

Sustainability-Oriented Transformation in Financial Firms: Bridging External Sustainability change and Internal Firm Change:

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Abstract

This paper explores the future of financial firms through the lens of sustainability change and of complex interacting systems.

Problems related to sustainability are interconnected across macro (global physical, social, economic systems), meso (financial clusters), and micro (individual firm) levels and their impact on **invisible** elements of financial firms. The inherent long-term, uncertain, and interrelated nature of sustainability risks leads to fragmented thinking, actions, and reporting, and incentivizes hypocrisy within firms. This dynamic weakens firm resilience, legitimacy, and overall systemic stability.

To address this fragmentation, the paper argues for developing a theory of the financial firm that can act as a bridging construct between the external environment and internal operations. This is necessary to connect external sustainability change to internal shifts in firm intangibles and financials, ultimately linking to sustainable and financial outcomes at both the firm and system levels.

The paper outlines a sustainability oriented 'Behavioural Theory of the Financial Firm' (BTFF) Version 3. This version, building on earlier iterations (Holland, 2016, 2022), is a grounded theory that explicitly outlines interaction of a firm's invisible intangibles and its tangible assets, as well as its organizational change processes.

The complexity of internal change is summarized using four interconnected metaphor areas 'Head, House, Community, Machine' (HHCM) to represent the internal socio-economic and technical systems that support the firm's business model in achieving sustainability and financial aims. This develops narrative and embedded metrics about change. The BTFF V3 serves as the missing link, connecting macro/meso external changes to micro-level changes in firm intangibles, financial decisions in business models, and subsequent outcomes.

The framework includes ideas of diversity based on a firm's sustainability stance ('critical,' 'non-critical,' or 'waverer') and its ownership structure (market-based vs. mutual). By comparing these diverse firms, the paper highlights how the evolution of sustainability-oriented change varies. This sensitivity analysis leverages the different ownership models, and degree of criticality for change, as natural experiments in finance (Iyer, Peydró, 2011). Interdisciplinary literature (de Bakker et al, 2019) is used to explore these similarities and differences, and problems of competing logics (Battilana & Dorado, 2010).

The paper argues that the integrated and purposeful functioning of a firm's invisible world (such as intangibles, culture, and governance) determines whether it supports or hinders sustainability change and whether new systemic risks arise. Making these intangibles visible and explicitly connecting them to financial and sustainability risks is key to future resilience.

To counter systemic risks, the paper identifies two main policy proposals:

Firstly, regulators should increase the proportion of 'critical' financial firms (both mutual and market based) and promote competition with 'waverer' and 'non-critical' firms to diversify business models within the financial system. This diversification is seen as crucial for systemic stability (Fligstein, 2021).

Secondly, regulators and standard setters must demand that firms connect intangibles risks and shocks explicitly to financial risks and climate risks. They must do the same in their system analyses.

The paper advocates for integrated, explicit, qualitative intangibles scenario generation and stress testing, closely linked to existing financial stress testing. This approach can help avoid "green swan" risks (Bolton et al, 2020), and limit dysfunctional market behaviour driven by uniformed beliefs about climate change (Shiller, 2019; Schoenmaker et al, 2017; Battiston et al, 2017). Ultimately, the paper concludes that the resilience of the financial system hinges on diversifying financial firm business models and making intangibles visible and linked to firm-wide risks. This illustrates insights into how the future of financial firms can emerge.

Keywords – Financial firms, Sustainability, Just transition, Knowledge, Values, Authenticity.

1. Introduction

This section establishes the research gap and problems, outlines the methodological approach, and presents the structure and core ideas of the paper. It situates the study within contemporary debates about the authenticity and impact of sustainability change in large financial firms and the wider systems they operate in.

1.1 Research gap and problems in sustainability change in financial firms

This section outlines a series of interconnected research gaps and problems concerning the transition to sustainability within financial firms and the wider financial system. The central argument is that there is a need to understand the interdependence between external systemic change and internal firm-level change. There is a need to understand how external change (macro and meso systems, e.g., regulation, market consensus, firm alliances, and clusters) influences the financial firm (micro-level) and, conversely, how firm-level change can influence the larger system. The paper proposes the need for a firm-level bridging theory construct to provide the 'missing link' that connects external system change with internal firm change.

Problems at Financial Firm Level

Several specific challenges and knowledge gaps exist within individual financial firms. These include conceptual, data, and behavioural issues.

Fligstein and Huang (2025) find there is a lack of conceptual clarity about sustainability change within financial firms across various areas (strategy, products, risk management, culture). Taglialatela et al (2024) reveal how the literature struggles to understand how internal firm factors (e.g., leadership, culture) and external factors (e.g., regulation, client demand) interact to change routine decision-making towards ESG orientation. Sedovs et al, (2025) note there are problems in understanding how to relate financial aims to sustainability aims.

In terms of data and capability barriers, Newlands (2024) finds that firms such as fund managers face major barriers due to inconsistent and incomplete ESG data about investee firms. They experience barriers because of their own internal inability to generate and use such data effectively. This suggests a failure to understand their own sustainability-oriented organizational change and business model change processes, and that of their corporate clients or customers.

Behavioural issues include authenticity, greenwash, and mislabelling. The difficulty in understanding and implementing desired sustainability change creates opportunities for hypocrisy and 'greenwash' (Cho 2015; Brunsson 1993; Bonifácio et al., 2019; Elderson, ECB, 2023) in actions and reporting. Evidence shows contradictions between banks' rhetoric and their continued financing of "brown" activities (Giannetti et al., ECB, 2023). There is evidence of firms being sanctioned for misleading disclosures (SEC 2022a,b; FCA 2021, 2022; ASA). EU and UK rules (UKSIF & PwC, 2024) have constrained mislabelling about 'sustainability' products.

There are also cases of top teams in significant financial firms seeking to maintain business-as-usual positions in sustainability change through facades and hypocrisy (Cho 2015; Brunsson 1993). Cases include Wells Fargo (Avery, 2016), BlackRock (Fancy, 2021), HSBC (Kirk 2022a,b; Liang 2022), DWS (Kowsmann & Brown, 2021).

Practitioner evidence (Larsen 2015, 2017; IIRC 2017) shows difficulty linking organisational change to sustainability-oriented intangibles and financial outcomes. Schoeneborn et al. (2020) highlight gaps between 'talk' and 'walk'; Holland (2022, 2024) notes belief and knowledge gaps between firms and stakeholders. These issues point to significant non-critical firms with weak learning capabilities (Pedler et al., 1997) and conservative beliefs about sustainability relevance. This leads to inauthentic behaviour, risk concentrations (climate, social, legal, financial), and contradictions between commitments and actions.

Systemic Instability and Regressing

The problems at the firm level have combined with wider events to contribute to larger, systemic issues:

In terms of systemic Risk, combinations of the above firm level problems occurring in cluster or alliances of significant financial firms suggest a continuing risk of systemic instability linking climate, social, economic, and financial outcomes (Fligstein, 2021; Fligstein and Huang, 2025).

