JÖNKÖPING UNIVERSITY
Jönköping International Business School

Downscaling the Doughnut Economics Model - Employing a Global Model at the Enterprise Level

A case study of Proton Group and Apotea AB

BACHELOR DEGREE PROJECT
THESIS WITHIN: *Business Administration & Economics*
NUMBER OF CREDITS: *15 ECT*
PROGRAMME OF STUDY: *Sustainable Enterprise Development*
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JÖNKÖPING *December 2023*
KEYWORDS: ***Doughnut Economics, Planetary Boundaries, Safe and Just Space for Humanity, Sustainable Development Goals, Downscaling, Sustainability Journey***

Abstract

In a rapidly changing world, sustainability is becoming more and more of a priority for organizations. This paper evaluates the possibility of using the Doughnut Economics Model (DEM) as a tool to implement sustainability within an organization on the firm-level, highlighting the potential opportunities and limitations that it poses. Through case studies conducted with two organizations (Apotea AB & Proton Group), both common and firm-specific gaps within sustainability strategies are identified, and the applicability of the DEM is appraised as a tool to help fill these gaps. A qualitative research method was employed, and interviews were held with sustainability managers from Apotea AB and Proton Group. A qualitative thematic analysis process led to the generation of initial codes, themes, and patterns that emerged throughout the interviews held. The results from this study highlighted the illustrative and visual nature of the DEM, and how it could help firms view sustainability from different perspectives. The visualisation of the model helps stimulate conversations about sustainability within the firm, and raising awareness on the topic of sustainability, promoting it within organizational culture. This study additionally concluded that the implementation of the DEM in only a firm-specific, directly impacted area, could help the firm with pinpointing niche areas where the enterprise can make its largest contribution towards a safe and just space for humanity. On the other hand, this study found and supported existing claims through past research on the model's limitations in terms of its downscaling, as the planetary boundaries are designed for a global scale. Moreover, the model lacks in defining policies, indicators, or measurements regarding areas of improvement. The opportunities that lie in the DEM are plentiful, however, the downscaling process on a firm-scale is extremely challenging, and little-to-no existing research or literature exists on the topic.

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1. Background & Introduction

This section introduces our thesis by explaining the background of the research and introducing the relevant concepts, followed by explanations of the problem, purpose, and research questions.

For a big duration of the 20th century, economics has been fixated on GDP as the primary measure of progress, which has led to extreme social inequalities coupled with unprecedented destruction of the living world (Raworth, 2017). The unsustainable economic growth has introduced the challenge of how to achieve a high quality of life for the inhabitants of the planet without further destabilising critical planetary processes (O'Neill et al., 2018). As such, there is an urgent need for a new paradigm which focuses on a balance between the development of human societies and the maintenance of Earth systems (Steffen et al., 2015).

Since the appearance of consumerism as a movement, people have been spending more on items than what were their needs, which has allowed for businesses to grow based on the idea that increasing the consumption of goods and services which have been purchased in the market is always a desirable goal (Raworth, 2017). What has become increasingly clear though, is that well-being and happiness is a nuanced issue that is dependent on far more factors than simply the ability to obtain consumer goods and material possessions (Dolan et al., 2008). With this in mind, it can be questioned if the "business as usual" idea which stems from consumerism is a viable goal, as many business and production practices have immediate effects which are counterproductive to the factors and conditions which make up human well-being.

Sustainability is a concept which encapsulates many of the conditions of well-being, since it considers people, the environment and the economy. Sustainability has been defined by the United Nations Brundtland Commission in 1987, as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 2023). However, this definition of sustainability has been criticized and condemned for its vague-ness. Additionally, sustainability has over time become a more relative term, meaning that one thing can be more sustainable as a

comparative to another (Stopper, Kossik & Gastermann, 2016). This has led to the emergence of many different theories and frameworks below the umbrella term that is sustainability, which has created a gap between what is considered weak sustainability and strong sustainability. While weak sustainability assumes that man-made capital can be replaced with natural capital, strong sustainability implies that it cannot.

In order to ensure clarity within this thesis and to avoid misunderstandings which can stem from these varying – and continuously developing – definitions, we choose to adopt an interpretation in which sustainability is considered an absolute, with polar extremes where we find a firm, state, or development to be either sustainable, or not (Stopper et al., 2016). This will allow us to pinpoint if the work that is being done is sufficient to achieve a set goal or not.

1.1 The Big Disconnect

Landrum (2018) stated that while "businesses are increasingly adopting sustainability, the environment continues to decline". Dyllick & Muff (2014) further explain that as sustainability management and efforts are becoming increasingly adopted by major companies, this is not reflected in the impact of their activities on a larger scale, which results in what is called a "big disconnect". For example, inspection of sustainability reports issued by 50 sustainability leader firms in Canada shows that out of 303 environmental sustainability targets identified, none were quantitatively tied to the currently established global boundaries (Haffar & Searcy, 2018). So while an increasing amount of corporations claim to be operating in a sustainable way, environmental degradation is still on the rise. Hence the need to clearly distinguish between companies which effectively contribute to sustainability and those who do not arises.

It can thus be argued that businesses and corporations will come to play an integral role in making our world a safe and just place for humanity through the integration of sustainability strategies focused on a significant impact. To resolve the paradox imposed by the continued desire for economic expansion despite the deleterious impacts it has on vital planetary systems, a reconceptualization of firm-level growth is necessary (Edwards, 2021).

Many business executives have been found to agree with the statement that “sustainability-related strategies are necessary to be competitive today and even more so in the future”, as the benefits of doing so have an impact not only on the environment and society, but also the companies themselves through intangible benefits such as increased competitiveness, brand reputation, and increased attractiveness (Dyllick & Muff , 2014).

However, the fact worthy of reiteration is that the discrepancy between micro-level progress at the company and macro-level deterioration of the planet is what results in the big disconnect currently visible between company activities and the global state of the environment and society. The aggregation of sustainability issues at the global scale means that aiming for efficiency is simply not enough (Raworth, 2017). To become truly sustainable, a company must ponder questions that go above and beyond, such as how they can contribute with their products and services to resolve pressing sustainability issues in the society they operate, as well as how they can use their resources, competencies and experiences in a way that helps address the big economic, social and environmental challenges that society is currently facing (Dyllick & Muff, 2014). In other words, the focus of a truly sustainable company has shifted from merely aiming to minimize detrimental impacts through meeting the legal requirements to understanding how a significant positive impact can be achieved through regenerative operations. The required ambitions are high sustainability performance across social and environmental boundaries, which are considered as pro-active and regenerative strategies. This continued movement along the line of sustainability performance which begins at doing the legal minimum toward regenerative practices and beyond, is what we will refer to as the sustainability journey (Mohrman & Worley, 2010; Edwards, 2021).

1.2 Circular Economics

Circular economics is a phenomenon which refers to an ideology in which economies emphasize reductions and the minimisation of greenhouse gas emissions and waste and aim to optimize resource allocation and usage (Konietzko, Bocken & Hultink, 2020). A Circular Economy differs and deviates from a Linear Economy in a wide range of ways, some of which make it a valid framework to implement strong

sustainability within an enterprise. In the linear approach to economy, we observe a "Take, Make, Use, Dispose" framework, where the resources in the economy follow the mentioned steps in their life cycle(s). The resources are taken, products are made with them, thereafter they are consumed by the consumers and then disposed of. On the other hand, in a circular economy firms implement a "Narrow, Slow, Close, Regenerate" approach to minimize their waste and to encourage the reusing of resources within the economy (Konietzko et al., 2020). This means that the application of circular economics could allow an enterprise to gradually become sustainable.

The use of Circular Economics within our thesis is based off our approach towards sustainability and the chosen definition of sustainability. We acknowledge the limitations behind circular economics, as it does not include or mention social sustainability. As we implement the circular economics model within our thesis, we realize that most companies will not achieve true sustainability, however, we strongly believe that the redirection of an organization's aims and objectives towards circularity is an essential and significant step on the way to align themselves with the theory that is strong sustainability.

1.3 Doughnut Economics Framework

The Doughnut Economics Framework is a relatively new model of human wellbeing, aimed to guide humanity in the Anthropocene – defined by National Geographic as "the most recent period in Earth's history when human activity started to have a significant impact on the planet's climate and ecosystems" (NGS, 2022) –, which was created by Kate Raworth in 2012. *"It recognizes that wellbeing depends on enabling every person to lead a life of dignity and opportunity, while safeguarding the integrity of Earth's life-supporting systems"* (Raworth, 2017). The model is meant to aid in visualizing ambition and providing a compass for progress, which it accomplishes by depicting the deeply interconnected social and ecological boundaries which together encompass human wellbeing in a doughnut shaped model (Raworth, 2017).

Figure 1 – The Doughnut of Social and Planetary Boundaries

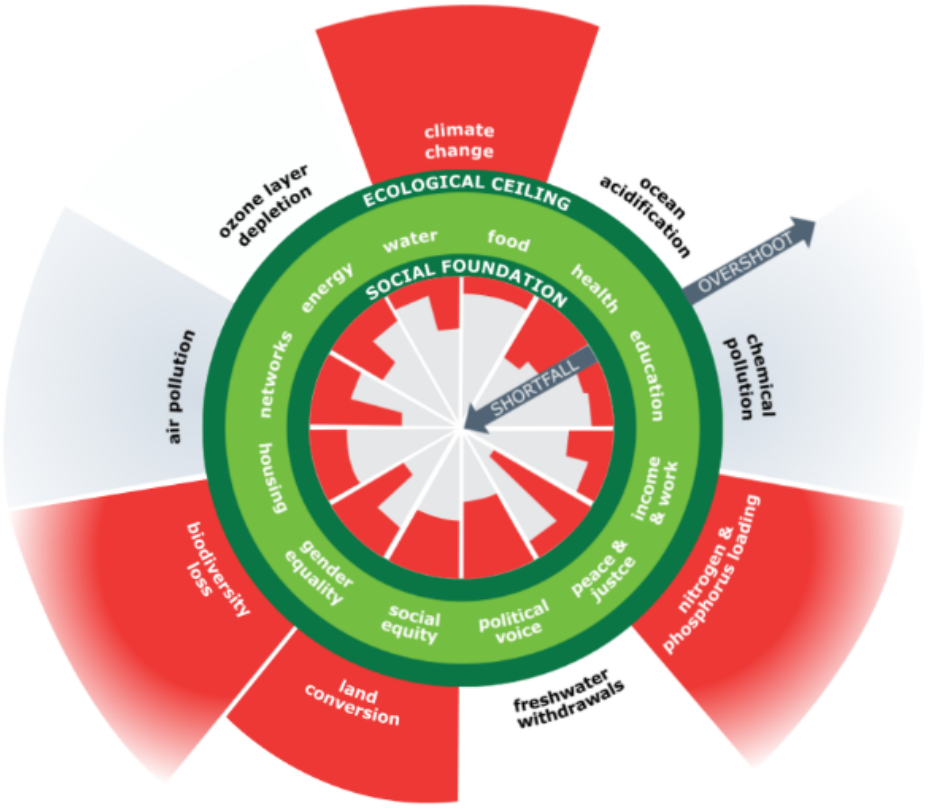

Figure 1 shows the Doughnut Economics Model (Doughnut | Raworth, 2017). The inner boundary represents the social foundation and is made up of twelve dimensions derived from the Sustainable Development Goals (SDG's), while the outer boundary represents the ecological ceiling that is made up of nine dimensions defined by the planetary boundaries' framework (Raworth, 2017). Life below the inner boundary set by the social floor means shortfalls in well-being, while operating outside of the boundary set by the ecological ceiling means an overshoot of pressure on Earth's life supporting systems (Raworth, 2017). Between the boundaries exists a *"safe and just space"* in which humanity can thrive, where the aim is to transform economies from local to global, with the intent to make them regenerative and distributive by design (Raworth, 2017).

In this regard, the concept of circular economics is clearly visible and interwoven within the doughnut model, but the doughnut model is not just another method of sustainability, it takes the concept of circular economics a step further and targets sustainability in a way that will address the fundamental problems that emerge at

the global level, while also considering the social and environmental aspects of sustainability.

1.4 Planetary Boundaries

The planetary boundaries presented by Rockström et al., (2009) outlines nine earth-system processes and thresholds which may generate unacceptable environmental change, if crossed. As the basis of the ecological ceiling or the outer ring in Raworth's DEM, the planetary boundaries provide a scientific framework to holistically understanding the limitations of the planet that are critical for maintaining the resilience and stability of Earth systems (Richardson et al., 2023). These systems include for example biodiversity loss, climate change and global freshwater use, and are intricately coupled; meaning that if one boundary is crossed, the other boundaries are at serious risk (Rockström et al., 2009). A safe operating space for humanity is thus defined by the planetary boundaries, which respects the Earths system (Rockström et al., 2009).

1.5 Sustainable Development Goals

The SDGs comprises 17 goals and 169 targets which were adopted by the United Nations in 2015 as a call to action to ensure that by 2030 all people will enjoy peace and prosperity (UNDP, n.d.). Twelve of the SDGs are included in the inner ring of the DEM and make up the social foundation of which no one should be falling short (Raworth, 2017). These twelve basics of life include access to education and to healthcare; decent housing; sufficient food; a minimum income and decent work; access to energy and clean cooking facilities; clean water and decent sanitation; and access to networks of information and to networks of social support (Raworth, 2017).

