multicapitalism.[296]

> In an ideal world, micro-level enterprise value creation naturally aggregates up to macro-level system value creation. In the real world, things don't necessarily work out that way. Monocapitalism's blinders often focus on value creation solely horizontally, converting natural, social, and human capital into financial capital, without regard to how these micro conversion processes negatively impact social (e.g., income distribution) and natural (e.g., environmental) capitals at a macro level.
>
> This blinders problem at the micro level cannot continue forever, with enterprises siphoning off 'free' macro capitals to maximize shareholder value. This depletes capital stocks and productive flows of these vital global resources below their carrying capacities, creating macro-level systemic risks…

Though seemingly divergent, GRI's focus on sustainability and IIRC's focus on value creation are actually opposite sides of the same door, with both intermediated through the multiple capitals, and both linking micro to macro. With their central concerns around "limits and demands" – i.e. the thresholds that delineate sustainability from unsustainability, "in the black" from "in the red", both hold keys to opening this door in either direction. Sustainable value creation requires respecting the carrying capacities of the system-wide capitals… [A]sset owner [integrated reporting] must reflect performance that bridges enterprise value creation with system value creation, thereby enabling accurate assessment of portfolio value creation…

Multicapitalism, a concept coined by Martin Thomas and Mark McElroy in 2014, enables this more far-sighted, expansive, and distributive approach to performance reporting, recognizing the umbilical cord between enterprise value creation and robust system value across all the multiple capitals. We urge asset owners to take up IR as a means of enhancing enterprise value, portfolio value, and system value in an integrative, holistic manner.[297]

4.4. MACRO (ECONOMY) LEVEL MULTICAPITALISM

As Ambachtsheer notes, there is a clear case (a fiduciary case for asset owners) for advancing Multicapitalism not only at the micro and meso levels, but also at the macro level, seeing as System Value applies from the macro level down. There are emerging examples of Multicapitalism being applied at this macro level.

4.4.1. EY MULTICAPITAL SCORECARD IMPLEMENTATION (NATIONAL LEVEL)

In 2017, EY commissioned a study for presentation at the World Economic Forum (WEF) Global Future Councils (GFC) on the Fourth Industrial Revolution (4IR) applying the MultiCapital Scorecard at the national level.[298] The study, part of the GFC Metrics Work Stream, focused on 4IR developments in four countries: Argentina, Estonia, Rwanda, and the United States, addressing the issues outlined in **Figure 37** below.

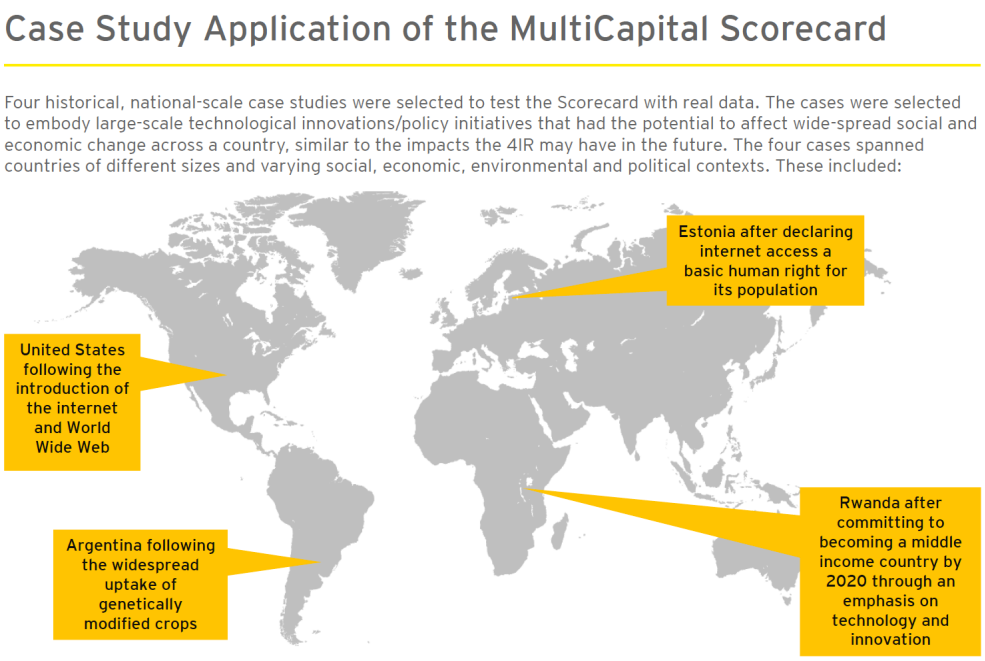


Figure 37: Geographic Scope of National Case Studies of 4IR MultiCapital Scorecard Study[299]

EY explained the background context of the Fourth Industrial Revolution thus:

> The velocity and scope of the Fourth Industrial Revolution (4IR) is upon us and is outpacing previous industrial revolutions and disrupting almost every industry around the world. Characterized by new technologies that span physical, digital and biological worlds, the 4IR will transform entire systems of production, management and governance, and will impact all disciplines, economies and industries. 4IR innovations will include artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, energy storage, driverless cars and quantum computing as well as the human body through the integration of synthetic biology, nanotechnology, biotechnology, and materials science. Like many previous industrial revolutions, advances in automation and connectivity are driving the 4IR, yet, in the current era, these changes are happening in faster and farther reaching ways than in the past.
>
> While the 4IR promises great benefits and advances in terms of knowledge, efficiency and health, it also poses risks of new threats to personal privacy, self-identity, governance and cybersecurity and could amplify inequalities, including through the loss of jobs due to automation. **The changes the 4IR will bring will have differential effects on nations, businesses and individuals, which currently are not well understood or being measured systematically to inform decision making around policies and programs.**[300] [Emphasis added]

In order to understand and systematically measure these potential positive and negative impacts on nations, businesses, and individuals, EY applied a customized implementation of the MultiCapital Scorecard as a possible tool for assessing the impacts of the 4IR on human well-being. Since future 4IR developments have not yet happened, the scope of EY's investigation focused on various technological revolutions in the past and present. **Figure 38** below shows the content and configuration of the MultiCapital Scorecard used by EY, as well as the scores achieved for one country in one year of study (Argentina, 2009) . (Refer to legends from Section 4.2.2)