In the period 2025 onwards, there has been a re-emergence of dominant finance logic where the 'finance machine' and finance values in the firm dominates attempts to develop sustainability-oriented purpose, socio-economic organisation, and business models. This is evidenced by declining membership in collective sustainability bodies (like NZBA), which poses risks to achieving sustainability goals. These problems are likely to increase in market-based firms facing an emerging consensus against net zero changes (Thomas, 2025) and fracturing of consensus on climate change (Catt, 2025). In addition the financial services industry faces problems driving sustainable economic transition due to the voluntary nature of many initiatives and the lack of standardized regulatory frameworks (Fligstein and Huang; 2025), requiring coordinated efforts from all stakeholders.

Ameli et al (2025) argue that structural changes are required to activate positive tipping points in the financial system to accelerate a fast, sustainable transition to a net-zero-carbon economy. A key structural factor involves a shared system wide understanding of the nature of the financial firm, its organisation, and business model, and how it changes with external change. This paper seeks to develop such knowledge. Policy interventions are required to exploit such research-based knowledge, and to activate and capitalize on learning and knowledge dynamics in individual firms. These are bases to encourage sharing of knowledge across alliances of firms to encourage positive sustainability change tipping points and avoiding regressing.

Paper's Aims and Contribution

The paper aims to address these issues by focusing on organizational change and critical action. The paper argues that firm system changes and external system changes are interdependent and deeply connected (Mitleton-Kelly, 2003; Watts, 2025) and must be addressed together in a holistic approach. The aim is to improve understanding and narrative of this complex change, to enhance resilience and stakeholder accountability at both the firm and system level.

The paper seeks to promote the development of 'critical' sustainability-oriented financial firms that can authentically achieve both their sustainability and financial aims, thereby contributing to a just transition (Curran et al, 2022; ILO & UNEP, 2023; Thomas, 2025) for diverse stakeholders. The paper responds to the call to study the organizational "journey" of sustainability change to interpret shifts in organisation, business model, decision-making and reporting (Higgins et al.'s (2019) in order to remove systemic barriers to sustainable finance in the firm, and wider finance system (Fligstein and Huang (2025).

1.2 Methodology

Addressing these complex dynamics requires grounded theory research (Strauss & Corbin, 1998) and interdisciplinary analysis (de Bakker et al., 2019) to explore "what is going on" within financial firms and their environments (Kay and King, 2020). Early phases of the author's work developed a "Behavioural Theory of the Financial Firm" (BTFF) (Holland, 2016, 2017b, 2019a, c) grounded in finance values and internal change. Later phases (Holland, 2022, 2024) extended this to a sustainability-oriented BTFF, exploring sustainability-driven organisational change and business model evolution. The current (phase 3) research expands this theory through sensitivity analysis and new concepts of "critical" and "non-critical" firms.

The author's long-term research programme develops a connected grounded theory of change in three phases (see Table 1, Appendix 2 for details). Between 2016 and 2025, practitioner conferences provided data on micro-level changes within financial firms, while academic discussions informed the interdisciplinary analysis of these themes.

- Phase 1 (2015–19): Developed the finance-values-oriented BTFF (Holland, 2016, 2017b, 2019a, c).
- Phase 2 (2020–22): Expanded BTFF to examine sustainability-oriented organisational change and business model adaptation (Holland, 2022, 2024), using Morgan's (1997) ideas of metaphors—“Head, House, Community, and Machine”—to explain organisational dynamics and business model changes.
- Phase 3 (2023–25): Refined the theory based on practitioner and academic feedback. This explored the impact of external macro and meso system changes on changes in metaphor areas in the financial firm.
- It further developed sustainability-oriented organisation change and business model change ideas, conducting sensitivity analysis of BTFF concepts and developing distinctions between “critical” and “non-critical” firms. Metrics were identified for key factors in each BTFF metaphor area.
- Phase 3 was also the basis to develop new analyses about the impact of firm change on external macro and meso systems.

In phase 3 the empirical base included ten market quoted or based financial firms (four fund managers, four banks, two insurers) and ten building societies. These were identified as “critical” firms with strong sustainability orientations. The market-based firms were selected from firms involved in prior case work with the author over the 1992–2022 period. The Building Societies were selected in collaboration with the UK Building Society Association (BSA).

Data sources comprise reports, direct interviews with senior executives, and extensive practitioner dialogues at events such as the Green Finance Summit (2017–19), Net Zero Conferences (2021–24), and Ethical Finance Summit (GEFI) (2017–24). The Green Finance Institute's COP26 (2021) videos also informed analysis.

These data—focused on firms committed to Net Zero (GFANZ, 2021)—enabled refinement of BTFF and development of new grounded theory concepts, notably critical vs. non-critical financial firms, as well as example narratives of sustainability change within “critical” firms.

The grounded theory insights were applied to develop new conceptual tools such as insights into organisational change, intangible resources, business model, and integrated thinking. Through GT theoretical sensitivity (Strauss & Corbin, 1998), the long-term engagement with financial firms enables reinterpretation of earlier grounded theory using new data and perspectives, supported by an interdisciplinary analytical lens (de Bakker et al., 2019).

This was the basis to develop the BTFF V3 concerning sustainability-oriented organisation change and business model change in the financial firm. The BTFF V3 provides a firm level bridging construct or ‘missing link’ between external change at macro and meso level and the micro level firm. It connects external macro and meso change to change in firm intangibles, tangibles, financial decisions, and outcomes (sustainable and financial). It makes explicit how external sustainability change drives similar invisible change in the firm and can be reported. It indicates how firm level change can influence larger system change. It provides a means to adapt sustainability change in groups of significant financial firms (connected clusters, alliances) and across the system (financial, physical). These can contribute to desired change at macro and levels meso in terms of sustainability and financial outcomes, and systemics risks.

1.3 Structure of the paper -aims - and major insights.

The paper adopts a holistic approach by developing a conceptual framework (in sections 2, 3, 4, and 5) connecting grounded theory of external system change and financial firm change. It develops conceptual tools at financial firm level

to explore ‘solutions’ at firm level. It uses them to explore ‘solutions’ to problems at macro, and meso levels (sections 6, 7 and 8).

Section 2 outlines a three-system grounded theory (Strauss & Corbin, 1998) illustrating the external change process in the environment of financial firms. **Problems** arise from complexity of external sustainability change at macro and meso levels and its hidden, initial impacts on invisible elements of financial firms. These stem from interrelated, long-term, and uncertain nature of sustainability risks, leading to fragmentation in thinking, activities, and reporting, and incentivising hypocrisy (Higgins et al., 2020; Holland, 2024).

An interdisciplinary theory interpretation is used to analyse how sustainability change occurs at **macro, meso, and micro** levels (Wijk et al. 2019). It entails renegotiation of institutional orders (DiMaggio & Powell, 1983) among actors with conflicting logics (Battilana & Dorado, 2010; Almandoz, 2012). Isomorphic pressures (DiMaggio & Powell, 1983) drive convergence in norms and practices across systems and are mediated and contested by industry bodies such as GFANZ (2021) and IFRS/ISSB (2022a). **These pressures** transmit sustainability-oriented symbolic and material changes (Thornton et al., 2012) into financial firm organisational change and business model change.

Sections 3 to 4 develop a BTFF V3 by creating a set of new conceptual tools concerning sustainability-oriented organisation change and business model change in the financial firm. These tools include a sustainability change narrative, and ideas of ‘critical’ firm, of diversity, sensitivity analysis, and interdisciplinary interpretation. These distinguish BTFF V3 from V1 and V2 of BTFF (Holland, 2016, 2019, 2022, 2024).