1.6 Problem

The DEM is a relatively new model which covers important global issues and is thus attracting attention from policy-makers since it could potentially unify stakeholders around a holistic vision of sustainable development (Turner & Wills, 2022). However, several challenges of its implementation have been recognized in previous research, both in relation to the concept of doughnut economics itself, but also

with reference to the underlying concepts of planetary boundaries and the sustainable development goals.

The DEM, PBs and SDGs are all issues on a global scale, which poses many issues in the attempt of downscaling them, since their implementation at the local level demands a process of adaptation and localisation where global limits must be recalculated into national and subnational targets and boundaries while taking into account performance indicators, synergies and trade-offs, integrated governance, indicators and actors (O'Neill et al, 2018; Dearing et al 2014; Valencia et al, 2019; Hansson et al 2019). Although the DEM and the PBs were not intended to be downscaled since it translates their meaning to sub-global scales, it is an important matter in relation to decision-making processes (Turner & Wills, 2022).

We aim to contribute to this limited area of research by outlining the potential benefits and challenges of downscaling and implementing the DEM to the enterprise level by conducting case studies with Proton Group and Apotea who can help us make advances within the problem area.

1.7 Purpose & Research Questions

The purpose of this project is to investigate sustainability models being utilized in a firm setting or the lack thereof, and to understand and evaluate the downscaling of the DEM to the firm-level, and how it is relevant for a company in order to ensure and monitor progress and help them implement sustainability initiatives. This will be done through conducting exploratory case studies with local firms in Sweden – namely Apotea AB and Proton Group – in order to highlight and outline the potential opportunities and limitations of downscaling and implementing the DEM on a firm-level. We wish to gain a clearer understanding of how the DEM could be put into practice and to add to the existing established literature by filling in the gaps identified, which we plan to do by conducting a clear and extensive evaluation of both the advantageous and disadvantageous sides of the model's implementation.

To summarise the above, the research questions developed are as follows;

RQ1: What opportunities can the implementation of the Doughnut Economics Model on the firm-level contribute to firms aiming to prioritize sustainability?

RQ2: What limitations and challenges can be identified in the implementation of the DEM on a firm-level?

2. Literature Review

This section explains the process followed for the literature review as well as an overview of the literature examined through an explanation of all common themes identified which will be used as the foundation for our research.

2.1 Method

2.1.1 Database Search Strategy

The aim of the literature review is to investigate the possibility as well as the opportunities and limitations of downscaling the DEM to the firm-level by conducting a generalized search of the fundamental concepts. The search was carried out manually using the academic journal databases Primo (Jönköping University's own database), as well as Scopus and Google Scholar. The key words used related to the "Doughnut Economics framework/model", including the foundational concepts of "planetary boundaries", "sustainable development goals", "safe and just space" as well as "downscaling", and "business".

2.1.2 Selection Criteria for Literature Review

Many pieces of literature were examined and chosen by reading the title, abstract and conclusion to determine their relevance. Additional literature was also chosen through a similar evaluation process while snowballing or going through previously read literature pertinent to the research area. All chosen pieces of literature were published in English, as it is the shared language of the researchers, and between

the years of 2009-2023, to maintain relevance to the concepts that have all been introduced during the 21-st century.

2.1.3 Verifying Credibility, Validity and Reliability

To ensure quality research, the aim was to only include journals from the "ABS Journal List" (Chartered Association of Business Schools, n.d.), which was not possible since not enough relevant articles could meet the set criteria. As such, the "Scientific Journal Rate" (SJR, n.d.) was also used to assess the quality of the journals, assessing the SJR score, number of citations, peer-reviews and the authors. The final number of literature chosen was 25 journals, one book, one book review, and one master thesis which was relevant to the subject. The literature was categorized using an excel sheet, displaying the title, authors, year of publication, a brief summary of the literature and its themes and patterns. This facilitated clarity and made it easier to spot common elements of the literature.

2.2 Integral Concepts and Themes Identified within Existing Literature

Through the existing literature review process, a variety of integral concepts and themes were identified within the pieces of literature considered significant, relevant, and appropriate for this particular study. The following areas of investigation and exploration will reflect what we consider the most suitable, viable, and important concepts, and the existing literature within the respective fields, which define and discuss these concepts and themes.

2.2.1 Firm-level Opportunities within the DEM

The DEM was a model initially created to be implemented on a global scale, incorporating aspects within the model itself which are relative to the planet (Raworth, 2017). The existing literature on Doughnut Economics, and the DEM, are largely influenced by the writings of Kate Raworth and John Rockstrom. According to the Doughnut Economics Action Lab (DEAL), the DEM provides businesses and firms with "an increasingly recognised compass for such a thriving future" (Sahan et al., 2022). Previous research through papers such as "What Doughnut Economics means for business" released by DEAL, claim that various significant factors of business design – that are closely integrated and interconnected – lie at the heart of the implementation of

the DEM on a firm-level (Sahan et al., 2022). These concepts listed are “Purpose, Networks, Governance, Ownership, and Finance” (Kelly, 2013). Regarding its opportunities, existing literature claims that the DEM – unlike other models – helps enterprises with creating feedback loops which positively impact organizations by “keeping them rooted in the real world” (Sahan et al., 2022). As a result of this, firms are able to ensure that a clear, consistent purpose exists, allowing its departments to work harmoniously in order to achieve shared regenerative and distributive goals (Sahan et al., 2022).

Additionally, the DEM was evaluated as a tool for sustainability strategy implementation for manufacturing SMEs as stated in the proceedings of the International Multiconference of Engineers and Computer Scientists in 2016 (Stopper et al., 2016). Through this report, the relation of planetary boundaries to potential interventions and EU standards is observed, which included both social and environmental sustainability approaches. This study concluded that alongside other theoretical frameworks and solutions (Green Manufacturing, Corporate Social Responsibility), the DEM is an appropriate and fitting approach to implementing sustainability, as the study highlights the long-term orientation of SMEs (Stopper et al., 2016). The model therefore aligns with SMEs operational processes and provides a solid foundation for SMEs to address environmental and social issues (Stopper et al., 2016).

Previous research suggests that the model offers a significant tool of assessing where interventions, policies, and initiatives are needed (Luukkanen et al., 2021). Moreover, the model offers a holistic approach to sustainability, which is not only available on a firm-level, but on a multitude of scales (Eriksson, 2022). Raworth herself claims that the model is simply “a radically new compass for guiding humanity this century” (Raworth, 2017), adding that the model helps businesses see past the “financial parameters” holding back sustainable long-term investments which benefit firms and encourage partnerships and resilient relationships that can be considered critical from a long-term perspective (Sahan et al., 2022).

2.2.2 Critiques and Limitations of the DEM

One aim of the DEM is to replace gross domestic product growth by an economic vision that seeks to transform economies (Raworth, 2017). The general critique of economic growth which the DEM expresses is not a concept which is

naturally found in the SDGs and thus it has been argued that the DEM is simply a communication tool used to raise awareness and stimulate public discourse (Drees et al., 2021). Similarly, it has been argued that the DEM does not take into account the true significance of GDP in an economy and simultaneously assumes that individuals in an economy will always value financial gain and monetary value greater than social or environmental sustainability (Milanovic, 2018).

The title itself of Raworth's 2017 publication has also been subject to scrutiny, as it implies that the DEM shall serve as "humanity's compass in the 21st century" (Raworth, 2017). For anything to serve as a compass, a reference point is required to determine a relative position to achieving the SDGs, a position which the DEM has been accused of making "anything but clear" (Drees et al., 2021). Additionally, since the prioritisation among the foundational concepts of the DEM remain unclear, a concern is that the needle of said compass may begin to spin rather quickly (Drees et al., 2021). It has thus been argued to set a scope which focuses on goals and targets instead of boundaries would be better (Downing et al., 2019), as the result may be an increasingly positive attitude toward necessary change, while taking into account the uncertainty imposed by scarcely quantifiable thresholds and abundance of influencing factors, interactions and case-specific variabilities (Hillebrand et al., 2020).

Nevertheless, the usefulness of the DEM remains recognized by those criticising it, as they see the potential benefits of working on social-ecological transformations that have been adapted to a local, sub-global scales (Heck et al., 2018; Drees et al., 2021). Furthermore, Raworth herself acknowledges the limitations of the DEM by referencing George Box, who stated that "all models are wrong, but some are useful. Rethinking economics is not about finding the correct one, it's about choosing or creating one that best serves our purpose" (Box, 1987; Raworth, 2017).

2.2.3 Economic Growth & Sustainable Development

This specific headline refers to the connectedness of the two concepts of Economic Growth and Sustainable Development, hence the conjunction of both concepts within this section

A variety of existing literature bring forward a juxtaposition between economic growth and sustainable development and argue for the possibilities of pursuing both of these goals simultaneously, and what that would entail. Firms and

enterprises are actively promoting and prioritizing economic growth as a question, which has both negative and positive implications when it comes to sustainable development (Edwards, 2021). Research highlights the paradoxical relationship between economic growth and sustainability as Edwards argues that "economic growth is a two-edged sword" (2021). On one edge of the sword, economic growth is a positive force, contributing to wealth and employment, on the other edge, complete global prioritization of economic growth has unprecedented negative impacts on the planetary boundaries (Edwards, 2021; Griggs et al., 2013). Despite these detrimental effects, the core strategic goal of many economies and businesses remains the pursuit of ongoing economic growth (Edwards, 2021).

At the same time, businesses around the world are adopting sustainability practices and sustainability reporting at an increasing rate, yet the degradation of the environment continues its rapid decline (Landrum, 2018). Dyllick and Muff (2014) argue that this is a result of misguided efforts, as reducing unsustainability and creating sustainability are not the same thing, and that a mico-, and macro-level integration based on understanding of the term is necessary.

It has been calculated that meeting the basic human needs with the global resources currently available is possible, the universal achievement of high life satisfaction would require a use of resources 2-6 times the sustainable level (O'Neill et al, 2018). This is further supported by looking at an array of countries with high levels of GDP which has not only contributed positively to the development of education and health, but also high levels of greenhouse gas emissions, material consumption, and waste (Pradhan et al., 2017; Valencia et al., 2019).

Regarding the DEM, the uncertainties regarding Raworth's definition of economic growth, and the lack of acknowledgment within the model of structures that refer to modern capitalism limit the model and its potential engagement with growth and urbanization (Eriksson, 2022).

2.2.4 Ownership and its Implications on Sustainability

Marjorie Kelly discusses traditional ownership and its negative implications on sustainability, arguing that "the systematic crisis we face today is entwined at the root with this design of ownership" (2013). Kelly further argues that publicly traded corporations who aim to push forward economic growth campaigns,

inevitably lead nations into overshoots in planetary boundaries (Kelly 2013, Griggs et al., 2013). To encourage a change and a sustainable transition and shift into sustainable ownership, the author evaluates and introduces a new and different ownership method, which instead of maximizing profits and financial gain – similarly to the "capitalistic, extractive ownership" – looks into maximizing the utility and benefits for the community in which it operates in, while simultaneously maintaining its own financial stability (Kelly, 2013). She called this method "Generative Ownership", which revolves around creating stabilizing feedback loops which moderate firms' behaviour (Kelly, 2013).

The Doughnut Economics Action Lab ties together the benefits of utilizing the DEM framework alongside the concept of generative ownership mentioned by Kelly, in order to ensure the presence of the regenerative and distributive designs of goals and strategies within the firm (Sahan et al., 2022). Moreover, possible transitions within ownership could potentially leave firms vulnerable, but with the implementation of generative ownership, and regenerative designs, resilience is built through feedback loops, ensuring the consistency of a firm with its sustainability ambitions and initiatives (Sahan et al., 2022).

2.2.4.1 Downscaling the Planetary Boundaries

The planetary boundaries were proposed concerning the planet as a whole which begs the question of what a fair share or burden is for a specific country, and what they entail for national and regional analysts and decision-makers (Biermann, 2020). An update in 2015 to the planetary boundaries both emphasized that the framework was not designed to be downscaled, yet it acknowledged that it had to be downscaled to better align the framework with decision-making scales (Steffen et al, 2015). Ryberg et al., (2021) argues that to downscale the planetary boundaries the safe operating space must be distributed among human activities in order to assess if an actor or activity is sustainable. Sadly, while many companies are setting sustainability targets based on the PBs, these targets have been proven largely unconnected to the wider ecological environment (Haffar & Searcy, 2018).

Similar to the planetary boundaries, the DEM was developed as a global model, but its effectiveness and ability to realise change has been argued to depend on effective governance to support its application (Turner & Wills, 2022), with an

increasing focus on subnational action in achieving global goals (Guerra et al., 2019). Thus, downscaling the planetary boundaries and the DEM becomes very complex by demanding an understanding of place-based dynamic systems which can be used to identify a safe and just path to lead development forward (Turner & Wills, 2022; Dearing et al., 2014; Rockström et al., 2021).

2.2.4.2 The Significance of Respecting the Planetary Boundaries

Raworth (2017) argues that respecting the planetary boundaries would mean to create to regenerate, stop treating a clean environment as a luxury good, and acknowledge ecological degradation as the result of a degenerative industrial design. The nine processes of Earth system science which are heavily affected by human activities would, if respected, allow Earth to remain in a "Holocene-like interglacial state", where life-supporting systems and global environmental functions remain similar to those experienced during the past 10,000 years (Richardson et al., 2023). Currently, six of the nine planetary boundaries have been exceeded (Richardson et al., 2023), which is endangering the stability of the safe operating space for humanity (Rockström et al., 2009). Rockström et al., (2021) further promotes an integrated people and planet perspective to guide human development, as the thresholds of the planetary boundaries, if crossed, could cause a shift of important subsystems with deleterious or potentially disastrous consequences for humans.