Framework Aspect	AOI #	Areas of Impact (AOIs) (and associated capitals) Vital Capitals: Constructed (C); Internal Economic: Financial (IE:F); External Economic: Financial (EE:F); Internal Economic: Non-Financial (IE:NF); External Economic: Non-Financial (EE:NF); Natural (N); Human (H); Social & Relationship (S)	Progression Score A	Weight (1-5) B	Weighted Score C (A x B)	Fully Sustainable Score D (B x 3)	Gap to Fully Sustainable E (D - C)	Area of Impact Bottom Line F (C/D)	Framework Aspect Total G
Social	1.	Health: Life Expectancy (H)	2	5	10	15	5	0.67	
	2.	Freedom & Transparency: Voice and Accountability (S)	-2	3	-6	9	15	-0.67	
	3.	Social-Culture: Urban Sanitation (C)	1	1.6	1.6	4.8	3.2	0.33	24%
	4.	Social-Culture: Internet Access (C)	1	1.6	1.6	4.8	3.2	0.33	
	5.	Security-Crime: Homicides (H)	1	2.8	2.8	8.4	5.6	0.33	
Economic	6	Social-Culture: % Women in Non-Ag Workforce (IE:NF)	3	1.6	4.8	4.8	0	1.00	
	7	Equality: Income (IE:F)	1	3	3	9	6	0.33	
	8	Jobs: Unemployment Rate (IE:NF)	-1	3.7	-3.7	11.1	14.8	-0.33	-1%
	9.	Business Producivity: GDP/Capita (IE:F)	-1	4.6	-4.6	13.8	18.4	-0.33	
Environmental	10	Environment: GHG Emissions (N)	1	3.2	3.2	9.6	6.4	0.33	33%
		*NOTE: This scorecard is an adaptation of the MultiCapital Scorecard developed by Thomas & McElroy LLC.	Overall Performance		13	90	78		14%

Figure 38: EY 4IR MultiCapital Scorecard Results[301]

EY summarized the primary findings of the study thus:

> Based on this analysis, it became apparent that commonly used metrics such as the Human Development Index (HDI) and Gross Domestic Product (GDP) do not capture all of the impacts across social, economic and environmental dimensions, important to both human welfare and sustainable economic development in the 4IR.[302]
>
> This work has demonstrated empirically the value of multi-capital measurement for the 4IR as a supplement to GDP and other commonly used indices such as HDI. Case study application of the model shows that measures such as GDP and HDI do not track performance in many of the impacts that will become increasingly important to monitor and evaluate in the 4IR.[303]

A closer look at the national level case studies is particularly revealing. In addition to comparing the MCS Triple Bottom Line (TBL) results to GDP and HDI, the study also compared them to the World Happiness and Gross National Happiness indexes. What EY found was that in a developed country like the U.S. where the economy is strong, TBL performance correlated closely with happiness but less so with GDP. (See Figure X). In less developed countries like Argentina where basic needs are still unfulfilled and the economy is not so strong, the opposite was true – meeting basic economic needs must understandably come first, in which case happiness correlates more closely to GDP than TBL. Much of this was speculative, of course, given the limited scope of the study, but the viability of the MCS methodology itself as a useful tool for assessing the well-being of whole countries was no less proven in the study.

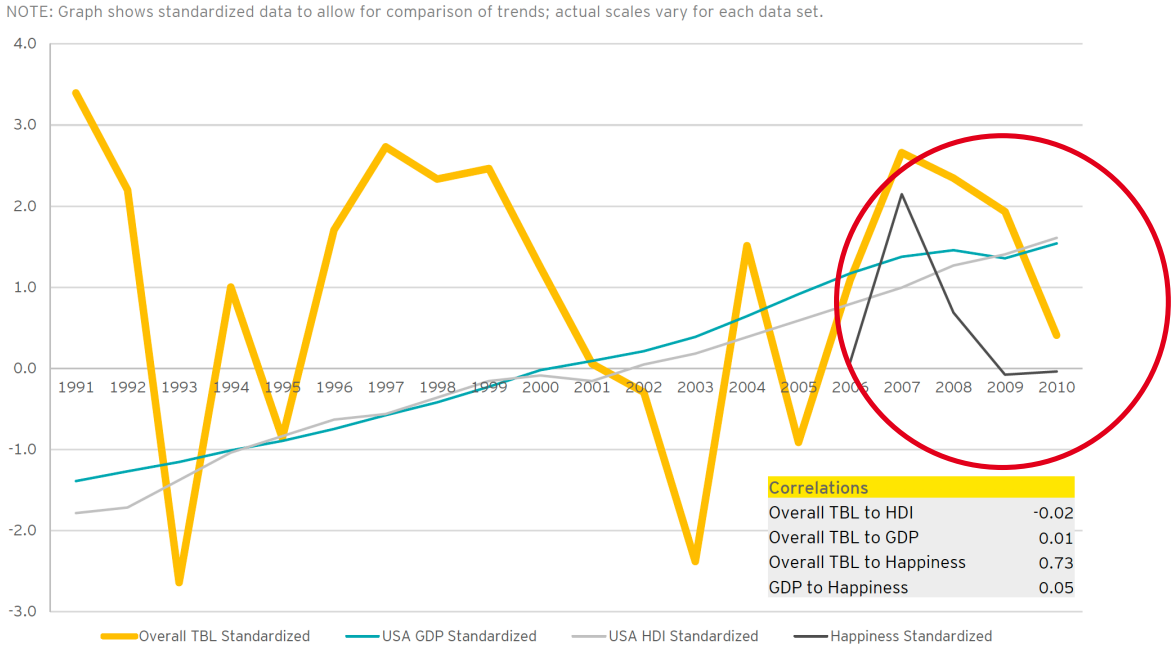


Figure 39: EY 4IR MCS U.S. Case Study: TBL / Happiness Correlation[304] [Emphasis Added]

Indeed, the study not only demonstrated the ability of a multicapital accounting tool like the MCS to reveal the sufficiency of vital capitals in the world, but also that major technological revolutions

> do not necessarily equate to improvements in performance across social, economic and environmental categories [much less happiness]. Therefore, impacts in these areas should be carefully considered, managed, and monitored throughout such transformations.[305]

Regarding the methodology itself, EY further concluded:

A unique advantage of the multicapital measurement approach is that it enables an assessment of progress in social, economic and environmental TBL categories relative to sustainability thresholds and trajectory targets, which are necessary for interpreting data and understanding if progress in each AOI and the conditions of vital capitals are on a sustainable path in the 4IR.[306] [Emphasis added]

4.4.2. WELLBEING ECONOMY GOVERNMENTS (WEGO) ALLIANCE

In New Zealand, we're roughly projecting 3% growth, unemployment's at 3.9%, on traditional measures – budget surpluses – people would look at us and say, "you're doing ok." But we have homelessness at staggering rates; one of the highest rates of youth suicide in the OECD; our mental health and well-being is not what it should be. So, our plan is through the well-being work we're doing, a Living Standards Framework and our Well-Being Budget, where if you're a minister and you want to spend money, you have to prove that you are going to improve intergenerational well-being. We are hoping to embed in, actually what the public is asking us for – to address the societal well-being of our nation, not just our economic well-being.
New Zealand Prime Minister Jacinda Ardern, World Economic Forum, 2019[307]