Section 3 discusses how isomorphic pressures at macro and meso levels transmit sustainability-oriented symbolic and material changes (Thornton et al., 2012) into financial firm organisational change and business model change in four BTFF metaphor areas of “Head, House, Community, and Machine”. This exploits Morgan’s (1997) idea of using metaphors to explain how organisations function and change; and to diagnose problems and develop strategies for complex organisational change and business model change.

Consequently, **micro-level (firm) changes** manifest in innovative sustainability practices, reporting, and communications that feed back to promote wider societal transformation. This involves reconfiguring decision routines, redefining “value,” and aligning with external sustainability frameworks—reflecting the emergence of **Sustainable Hybrid Organisations** (Battilana & Dorado, 2010) within financial systems. Conflict emerges at all systems level and is reflected in financial firms (Battilana & Dorado, 2010; Almandoz, 2012) concerning purpose, logics, and organisation change.

Sections 3, and 4 exploit diversity in case firms to develop sensitivity analysis of the grounded theory BTFF change themes and behaviour in firms. Section 3 explores diversity in ‘critical’ financial firm sustainability change behaviour by comparing sustainability change narratives for market based and mutual case firms. Section 4.1 analyses behaviour difference between ‘critical’, ‘waverer’ and ‘non-critical’ variants of financial firms. Section 4.2 uses interdisciplinary analysis to conduct a theoretical analysis of similarities and differences in behaviour in diverse financial firms.

Section 5 uses the conceptual framework and analysis of change (3 systems and BTFF V3) to explore the future of financial firms and the wider field of finance. It examines the impact of financial firm change on external macro and meso systems, arguing that firm or micro level ‘solutions,’ such as the ‘Behavioural theory of the financial firm’ (BTFF) V3), can contribute to solutions at the broader macro and meso levels. Sustainability-oriented change within financial firms offers a foundation for addressing emerging systemic risks across individual institutions, clusters, and the wider financial system.

The firm level analysis is a basis for thinking about two key policy responses.

Regulators should increase the proportion of “critical” financial firms—those with strong sustainability orientations—to diversify business models and promote sustainability competition. This requires expanding mutuals and ‘critical’ market-based firms to increase competitive pressures on ‘waverer’ and ‘non-critical’ firms.

Regulators can use the BTFF V3 framework to identify, define, and publicise these firms, guiding “non-critical” and “waverer” firms to develop belief in sustainability change and manage competing logics. This enhances system resilience by preventing concentrated risk profiles.

Regulators and standard setters should require firms to link intangible risks and shocks to financial and climate-related risks, improving disclosure and transparency. Future resilience depends on understanding how sustainability orientated intangibles (e.g., culture, purpose) shape financial outcomes and climate exposures.

The paper argues for integrating qualitative intangibles-based scenarios and stress tests with existing financial frameworks. Making financial firm intangibles visible and measurable and connecting them to risks is key to a sustainable future for individual firms, clusters, and the finance system.

In section 6, the discussion places the findings in wider research and theory contexts. It illustrates new ideas for developing literature and relevant theories cited. It explores the role of the framework in generating new research and holistic hypotheses and empirical tests. **Section 7** summarises the paper.

2. Using theories and literature –to understand systems change and problems

Section 2 outlines a three-system grounded theory illustrating external change processes and impact on financial firms. This is based on grounded theory themes (Strauss & Corbin, 1998) about agreed and contested sustainability change at macro (global), meso (finance community, ‘local’ community), and micro (financial firm) levels (van Wijk et al 2019).

It illustrates how **problems** of managing sustainability change in financial firms, arise from the complexity of external sustainability change at macro and meso levels and its hidden, initial impacts on invisible elements of financial firms. These stem from the interrelated, long-term, and uncertain nature of sustainability risks, leading to fragmentation in thinking, activities, and reporting, and incentivising hypocrisy (Higgins et al., 2020; Holland, 2024).

These empirical insights are means to understand multi-faceted aspects of socio-economic *structure and change*, their connections at macro, meso, and micro levels, and impact on behaviour. These are means to understand how sustainability change and problems in global, finance and financial firm systems, involves **common, connected, and shared features** as well as **variety, disputes, and framing differences about** many areas. These include the path of change in social order, aims, values, activities, purpose; in and between 3 system levels.

The explanatory power of the empirically based narrative for three systems change can be enhanced by interpretation in a wider interdisciplinary theory approach (Knights and Willmott, 1997; de Bakker et al, 2019) matched to the complexities of sustainability change. This is used to analyse how sustainability change occurs at **macro, meso, and micro** levels (Wijk et al. 2019). It entails renegotiation of institutional orders (DiMaggio & Powell, 1983) among actors with conflicting logics (Battilana & Dorado, 2010; Almandoz, 2012). Isomorphic pressures (DiMaggio & Powell, 1983) drive convergence in norms and practices across systems and are mediated and contested by industry bodies such GFANZ (2021) and IFRS/ISSB (2022a).

These pressures transmit sustainability-oriented symbolic and material changes (Thornton et al., 2012), and contests about these, into financial firm organisational change and business model change. In terms of the ‘Behavioural Theory of the Financial Firm’ (BTFF) (Holland, 2022, 2024) these are transmitted into metaphor areas of ‘Head, House, Community, Machine’ leading to change in purpose, behaviour, decisions, and outcomes (sustainability and financial).

Structure at macro, meso, and micro levels or contexts

The analysis in the paper reflects social system **structures** at macro, meso and micro levels (van Wijk et al 2019) and their impact on behaviour and decisions. **Macro** level human systems include political, legal, business and finance community,

and market systems, at global and national levels (Puxty et al, 1987; Whitley, 1999). **Meso level** ‘Social finance’ structures concern financial markets, networks, and regulators. These include ‘Communities of practice’ (Lave and Wenger 1991) such as alliances of large businesses, finance elites, banks, and accounting professionals, as well as regulators (Scott, 1993, Beaverstock et al, 2013; Flower, 2015). For example, GFANZ, (2021a,b), PRI, (2020), and BSA (2024) operate at meso and macro levels. At **micro** level this involves financial firms (market, mutuals) as organisations with their unique social structures, knowledge, culture, and processes (Holland, 2016, 2019, 2022, 2024).

Change processes at macro, meso, and micro levels.

These ideas of change and behavioural influences at macro, meso and micro levels (van Wijk et al 2019), also involve **processes of social influence** and in **change** in these human systems. They concern subsequent changes on behavioural biases and financial decisions in financial firm individuals and teams and with customers. This includes the influence of change processes at Macro levels (Global Society & Environment), and at Meso levels (Communities, Networks & Markets) and Micro level (firm), *on firm decisions*, both market-based and mutuals.

In Institutional logics terms (Thornton, et al, 2012), financial firm or micro level changes in values and practices reflect the development of new sustainability-oriented ‘**material practices and symbolic systems**’ at macro and meso levels. **Material practices** include UN COP guidelines and agreements (Paris, 2015; Dubai, 2023; Baku, 2024), and use of UN SDGs. Baku COP29 (2024) agreed on new practices and targets for climate finance flows and for operating a UN governed carbon market. The practices include use of IPCC (2023) and SBTi (2025 a, b) targets; and showing evidence of global growth of GHG emissions, green energy sources, sustainable production processes, sustainable supply chains; and sustainable waste reduction systems. They concern regulation requiring firms ‘financials’ scenario and stress testing (EBA, 2025; PRA, 2025b). They involve use of sustainability reporting standards by IFRS /ISSB (2022a), EFRAG, (2021), TCFD (2021), and TPT (2023). They concern development of bodies, structures, processes, and regulation at global and national levels to support and promote these changes.