O'Neill et al., (2018) evaluates the planetary boundaries and the potential of living within them, while describing the complexity of achieving and meeting basic human needs and achieving higher quality-of-life goals simultaneously, which may require actors on local or regional levels to step out of the safe and just space for humanity as outlined by Raworth.

However, true sustainability is argued to go well beyond an attempt to minimize negative impacts, it seeks an understanding of how to create a significant positive impact for the planet and society by considering how to help overcome critical challenges by leveraging resources and competencies (Dyllick & Muff, 2014). By putting the most transformative ideas on the table, enterprises, nations and global economies that are regenerative and distributive by design may be created (Sahan et al., 2022), which is what is currently needed to not only respect the planetary boundaries, but to allow life on Earth to thrive (Raworth, 2012).

3. Methodology

This section explains the research approach used, including data collection, data analysis, as well as the research philosophy and interview design and sampling.

3.1 Data collection method

The methodology for this project is in the form of a case study, since it will allow us to explore a phenomenon in a natural setting while obtaining in-depth knowledge (Collis & Hussey, 2009). We collected primary data through the conduct of semi-structured interviews with sustainability managers at Proton Group and Apotea AB. The participants were identified through individual networks and selected due to their relevant roles to the research project. Each interviewee was primarily contacted through email, where an explanation of the research purpose and question was disclosed, followed by an invitation to participate in the project, which led to the scheduling of interviews. By acquiring data from two separate companies and several sustainability managers, we aim to generate credible context-specific data (Collis & Hussey, 2009).

3.2 Case selection

For this thesis project, our targeted audience is firms who are involved or actively trying to be involved with sustainability. As framed in our first research question, we were looking for firms that were looking into prioritizing sustainability and were focused on the transition from possibly unsustainable practices to having sustainability interwoven within their culture and operations. Our choices for our cases were based off the main purpose of our project, we needed local actors on the firm-level, to be able to evaluate the downscaling and implementation of the DEM on this scale. With the help of these two firms, we are able to observe the opportunities and limitations within the DEM model.

Additionally, the selection of Apotea was largely encouraged as the firm had been declared the Industry Winner of the Sustainable Brand Index in both 2020 and 2021, being crowned "Sweden's Most Sustainable E-Commerce Store" (*Sweden —*

SUSTAINABLE BRAND INDEX, n.d.) The selection of these two firms, one of which is largely based on e-commerce as an online pharmaceutical firm (Apotea), and the other being an industrial growth firm (Proton Group) provided a view on sustainability from two different lenses.

3.3 Data analysis

For analysing the information generated through the interviews, a qualitative thematic analysis was chosen as the most appropriate approach. The data generated from the interviews was analysed using a thematic analysis, which entailed reading through the data looking for patterns in the meaning of the data to establish themes (Braun & Clarke, 2012).

After the interviews were held, they were transcribed through the automatic transcription feature built within Microsoft Teams, with supervision of the automatic transcription by the researchers. After the transcripts were compiled, we compared the recordings of the interviews and the transcriptions, and manually fixed any errors which the transcription program made. The transcripts were then manually coded and analysed based on the common themes found within the data collected. The coding process was carried out in a manner which started off with finding common keywords and themes in the transcripts. Thereafter, these keywords and themes were sorted and categorized into different sub-categories, which were sorted and refined into more generic themes which outlined and highlighted the important aspects of the data collected throughout the interviews. At the end of this process, the researchers compared perspectives regarding the generated themes, and adjusted appropriately to find a middle ground between their points of view.

Analysing the data was a challenging part of our thesis project, as we had to not only look through the content of the interview, but also how the interview was carried out. Therefore, we tried to identify all possible factors which could have an impact on the data collected and generated, such as biases and preconceptions.

3.4 Research philosophy

Interpretivism argues that "value free data cannot be obtained, since the enquirers use their own preconceptions in order to guide the process of enquiry"

(Chowdhury, 2014). It further states that knowledge and value could be added to data from perception and interpretation, and it is thereby impacted by said interpretation (Marsonet, 2019). We decided to use the interpretivism paradigm since our thesis project was built on a qualitative study, where multiple interviews were carried out with various interviewees and interviewers, meaning that our findings would be derived from subjective evidence (Collis & Hussey, 2009). We acknowledge that the raw data generated from the interviews could have been impacted by the interpretation of the interviewees or interviewers, and thus the impact of interpretation on the data as well as the results of this thesis project should not be ignored.

3.5 Interview Design and Sampling

The design of our interviews was a semi-structured design, with both open-ended and closed-ended questions. The interviews were semi-structured as to ensure the inclusion of all possible value that could be added from the interpretation of questions from the interviewees, hence the inclusion of open-ended questions (Collis & Hussey, 2009). Choosing a strictly structured and closed-ended approach might have decreased the amount of valuable data collected, and confined the interviewees in terms of information they provided us. The interviewees were chosen based on their positions at the firms they worked in. We chose to interview sustainability managers specifically as they were clearly the most involved in the firms' sustainability culture and strategy. This was relevant as we needed information from individuals in the firms which worked closely with sustainability strategies, upcoming regulations, and knew about the challenges and issues arising in the respective fields.

The interviews with Proton Group were carried out on three separate dates and times. These were chosen as best fit for the interviewees, based on their personal schedules. We had a total of 4 interviews which we collected data from, with three different interviewees. The first interview was carried out with the sustainability manager at Proton Group. The second interview was again held with the same sustainability manager at Proton Group, with a different set of questions and a shifted focus. The third interview was carried out with the sustainability manager at Proton Lighting, a subsidiary of Proton Industries. The interview with Apotea was carried out with the sustainability manager of the firm and was held in an online, semi-structured, open-ended manner.

Before the interviews started, all interviewees were informed of the code of ethics set previously and informed about the recordings. Permission was granted for all interviews held, as well as permission to record and store the data in a shared drive which only the researchers have access to. To ensure compliance, the interviewees were asked to sign a GDPR consent form prior to the interviews taking place, where they gave their consent to our processing of their personal data.

The first interview with Proton Group's Sustainability Manager was carried out in the planned semi-formal, semi-structured, online (Microsoft Teams) order, and was held by all researchers and revolved around the manager and their work in Proton Group. The interview was transcribed automatically via the Microsoft Teams transcription feature to save time, thereafter it was manually corrected to ensure accuracy. Similarly, the interview with Apotea was held and transcribed in the same manner, on a different date and time. The second interview with the sustainability manager at Proton Group, and the interview with the sustainability manager of Proton Lighting were held in person, on-site at the Proton Group headquarters. Both researchers involved were present for the on-site interviews. During our visit, we had the chance to look at the facilities, meet the employees of Proton Group, and conduct the planned interviews.

4. Empirical Findings

This section of the paper will briefly describe the empirical findings generated through the interviews carried out between the researchers and the companies Proton Group and Apotea AB to ease into the Discussion and Analysis section.

4.1 Case study 1: Apotea AB

The first case study carried out was approximately an hour-long interview with Sustainability Manager 3, the Sustainability Manager at Apotea AB. Through this interview, the researchers were able to gain knowledge and insight into Apotea's perspectives on their current sustainability efforts and their future sustainability ambitions.

4.1.1 Apotea's View on Sustainability

Sustainability Manager 3 mentioned that the organization's main goals included reducing emissions within their operations, as well as carry out simple sustainability initiatives, which include – but are not limited to – e-commerce-ready packaging – which would result in a decrease of materials used, and sufbsequently a decrease in emissions – and ensuring the presence of recycling bins at all Apotea sites.

4.1.2 Ownership and Sustainability Strategy

After a quick brief on Apotea and how it views sustainability, the organization's ownership structure was discussed, in which Sustainability Manager 3 stated that Apotea was owned by Apotea Holding, which in turn was owned by Laulima – a large investing company in Sweden – as they held the majority shares. Within the interview, it was discovered that the sustainability strategy is usually set by Laulima, and the other "high-hierarchy" shareholders, according to Sustainability Manager 3.

4.1.3 Challenges in Implementing Sustainability

The other questions in the interview were focused on sustainability. The main challenges that Apotea faced in their attempts to implement a sustainability strategy and sustainability initiatives included some generic business challenges, as well as more specific emission-related challenges. The generic challenges mentioned were goal conflicts within departments, which refers to the potential issues that may arise in prioritization of sustainability goals within the different departments at Apotea. Additionally, Sustainability Manager 3 felt that Apotea needed to influence their employees and suppliers more directly, in order for them to be able to be on the same page in regards to how Apotea – and they as individuals – view sustainability. This links closely to the environmental challenges that Apotea faced, the most difficult of all being the reduction of emissions in Scope 3, as they did not "own" the emissions. Sustainability Manager 3 stated that the "suppliers need to understand why it is important to do something about their emissions, so communication is key, as well as having everyone on board".

4.1.4 Social Sustainability in Apotea

Apotea viewed social sustainability as the most challenging pillar of sustainability – from the pillars economic, environmental, and social – to implement, due to the sheer size of the supplier network and the supply chain in the organization. A recurring theme during the interview was the challenge of ensuring that suppliers follow the code of conduct, and finding indicators, standards, or tools, to make this process less challenging.

4.1.5 Sustainability Journey Assessment

Thereafter, the interviewers asked questions about a specific concept, the Sustainability Journey, which describes where organizations are placed on a graph in terms of their sustainability ambitions and efforts. When asked about where Sustainability Manager 3 thinks Apotea stands in the Sustainability Journey graph, she stated that Apotea were around the moderate point, but definitely not weak, due to their prioritization of sustainability within the organization, and their high and rising sustainability ambition.

4.1.6 Governance and its Implications on Sustainability Strategies

When considering the integration and prioritization of sustainability within the organization, the ownership structure of Apotea comes into play, as it draws a large part of its values regarding sustainability from its CEO, Pär Svärdson, who ensures the inclusion of sustainability within decision-making. Sustainability Manager 3 stated: “I think he’s the reason why we do all the stuff that we do and get it prioritized within the company”. This links directly to one of the common themes found through our qualitative thematic analysis process, Governance and Organizational Structures in Sustainability.

4.1.7 Upcoming Legislations

Regarding upcoming legislations and guidelines, -such as the CSRD – Corporate Sustainability Reporting Directive which requires firms to transparently report about the environmental impact of their operations (European Commission, n.d.-a) – or ESRS standards – European standards which are set in place in order to help firms and corporations report more transparently and accurately (European

Commission, n.d.-b). Apotea expects slight challenges and changes in the organization, such as the initiatives that the organization needs to have in place for those standards, and how to monitor and supervise these initiatives. Additionally, they expect the finance and sustainability departments to work more closely with one another. Apotea is currently working on tackling these issues through tools such as gap analyses.

4.1.8 Firm-Specific Initiatives

Since Apotea is a pharmaceutical company, the interviewers asked "Can you describe any specific initiatives that Apotea has implemented to reduce the impact on the planetary boundaries for biodiversity and chemical pollution?". Sustainability Manager 3 stated that there are no specific initiatives that target these two questions, however, there are processes which work towards these goals, such as the recollection of sold drugs and their safe destruction, in order to reduce the probability of chemical leakage into oceans, which would be harmful to ocean biodiversity, and also chemically pollute the oceans.

4.1.9 Implementation of the DEM

The final part of the interview revolved around the DE model, Apotea's thoughts on the model and how it could potentially be integrated into sustainability strategies and the opportunities that could arise in that field. The interviewee was provided a picture of the DE model and a brief explanation of the model written by the researchers beforehand. There were clear advantages and disadvantages of the integration of the model which Sustainability Manager 3 mentioned. The sustainability manager stated that "the difficult part when it comes to sustainability is having all the three legs (social, economic, environmental), but here, you have those in the same graph, so I believe in it". Additionally, the clear illustrations in the model helped Apotea understand it easier, as Sustainability Manager 3 said she believes this is a great tool as it helps those outside of the boundaries gain a deeper understanding, and using the DE model as a tool for how organizations view the planetary boundaries, would make sense.

4.2 Case study 2: Proton Group (incl. Proton Lighting)

The second case study which was carried out was in the form of 3 interviews in total, carried out in different dates, times, and places, one of which was carried out in two parts. The interviewees consisted of Sustainability Manager 1, Sustainability Manager at Proton Group, and Sustainability Manager 2, Sustainability Manager at Proton Lighting. As these interviewees work closely with one another, and work on similar goals within sustainability, the data generated from these interviews could potentially be rather repetitive, and therefore, both interviews were conjoined in this subheading – Case Study 2: Proton Group – instead of creating 3 separate case studies. This was done to maintain research clarity and minimizing confusion for the reader.

4.2.1 Challenges in the Implementation of Sustainability

Proton Group faces a few challenges in regard to the implementation of their sustainability initiatives and strategies, one of the largest of which is allotting resources for sustainable investments. Sustainability Manager 1 stated that “it’s always challenging with the resources, because it takes a lot of money and a lot of time to do these investments, and it’s not always that these investments and topics directly gain money for the company”. This links to a common theme identified during the interviews, defined in our thematic analysis as “The Juxtaposition of Sustainability and Profitability”. Proton Group faces strong demands from upcoming regulations, which steers the organization on the road of reporting in a more advanced way, in order to achieve complete transparency in Proton Group’s value chain. Sustainability Manager 1 expects the meeting of these demands in a sustainable manner to be one of Proton Group’s largest upcoming challenges. Additionally, Sustainability Manager 1 states that as a medium-sized company, Proton Group will survive with meeting these demands, however, smaller companies are likely to struggle. This links to the theme defined in the thematic analysis as “The Financial Challenges that come with the Implementation of the CSRD Directive in an Organization”.