National governments are starting to take substantive steps to integrate the multiple capitals and well-being into the policies and practices. Perhaps most prominently, New Zealand Prime Minister Jacinda Ardern is championing this Multicapitalist approach this its Living Standards Framework and Wellbeing Budget. She says:

> The Wellbeing Budget will broaden the Budget's focus beyond economic and fiscal policy by using the Treasury's Living Standards Framework to inform the Government's investment priorities and funding decisions. The Government will measure and report against a broader set of indicators to show a more rounded measure of success, as a country and as a Government.[308]

The New Zealand Treasury's Living Standards Framework (LSF) adds four capitals (natural, human, social, and physical & financial) to the 11 wellbeing measures of the OECD Better Life Index (Subjective Wellbeing; Civic Engagement & Governance; Health; Housing; Income & Consumption; Knowledge & Skills; Safety; Social Connections; Environment; Jobs & Earnings; and Time Use).[309] (See **Figure 40**)

Figure 40: The Four Capitals of New Zealand Treasury's Living Standards Framework[310]

The New Zealand Treasury hosts a Living Standards Framework Dashboard with data on each of these indicators, including the four capitals. For example, on natural capital, it shows rising levels of carbon stored in biomass, a good sign for climate regulation, but on social capital, it shows falling then rising discrimination, which bodes poorly for social cohesion. (See **Figure 41**)

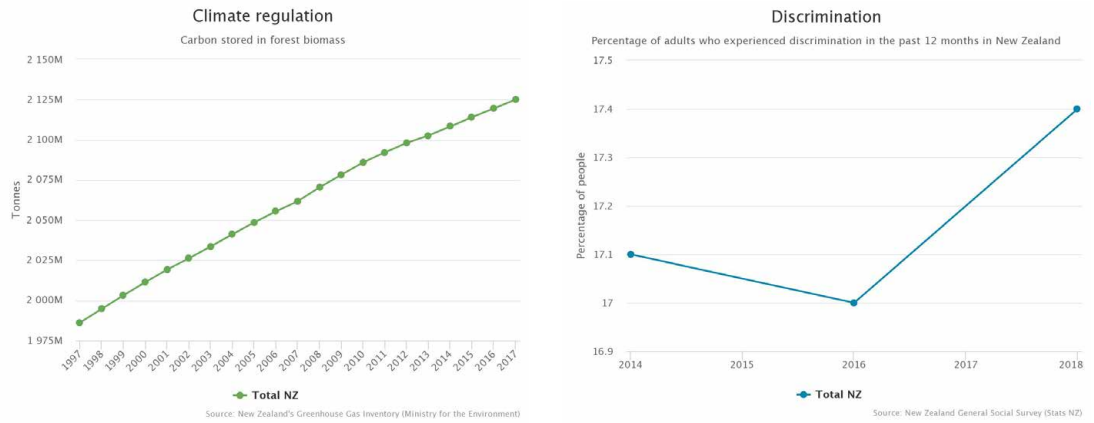


Figure 41: NZ Living Standards Framework Dashboard: Climate Regulation[311] & Discrimination[312]

As of now, the Living Standards Framework does not integrate the carrying capacities of the capitals. But there are developments afoot that head in this direction. Rebecca Mills of the Lever Room created a draft map of the Impact Economy Ecosystem for Aotearoa New Zealand that incorporates the ecological ceilings of the Planetary Boundaries and the social foundations of Doughnut Economics.[313] (See **Figure 42**)

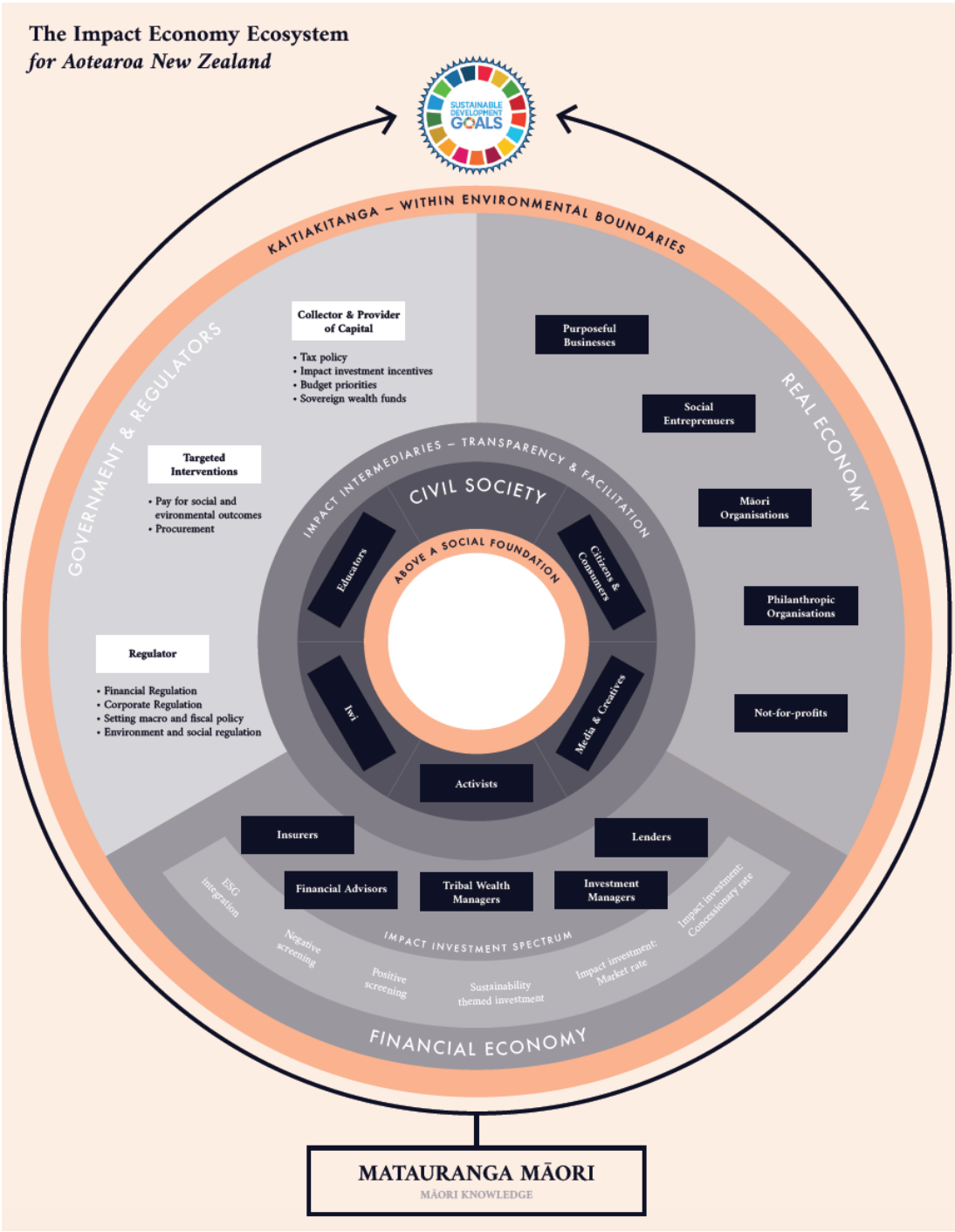


Figure 42: Progressing an Impact Economy for Aotearoa New Zealand[314]