They involve changing **symbolic systems** include emerging Green, Biodiversity and CSR **norms** at global level; and UN based SDGs as goals and norms (Dashwood, 2020; Dasgupta, 2021; Falkner, 2020). They include implementing ideas and values underlying, green taxonomies for sustainable investment (EU, 2023), and for market based ESG rating systems (Berg et al, 2022).

The paper argues that *similarities in sustainability change and behaviour in mutual and market based financial firms, arose due to common change forces at macro and meso levels. Similarities* in sustainability change at macro and meso levels, and in firm functions such as financial intermediation encouraged *similarities* in changes in both mutual and market based financial firms. These collectively encouraged similar changes in institutional logic (Thornton et al, 2012), such as in firms’ material practices (contexts, processes, technology) and symbolic systems (value and norms), and in financial decision logics at micro level in these financial firms.

‘Critical’ financial firms and similar approaches in diverse firms.

The cases indicated the degree to which firms adopted a critical stance to external macro and meso change, determined in part, success in implementing change. The case data (in section 2) reveals that ‘**Critical’ financial firms** were ‘learning organisations’ (Pedler et al 1997; Martineau et al 2014). They learnt about similar changes in material practices and symbolic systems (Thornton et al, 2012) at macro and meso levels, and developed similar approaches to sustainability-oriented change in financial firm purpose, structures, processes, and activities. This ‘integrated thinking’ (IFRS b, 2025) was the result of critical reflection by ‘learning organisations’ during shared learning and development of agreed guidance by sector wide alliances such as GFANZ (market based) and BSA (mutuals). Mimetic change forces were also present in

this process reflecting Institutional theory (DiMaggio & Powell, 1991; Scott, Meyer, 1994). These collectively promoted similar changes in financial firm purpose, values, structures, processes, and activities. ‘Critical’ firms, both as mutuals and market-based firms, faced problems **of firm design and competing logics** (Battilana & Dorado, 2010) when responding to sustainability change. They sought to ameliorate these problems by developing sustainability-oriented firm purpose, context, process, and heuristics **together**, in a consistent, coherent, and integrated way. They sought to use strengths in each area to offset limits in each area such as in use of heuristics.

The above ideas of ‘critical’ firms are the basis to define and identify problematic ‘non-critical’ firms and ‘waverer’ firms and to compare them with ‘critical’ firms. Noncritical firms do not believe in, learn about, or act relative to sustainability change. ‘Wavering’ firms existed as firms that ‘sway with the wind’ between ‘critical’ and non-critical positions. These are financial firm top and middle teams who are easily influenced to change their beliefs and actions by the external macro and meso debate and fracturing of consensus on sustainability issues.

Differences in firm responses to macro and meso change

Differences in sustainability change and behaviour in these firms, arose due to differing sector alliance influences, firm socio-economic function and predispositions, all mediating change. *Differences* in how special meso alliances mediated change encouraged *differences* in changes in institutional logic at firm level. For market-based firms, bodies such as GFANZ mediated change. For mutuals, bodies such as BSA, AFM mediated change. In addition, *differences* in ownership (customers, shareholders) and in historic function or founder institutional logic between Mutuals and Market based firms effected change in decision logics and hence *differences in sustainability change and behaviour in these firms*. Firm specific *predispositions* also had an important influence on differences. Key grounded theory themes here concern ‘critical’ firms and ‘non-critical’ firms, and their differing impact on decision behaviour and disclosure (Holland, EIASM, 2024).

These similarities and differences contributed to **problems of competing logics** (Battilana & Dorado, 2010) in differing but connected socio-economic contexts (external macro and meso, internal micro firm) (Almandoz, 2012). More specifically at firm level, ‘critical’ firms, both as mutuals and market-based firms, faced problems **of firm design and competing logics** (Battilana & Dorado, 2010) when responding to macro and meso sustainability change. The macro and meso change forces, are mediated by market and social communities in different ways, to vary the impact on ideas of purpose and behaviour in financial firms.

For example, the top team at mutuals such as Yorkshire Building Society (2023) signed the UN Principles for Responsible Banking in 2023. Nationwide (2024) ‘is a member of the Net-Zero Banking Alliance (NZBA), and part of the Glasgow Financial Alliance for Net Zero (GFANZ)’. Mutuals also focus on **change processes in social structure of members of their communities** based on geography, history, and beliefs. This is a more hidden process of change involving special mutual firms occupying their own discrete socio-economic spaces.

Thus, when compared to market-based firms, community opinions replace market prices and market topical themes, as a primary source of influence in mutuals about how to respond to common external change issues such a climate change, biodiversity, and impact on humans.

Problems in the sustainability change process.

Ongoing problems in the sustainability change process at Macro, Meso and micro levels have revealed problems in ‘waverer’ and ‘non-critical’ firms. Problems have arisen in market based financial firms as the consensus for net zero changes (Thomas, 2025) and climate change action (Catt, 2025) has fractured. The problems arise at macro and meso levels with a shift amongst elites away from Glasgow COP 26 consensus in 2021 that sustainability action is urgent, to the growth of an anti-sustainability movement, especially amongst US Republicans, in 2024 and the second Trump presidency in 2025.

In 2025 key financial institutions such as Blackrock, UB, and some Japanese banks reduced their formal commitment to sustainability changes or left NZBA. The EU faced divisions as it sought to simplify EU sustainability reporting requirements in its ‘Omnibus’. Thomas (2025) at the Green Finance Institute noted that the problems of transition were stimulating a media narrative about shifts from net zero policies. However, world temperature breached limits set in Paris 2025. Capital continues to flow to where it can make adequate risk-adjusted returns. Thomas argued that there is a need for pragmatic action to create conditions for capital flows to sustainability-oriented projects, infrastructure, and technology. This paper seeks to create those conditions in financial firms.

Problems also concerns public lobbying and ‘behind the scenes’ lobbying by powerful groups in finance such as asset managers (NZAOA) and bankers (GFANZ) who publicly agree with Net Zero change but wish to ensure change is feasible and matches their interests. It involves extensive ‘behind the scenes’ lobbying by large oil companies who may wish to delay or derail Net Zero change. These parties have enormous financial resources to support their aims against diverse citizens, campaigner, and activist stakeholders seeking rapid and substantial Net Zero outcomes.

The existence of geopolitical tensions, wars, economic problems, and lobbying, offer opportunities for delay in sustainability change. This means there is deep conflict emerging in global political, economic and finance elites about the path, and rate of sustainability change. It reveals how different groups seek to ‘influence collective definitions of the (crisis) situation’ (tHart, 1993).

However, there is significant resistance to this pushback on sustainability change both in ‘insider’ large firms, and by ‘outsider’ stakeholders and citizens in wider society. Considerable effort is being placed in dealing with the geopolitical tensions. As Murray (2023a) commented

"There is a hugely powerful coalition of businesses, investors, campaigners and governments that have fully internalised how net zero is the only viable route forward for the UK and for the world as a whole.....Companies and investors understand that the development of the net zero emission economy is something to celebrate - not something we need to avoid, or is too costly ... But an era-shaping opportunity that should be seized".