From another perspective, Sustainability Manager 2 states that some of the largest challenges within implementing sustainability are social challenges. Gustafsson passionately declared in the interview that “it’s not just environmental issues, not just water, and air, and stuff like that, but it’s also about people, about the society, about

growth, and about economics, and how those things connect to each other". The thematic analysis refers to the concept of this challenge as "The Subsistence of Sustainability within Organizational Culture". Proton Group believes that in order to create efficient sustainability strategies, sustainability must be involved in the entire company.

In regard to environmental sustainability, Proton Group finds a challenge in creating completely – "100% – efficient investments, when trying to focus on their climate impact. Proton Group's environmental sustainability is rather investment-heavy, whether that be in new technologies or new energy sources. The organization has implemented a multitude of environmental sustainability initiatives and efforts, and aim to work within their local area, as they believe that is where the largest change Proton Group could possibly make is.

4.2.2 Sustainability Ambitions

Proton Group prides itself on its sustainability directives and aims to ensure that all of its subsidiaries are following these directives and initiatives closely. Proton Group's sustainability ambition revolves around the creation of positive impact and betterment of the world for the flourishing of future generations. When asked to specify processes that Proton Group intends to take that path, Sustainability Manager 2 stated that Proton Lighting aims to "take part and be involved early in all the different legislations that surround electronics" and to be able to offer the customers and clients of Proton Lighting sustainable options of luminaires. Some of the goals which Proton Group aims to reach include – but are not limited to – a completely neutral carbon dioxide footprint and a 40% reduction of purchased energy by 2035.

4.2.3 Sustainability Journey Assessment

According to the sustainability manager, Proton Group's placement on the Sustainability Journey graph lies in between proactive and reacting. The organization is trying to become more proactive in its sustainability initiatives, however, they are reactive when there are upcoming regulations or directives. Sustainability Manager 1 stated, "we really try to adapt and find good ways before it's demanded of us or because we can", thus highlighting the ambitions of Proton Group when it comes to potential upcoming legislations. An example that was given during the interview was the

maximum allowed level of metal substances that can exist in the treated water that leaves the Proton Finishing areas, and Proton Group has set that level at 25% on their own accord. “Even if we were allowed to use 100%, we would only allow ourselves to use 25% of what is permitted, because it’s no good to be just legal”, stated Sustainability Manager 1, when describing how Proton Group places itself above the legal minimum line on the Sustainability Journey graph.

Proton Lighting’s placement on the graph and its efforts range between the different operations and processes carried out. Gustafsson stated that in some areas, Proton Lighting does absolutely the legal minimum, however, in other areas, they go beyond that line. A challenge faced within this field is providing a sustainable luminaire alternative while ensuring the price is still reasonable for clients and maintaining the performance. When it comes down to the safety and security of Proton Lighting employees however, they go above the legal minimum line as they take on sponsors with schools and dedicate time for student visits, as well as engage with the community and society in their local area.

4.2.4 Governance within Proton Group and its Implications

Governance within Proton Group plays an extremely significant role. Sustainability Manager 1 discussed how governance impacts sustainability performance in Proton Group, stating that “together with the philosophy of the owners we get direction, and then the owners and the board don’t interfere. That, I think, is the key that gives us the motivation and the power and the pride to really do the work in a good way”.

The Sustainability Strategies for each Proton subsidiary is usually defined and developed by the owners, who also assign environmental, social, and economic targets for each company, as well as manage the margins of profitability in order to maintain the economic stability of Proton Group. After the board and the owners decide upon a goal or target that the subsidiary needs to reach, it is then in the respective subsidiary’s hands to decide how involved and engaged they want to be with that goal or target. Sustainability Manager 1 stated regarding this: “For some companies, it’s very easy to do a very big share, but for some, they don’t have those kinds of resources, or don’t have the emissions to begin with”.

4.2.5 Thoughts on the DEM

When asked about the DEM, Proton Group's sustainability manager stated that the implications of the model and its purpose are clear. They claimed that the model is most likely going to lead to a betterment of the decision-making in the firm it is implemented in. However, it was also stated that the model is indeed designed to be implemented on a global level, agreeing that the downscaling process would come with various challenges. The manager stated that "the target for this model is to make it visual where you perform good, and where you perform bad, that would probably help with doing the right decisions.". When the Sustainability Manager at Proton Lighting was asked about the model, they also highlighted the potential opportunities that arise when considering the visualization of the model and the possibility to explain and visualize sustainability strategies at Proton Lighting. However, they also stated and identified a limitation, claiming that "you need to – sort of – scale it down and not make it [the outer ring] the world...it becomes this overwhelming task that [you think] "what's the point"?"

5. Data Analysis

This section of the paper will attempt to analyse the data generated through the interviews carried out with the Sustainability Managers at firms Apotea AB and Proton Group, highlighting gaps within the firms' sustainability strategies, and creating suggestions on how the DEM could fill the gaps identified.

5.1 Downscaling the DEM and its Opportunities

The Doughnut Economics Model (DEM) and its implications in organizations have – thus far – been described and will now be evaluated based on the data collected and collated within the interviews carried out by the researchers, as well as data found from the public reports and documents provided by the firms interviewed.

The implementation of the DEM on the firm-level proves to be quite challenging, as deduced from the thoughts of the sustainability representatives interviewed by the researchers. However, if successful, the DEM could provide a deeper

insight and understanding of sustainability within an organization and bring forth opportunities for the firm to bridge the gap between their current and future sustainability ambition and sustainability efforts.

The opportunities and possibilities which may arise for the firm as they implement DEM are copious. First and foremost, we must acknowledge that the DEM is an illustrative model, and in itself, provides an easier visualization of sustainability issues, and where these issues exist. The current existing DEM is – as mentioned above – a model relating to a macroeconomy, or the entirety of a nation. If the downscaling of the model is a possibility, this allows firms to utilize this model to discover which planetary boundaries are being the most directly and indirectly impacted as results of the firm's operations and processes. This plays a significant role for the firm as they are then able to focus on a specific operation or process which has the greatest impact on a specific planetary boundary, and therefore, create a more efficient problem-solving plan for potentially unsustainable practices.

As we discuss areas which firms directly impact, we find yet another opportunity for a downscaled DEM, where the model elucidates the planetary boundaries and areas which are directly impacted by the organization. This model could furthermore also be adjusted to display areas which are only indirectly impacted. The opportunities within these simplified and downscaled versions of the DEM could create a clearer, more transparent view of sustainability for the firms utilizing them, leading to an increased chance of their efficiency and success in implementing sustainability strategies and initiatives.

Linking closely to this, we – the researchers – have identified what we refer to as "Peripheral Areas", which are areas in the peripheral of the company's direct impacts which are still important but are unlikely to be prioritized within sustainability strategies. The concept of peripheral areas and the illustrative nature of the DEM allow for organizations to visualize the points at which sustainable development is needed the most. Additionally, for unsustainable firms or firms in unsustainable industries, the DEM would pose an opportunity in identifying where the firms need to start to be able to successfully implement sustainability into the organization.

Considering other tools used to implement sustainability, the DEM triumphs in efficiency, as it merges other potential sustainability tools, collating all pillars of sustainability – economic, environmental, and social – and interlink them.

This is advantageous in itself, and moreover, could reduce and potentially eliminate the need for other sustainability tools which might be less effective. Furthermore, compiling all sustainability pillars into one model allows and promotes collaboration within the organization. For example, if a firm assigns an expert in social sustainability and another expert in environmental sustainability, they would be able to collaborate and work together within the same model to produce mutually beneficial results and be able to more easily identify points of priority.

As a firm attempts to implement sustainability within its activities, operations, and culture, it is bound to face potential conflicts and/or resistance from a variety of sources. For example, when an organization decides to pursue sustainability, and to prioritize sustainability over other aspects of the firm such as profitability, employees might seem reluctant or resistant to the changes that could happen in organizational structure. The DEM plays an important role in illustrating sustainable development and the planetary boundaries in a clear and easily understandable way, where specific improvement areas can easily be pinpointed, which can help with spreading the word about sustainability and getting it interwoven within organizational culture, therefore lessening change resistance.

5.1.1 Gaps in Apotea’s sustainability strategy

Apotea's sustainability strategy does not clarify the priority of goals between departments and could therefore lead to a difficulty in the respective goals' prioritization, which results in goal conflicts within departments. An example of this is Apotea's challenges due to the complexity of prioritizing or deciding between financial and environmentally sustainable investments, and how on one hand, profitability is the priority, while on the other, environmental sustainability is. This can lead to confusion within the organization, as well as potential reluctancy for the environmental sustainability department in implementing initiatives.

One of the largest gaps in Apotea's sustainability strategy links to the incredibly large network of approximately 700 suppliers. The organization feels confident in its attempts to lower its emissions in Scope 1 and 2, however, the greatest proportion of Apotea's emissions - around 95% - lie in Scope 3, indicating that 95% of Apotea's emissions are in the hands of their suppliers. This ties closely to some of the other supplier conflicts which Apotea have been struggling with. Sustainability

Manager 3 stated in the interview conducted: "What we can do is only to influence or impact and talk to the suppliers, I'd like for them to understand that the emissions are in their hands". This is a clear display of Apotea's urgent need for influence work to be able to cooperate with their suppliers in order to deal with their Scope 3 emissions. This process proves rather difficult, as Apotea struggles with monitoring and supervising suppliers, and ensuring that each supplier is following the code of conduct. There is a lack of management and tools that help Apotea to deal with this issue. Since the supplier network in itself is extremely large, the organization feels the pressing need to integrate systems to monitor and manage their suppliers more efficiently, as well as a method of reaching out to the suppliers and helping them understand the significance of acting on their emissions and initiating sustainable practices within their operations.

Without a stable organizational culture and structure, the implementation of sustainability within a firm's operations and values, becomes tremendously more difficult. Apotea is currently somewhat struggling with the involvement of its employees and stakeholders in its sustainability ambitions and practices. The lack of sustainability measurements in all departments make it difficult for those working at Apotea to understand exactly how sustainability impacts their job, and how their job can possibly impact Apotea's sustainability performance. As the organization attempts to push sustainability forward, Sustainability Manager 3 struggles with Apotea's organizational structure, and how unfitting it is for the attempted strong sustainability culture that needs to be implemented in order for Apotea to reach their sustainability ambition. Sustainability Manager 3 mentioned this during the interview in multiple instances, stating "we don't have the organizational structure to be that strong" when asked about Apotea's placement on the sustainability journey graph. Additionally, regarding the implementation of regulations, directives, and standards, Sustainability Manager 3 stated that the organizational structure of Apotea hinders the potential sustainability initiatives, voicing "we still have a start-up mindset, so we don't have the organization in place to comply with all those standards". The presence of the start-up mindset could also potentially pose a threat to the rapidly growing organization, as adaptability to sustainability regulations is essential.

A few other potential gaps were identified in Apotea's sustainability strategies. The first of which being the lack of metrics in place which measure the success of Apotea's sustainability initiatives. The organization has indicators in place to

measure some key factors of their sustainability strategy, however, no metric measures its success. The final gap we found and identified in Apotea's sustainability strategy is the potential conflicting misuse of data. Sustainability Manager 3 stated that Apotea does indeed have a lot of data available about their operations and sustainability initiatives, however, that data is mostly being used in order to optimize their operations, rather than to guide and promote further work which could positively impact Apotea’s sustainability performance.

5.1.2 Gaps in Proton Group’s sustainability strategy

Proton Group faces generic challenges when it comes to their sustainability strategy and fewer challenges which are specific to the organization itself and its processes. A large part of Proton Group's operations revolves around creating sustainable investments, which in turn, do not always play out as intended. The firm struggles with creating efficient and sustainable investments due to the resource-demanding nature of these investments, which results in potential conflicts between financial and environmental sustainability. Additionally, these investments are not always guaranteed to be profitable or to have a positive result and cannot be 100% effective if there are no investments made in new technologies or energy sources. This problem deepens as chemical operations make up a large part of Proton Group's work, and consequently, this forces Proton Group to undergo financially unsustainable and unprofitable investments in order to offset the heavy chemical operations being carried out.

Regarding the topic of profitability within sustainability, Proton Group claims that it aims to be the first to discover new technologies and new ways of working, which means that Proton Group must balance and maintain stable operations, profitability, and economic growth, while attempting to revolutionalize sustainability. Similar to Apotea's, the identified gaps in the sustainability strategy of Proton Group are partially due to some of the challenges faced in the social pillar of sustainability. Within the organization, Proton Group aims to ensure that all stakeholders and employees are aiming to go in the same direction when it comes to the sustainability ambition.

Sustainability Manager 1 mentioned that a large part of this issue results from the lack of implementation of sustainability within all job positions at Proton Group. The sustainability ambition behind this conflict is to ensure that all employees at

Proton Group are willing to undertake tasks and operations that are outside of their job position's remit to be able to contribute to society through sustainability. The identified gap links to the fact that a large part of jobs at Proton Group still consider economic growth the priority and main focus.

One of the larger gaps identified within Proton Group's sustainability strategy is the current uncertainty regarding the conflict-resolution of upcoming regulations and voluntary sustainability initiatives. For example, Sustainability Manager 1 believes that an extremely challenging task will be for Proton Group to find partners, stakeholders, and collaborators that they must eventually work with to create a regenerative and circular flow within their operations. As it currently stands, there is no clear identified method of dealing with the mentioned task.