This complements parallel work to translate the Doughnut into the indigenous Māori cultural context of New Zealand. This transliteration reveals that the categories and concepts embedded in the anglophone Doughnut have equivalent counterparts in Māori culture.

Figure 43: Te Reo Māori Doughnut[315]

Interestingly, BHW Lands Trust Executive Manager Teina Boasa-Dean and Project Moonshot: City Co-Founder Juhi Shareef also created a complementary version that flipped the orientation on its head, "reimagining of the doughnut from a Tūhoe Māori perspective, with the environment as its foundation, and social elements on the outer ring."[316] (See **Figure 44**) What's striking is that this reconfiguration affirms the universality of the underlying *values*. Shifting the orientation changes perspective, but it does not overturn the valuing of the key elements of the Doughnut, which are all necessary elements for nurturing the fundamental viability of earth as a home for *all* of humanity to meet their core needs with dignity ongoingly.

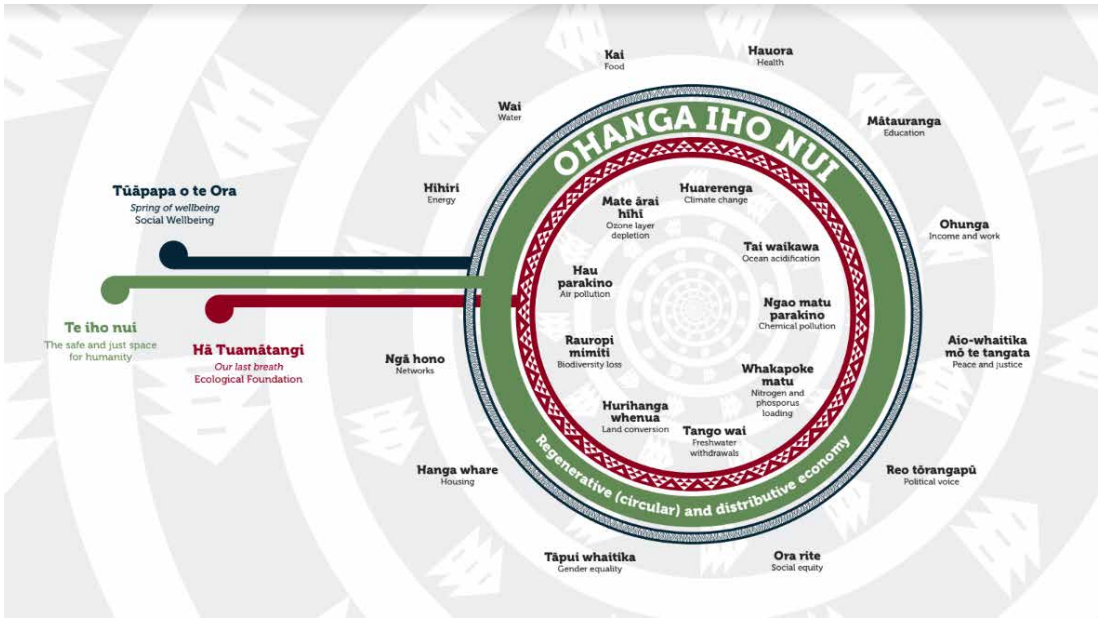


Figure 44: Tūhoe Māori Doughnut[317]

Explains Bossa-Dean:

> there was a balance between human behaviour and healthy boundaries of human behaviour in their relationship to the environment. So, at that particular point in time, when things were in more of a balance, of course people could celebrate their behaviour in relationship with the environment.
>
> Today, indigenous communities increasingly recognise that this is not the case, and having to position the earth mother and sky father at the centre of a diagram like this, makes things overt and explicit.[318]

So, the next step for New Zealand is to marry these visions of a Doughnut-based economy with its current reality of governmental multicapital assessment to bring Multicapitalism into fuller practice.

And New Zealand is not alone. After a first meeting at Scotland's Inclusive Growth Conference at the University of Glasgow in October 2017, the Wellbeing Economy Governments (WEGo) Alliance formally launched at the OECD's World Forum in Incheon, South Korea in 2018.[319] The Alliance, which was instigated by the Wellbeing Economy Alliance and is supported through a secretariat provided by the Scottish Government, consists of the governments of New Zealand, Scotland, Iceland, and more recently, Wales.[320]

In 2018, Scotland published a new National Performance Framework that encompassed both natural and social capital. Here again, this framework does not currently integrate the carrying capacities of the capitals, so this is a next maturation step for the participants of WEGo.[321] In September 2019, the Government of Iceland introduced its Indicators for Measuring Well-being, which included social capital.[322]

At its first Economic Policy Lab in Edinburgh in May 2019 (at the former home of Adam Smith, Panmure House), WEGo members discussed the role of natural capital in their work, along with performance frameworks, wellbeing budgeting, and predictive analytics. In her speech at the event, Scottish First Minister Nicola Sturgeon quoted Adam Smith as saying,

All constitutions of government are valued only in proportion as they tend to promote the happiness of those who live under them. This is their sole end and use.[323]

5. PROPOSED PATHWAYS TO SPUR THE EMERGENCE OF MULTICAPITALISM

We live in a political world…
Bob Dylan, "Political World," *Oh Mercy*, 1989

We are living in a material world…
Madonna, "Material Girl," *Like a Virgin*, 1984

I'm living in the material world…
George Harrison, "Living in the Material World," *Living in the Material World*, 1973

The pathway from Monocapitalism to Multicapitalism navigates the dynamic tension between the political world and the material world. The political world is currently entrenched in the existing Monocapitalist paradigm, which does not concede power without a struggle, to paraphrase slavery abolitionist Frederick Douglass.[324] Indeed, Monocapitalism has not conceded the power to profit from enslavement, despite the legal abolition of slavery more than a century-and-a-half ago: there are more slaves today than at the height of its legal institutionalization, and the racism that undergirded that institutionalization persists insidiously, like a knee upon the neck of humanity that cannot be removed until it is extricated from the fundamental design of our economic systems.[326] As Dylan astutely observes:

> We're living in times
> Where men commit crimes,
> And crime don't have any face.