3. Developing a sustainability change narrative - in diverse ‘critical’ firms.

Section 3 develops a sustainability change narrative for diverse 'critical' financial firms. This illustrates the adapted Behavioural Theory of the Financial Firm (BTFF V3). The section uses the narrative to compare how diverse 'critical' firms, as market-based and mutual types, managed sustainability change. The section illustrates how these firms adapted their internal structures (metaphor areas of the BTFF) in response to external sustainability-oriented changes at macro and meso levels. There were many similarities in change in the different types of financial firm. The financial functions (say lending, insuring, investing) of case financial firms did not change significantly during sustainability change. Some differences in purpose, decision logic and design of financial products were observed. This sensitivity analysis of the BTFF ideas and sustainability-oriented behavioural change in firms is developed in section 4.

The section refines conceptual tools: including the BTFF, the 'critical' firm, sustainability change narrative, and sensitivity analysis; to explain sustainability-oriented change in firms. The ‘critical’ firm analysis provides a best-case scenario for sustainability transition. This serves as a benchmark to identify barriers in, and propose changes for, 'non-critical' and 'waverer' financial firms, which are discussed further in Section 4. The ‘critical’ firms (mutual and market-based) pursued combined sustainability and financial aims, seeking to contribute to a just transition (Curran et al, 2022), and the section offers insights into their shared and differing approaches.

3.1 A sustainability oriented ‘Behavioural theory of the financial firm’ (BTFF)

Section 3 extends versions 1 and 2 of the ‘Behavioural theory of the financial firm’ (BTFF) (Chen et al 2014; Holland, 2016, 2019, 2022, 2024) to explain sustainability-oriented change arising from macro and meso systems. In this version 3 of the BTFF, the empirical narrative in the BTFF employs metaphors (Morgan,1997) in the form of ‘Head’, ‘House’,

‘Community’, financial ‘Machine’ to explore the complexity of sustainability change. These grounded theory themes (Strauss and Corbin, 1998) are interpreted in an interdisciplinary approach (de Bakker et al, 2019). This shows how financial firms evolve and develop their sustainability-oriented intangible resources in metaphor areas. It shows how they develop their ability to mediate external change and its impact on their tangible financial resources and decision behaviour.

This paper argues the BTFF, and its metaphors are relevant to internal change in *both* stock market based and mutual financial firms. They are central to influencing ‘non-critical’ firms to be ‘critical’. Adapting BIS (p6, 2015) for both mutual and market based financial firms, the BTFF shows that corporate governance (‘Head’) requires that financial firms ‘align corporate sustainability-oriented intangibles (sociocultural, knowledge) in the ‘Head, House, and Community’, with corporate activities and behaviour with the expectation that the financial firm’s financial ‘Machine’ will operate in a safe and sound manner, with integrity and in compliance with applicable laws and regulations’.

3.2 Sustainability change in the ‘Head’ or top teams

The first part of the empirical narrative involves top teams (‘Head’) on board and executive teams of ‘critical’ firms ‘looking out’ in peer groups to learn (Pedler et al., 1997) about external climate related change. It concerns them ‘looking in’ and learning how to make sustainability oriented strategic changes to avoid harm to individuals, teams, and environment. This includes learning about purpose, ‘integrated thinking’, and governance mechanisms (Casu, 2023) such as change in board and executive teams. External changes include developing sustainability reporting (Holland, EIASM, 2024) and communicating with markets and society. **Table 1** provides case examples of ‘Head’ changes to purpose and strategic actions.

Similarities between ‘critical’ mutual and market-based firms

Top teams (‘Head’) in market-based case firms such as Schroders (Harrison, 2019, 2020), NatWest (Rose, 2020) and mutuals such as Nationwide (2024) ‘looked out’ (Pedler et al., 1997) to learn about climate change pressures, current and expected. They learnt about associated biodiversity, and socio-economic change pressures in society (national, global). They actively engaged with and learnt from other top teams (peer groups), other elites in financial community, and stakeholders in wider society.

Leaders in market based financial firms such as Rose at NatWest (Rose, 2020) and Harrison at Schroders (Aden, Chang, Murray, 2022) have ensured their firms became signatories to the Science Based Targets initiative (SBTi) in 2020. Major mutuals such as Nationwide (2022) also use SBTi methodologies to calculate intermediate (near-term, by 2030) firm-wide targets for their scope 1, 2, and 3 emissions. Yorkshire Building Society (2023) signed the UN Principles for Responsible Banking in 2023.

Market based financial firms use sector alliances (eg GFANZ) to cooperate and iterate towards best Net Zero practice and outcomes before regulators take control (Aden, Chang, Murray, 2022). The existential threat of climate change means that top teams go beyond a competitive outlook. They work together in alliances (GFANZ, 2021) to create co-operative advantages with other international financial firms and with client firms in the real economy. Within this they compete on achieving sustainability and financial aims.

Large mutuals such as Nationwide are also active in this way with Nationwide and their top team becoming members of NZBA, and GFANZ and contributing to this wider debate. The Building Societies Association (2021) has also set up its own Green Finance Taskforce.

Similarities in learning about purpose and change throughout the firm – ‘critical’ mutual and market-based firms.

A key outcome of the external learning process above was that the ‘Head’ or top team’s primary strategic action involved learning about and clarifying *purpose*. The case financial firms identified and pursued *purpose* as a ‘combination’ of sustainability, social, and financial aims. For example, these include sustainability aims where the firm seeks to maximise

sustainability impact, for chosen sustainability risks for the firm and environment. They include financial aims, where the firm seeks to maximise financial return or value, for chosen financial risks for the firm and stakeholders.

Questions exist about ‘purpose’ in both market based and mutual financial firms. It is not clear how to reconcile financial reasoning and subjective values-based judgment in practice, or what the appropriate relationship between sustainability and financial aims is or should be. Despite the analytic work of authors such as Donaldson (2021) it is not clear what is a logical or rational solution on how to relate these aims and how pursue them in practice to fully satisfy the diverse needs of stakeholders.

However, shared learning about purpose and practices in the finance system is occurring as pressures are developing ‘along a chain of accountability’ in finance (Holland, 2011) as ‘critical’ external bodies supplying capital *demand* change in financial firms and ‘real’ economy firms. They expect top teams, middle managers, and front-line teams in financial firms to learn about their needs. Charities and trusts, such Glasgow (2021) and Reading (2024) universities and DMT (2024), as financial asset owners, have developed socially responsible and climate change-oriented investment policies. These make explicit their idea of a balance between sustainable and financial objectives to be achieved by fund manager firms such as Schrodgers when managing charities investment portfolios. These in turn demand that their investee companies, including market quoted banks and insurance firms do the same. The latter financial firms influence ‘real’ economy firms.

As a result, ‘critical’ financial firms as ‘learning organisations’ sought to learn about purpose or how to pursue combined sustainability and financial aims and decisions in the firm. They recognised that shared learning and a clear statement of about purpose (see Table 1), informed financial firm top teams and employees on appropriate actions.