Facing legal and public demand is one of Proton Group's main obligations, as it vows to go beyond the legal minimum point in its sustainability efforts and ambitions. Currently, Proton Group faces demand from coming regulations that forces the organization into more advanced reporting to reach complete transparency in reporting on its value chain. Regulations such as implementing Environmental Product Declaration (EPD) and the Corporate Sustainability Reporting Directive (CSRD) are therefore demanded and expected from Proton Group, which they currently undertake. Since Proton Group is a medium-sized company, they have adequate resources to uptake the challenging task of meeting demands. However, this will be extremely challenging for smaller companies.

Proton Lighting specifically faces the challenge of incentivizing consumers to purchase sustainable alternative products with similar performance to existing products at a higher price point. This identifies a clear gap in the sustainability strategy of Proton Group, as the existence of sustainable alternative products will simply be a cost for the organization if there is no incentive for consumers to purchase it. Subsequently, if the sustainable luminaires that Proton Lighting offers do not sell, then Proton Group is creating yet another unprofitable investment, and will be incentivized to take back their sustainability initiative - the sustainable luminaires.

When considering suppliers and the challenges and issues that may arise, we were able to identify a handful of gaps within Proton Group's sustainability strategy in relation to its suppliers. Proton Group currently finds that it cannot be 100% sure of all their suppliers' compliance to their code of conduct and the organization's

sustainability ambitions. Proton Group holds audits for their most critical suppliers, however, Sustainability Manager 1 states in regards to the supplier audits that "up until now, it has not been enough focused on sustainability issues".

Another gap that was identified regarding the suppliers at Proton Group was the lack of a tool or software that would help monitor, track, and inform suppliers of sustainable practices and ambitions, as well as ensure their sustainable manners in carrying out their operations. This is significant due to the upcoming regulations within the EU which state that supplier evaluations are obligatory. Proton Group struggles to find an optimal tool or solution for this challenge.

5.2 Application of the DEM in the Case-Study Organizations

5.2.1 Apotea

When considering the implementation of the DEM and how it would fit into Apotea's sustainability strategy, we must consider the possibilities of developing their sustainability strategy further, in order to make it more complete and thoroughgoing.

5.2.1.1 Metrics for Success

The downscaling and implementation of the Doughnut Economics Model encourages the use of metrics to measure success in achieving social, economic, and environmental goals. The model itself brings forward a holistic approach to sustainability, as it takes into account all pillars of sustainability – economic, social, environmental –. Therefore, If Apotea aims to prioritize sustainability, then the organization can adopt this approach to assist with the development of a variety of specific metrics that help measure and assess the success of its sustainability initiatives. Additionally, the existence of metrics can help Apotea and its stakeholders collaborate within departments to ensure the overall success of sustainability implementation within each department, as well as measure general sustainability performance.

The presence of these metrics within the organization plays a significant role in monitoring Apotea's progress, helping the firm identify possible areas for improvement, and ensuring a more transparent evaluation of the impact of their activities.

The implementation of the DEM could help Apotea identify where metrics need to be implemented. For example, since Sustainability Manager 3 mentioned that Apotea struggles with ensuring that suppliers are following the code of conduct, and that the organization finds it hard to monitor its large network of suppliers, the DEM model could implement metrics such as compliance rates of suppliers to the code of conduct, or training for suppliers to follow the guidelines and regulations, which can be tracked with a training completion percentage metric. Since Apotea is a pharmaceuticals firm, they will also be able to implement metrics regarding the sustainability initiatives regarding chemical waste treatment and safe destruction of chemical waste. The organization could potentially look into setting metrics on waste disposal compliance or set monitoring and reporting systems to be able to review chemical waste disposal incidents and report them in a transparent and timely manner.

These metrics are extremely significant for Apotea, as they not only allow the firm to observe and track their progress, but also helps engage the stakeholders in questions and issues that revolve around sustainability. This is key to Apotea as it helps ensure that sustainability is interwoven within stakeholders' jobs and daily life, leading to a more sustainability-oriented organizational culture.

5.2.1.2 Data Usage for Planetary Boundaries

Through the interview held with the sustainability manager at Apotea - Sustainability Manager 3, the interviewee stated that one gap which is clearly identified is the existence of a plentiful amount of data which is currently being used to optimize Apotea's main operations, but not for other uses that may involve social or environmental sustainability.

As the DEM comes into play, it emphasizes a safe and just space for humanity, which is within the planetary boundaries. If Apotea wishes to prioritize sustainability, it would be able to then align the data that it has available with sustainability principles, by leveraging the available data not only for operational optimization, but also for sustainability initiatives and efforts, leading to an increased priority of sustainability in Apotea. The DEM is able to guide Apotea through this, in ensuring that the data is used to support environmental sustainability, and social well-being, by identifying key factors that should be taken into account in the data usage strategies.

Additionally, the DEM also highlights the interconnectedness of environmental and social sustainability with economic sustainability, which can help Apotea look beyond the common traditional approaches behind using data for economic growth and looking past the numbers instead.

5.2.1.3 Organizational Culture and Structure

Apotea faces social challenges, some of which stemming from the inability to implement sustainability initiatives due to a lack of organizational structure. Sustainability Manager 3 stated regarding this that "we have a lot of people involved in the business now and we still need the organizational structure for everything to work".

To help with filling in this gap in Apotea's organizational structure, the DEM would push forward to Apotea the images of regenerative and distributive approaches in Apotea's operations and economic activities. If applied at the firm-level, then Apotea will be able to work towards fostering a sustainable organizational culture. This involves engaging stakeholders and employees from all departments in Apotea, and helping them understand the broader impact of their work on sustainability.

Ultimately, The DEM guides Apotea into looking at environmental, social and economic sustainability from a long-term perspective by providing these holistic perspectives on regenerative approaches, which can help Apotea develop an organizational culture which transcends short-term financial gain, and instead, prioritizes long-term financial, environmental, and social sustainability. By identifying and establishing the safe and just space for humanity as a goal to reach and to contribute to, Apotea creates a shared value, goal, and purpose for their stakeholders and – more specifically – employees. This can not only help align and unite employees' beliefs and values, but also tackles the challenge of change resistance within the organization. The shared purpose of reaching the safe and just space for humanity thereby develops into an essential and elementary aspect of Apotea's organizational culture and structure, which fits and supports its sustainability ambitions more appropriately.

5.2.1.4 Adaptability to Regulations

With the constantly developing regulations regarding sustainability and consistently pressuring demands of the general public and of the law, Apotea - amongst all other organizations - is taking action to ensure its compliance with legal regulations and directives which are being enforced within Sweden and Europe.

Within this field, the DEM acts as a guidance tool for Apotea to understand the importance of adhering to regulations that revolve around the planetary boundaries mentioned in the DEM. The balanced nature of the DEM - in balancing all pillars of sustainability - allows for Apotea to incorporate and align its organizational structure and sustainability initiatives with the evolving regulatory landscape. This is significant and relevant to Apotea's sustainability strategy as well, as it helps the organization with overcoming the potential barriers that might be self-imposed by the start-up mindset that Sustainability Manager 3 mentioned they were stuck in.

Additionally, by operating within the safe and just space for humanity, Apotea is able to build resilience and adaptability to external impacts and shocks, as might be caused by economic downturns, global health crises - such as the COVID-19 pandemic -, or other factors.

5.2.1.5 Integrated Goal Prioritization

One of the main challenges described by Sustainability Manager 3 during the interview was the co-existance of conflicting goals within Apotea, the interviewee stated regarding this that "I think it's not [a challenge] especially for Apotea, but in general, goal conflicts within departments, that's what makes it more difficult to implement sustainabillity initiatives".

The goal conflicts that arise in Apotea could include trade-offs between goals in varying sustainability pillars, the most common of which being the goal conflict between profit maximization and implementing sustainability initiatives. If Apotea aims to prioritize sustainability, the implementation of the DEM would encourage and provide a holistic perspective on economic activities, which consider both the social and environmental factors. The model aims to balance the potential trade-offs between economic growth and development, social well-being, and environmental sustainability, and encourages Apotea to attempt to minimize or eliminate the solutions that lead to these trade-offs.

As the model aims to avoid an overshoot in the planetary boundaries, and simultaneusly avoid a shortfall in the social foundations, by aiming for the safe and just space for humanity, Apotea thrives through balance and resilience, as mentioned above. This indirectly positively impacts Apotea as a balanced organization which will be able

to create sustainable investments which do not sacrifice or ignore the significance of one of the three pillars of sustainability.

5.2.1.6 Supply Chain Integration

As a rapidly growing firm, Apotea boasts a vast network of approximately 700 suppliers, which as we learned throughout the interview, is extremely difficult to manage and monitor, which made up one of the identified gaps within Apotea's sustainability strategy; the inability to manage suppliers with complete efficiency. The DEM emphasizes the importance of considering the environmental impact of entire supply chains, which Apotea can leverage in order to engage and collaborate with their multitude of suppliers much more effectively. This is relevant and significant to Apotea as it tackles one of the largest challenges that the firm is facing: Scope 3 Emissions. Since most of Apotea's emissions - around 95% - lie in Scope 3 and are in the hands of suppliers, the organization could utilize the DEM to attempt the integration of sustainability metrics and standards into their supply chain, which their supplier network would then have to follow.

Since the DEM incorporates the concept of planetary boundaries, recognizing that environmental resources are finite, it would act as an encouragement and urge the owners and decision-makers at Apotea to evaluate the cumulative impact of entire supply chains on these boundaries. This includes factors such as resource extraction, emissions, and waste generation throughout the entire production and distribution process within the supply chain.

Due to the complexity and interconnected nature of supply chains, the implementation of the DEM on a firm level would play a significant role in acknowledging the interconnectedness of economic activities and their influence on the environment. Due to supply chains often involving a complex network of relationships between suppliers, manufacturers, distributors, and retailers, Apotea ignoring the environmental impact of any one segment of the supply chain can lead to incomplete assessments, miscalculated climate data, and missed opportunities for sustainability initiatives and efforts.

5.2.2 Proton Group

5.2.2.1 Balancing Financial and Environmental Sustainability

Proton Group's investment-heavy operations and way of work, whether that be investing in new technologies or new energy sources, takes a drastic toll on the company's finances, and could potentially prove unproductive and unprofitable. This leads to the gap identified in Proton Group's sustainability strategy regarding efficient investments. The implementation of the DEM could provide Proton Group with a structured framework for assessing and balancing economic activities within the planetary boundaries. It acts as a guide for Proton Group to align its financial decisions and its sustainability ambitions and goals together.

Sustainability Manager 1 – sustainability manager at Proton Group – claimed that "it takes a lot of money and a lot of time to do these investments, and it's not always that these investments and topics directly gain money for the company". By utilizing the DEM, Proton Group stands to gain a holistic perspective in its decision-making processes, helping them evaluate the impact of their financial decisions while simultaneously considering social and environmental sustainability. To deal with this, the DEM would help Proton Group ensure that their investments are fruitful in at least one area. For example, Proton Group could identify an investment that might return unprofitable revenues and lose money for the company. However, with the DEM, the organization could be able to see a positive impact in adding value to communities and promoting social equity. Therefore, they can evaluate the investment appropriately, based on a variety of factors, instead of the simple, traditional economic revenue-centred-approach.

Furthermore, the application of the DEM in Proton Group's operations could assist the organization to identify the potential synergies that could lay between the economic, social, and environmental pillars of sustainability, and between the goals the company sets, which helps prevent potential upcoming conflicts that could pop up if there wasn't a comprehensive sustainability framework such as the DEM in place.

5.2.2.2 Integration of Sustainability in Job Positions

As previously mentioned, the DEM emphasizes the interconnectedness of the social, economic, and environmental pillars of sustainability, allowing for a lot of opportunities that could be potentially missed within sustainability tools that only offer

a framework for one of the pillars. When implemented, this aids Proton Group into integrating sustainability further within the organizational culture, through integrating it first and foremost within the job positions.

Both sustainability managers at Proton Group that were interviewed had claimed that sustainability is not as interwoven within the organization's culture as they would like it to be. Sustainability Manager 2 stated that "the difficulty is to break free and get the information into the organization that it's not only Sustainability Manager 2 that works with sustainability. You work with sustainability in a way, and you can affect sustainability for Proton Lighting in a way, and I think that's a really, really difficult part of it". To tackle this gap in the organizational culture, Proton Group needs to make an impression on the employees and help unite employees across different departments to look into sustainability and their individual responsibility as Proton Group employees.

In some job positions in the firm, a tendency exists to prioritize economic growth over sustainability in certain job functions, but through a cultural shift spearheaded by the implementation of the DEM and its goal alignment strategies, Proton Group can foster employee engagement within all departments by emphasizing a collective responsibility for all individuals in all job positions towards sustainable development and sustainability as a whole.

5.2.2.3 Regulatory Compliance and Collaboration

In regard to upcoming regulations and directives, Proton Group attempts to stay ahead of the competition and be early to implement initiatives, whether these are legally required or voluntary. To deal with the future challenges of finding partners – and collaborating with various actors – to achieve circular and regenerative approaches to sustainability, Proton Group could leverage the DEM to identify the area and field that they would engage with stakeholders in. For example, if there is a local actor that can use some of the waste which Proton Group generates, then they will need to attempt collaboration with the local actor in order to foster the regenerative approach, and thereby promoting systematic change through this collaboration. The DEM could also be used as a tool to discover collaborations with partners who share similar goals and sustainability ambition to Proton Group.

Since the world faces the pressure of climate change, Proton Group must be adaptable to the legal environment when considering regulations and sustainability

initiatives, since they are extremely susceptible to change based on the severity of issues such as climate change and global warming. As Proton Group weaves their way into the safe and just space for humanity, they become more adaptable, and equip themselves with metrics, measures, and tools of ensuring that the organization navigates through possible uncertainties within upcoming regulations efficiently.