Multicapitalism, on the other hand, focuses on reconciling vital capital resource use with the carrying capacity constraints of the material world. Multicapitalism thus concerns itself with a material world located somewhere between Madonna's pecuniary *materialistic* world ("The boy with the cold hard cash / Is always Mister Right")[327] and Harrison's spiritual transcendence of this earthly realm ("Got a lot of work to do / Try to get a message through / And get back out of this material world… / To the Spiritual Sky").[328] The material world of Multicapitalism is more literalist, bounded by universal laws and biogeochemical realities here on earth, which humans comprehend through mathematics and thermodynamics and quantum physics. These tools help us translate from the financial measures of "cold hard cash" to the transcendental yearnings of "the Spiritual Sky." As GRI Co-Founder Allen White says, "measurement is a lens on the character of institutions and, ultimately, ourselves."[329] How we measure is a measure of our humanity.

One could say that the paths of Monocapitalism and Multicapitalism have been intertwined for centuries, dating back to the world's first initial public offering (IPO) in 1602, when shares of the Dutch East India Company were traded on a stock market. From the get-go, Dutch religious pacifists campaigned by lamplight house-to-house to gather signatures for a notarized public petition to boycott investment, and make a show of selling shares, in protest over the company's business model that relied on "generous application of warfare, blockade, piracy, assassination, imprisonment, plunder, terror, slavery, [and] bribery."[330] While this activism was not framed in terms of the multiple capitals, the underlying rationale concerned the wellbeing of rightsholders who rely on the resources the Dutch East India Company was seeking to capitalize on. The activists were seeking to put a face on the crimes committed in the name of financial capital accumulation.

The modern struggle between Monocapitalism and Multicapitalism has unfolded over the past half-century or so, since the Socially Responsible Investing and Corporate Social Responsibility movements emerged from the social and environmental activism of the 1960s that formalized in the 1970s. The 1987 Brundtland Report from the United Nations can be viewed as the first attempt to reconcile intergenerational sustainability with the development agenda entangled in the economic growth imperative.[331] At the turn of the millennium, the first attempts to establish a *bona fide* vision of sustainability (with the establishment of the Global Reporting Initiative's Sustainability Context Principle) coincided with the rise of ESG (Environment, Social, Governance), defining the fault lines between "political world" and "material world" solutions.

GRI Co-Founder Allen White recalls these turn-of-the-millennium developments in ways that help us understand the paradigms at play:

> In the earliest days of GRI, working groups would spend countless hours on refining absolute measures of energy and water use; occupational safety, wages, and injuries; and community donations. All such measures, of course, have value in their own right.[332]
>
> As head of GRI at that point, I felt very strongly that **an initiative that purports to be a sustainability initiative could not simply frame its work along the lines of, shall we say, incremental performance assessment.** That is, companies that were improving each year in regard to water management, energy management, living wages and occupational health and safety should be recognized in the evolving GRI framework. **But incrementalism alone, at the end of the day, was insufficient** to be faithful to a sustainability reporting framework. We would have to take a further step and include a principle that would call for assessing — in addition to disclosures on backward-looking benchmarks, peer group comparisons, and improvements against a company's own goals — performance against thresholds and limits.
>
> When GRI introduced the "Context Principle" in 2002, it was met with a mix of curiosity and silence. However imperfectly its phrasing, its core purpose was to place a stake in the ground to communicate an irrefutable truth: **sustainability measurement without context cannot and does not measure sustainability performance.** We were under no illusions regarding the implications and operational complexity of this principle. But we were steadfast in the belief that over time, it must be fully embraced by the rapidly growing number of both preparers and users of sustainability disclosures.[333]
>
> Two decades later, **exclusive focus on "numerators" without contextualization, along with confining measurement to those capitals based primarily on measurability, sends flawed signals to both corporations and their stakeholders regarding the long-term sustainability of the enterprise.** [334]
>
> **ESG does not, by nature, carry a true sustainability gene**. A company may rate very highly on an ESG score, but do so just because it has performed well against its own internal goals or against a peer group. But to say this company is an excellent sustainability performer is a very fundamentally different statement. It means that the company is positioned to prosper for the long-term and in a way that respects limits, thresholds, and norms that are externally defined, not simply defined by peer group comparison or internal targets and goals. **Sustainability requires contextualization within thresholds. That's what sustainability is all about.**
>
> **Absent such "denomination," we will continue to move blindly forward**, hoping that the collective impact of thousands of enterprises all "doing better" will avoid violation of the upper and lower boundaries. Overshooting upper limits and undershooting minimum standards and norms is antithetical to building a just and livable world. In other words, **continuing to design measurement in what might be called a "context vacuum" is a fool's errand.**[335]

It was Allen White who first introduced the notions of "Numeration" and "Denomination" that the UNRISD Three-Tiered Typology embraced – and these concepts help us understand the paradigm shift from Monocapitalism to Multicapitalism that we are navigating. White's comments about the experience of steadfast adherence to numeration at GRI could apply across the board.

The fields of business, finance, investment, and governance have largely sought to address whatever perceptions they had about the shortcomings of Monocapitalism through incrementalist "Numeration" strategies. Initiatives such as SASB, EU Sustainable Finance Taxonomy, and even the Sustainable Development Goals would all fall into this category – despite the fact that these initiatives have the term "sustainability" in their names, none of them integrate sustainability thresholds. Such initiatives "live in a political world," as Dylan says, as they seek change that is politically feasible, not change that is normatively necessary.

In contrast, Multicapitalism advances a Denomination-based vision that is inherently normative – political feasibility is a secondary strategic consideration, subservient to the necessity of aligning with the realities of the material world, as we best understand them. White's observation that the introduction of the Sustainability Context Principle was met with "a mix of curiosity and silence" is telling: whether conscious or unconscious, actors in the fields listed above (which likely includes you, who are reading this paper now), recognize that normative thresholds challenge the fundamental foundations of our existing Monocapitalist system, so implementing such thresholds requires transformations that can introduce career risk for "rocking the boat."

In "the book," as Thomas Kuhn called his masterwork *The Structure of Scientific Revolutions* that transformed the term "paradigm" from an obscure term into a household word, he noted that the ideas of the likes of Copernicus, Newton, and Einstein were resisted by "normal science" at first, because they represented such a radical departure from all that was thought and practiced at the time.