It was a means to make this explicit to stakeholders (Schrodgers, Harrison, 2019, 2020)

A clear statement of sustainability-oriented purpose was central to change in all BTFF metaphor areas and the whole firm. Top teams recognised that learning about purpose was a way to learn about the relationship between aims, make more informed choices about it, and make this explicit to stakeholders (Schrodgers, Harrison, 2019, 2020). Top teams (‘Head’) in ‘critical’ firms ‘looked in’ to learn (Pedler et al., 1997) how to change the firm. This involved change in firm purpose, and in internal governance mechanisms (Casu, 2023) such as changing board and executive teams. Top teams sought to learn how to create a sustainability orientation to the wider firm and its contribution to a just transition (Curran et al, 2022).

. This concerned making strategic changes to ‘socio-technical’ infrastructure (Mumford, 2000) in the firm ‘House’, and its contextual influencing role in the ‘Community’. These included areas such as organisation, culture, incentives, and information systems and their impact on employee ‘lived experience’ in ‘Community’. They learnt how to change this ‘House and Community’ context and its influence on the use of financial resources for making financial decisions in the financial ‘Machine’.

These are **strategic** means to avoid the harm caused by inaction in ‘non-critical’ top teams (Avery, 2016). They are means to reduce chances of organised **hypocrisy** and use of facades about Net Zero actions (Cho et al ,2015; Brunsson 1993). Top teams (‘Head’) aimed to ensure areas such as decision logic, data, heuristics, metrics (risk, value), targets changed together in the firm context in widely understood, purposeful and sustainability-oriented way. They sought to ensure this occurred within shared organisational learning (Schrodgers, PRI, 2022). This informed internal debate and learning (Pedler, et al, 1997) about purpose and the dynamic interactions between ‘Head, House, and Community and Machine’ during sustainability-oriented change. The integrated changes embedded sustainability-oriented change in behaviour and in the financial ‘machine’. Learning at the top and throughout the firm about change was a means to develop dynamic capabilities (Teece. 1997, 2007) in an agile and resilient financial firm relative to sustainability change.

Differences in learning about purpose - 'critical' mutual and market-based firms

Mutual firms have advantages in this learning process and clarifying their purpose. They have always combined social and financial aims and have learnt in recent decades how to add sustainability aims. This 'goes' with the grain (Levy, 2014). This was consistent with their policy of pursuing the greater good of communities (Leeds BS, Withey, 2023); Yorkshire BS, 2023); Nationwide, 2024).

In contrast market-based firms must learn about this change in purpose and radically change their sole focus on financial value and values. They have to some extent 'go against the grain' to do this (Levy, 2014). The change in 'purpose' involves a major shift for all market based financial firms. External pressures and internal tensions are reflected in problems in market-based banking firms with firm purpose, disclosure (about green/high carbon loans, carbon emissions) and behaviour (Watts (2025).

Market based firms such as Schrodgers do provide evidence of authentic sustainability change in purpose (PRI, 2022; Harrison, 2019, 2020) consistent with their long-term practices, aims and culture.

However, in firms such as NatWest (RBS) this involves a radical shift from its 1990 to 2008 position, when it was implicated in the GFC. NatWest (RBS) has changed its public intentions since its intense pursuit of financial value alone in the lead up to the Great financial crisis in 2007-2008 (Holland, 2010). This shows their public recognition of the central role of climate change, and its social and biodiversity impact. A sceptic might argue changing name from RBS to NatWest, and the publicly promoted change in sustainability-oriented purpose, continues to conceal the dominance of financial value in private thinking and behaviour. NatWest 'got out of coal' in the UK in 2024. However, until the firm can demonstrate a rapid decline and end to lending to the big 6 oil firms (Gayle, 2024), questions remain about the authenticity of its sustainability aims and commitments as part of purpose. Wells Fargo (Avery, 2016) reveals such hypocrisy and inauthentic behaviour (Brunsson, 1989; Cho et al 2015; Higgins et al, 2020;)

In contrast, Building Societies such as Leeds BS (Withey, 2023) and Yorkshire BS (2023), and mutuals such as Nationwide (2024), find the adding of sustainability aims to historic social and financial purpose wholly consistent with their culture, history, ownership, and idea of mutuality. Climate change provides an opportunity for mutuals to highlight their mutuality role and combined social and customer purpose, and its significance for sustainability change.

Differences in emphasis in learning about purpose between market based and mutual case financial firms also arose in the relative focus on stakeholders and learning and purpose. Boards and executive teams in market based financial firms placed emphasis on sustainability changes to purpose to strengthen their position with regulators and market agents. The latter normally involved analysts and fund managers in a 'market for information' (Holland, 2017), security markets, and specialist markets for their products. In contrast, mutual financial firms placed emphasis on sustainability changes to purpose, to strengthen their mutual role for 'people'. The latter included mutual members, employees, and local social communities. They directly engaged with these stakeholders as the primary source of external feedback. Table 5 provides more insights into the issues connecting purpose, learning, authenticity, and disclosure (Appendix 4).

Develop board capabilities, organisation and process.

The first part of the BTTF 'change narrative' also discusses how top teams ('Head') in 'critical' firms made sustainability-oriented changes to internal governance mechanisms (Casu, 2023) such as changing board and executive teams. Similarities and differences arose between mutuals and market-based firms in this respect.

In terms of *similarities*, both market-based, and mutual financial firms developed board capabilities, composition, organisation, and processes (internal, external) as new forms of internal and external governance (Casu, 2023). Both market based and mutual financial firms sought and received informed external comments and critiques of firm's sustainability-

oriented climate-related strategies and sustainability reporting concerning their Transition Plans (TPT, 2023). They received extensive internal risk (sustainability, financial) reports and analysis based on TCFD (2017, 2021) scenario analysis and stress testing (e.g. Nationwide, 2024).

In terms of *differences*, both types of firms engaged with a wide range of stakeholders but had different emphases in this activity. Boards and executive teams in market based financial firms engaged with external consultants and placed much emphasis on engaging with markets for external feedback. Mutual financial firms placed considerable emphasis on sustainability changes to boards and executive teams to strengthen their mutual role for ‘people’ including members, employees, and local social communities.