5.2.2.4 Alignment with Future Regulations

The DEM could facilitate an environment for Proton Group in which they are able to align their sustainability ambitions and initiatives with future regulations, meaning that they are able to maintain their status as pioneers and revolutionary actors within the field that they operate in. By using the DEM, Proton Group could stay ahead of the constantly evolving sustainability reporting standards, to potentially ensure their compliance with initiatives in future years.

Proton Group identifies itself as both proactive and reactive as they are aiming to become more proactive but have not reached that goal yet. Sustainability Manager 1 mentioned in an interview that "I will not say that we are – all the time – years ahead of the regulations.... but we are going in that direction, and we really try to adapt and find good ways before it's demanded of us or because we can". This shows the willingness of Proton Group to become a more proactive organization than a reactive one, and with the help of the DEM, it should be able to do so. The model has a strong emphasis on regenerative practices, which would encourage Proton Group to go beyond the point of compliance, pushing them further than they are currently going, while maintaining resource-stability within the organization, and not overexerting the firm's capital. By incorporating these regenerative practices, Proton Group will become a largely proactive organization, which is able to anticipate and integrate upcoming regulations seamlessly. Subsequently, this enhances Proton Group's market position and reputation as an organization committed to sustainability, helping push them far ahead of the competition, and creating an exemplary sustainability standard in the industry.

5.2.2.5 Supplier Engagement and Monitoring

When considering suppliers and assuring that suppliers are complying with the guidelines and regulations that Proton Group have set, the firm is able to leverage the concept of shared responsibility and values embedded in the DEM to create a collaborative ecosystem with its suppliers. By emphasizing the interconnectedness of

social, economic, and environmental dimensions, as advocated by the DEM, Proton Group communicates a broader purpose that extends beyond transactional relationships. This shared responsibility fosters a sense of mutual commitment and encourages suppliers to recognize their integral role in contributing to a thriving society within the planetary boundaries.

Through regenerative partnerships, another key element of the DEM, Proton Group positions sustainability not merely as a compliance requirement but as a collective effort to create positive impacts, increasing the likelihood of suppliers aligning with Proton Group's sustainability ambitions. The model instils a sense of accountability, while promoting transparency and encouraging suppliers to actively contribute to the organization's circular and regenerative goals.

Furthermore, by proactively engaging suppliers in supplier audits and through dialogues about the holistic benefits of sustainability, Proton Group can foster a culture within their supply chain where adherence to sustainability guidelines becomes a strategic advantage for suppliers. This recognition can serve as a powerful incentive for suppliers to not only comply with Proton's sustainability initiatives but also to innovate and contribute to the overall success of a circular and regenerative economic model.

5.3 Limitations found in downscaling the DEM

5.3.1 Overwhelmingness

Overwhelmingness in this context refers to the feeling that the implementation of the DEM is too difficult or too costly to go through with. The concept of overwhelmingness in implementing the DEM at the firm-level stems from the model's broad and ambitious scope. Raworth's DEM aims to discuss, evaluate, and interlink an array of planetary boundaries, including - but not limited to - climate change and biodiversity loss. The extensive approach to the planetary boundaries and regenerative economies plays a significant and relevant role largely due to its holistic perspective on sustainability. However, when applied at the firm level, the DEM introduces a complex and challenging perspective that firms must navigate through to be able to utilize the model and leverage it to optimize their sustainability strategies.

The model distinctly highlights the interconnectedness of environmental and social issues as elementary aspects of the model. However, the interconnectedness between these two pillars of sustainability along with an economic perspective can

create confusion within firms about which specific planetary boundaries are most relevant and applicable to their operations. The downscaling process of the DEM requires a careful and thorough examination of these boundaries and demands an extremely nuanced understanding of each of the individual building blocks of the DEM, as well as the relationships between each of these blocks.

Furthermore, the term planetary boundaries itself implies that these boundaries are designed to be measured and applied on a global or planetary scale, hence the name. This may lead to a potential lack of direct relevance between certain boundaries and the day-to-day operations of a firm. For example, Apotea as a pharmaceutical firm, may find it challenging to directly address and evaluate the impact of their operations regarding ozone layer depletion. The simple misalignment of directly or indirectly impacted planetary boundaries poses a limitation to the potential pertinence of certain aspects of the model to Apotea or Proton Group, potentially resulting in misdirected efforts and suboptimal or inefficient resource allocation, which leads to the second identified limitation.

5.3.2 Resource Issues

When discussing the DEM, a potential assumption that the model makes is in the resourcefulness of the entity applying the model. Since the DEM is initially designed to be implemented in a macroeconomy or nation, it makes sense to assume the abundance in resources as governmental organization could interfere and support the integration of the model. However, when downscaling the model, assuming that a firm is profitable and resourceful poses a significant limitation when applied to organizations of a variety of sizes. When considering the implementation of the DEM, a certain threshold of organizational and stability is expected. This can cause conflicts and challenges when applied to companies of smaller sizes. For example, when looking into the integration of the model in Proton Group, we observe that the organization is medium-sized, and therefore, it would be a safe assumption that the company is capable of the implementation. However, when interviewing Sustainability Manager 3 of Apotea, she mentioned the lack of organizational structure and culture, and how it negatively affected the creation and application of sustainability initiatives. Therefore, it could be problematic to assume the resourcefulness of a smaller and newer organization when considering the implementation of the DEM on the firm-level.

Looking at this situation from the perspective of a company who is currently unprofitable or struggling with reaching its economic goals, there is a clear decrease in the incentive to downscale and apply the DEM, due to its obvious demands for additional resources in order to carry out the sustainability initiatives. This leads firms to what we refer to as the sustainability vs profitability complex, which we define as the conflict in financial sustainability and environmental sustainability and their prioritization. On one hand, firms must do their part in contributing to environmental and social sustainability, but on the other hand, a firm cannot do its part if it is unprofitable, as it has no incentive to. As a result, organizations are forced to - as Sustainability Manager 1 mentioned - pull off balance acts between financial stability and environmental sustainability. This poses a risk to the organization as they then have to decide between short-term economic sustainability or long-term environmental sustainability, making the decision-making process that much more complex.

Understanding the intricate nature of these relationships is crucial for the effective implementation of the DEM, as the model's success in prompting a shift away from conventional growth-driven economic models depends on the financial feasibility of such a transition. This involves considering how sustainability goals can be integrated into a firm's sustainability strategies while simultaneously considering any potential trade-offs that might arise between the three sustainability pillars.

5.3.3 Organizational Culture

The successful implementation of the DEM at the firm-level requires a shift in organizational culture, values, and structure towards sustainability. The model not only encourages the adoption of specific policies but calls for a fundamental change in mindset and perspective, as it involves more than the mere adoption of sustainable practices; it requires a holistic approach that influences and galvanizes the stakeholders of an organization.

One of the primary challenges lies in engaging employees and stakeholders in this transformative process. The model provides a theoretical framework, but translating these principles into comprehensive understandable strategies within an organizational context demands heavy effort. Therefore, when acknowledging the need for an organization to transform to a sustainable entity, there is a need to additionally acknowledge the potential resistance to change that may arise and

act as an obstacle in the process of transformation. This resistance may be caused by concerns about disruption, perceived incompatibility with existing and established norms and processes, or a lack of understanding about the long-term benefits of sustainability. Governance plays a pivotal role in driving this cultural shift and the organizational transformation, as the organization needs to be able to coherently communicate and listen to the stakeholders and employees the vision behind the process and provide any necessary support and resources for employees to embrace the new perspective. Another duty lies on the owners, managers, and leaders of organizations, which is the encouragement and promotion of transforming job positions to integrate sustainability within their remit and an employee's day-to-day practices.

Creating an organization with a sustainability-oriented culture and structure is a process which requires all actors to share similar values and beliefs, and therefore, when implementing the DEM, an organization should emphasize a shared sense of purpose and promote the availability of an atmosphere and environment where individuals can express their thoughts and develop their skills in relevancy to sustainable innovation, sustainable development, and sustainable practices.

5.3.4 The Process of Downscaling the DEM

The process of downscaling the DEM from a macroeconomic model to a firm-level is a complex and challenging process. The very terminology of planetary boundaries implies a global scope that extends way beyond individual organizations. Therefore, the adaptation of the DEM requires not only the prioritization of sustainability within the firm, but also, a systems-thinking approach to sustainability. An organization must be able to acknowledge the interconnectedness of global challenges and its ability as well as inability to impact these challenges. An organization must have substantial understanding of how environmental and social challenges could possibly manifest within their organization and industry to maintain the relevance and significance when implementing the DEM.

This downscaling process involves identifying key relationships between planetary boundaries, increasingly complex global problems, and organizational operations. It requires not only a rigorous examination of the direct and indirect impacts of the organization on the planetary boundaries, but also preserving the initial concept

and essence of the planetary boundaries while tailoring these boundaries to fit on an organizational scale, rather than a global one.

Furthermore, this process demands a re-evaluation of traditional business metrics and key performance indicators. While global sustainability goals such as the SDGs may be clear, aligning these large goals with specific, measurable, and achievable targets at the firm level poses a challenge for the organization. This involves collaboration between sustainability experts, industry specialists, and organizational leaders to develop a tailored approach that addresses global, industrial, and local challenges, and the needs of the firm.

5.3.5 The "How Factor"

A fundamental limitation in the implementation of the DEM at the firm-level is the lack of practical guidance following the identification of sustainability improvement points. While the model effectively highlights areas of concern and emphasizes the areas which a firm directly and indirectly impacts, it falls short in providing specific recommendations or a roadmap for addressing these challenges.

After identifying overshoots or areas where the firm's practices may deviate from sustainable targets, there is a lack of clear directives on how to deal with these issues. This lack of applicative guidance leaves firms grappling with the *"how"* of sustainability improvement, hindering an organizations effective implementation of the DEM. Furthermore, the dearth of policies that target specific planetary boundaries within the DEM adds to the complexity of a firm's thought processes as they downscale and implement the model. Subsequently, firms are left to navigate their transition and path to sustainability without a comprehensive set of guidelines, policies, or practices for addressing each planetary boundary mentioned in the model. The lack of specificity within the model may contribute to a sense of uncertainty and hinder the development of targeted sustainability strategies. Additionally, the uncertainty within the model and the absence of a roadmap link to the potential feeling of overwhelmingness mentioned in the first sub-heading of the limitations section.

In order to tackle the issue with the missing “How Factor", an organization needs to foster innovation and collaboration between sustainability and industry experts, in order to establish standards, policies, methods, and guidelines that the firm can follow in order to successfully implement sustainability within their operations and

organizational culture (Mohrman & Worley, 2010). Additionally, a firm needs to acknowledge the need for success metrics within these guidelines in order to ensure proper progress monitoring and oversight. A collaborative and open-minded approach to the implementation of these guidelines further helps the organization with identifying challenges and opportunities that might arise within future collaborations. This could help organizations such as Proton Group, who are constantly looking for collaborations to achieve a regenerative and circular flow and believe that this could be a serious challenge that they need to tackle in the future.

6. Conclusion

This section of the paper will aim to present the research objectives that have been achieved through this study, and to answer the two research questions which were posed by the researchers.

The main research objective of this study was to evaluate the downscaling and implementation of the DEM on a firm-level to highlight the potential opportunities and challenges of implementing the model in an enterprise – namely Apotea AB and Proton Group, thus contributing to the existing research. To guide our research, we had two research questions to guide us, these will be answered below.

RQ1: What opportunities can the implementation of the Doughnut Economics Model on the firm-level contribute to firms aiming to prioritize sustainability?

The opportunities found in the implementation of the DEM on the firm-level with the organizations studied (Apotea AB, Proton Group) were abundant. The model in itself can act as a holistic approach to sustainability, which allows for organizations to view economic, social, and environmental challenges in a new light. The balance of all pillars of sustainability that the model brings to the table can allow companies to view sustainability throughout their organisation. As such, the DEM can

provide great value through its use as a tool for visualization and to raise awareness and stimulate public discourse, which was originally outlined as a limitation of the model (Drees et al., 2021).

The downscaling of the model offers a possibility of basing the DEM on a firm's field of work, such as pharmaceuticals operations and their direct areas of impact in Apotea, or wastewater chemical treatment in Proton Group, and identifying not only unsustainable practices within the field, but also the strongest areas for the firm where they can make their largest contribution.

RQ2: What limitations can be identified in the implementation of the Doughnut Economics Model on a firm-level?

Limitations that were discovered in the implementation of the DEM on a firm-level were established on potential challenges that firms might come across during their attempts to downscale the model and/or transition towards sustainability. These limitations included – but were not limited to – the overwhelmingness of the implementation of the DEM, potential resource issues a firm might have – which the model does not address –, and issues within organizational culture, such as the absence of sustainability work in job positions, or stakeholders with traditional, economic-growth-oriented mindsets.

The downscaling process of the DEM is without a doubt a challenging task, largely due to the prominence of the planetary boundaries identified in the model, which – as the name suggests – are designed on a global scale. Downscaling these boundaries might lead to the loss of essence of these planetary boundaries, and a change in the conceptual meaning of the term.

The genericness of the DEM also affects the ability of a firm to implement the model, as the DEM is opportunistic in identifying areas of improvement, however, inadequate in defining and suggesting methods, policies, or ways in which the improvements could take place. This lack of clear and specific indicators and measurements for compliance and progress, makes it a difficult framework to employ within an enterprise.