> That is why a new theory, however special its range of application, is **seldom or never just an increment to what is already known.** Its assimilation requires the reconstruction of prior theory and the re-evaluation of prior fact, an intrinsically revolutionary process that is seldom completed by a single man [sic] and never overnight.[336]

The world-weariness of Harrison's "Try to get a message through" resonates here. Paradigms are systemic and structural – they do not necessarily yield to political persuasion, but rather they are more inclined to follow the dynamics of social tipping points as they pertain to complex adaptive systems. Incrementalism can help set the stage, but as Kuhn points out, paradigm shifts tend to transcend increments.

Viewed through this lens, we can better understand the past and better prepare for the future. Allen White has described that past two decades as defined by Incrementalist Numeration, and the coming decades as defined by Transformative Denomination. We therefore stand at a pivot point, where we can choose to consciously build on the foundations set by our incrementalism (that ultimately serves to entrench Monocapitalism) to trigger the necessary transformation to Multicapitalism.

As we turn the corner into a new decade, it is abundantly clear that Former UN Secretary-General Ban Ki Moon's 2011 diagnosis of our "consumption without consequences" economic growth paradigm is indeed a "global suicide pact."[337] Therefore, the decades ahead must seize the opportunity to transform our systems to operate in harmony with living systems principles – first and foremost, the necessity to respect carrying capacity thresholds. Framed this way, it is self-evident that Monocapitalism cannot stand, and that Multicapitalism is the necessary next evolution of our economic system.

5.1. IDENTIFYING THE END GOAL: TRANSFORMING CORPORATE, INVESTMENT, ECONOMIC AND POLICY ARENAS

With the end goal of Multicapitalism, what transformations are necessary in the corporate, investment, economic, and policy arenas?

5.2.1. CORPORATE PATHWAYS TO MULTICAPITALISM

On the corporate front, transformations in performance accounting, management principles and practices, data flows and information system architecture, reporting standards, and business model design will need to align with Multicapitalism, in particular expanding scope across the multiple capitals, expanding scale to align micro-level impacts with macro-level systemic thresholds, and accelerating pace to trigger positive social tipping points[338] and avoid negative ecological tipping points.[339]

- **Performance Accounting**: We need to shift from an incrementalist Impact Valuation regime to a thresholds-based Sustainability Accounting regime that applies organization-specific allocations of responsibility for respecting the carrying capacities of the capitals. The *r3.0 Accounting Blueprint* lays out a broad framework for a shift to Integrated Accounting, and the Sustainability Context Group's Public Comment Letter on the Blueprint provides more specific guidance on adopting Sustainability Accounting.[340] More recently, Mark McElroy has proposed a set of ten "Generally Accepted Non-Financial Accounting Principles" (GAAP-NF) for *bona fide* sustainability accounting.[341]

- **Management Practices and Principles**: The r3.0 Integral Materiality Process provides a Deming Wheel Plan-Do-Check-Act approach to implementing Multicapitalism. The first three steps in the "Plan" section entail the key aspects of Multicapitalism:
  - Identify rightsholders to whom duties & obligations are owed;
  - Identify impact areas and capitals impacted;
  - Identify sustainability thresholds and fair-share allocations.

  Subsequent steps carry forth these multi-capital thresholds alignment into goal-setting, strategic development, risk management, and governance structures. See **Figure 45**.

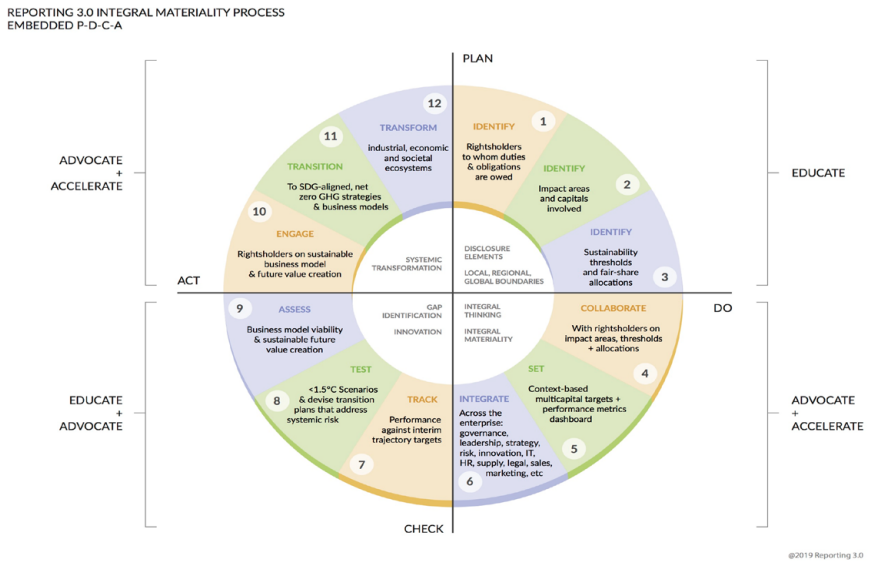


Figure 45: r3.0 Integral Materiality Management Process[342]

- **Data Flows and Information System Architecture**: the *r3.0 Data Blueprint* lays out a multi-capital, context-based data flow and information system architecture geared toward System Value Creation, as illustrated in **Figure 46**. The data inputs span from the micro level of the organization itself (internal data) to the meso level of the habitats it operates in to the macro level of ecological, social, and economic systems the company operates within, as well as spanning the multiple capitals. This external and internal data is integrated to assess compliance with carrying capacity thresholds across the multiple capitals, allocated to the company's fair shares of responsibility and entitlements. This enables determination of sustainable or unsustainable performance, as well as benchmarking against peer performance. The data can then be disaggregated from the company level and aggregated at the meso level in investment portfolios and bioregional habitats, as well as at the macro level by national statistics offices and more globalized assessment of contributions to aggregate ecological, social, and economic systems health. As a final step, this data flow and information architecture enables assessment of System Value Creation.[343]

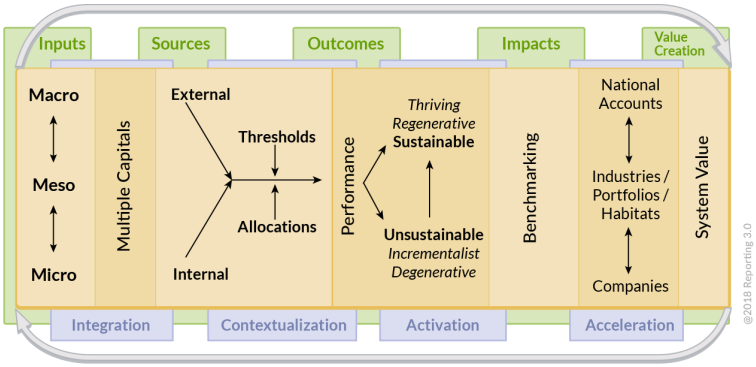


Figure 46: r3.0 Integral Data Flowchart[344]