Table 1 Examples of ‘Head’ changes to purpose and actions

Cases - market based financial firms such as NatWest bank have developed their idea of purpose and closely connected their strategy and targets to this. As Chief Executive Rose commented (Feb 14, 2020) ‘Purpose is thinking about business in a much wider sense than before. It is about our role in - and connection to - society.....So, for me, purpose has to be the driving force in all we do. It is about making sure that in how I lead, I’m thinking about the wider positive impact that we can have on all our stakeholders when we are making decisions.....This simple expression will be the standard to which we will hold ourselves, and to which I expect you to hold us as well.....Building on strong foundations, it will sit at the core of all our decision making and we will aspire to live by it every day.’. Rose commented (21st Sept, 2020) ‘Climate change is the defining challenge and becoming more urgent every day.... we have put it at the heart of our strategy...this a key starting point.... we have to make it a key business agenda. Nat West has an obligation to play an active role... We have mapped our three focus areas onto the UN Sustainable Development Goals. The focus areas include Enterprise (SDG 5,8,17), Learning (SDG 4,10), and Climate (SDG 7,13). This is where we think we can make positive contributions by 2030.....We have decided to make out own direct operations to be climate change positive by 2025. We have decided to halve the climate change impact of our financing activities (loans, mortgages etc) by 2030. This involves ending lending to our customers in oil, gas and coal unless they can show they are making progress toward Paris 2015 aims by 2021.... We are doubling our funding and financing support to sustainable energy to £20bn by 2022. ... By 2030 we expect to increase mortgage financing by 50% to customers with energy efficient homes...This change must involve setting measurable targets if it is to have any impact. I am great believer in ‘if it gets measured it gets done’. Targets are important because they are quantifiable. However, we cannot do this alone. This requires co-operation across the sector’. Cases – Mutual financial firms such as Building Societies have had a clear historic purpose in financing house ownership, often within local communities in City regions in the UK. This historic purpose, and associated strategy and targets are now being adapted for sustainability change, and for problems of slow progress. Nationwide (2024) as a member of NZBA, and GFANZ, ‘disclosed intermediate (by 2030) science-based emissions targets in December 2022, across scope 1, 2, and 3, and in December 2023, we published our inaugural Intermediate (by 2030) net-zero-aligned Transition Plan 2023, detailing the actions and potential actions needed for us to progress towards our targets....the UK’s progress towards net-zero, particularly the greening of homes ...as ‘worryingly slow...Therefore, we now do not believe that our intermediate (by 2030) science-based target for mortgages will be achieved’. Nationwide (2024) argue this sustainability adaption of historic social and financial purpose as wholly consistent their idea of mutuality. ‘Nationwide is committed to a net-zero future. It is our aspiration to support the UK in achieving its ambition to be net-zero by 2050. ...This aspiration is embedded into our strategy, supported by our Mutual Good Commitment – we aim to build a more sustainable world by supporting progress towards a greener society. ... We know that climate change will have a significant impact on our customers, their homes, and wider society, and so tackling climate change, and the risks associated with it, are fundamental to our mutual purpose’
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For example, in market-based firms such as the NatWest (RBS) case, a key change was to develop green oriented enabling infrastructure and conditions (Mitleton-Kelly, 2003) at the top of the firm. NatWest (2018) developed a ‘Sustainable Banking Committee’ which ‘supported the Board in overseeing, supporting and challenging actions being taken by management to run the bank as a sustainable business, capable of generating long term value for its stakeholders’. NatWest (RBS) hired climate change expert Nicholas Stern to help shape its sustainability strategy (Withers, 2020).

Mutual firms such as Nationwide (2024) and Coventry Building society (2023) developed similar board level Sustainable Banking Committees and recruited similar experts. For example, Nationwide (2024) developed board capabilities, committees and processes in direct response to climate risks.

‘Nationwide’s Board has a wealth of diverse experience and skills, including across the Environmental, Social, and Governance (ESG) landscape.Chris Brown advises Nationwide on climate change and the built environment providing an external perspective and supporting Nationwide’s strategy in transitioning to a net-zero economy. In 2023/24 this included providing feedback on Nationwide’s climate-related financial disclosures, including its Transition Plan, and regular engagement with the Director of Strategy, Performance and Sustainability on the Society’s climate change strategy.

3.3 Sustainability change in the ‘House’ - Changing organisation to achieve sustainability aims.

The second part of the BTFF narrative involves the ‘Head’ or Top teams making Net Zero, Biodiversity, and CSR oriented strategic changes to ‘socio-technical’ infrastructure in the ‘critical’ financial firm ‘House’. Similarities and differences arose between ‘critical’ mutuals and market-based firms.

The *empirical narrative* concerns how case financial firms, including *market-based firm* such as Schroders (Harrison, 2019, 2020), and *mutuals* such as Hinckley and Rugby BS, (2019), Coventry BS (2023), and Ecology BS (2024) have made **similar** clusters of connected strategic change for sustainability and financial aims.

The *first* cluster includes how case financial firms (*market based and mutual*) made changes to: firm wide social and organisation structure, culture as ‘organising’ means, and to knowledge resources; at both macro and micro levels. The

second cluster concerns green changes to control, incentive, and influence mechanisms. The *third* cluster include sustainability-oriented changes to formal internal processes and operations in the ‘House’ to control the firms internal and external environmental and social impact. The *fourth* cluster involves green changes to technology and its impact on information production and use of environmental, knowledge, social and financial resources.

The *theory narrative* concerns how Top teams used the green changes in their learning, understanding, and strategic thinking capabilities to ‘look in’ (Pedler et al 1997) and make strategic changes to purpose, and planning, structures, and resources. They adapted internal processes for conducting sustainability change with employees and customers.

This involved changes to ‘enabling infrastructure’ or ‘soft’ ‘socio-technical’ contexts (Mumford, 2000; Mitleton-Kelly, 2003) in the existing financial firm ‘House’, and its (contextual) influencing role on ‘Community’ and decision behaviour. It involved changing the way the firm thought about the use of environmental, knowledge and social resources in the use of financial resources. It concerned how they made change to the sustainability orientation of formal internal processes (social, decision, physical) and operations in the ‘House’.

Despite the similarities, **differences** arose in the above. Market based firms **focussed their emphasis of** ‘House’ changes on how to help employees learn how to create financial value when combining sustainability and financial aims in everyday activities (see cases below). They helped management teams and employees learn about the impact on shareholders, market price, and reputation in financial markets.

Mutuals focused **their emphasis of** ‘House’ changes on how employees can protect their core mutuality function when combining sustainability and financial aims in everyday activities (see cases in table 2). They helped management teams and employees learn about impact on host communities, and trust and reputation in internal and external communities.

Cases - market based ‘critical’ financial firms.

For example, Schroders as a market-based fund manager with strong sustainability aims sought to reorganise its ‘House’ and *organisational and team conditions* to be able to pursue these aims. In their **operational narrative**, Harrison (2019, 2020) and Schroders top team (‘Head’) recognised that the *enabling infrastructure* or ‘House’ played a role in creating desirable ‘Community’ or organisational conditions and team conditions. This ‘House’ consisted of existing; organisational intangibles such as organisational structure, clear purpose, and responsibilities (in hierarchy and teams), culture and knowledge; and team intangibles such expertise and cohesion.

The *organisational and team conditions* included access to data and information, support of high-quality technology and technical systems, as well as appropriate pay systems and levels, and matching performance assessment methods. The conditions included, inter alia, wide acceptance of firm norms and beliefs (from culture), collegiate atmosphere, shared knowledge, common sense of purpose, and effective social support systems.

Essential team conditions included, diversity and a range of talent, and high co-operation in teams and with other teams. The firm sought to avoid doing things that harmed teams and individuals doing their jobs. Technology when combined and adapted with intangibles in mutually supportive ways, was central to buttressing desired team and decision conditions.

In terms of financial decision team organisation, the depth of human resource **intangibles** supporting Schroders’s ‘Global Climate Change Team’ (Schroders, 2019) was shown by composition of the team. It was made up of two climate change specialists, two global sector specialists, a Climate Change Analyst, and a portfolio manager. They were supported by a fourteen member ‘Global and International Equity Team’. These in turn were supported by local research teams with more than 100 analysts in 11 countries, and by a ‘Sustainable Investment team’ with 17 dedicated Sustainable Investment analysts and professionals. A key support team included ‘Data Insights’ with over 25 Data Scientists and Analysts. This shows how each specialist investment team was supported by formal organisational links to other investment teams and support

service teams. Information search and analysis phases in investment decision making involved activity in the investment team supported by specialist information teams.

Cases – mutual financial firms

Table 2 provides examples of ‘House’ change in mutual financial firms.