7. Discussion

This chapter of the paper will discuss our reflections on methodological, theoretical, and practical implications within this study, as well as highlight limitations within the research conducted, and create suggestions for future research.

7.1.1 Literature and Theory

Throughout the case study and research conducted in this paper, the authors were able to contribute to the existing literature regarding the field of Doughnut Economics, more specifically, the downscaling of the DEM to the firm-level. Through the case study carried out, this paper supported existing theories and notions regarding the potential opportunities and challenges of the DEM's implementation or downscaling on the firm-level.

7.2 Contributions

While our study revealed that the DEM is a particularly difficult model to downscale to the enterprise level, further consideration reveals that the difficulty for individual firms to provide a significant impact to many of the areas portrayed within the model is what makes up one of its greatest contributions, the ability to focus on the one or few areas where each individual company can provide a significant impact and create something regenerative. Thus, it could be argued that the largest contribution of our research is that it shows that the DEM through its incorporation of SDGs and PBs is

a great framework and tool for visualization and sparking conversation, but that it lacks clear and specific indicators and measurements of progress.

7.3 Limitations of the Study

When carrying out this study, a handful of limitations were identified, the first of which being the applicability of this study within other differing contexts. This study was carried out in Sweden, where organizations and their employees might behave differently to another country and might have different priorities or ambitions. Additionally, the interviews were only conducted with sustainability managers, which could have had an impact on the data generated from the interviews with Apotea and Proton Group. Moreover, interpretation of the interview questions and answers within the interviews could have impacted the data, as well as the format of the interviews, as some interviews were carried out in person, and some were carried out online.

It is also strongly suggested to hold interviews in similar formats, settings, and with all researchers included in the study. The similar environments would allow for a decrease in any impacts that the environment that the interview is held in might have on the interviewee and the interviewers. The presence of all researchers would allow for the availability of insights from varying perspectives. However, when involving a multitude of researchers, one must consider the concept of groupthink – defined as the tendency for a group of individuals to reach consensus without critical reasoning (Park, 1990), and biases that could come forth when working in group settings. Interviews could be carried out in a more varied manner, with interviews being held with employees and stakeholders who are not necessarily directly engaged within the sustainability strategy and work at the heart of the sustainability department at the firm. This could provide perspectives which are equally valuable and relevant when considering the transition from unsustainable to sustainable practices and organizational culture.

7.4 Suggestions for Future Research

The findings of our research regarding the ability to downscale the DEM to the enterprise-level is quite limited, thus our proposal is that future research should focus on the identified strengths and weaknesses of downscaling the DEM to the

enterprise level. The identification of clear indicators and measurements of progress would greatly benefit future endeavours to employ the DEM in sub-global settings. Similarly, we argue that the focus should be shifted from the inability of firms to comply with the different areas of the DEM, to a focus on developing the work within niche areas of each enterprise where they can make the largest contribution toward a safe and just space for humanity. Future research within the field could thus benefit from employing either qualitative or quantitative methods, depending on the chosen scope of the research. We also recommend exploring multiple case studies to achieve as objective results as possible. These case studies should target different demographics, such as companies based in different countries with completely different operations and processes. This way, the implications of the DEM on the firm-level could be assessed and evaluated based on differing organizational cultures and structures, as well as demographic differences.

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9. Appendices

9.1 Appendix A: GDPR Consent Form and Participant Information Sheet

GDPR Thesis Study Consent Form

Required by European Union General Data Protection Regulation 2016/679

GDPR Consent for Downscaling the Doughnut Economics Model to the Enterprise Level

Please tick the appropriate boxes	**Yes**	**No**
Taking part in the study		

I consent to JIBS processing my personal data in accordance with current data protection legislation and the data delivered.	o	o
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	o	o

My signature below indicates that I choose to take part in the thesis study and consent to JIBS treating my personal data in accordance with current data protection legislation and the data delivered.

_____ _____ _____ Name of participant [IN CAPITALS] Signature Date		
Contact details for further information ***Thesis supervisor - Mark Edwards - E-mail:*** ***mark.edwards@ju.se*** ***Thesis student - Adrian Ryberg - E-mail:*** ***ryad20gv@student.ju.se*** ***Thesis student - Jad Hmeidi - E-mail:*** ***hmja20ie@student.ju.se***		

Participant Information Sheet

This is for guidance only, You MUST, however, include contact details and the Data Protection Privacy Notice.

Invitation paragraph

You are being invited to take part in a thesis study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study collecting personal data?

This study is a bachelor's Thesis Project carried out by Sustainable Enterprise Development students. The study evaluates the Doughnut Economics Model, and the advantages and contributions it could offer on the firm-level, instead of a macro-level view. By collecting data through this interview, we aim to gain insight on how Proton Group/Apotea maintains its sustainability, and the challenges faced by the enterprise throughout its path to sustainability. In context, we will consider how the Doughnut Economics Model could improve sustainability operations at Proton Group through its implementation.

It is entirely up to you to decide whether or not to take part. If you decide to do so, you will be given this information sheet to keep and will be asked to give your consent.' All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any ensuing reports or publications.'

Under GDPR you have the following rights over your personal data:

- ***The right to be informed**. You must be informed if your personal data is being used.*
- ***The right of access**. You can ask for a copy of your data by making a 'subject access request'.*
- ***The right to rectification.** You can ask for your data held to be corrected.*
- ***The right to erasure**. You can ask for your data to be deleted.*
- ***The right to restrict processing**. You can limit the way an organisation uses your personal data if you are concerned about the accuracy of the data or how it is being used.*
- ***The right to data portability**. You have the right to get your personal data from an organisation in a way that is accessible and machine-readable. You also have the right to ask an organisation to transfer your data to another organisation.*

- ***The right to object***. *You have the right to object to the use of your personal data in some circumstances. You have an absolute right to object to an organisation using your data for direct marketing.*
- ***How your data is processed using automated decision making and profiling***. *You have the right not to be subject to a decision that is based solely on automated processing if the decision affects your legal rights or other equally important matters; to understand the reasons behind decisions made about you by automated processing and the possible consequences of the decisions, and to object to profiling in certain situations, including for direct marketing purposes.*

You should also know that you may contact the data protection officer if you are unhappy about the way your data or your participation in this study are being treated at *dpo@ju.se*

9.1.1 *Thank you for reading this information sheet and for considering whether to take part in this research study.*

Contact details for further information

Thesis supervisor - Mark Edwards - E-mail: mark.edwards@ju.se

Thesis student - Adrian Ryberg - E-mail: ryad20gv@student.ju.se

Thesis student - Jad Hmeidi - E-mail: hmja20ie@student.ju.se

9.2 Appendix B: Interview Guide

Questions Regarding Interviwee

Can you tell us a little bit about yourself?

How did you start working at [Firm Name]?

Questions Regarding the Organization

Can you provide a brief overview of what [Firm Name] does, and how it fits into the industry or market in which it operates?

Can you describe the key products or services that [Firm Name] offers, and how they are produced or delivered?

How is [Firm Name] organized, and what are the main departments or divisions within the company?

Can you discuss any recent changes or updates to [Firm Name] 's operations, such as new facilities or processes?

Questions Regarding Sustainability within the Firm

What are the challenges the company has faced when implementing sustainability initiatives?

Follow up: How did [Firm Name] tackle these challenges?

Which pillar of sustainability (economic, social, environmental) do you think is the toughest to implement on a firm-level?

Follow up: Why do you think said pillar is the toughest to implement?

What metrics or indicators have you used to measure the success of your sustainability strategies at [Firm Name]?

Follow up: Why did you choose these metrics/indicators?

Follow up 2: Why have you swapped your previous sustainability strategy to the one the company utilizes now?

Follow up 3: Since when have you been implementing these sustainability metrics?

What is [Firm Name]'s sustainability ambition?

Follow up: Have you implemented both short-term and long-term sustainability measures in [Firm Name]?

How does [Firm Name] ensure sustainability within its supply chain?

Follow up: Why is it important to ensure this?

How do you integrate sustainability into your company's overall strategy and decision-making processes?

Follow up: You mentioned software to ensure transparency through the supply chain, would you say that

How does your company manage and reduce its environmental impact?

How does your company currently engage with stakeholders on sustainability issues?

What role do you see for your company in contributing to broader sustainability challenges?

What role do you see for your company in contributing to broader social sustainability challenges?

What role do you see for your company in contributing to broader economical sustainability challenges?

Questions Regarding DEM

After hearing our brief explanation about the doughnut economics model, how do you believe that it could have the potential to optimize sustainability?

Thinking back to the Social Foundation shown in the doughnut economics model, do you think it would be possible to tackle all of the areas in the Social Foundation in [Firm Name]?

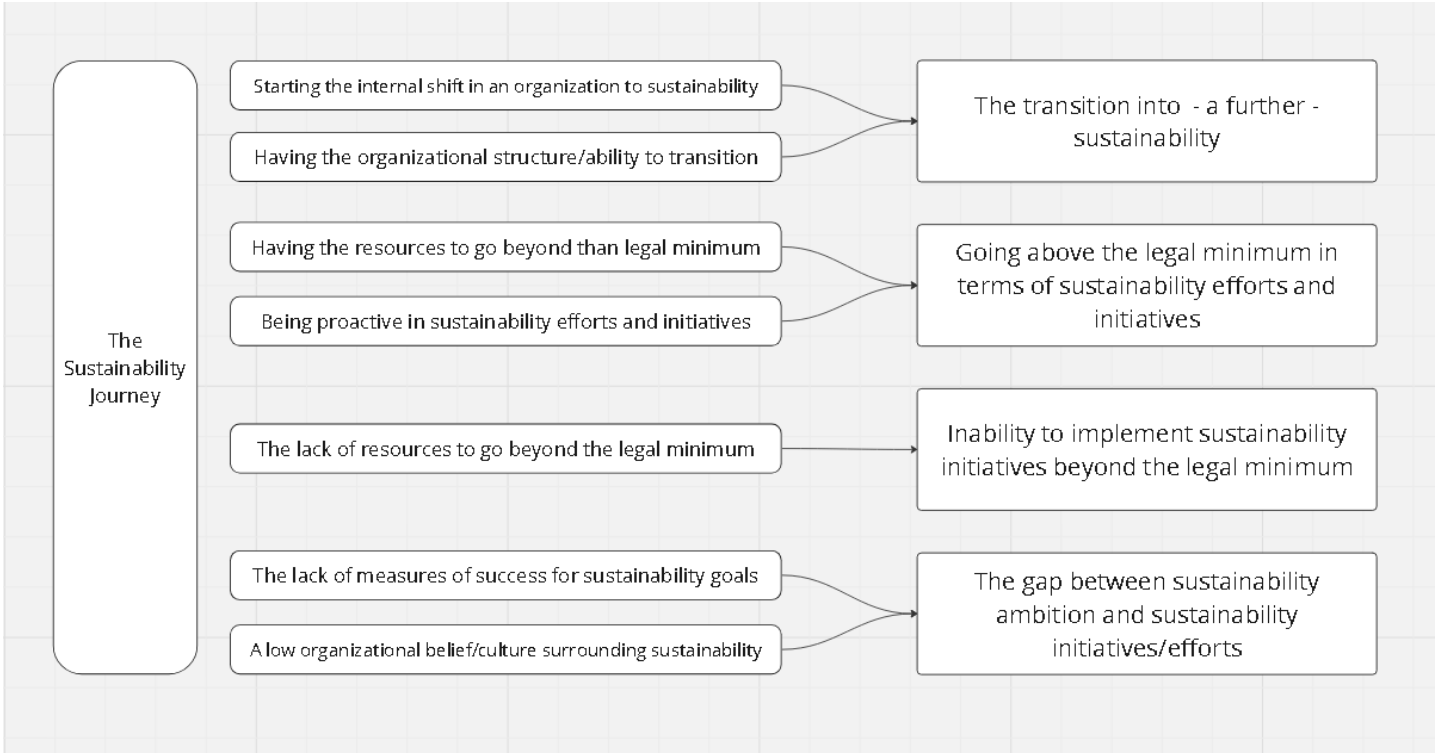
Follow up: Do you believe that your current sustainability strategies tackle these issues?