- **Reporting Standards**: Two recent United Nations reports include Recommendations that warrant echoing here.
  - UNEP *Raising the Bar* report (2015): "Reporting standards / guidance bodies such as GRI, IIRC, SASB, CDP, etc. should integrate Sustainability Context more explicitly into their frameworks, for example by applying the concept of carrying capacities to multiple capitals-based frameworks."[345]
  - UNRISD *Compared to What?* report (2019): "Organizations with purview over reporting and accounting should embrace Context-Based mindsets by integrating **Tier Two** (*Contextualized Denomination*) indicators more explicitly into their frameworks, for example by applying the concept of carrying capacities to multiple capitals-based frameworks."[346]
  - It also warrants pointing out that the raft of recent proposals for "convergence" of sustainability reporting standards from the standard-setters themselves, the IFRS, and the Big Four accounting firms are all predicated on incrementalism, with only token reference to carrying capacity thresholds.[347] What is perhaps most surprising (or not?) is that the proposal from the sustainability reporting standard setters themselves (CDP, CDSB, GRI, IIRC, SASB) is *completely devoid* of reference to sustainability thresholds, which essentially define sustainability.

- **Business Model Design**: The *r3.0 New Business Models Blueprint* lays out a template that supports the design of business models that integrate the multiple capitals and respect for carrying capacity thresholds.[348]

- **Transformation Triggering:** The *r3.0 Transformation Journey Blueprint* outlines a comprehensive framework for pursuing necessary transformations to Multicapitalism that synthesizes the key elements of the four foundational r3.0 Blueprints mentioned above. As well, the UNRISD *Compared to What?* report devotes its **Third Tier** to transformation, thus providing an overview of this emerging priority.[350]

5.2.2. INVESTMENT PATHWAYS TO MULTICAPITALISM

On the investment front, asset owners are starting to embrace integrated reporting, and they can extend this trajectory by applying Multicapitalism, specifically through the application of Thresholds Investing. And this practice can be extended beyond asset owners, to all providers of financial capital, and all players in the investment value chain – as explained in the r3.0 *Sustainable Finance Blueprint*.[351] This *Blueprint* also advocates for applying Beta Activism as well as assessing Systemic Risks as well as Existential Risks.

5.2.3. ECONOMIC PATHWAYS TO MULTICAPITALISM

On the economic front, transformations in the economics discipline must shift away from Nordhaus' neoliberal Economic Growth Theory to Post Growth and Degrowth doctrines,[352] and economic system design must shift from a supply and demand orientation to align with resource thresholds and population allocations[353] and thereby design economies as ecosystems.[354] In other words, we need to live within our means and ensure all the means to live, to riff on Cabot Creamery Cooperative's Sustainability Credo.[355]

5.2.4. POLICY PATHWAYS TO MULTICAPITALISM

On the policy front, global governance needs to adopt policy orientation toward a carrying capacity regime. This will entail abandoning Gross Domestic Product as the global benchmark of progress, and embracing instead measures aligned with ecological and social thresholds, such as the Planetary Boundaries, Doughnut Economics, and the Ecological Footprint. It will also entail abandoning the mindset of progress through economic growth, and embracing an ethic of abundance through sufficiency for all.

Returning to the two UN reports, each provides a policy Recommendation at the global policy level:

- "Multilateral organizations should collaborate to create a global governance body of scientists, academics, business practitioners, NGOs and other stakeholders to provide guidance on methodologies for determining ecological (and social) thresholds, as well as guidance on approaches to allocations, all of which are broadly applicable to the business level."[356]
- "Multilateral organizations (such as UN bodies) should collaborate to create a global governance body of scientists, academics, business practitioners, NGOs and other stakeholders to provide guidance on methodologies for determining ecological and social thresholds, as well as guidance on approaches to allocations, all of which are readily and broadly applicable in practice by business, investment, and governing organizations, among others."[357]

These recommendations are being pursued through the incubation of a Global Thresholds & Allocations Council, via its three-fold mission:

- Identify thresholds & norms for sustaining the carrying capacities of systems-level capital resources in the commons that are vital to stakeholder wellbeing, based on a comprehensive review of research in physical and social sciences and practice in the field;
- Design and validate allocation methodologies that apportion fair share responsibility for jointly preserving and enriching capital resources vital to stakeholder wellbeing;
- Disseminate consensus-based thresholds/norms/allocations with "off-the-shelf" ease-of-use in mind to facilitate global mainstreaming of such practices.[358]

6. CALL TO ACTION

The Call to Action prompted by this White Paper is both philosophical and practical.

On the philosophical front, embracing Multicapitalism is actually deceptively radical, as it invites adherence to an ontology and an epistemology that run contrary to the current predominant ontology and epistemology of Monocapitalism. Specifically, the ontology of Multicapitalism, as presented in Section 2.2, is explicitly normative, and is predicated on a causal chain that is anchored in the ultimate achievement of human well-being through sufficiency of vital capital resources. The epistemology of Multicapitalism is predicated on John Rawls' Theory of Justice, which undergirds the commitment to fair, just, and proportionate allocations of vital capital resources.

The ontology and epistemology of Monocapitalism, by contrast, focuses on economic growth as its goal, with a secondary assumption that economic growth leads to human prosperity and progress, regardless of whether such outcomes are supported by the evidence (without needing to revert to cherry-picked data.)[359] The epistemological orientation of Multicapitalist allocations explicitly runs contrary to the epistemological underpinning of Monocapitalism, which is predicated on private ownership of resources, which is anathema to fair, just, and proportionate allocation of resources. In fact, the history of Monocapitalism could largely be viewed as a multigenerational experiment in the enclosure of the Commons, otherwise known as legitimized theft of mutual resources.

So, the first call to action (on the philosophical front) is to embrace Multicapitalism as an alternative life-affirming mindset, predicated as it is in a normative and justice-based ontology and epistemology.

On the practical front, embracing Multicapitalism carries with it a series of very tangible commitments:

- First, entities need to identify the vital capital resources they impact;
- Second, they need to identify the rightsholders who also rely on those resources for their well-being;
- Third, they need to identify where their impacts fall in regards to the carrying capacities of those vital capital resources.

So, the call-to-action, practically speaking, is to adopt a new orientation to accountability that is liberating in the sense that it enables identification of *bona fide* sustainability – or not. If not, it enables rectification to achieve *bona fide* sustainability. And the degree to which *all* entities pursue the same practice, it is hypothetically possible to achieve systemic sustainability. In the absence of such practice, it is practically impossible to achieve sustainability, except by the most implausible accident ever conceived.

Perhaps the most important element of actualizing Multicapitalism is through robust availability of accurate information on the carrying capacities of the capitals, many of which exist outside an entity's direct control. So perhaps the single most important call-to-action for this White Paper is for *all* readers to support the mechanisms necessary to generate accurate carrying capacity data, and to further experiment with approaches and methodologies for measuring the carrying capacities of the capitals, to ensure the ongoing viability of *all* capital stocks and flows, and hence the ongoing ability to create System Value.

7. CONCLUSION

We are the first generation to know we are destroying our planet and the last one that can do anything about it.
Tanya Steele, Chief Executive, WWF, 2018[360]

The advent of the Anthropocene presents humanity with a challenge and opportunity – opposite sides of the same coin. On the challenge side, the natural buffers that in the past have protected humanity from the adverse consequences of our collective behavior are now being transcended – we literally have geological-scale impact. The glass-half-full interpretation of this fact goes like this: if humanity has the collective power to self-destruct, so too do we have empowerment to self-regulate.

Indeed, Gaia Theory holds that life on earth is defined by self-regulation, which plays out not only at the individual but also at the planetary level.[361] Viewed through this lens, humanity literally holds the key to its own destruction or salvation. Turning this key requires that we turn away from Monocapitalism to Multicapitalism, honoring *all* of our life-giving resources by stewarding them in ways that they can continually regenerate. Unfortunately, turning the key part-way will not open the door. Embracing the multiple capitals without embracing the carrying capacities of the capitals leaves the door locked.

The choice is yours to make, dear reader.

Will you join us?

8. ABOUT AND ACKNOWLEDGEMENTS

About r3.0

r3.0 promotes Redesign for Resilience and Regeneration. As a global common good not-for-profit platform, r3.0 crowdsources open recommendations for necessary transformations across diverse fields and sectors, in response to the ecological and social collapses humanity is experiencing, in order to achieve a thriving, regenerative and distributive economy and society.

About Bill Baue

As an internationally recognized expert on Sustainability Thresholds, Thriveability, and Online Stakeholder Engagement, Bill Baue catalyzes systemic transformation. As a serial social entrepreneur, he has co-founded several enterprises: r3.0, Sustainability Context Group, Sea Change Radio, and Currnt.

Baue currently serves as Senior Director of r3.0 (Redesign for Resilience & Regeneration), a not-for-profit common good that networks a global community of Positive Mavericks focused on transcending incrementalism to trigger necessary transformations that enact living systems principles. In this role, he serves as the Convener for the Connecticut River Valley Bioregional Collaborative of the Capital Institute's Regenerative Communities Network. He also serves as the Convener of the Indicators Scorecards workstream of the Transformations Systems Mapping & Analysis Working Group.

Baue has worked with prominent organizations across the sustainability ecosystem, including Audubon, Cabot Creamery Coop, Ceres, GE, Harvard, International Integrated Reporting Council, several United Nations agencies (UNCTAD, UNEP, UNGC, UNRISD), Walmart, and Worldwatch Institute. He serves on the Board of Co-op Power, the Technical Advisory Group of the Science Based Targets initiative, and as Senior Advisor to Preventable Surprises.

He lives on the outskirts of the Connecticut River Valley bioregion near his partner Jennifer, where his daughters Clara, Emma, and Aoife periodically visit. He is a diehard Deadhead who enjoys camping, hiking, kayaking, yoga, meditation, and dancing contact improvisation.

Acknowledgements

Mark McElroy: This White Paper is built on the foundation of fundamental concepts established by Mark McElroy, including Multicapitalism (co-conceived with **Martin Thomas**) and the carrying capacities of the capitals. McElroy's contributions to the field are underappreciated compared to their significance, so this White Paper is a modest attempt to catch up with a thinker and practitioner who is well ahead of his time.

Brendan LeBlanc: Brendan, who is perhaps best known for his statement that "the only thing more dangerous than no progress is the illusion of progress," served as the key bridge between r3.0 (as Steering Board Member) and IIRC (as an Ambassador). As an early evangelist for Sustainability Context, Brendan helped raise awareness with IIRC colleagues of the strategic wisdom and conceptual imperative of embracing the carrying capacities of the capitals.

Richard Howitt: As CEO of IIRC when this project was first conceived, Richard championed the need to further build out the thinking behind Multicapitalism. Richard also authored one of the Forewords.

Sarah Grey: As an r3.0 Steering Board Member and former IIRC Markets Director, Sarah played a behind-the-scenes role in coordinating between the two organizations.

Neil Stevenson: Neil served as IIRC's Project Manager of this project in its early stages.

Lisa French & Laura Girella: Lisa and Laura took on the role of joint Project Managers mid-way through, and helped usher this project forward.

Charles Tilley: Charles authored one of the Forewords, maintaining a bridge to the IIRC.

Jeff Thomson & Brad Monterio: As Institute of Management Accountants CEO and Board Member (respectively), Jeff and Brad showed faith in this project early on with funding support.

Jed Davis: As Director of Sustainability at Agri-Mark / Cabot Creamery Cooperative, Jed Davis provided instrumental support for the MultiCapital Scorecard case study, with a side serving of his usual humor.

Keith Ambachtsheer: Keith has been a pivotal supporter of the notion of asset owner integrated reporting, and as soon as he encountered the Multicapitalism concept, he embraced it, lending the validation of his voice by covering the idea of Threshold Investing in his monthly *Letters*.

Ralph Thurm: As Managing Director of r3.0 and the early COO / CFO / CIO of the Global Reporting Initiative, Ralph played the dual role of helping steer this project into existence on the practical side, while also serving as a key player in the establishment of the Sustainability Context Principle that serves as the foundational concept undergirding Multicapitalism.

Allen White: If a concept such as Multicapitalism could have a godfather, Allen is it. He has steadfastly used his prominent position as Global Reporting Initiative Co-Founder to advocate for both Sustainability Context and Multicapitalism, providing most eloquent articulations of each.

Dana Meadows: It would be an inexcusable oversight not to mention the key role that Dana played in advancing the concepts of carrying capacity and paradigm shifts in the popular consciousness, while also validating the multiple capitals concept throughout her career. Without Dana, this White Paper likely wouldn't have a leg to stand on.

Jennifer Nucci: Finally, the author would like to acknowledge and thank his partner Jennifer, who endured, with grace and deep care, the inordinate amount of time he spent in the company of this Paper.

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