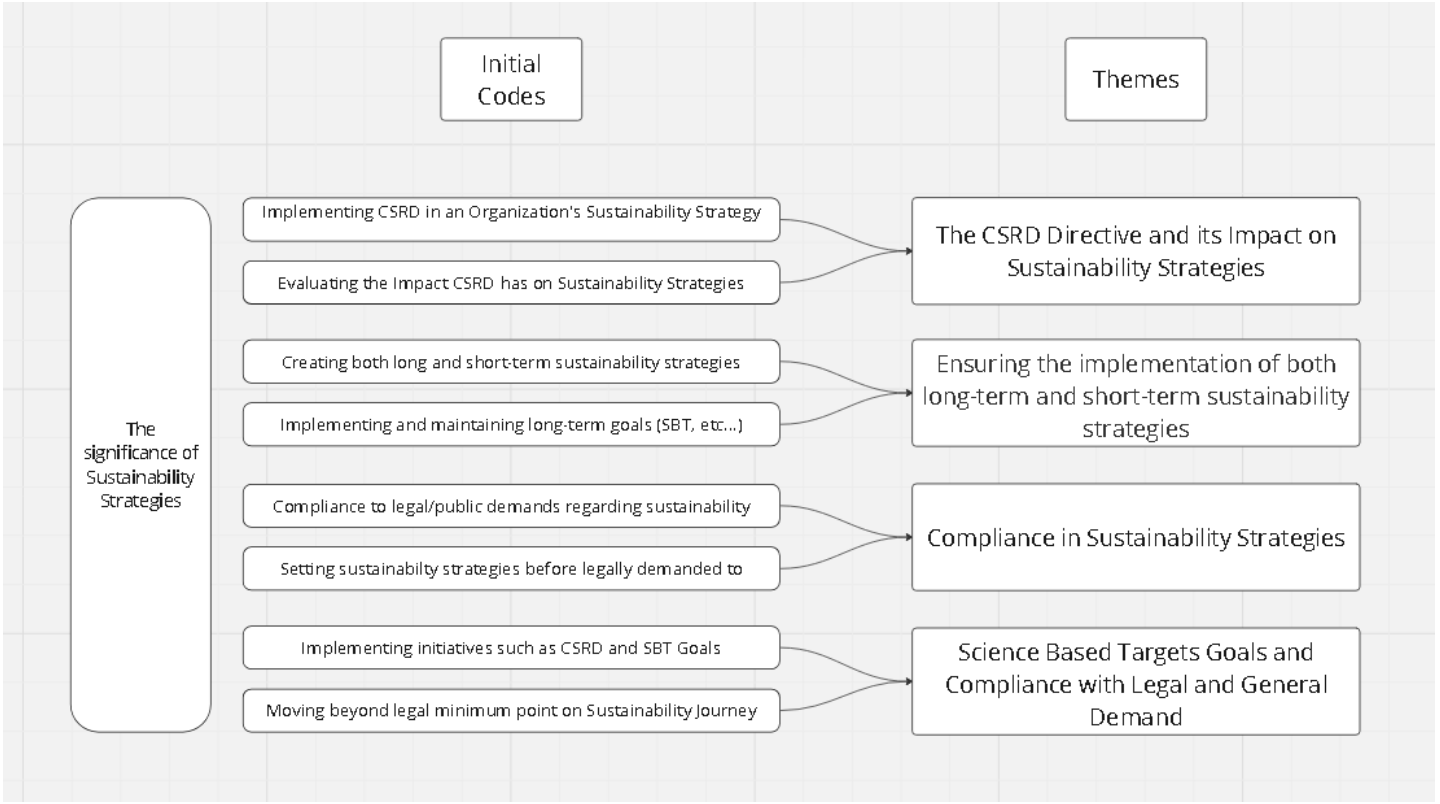
Thinking back to the Ecological Ceiling shown in the doughnut economics model, do you think it would be possible to tackle all of the areas in the Ecological Ceiling in [Firm Name]?

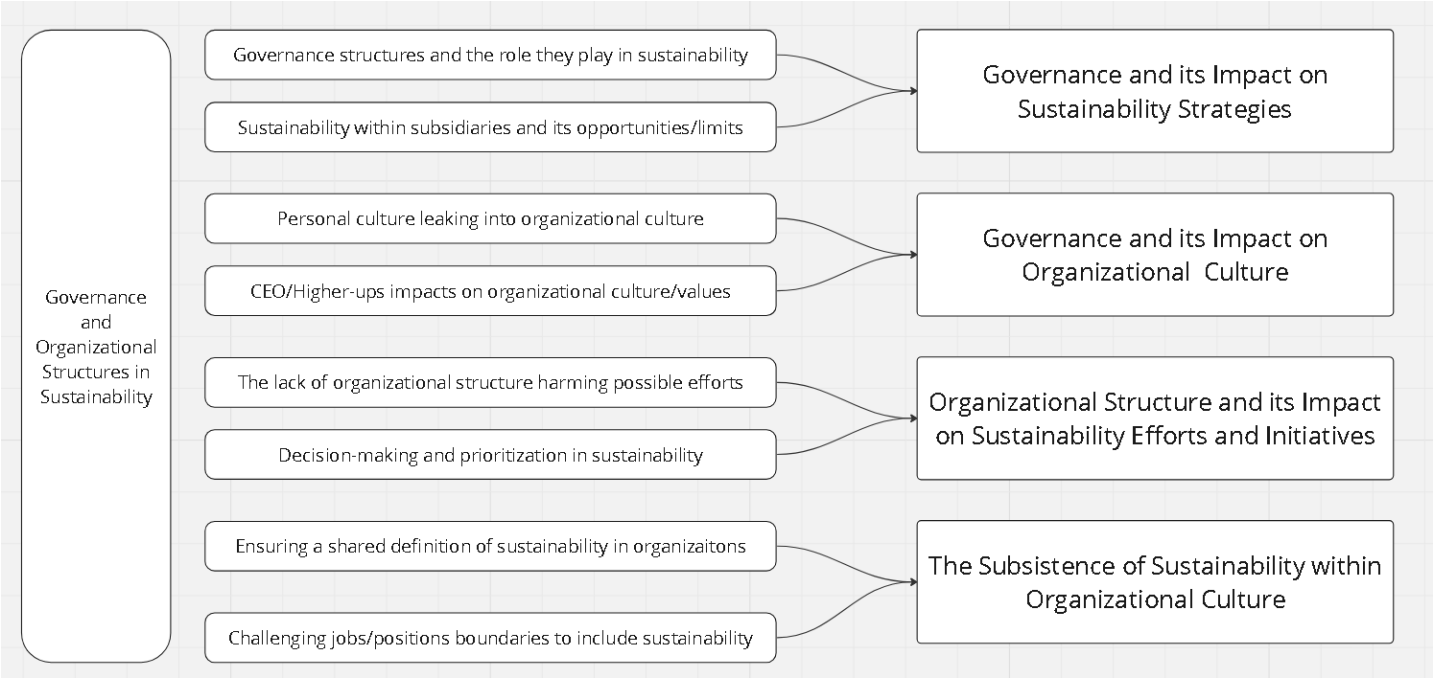
Follow up: Do you believe that your current sustainability strategies tackle these issues.

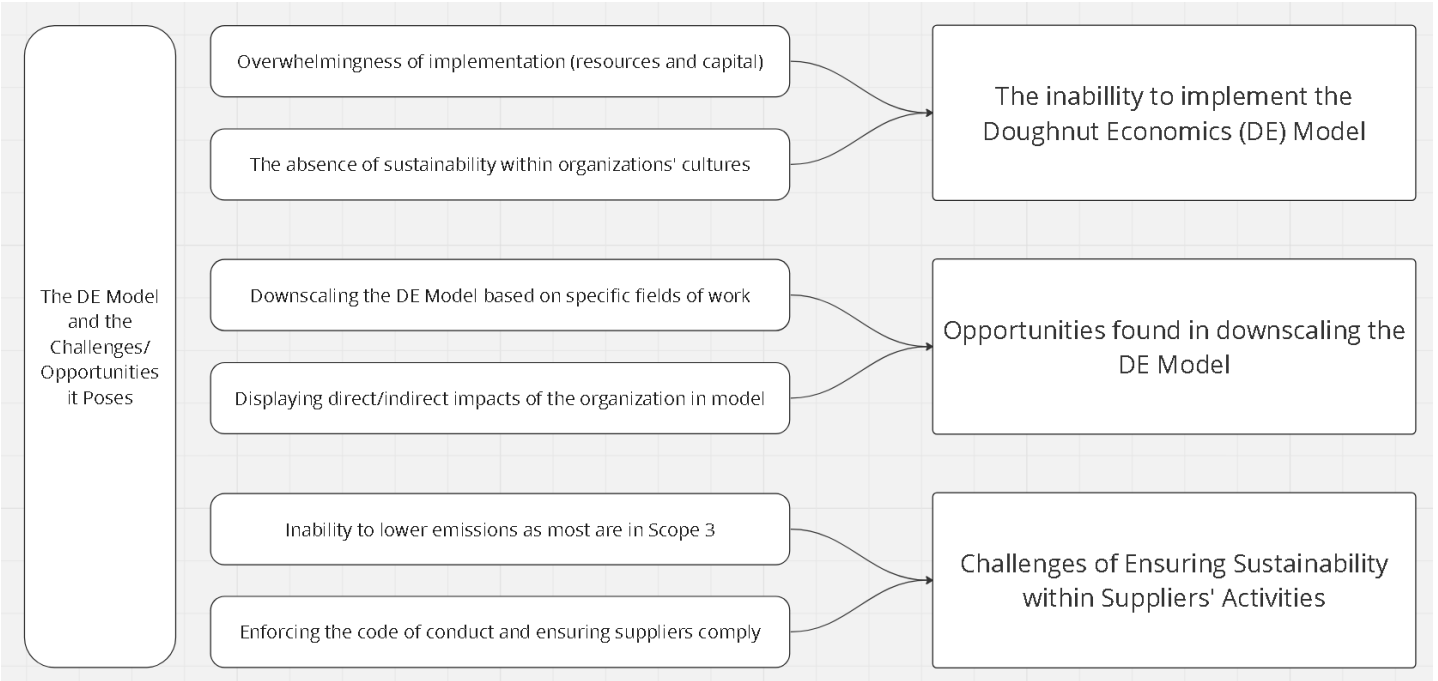
What parts of the doughnut economics model (at first glance) do you feel is missing which are integral parts of [Firm Name]'s sustainability strategy?

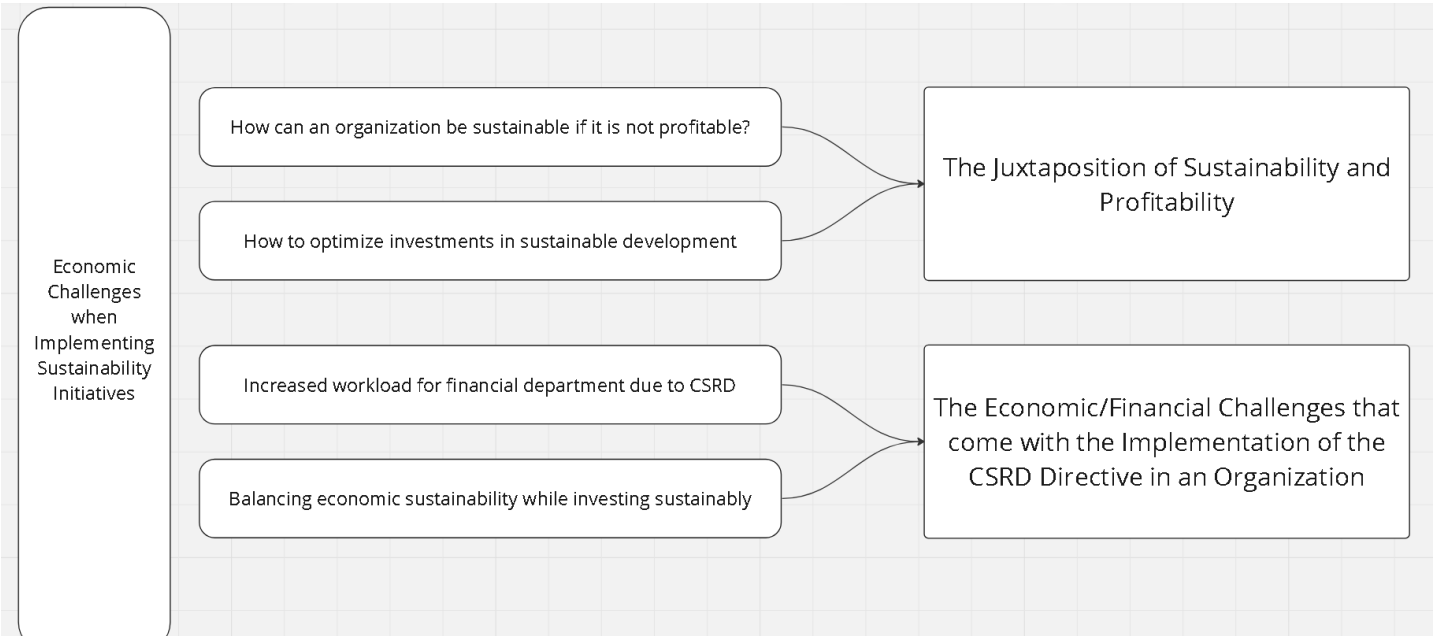
Appendix C: Qualitative Thematic Analysis Coding






Governance and Organizational Structures in Sustainability
Governance structures and the role they play in sustainability
Sustainability within subsidiaries and its opportunities/limits
Governance and its Impact on Sustainability Strategies
Personal culture leaking into organizational culture
CEO/Higher-ups impacts on organizational culture/values
Governance and its Impact on Organizational Culture
The lack of organizational structure harming possible efforts
Decision-making and prioritization in sustainability
Organizational Structure and its Impact on Sustainability Efforts and Initiatives
Ensuring a shared definition of sustainability in organizaitons
Challenging jobs/positions boundaries to include sustainability
The Subsistence of Sustainability within Organizational Culture


The DE Model and the Challenges/ Opportunities it Poses
Overwhelmingness of implementation (resources and capital)
The absence of sustainability within organizations' cultures
The inabillity to implement the Doughnut Economics (DE) Model
Downscaling the DE Model based on specific fields of work
Displaying direct/indirect impacts of the organization in model
Opportunities found in downscaling the DE Model
Inability to lower emissions as most are in Scope 3
Enforcing the code of conduct and ensuring suppliers comply
Challenges of Ensuring Sustainability within Suppliers' Activities


Economic Challenges when Implementing Sustainability Initiatives
How can an organization be sustainable if it is not profitable?
How to optimize investments in sustainable development
The Juxtaposition of Sustainability and Profitability
Increased workload for financial department due to CSRD
Balancing economic sustainability while investing sustainably
The Economic/Financial Challenges that come with the Implementation of the CSRD Directive in an Organization