Table 2 Examples of ‘House’ changes - in *Mutual financial firms*

The Hinckley and Rugby building society (2024) has also re-organised to understand and implement its strategy for climate change. This took place in 2019 ‘when CEO Colin Fyfe and Operational Risk and Climate Manager Clare White decided to introduce an Environmental Committee, with the desire of becoming a local market leading business for engaging with customers and its local communities on environmental issues’. This is made up of ‘A committee of staff from across the Society has been working for seven months to create the environmental strategy, which addresses both what the Society can do about its own activities and also how it can incentivise and educate its customers to also act...Hinckley & Rugby’s chief executive Colin Fyfe is chairing the national Building Societies Association’s Green Finance Taskforce, as well as the Society’s own environmental committee. Greener finance initiatives include developing products such as mortgages that incentivise homeowners to improve the energy efficiency of their houses or install renewable energy technology’. Changes in the ‘House’ also involved change to *formal* internal processes and operations in the ‘House’. Fyfe noted (Hinckley and Rugby BS, 2019) ‘The Society’s environmental strategy addresses cutting back on the resources used in its day-to-day operations. Moving away from pen and ink signatures to online and email approval processes and the digitisation, through scanning and other means, of documentation aims to cut that use’.

3.4 Sustainability change in the ‘Community’ - internal and external changes

The third part of the narrative concerns how sustainability-oriented changes arise in the firm internal ‘community’ and in external ‘relationship’ networks and market ‘communities’. This involves the use of organisation conditions and processes in the ‘critical’ financial firm to mobilise its social and knowledge resources to enable community change.

Similar changes in ‘community’ occurred in cases in market-based firm such as Schroders (Harrison, 2019, 2020) and mutuals such as Nationwide (2024), Hinckley & Rugby BS (2019), and ‘Insure’ a large Swedish insurance (and reinsurance) mutual firm (Cederberg et al (2024).

In the case firms, organisation processes such as sustainability-oriented communications, training, and interactions, occurred between top teams, middle management, front, and back-office employees. They involved Net Zero, Biodiversity, and CSR based purposeful communications and interactions in firms, and in markets and stakeholder communities. The top teams typically set up schedules of formal internal meetings and/or committees for middle management and specialist asset and liability teams to explore how their financial firm employees can collectively learn together about areas such as climate change.

These clarify firm wide sustainability aims, norms and values **and how** they relate to external debates such as Net Zero aims and SDGs. These are expected to be incorporated into team financial decisions (transaction, portfolio, firm level) to achieve the desired balance of sustainability and financial aims.

These multidimensional interactions in internal employees and external stakeholder relations are the locus and focus of change in information production, behaviour, and decisions. This ‘lived experience’ of employees in the firm and externally is where much ‘value’ is created from intangibles and financial resources, and where Net Zero, Biodiversity, CSR and financial values are expressed and operationalised. These organisation processes involved many ‘Head’ and ‘House’ factors interacting in a dynamic way to create ‘Community’ in the firm. Understanding these dynamics was central to managing the change process (Harrison, 2019, 2020).

Hayhoe (2021) argues that organisation processes that work from existing culture, values, norms, and experiences of employees in firms and their customers and stakeholders is a route of least resistance to change or ‘going with the grain’ (Levy, 2014). It involves telling stories with a moral or ethical dimension to illustrate what ‘doing the right thing’ looks like in sustainability change as defined by bodies such as GFANZ (2021), PRB (2019), BSA (2021).

A key **difference** in such sustainability change in ‘community’ involves ‘going with the grain’ for mutual firms, and ‘against the grain’ for market based financial firms (Levy, 2014). External pressures and internal tensions are reflected in problems in market-based banking firms with firm purpose, disclosure (about green/high carbon loans, carbon emissions) and behaviour (Watts (2025).

As a result, market-based firms can learn from mutual firms and their long experience of how to manage combined social and financial aims when adapting to sustainability aims.

Cases - ‘critical’ market based financial firms

For example, Harrison (2019) explains how Schroders organisation processes concerned investing (money, time, effort) extensively in culture and ‘people’ factors to create the ‘right’ conditions in the work ‘community’. Harrison (2019) uses narrative to promote and adapt Schroders’s existing culture and highlight the importance of employees to change processes. He makes a case to employees and stakeholders that ‘Getting people right and getting culture right... then business decisions were relatively straightforward’. This included creating a supportive atmosphere for staff, and by promoting a culture of ‘doing the right thing’ in the firm and externally.

Schroders and Chief executive Harrison (2019, 2020) recognised these intangible factors were interdependent in creating the internal ‘**Community**’. Culture influenced ‘people’ factors such as commitment and sense of purpose. ‘*People factors*’ (intangible knowledge, social, psychological) at team (top, middle, front line) and individual levels played a role in developing organisational culture and vice versa. Culture and ‘*people factors*’ were part of the means to create the *right environment (or conditions)* for individual fund managers and their teams and were essential for conducting activities and actions. The intangibles (culture and ‘people’) and conditions (environment) in the firm and teams *combined and* played key roles in influencing behaviour. They provided part of the resilience to climate change and to provide means to respond to growing CSR pressures.

Harrison (2019) argued that the formula for culture was not obvious, but if people were happy, engaged, innovating, and moving quickly, that became a place they wanted to come to work in. Harrison and Schroders used various organisation processes and means to *maintain culture* in the firm. These included investment in substantial resources (technology and social) to support a flexible mix of office working and home working. The involved prior investment in mental health and well-being of employees. They included promoting a collegiate atmosphere in teams and the firm. They included high visibility, credible behaviour, and trustworthy communications by top teams in the business. Harrison and the rest of the top team understood their internal role was critical to ensure all Schroders employees played a serious role on ESG issues as well as financial issues. This required top team clarity in communication of Schroders sustainability policies, promoting high employee and team sense of purpose, and investing in enhanced employee understanding and awareness of climate change risks and financial risks. Employee contribution to this debate and active discussion within teams was a basis to get employee ‘buy-in’ to green policies adopted in the firm. Incentives, and performance assessment schemes were important influences on buy-in, behaviour and action.

Cases – Mutual financial firms

Cederberg, Chua, Strömsten (2024) show how a large Swedish insurance (and reinsurance) mutual firm (‘Insure’) is adapting to climate change and in particular TCFD for sustainability reporting (TCFD, 2017, 2021). The top team directed middle management and their specialist experts to form a committee in the form of the ‘TCFD group’ to explore how ‘Insure’ can report on its responses to climate change in the TCFD format. The ‘TCFD group’ in ‘Insure’ is made up of middle managers and key specialists across all major functions in the firm. These include sustainability staff specialists, risk managers, actuaries, insurance contract pricing teams, reinsurance teams, claims teams, and risk prevention teams. These are all key functions in the management, design, and delivery of insurance products to customers.

This organisation process of thinking and working *together* on sustainability change issues altered manager and operational team member ideas of ‘community’ or how they lived and worked together. They became more aware of each other and specialisms and how the overall business model and firm was connected. Their experience of working together in new ways

added to the sense of ‘Community’ as a shared ‘lived experience’ in the firm. Many of these teams had not met up before in a common group pursuing a common task. They had been brought together for the first time in the formal and explicit pursuit of common tasks and aim. These was previously implicit in their previous behaviours as they mainly dealt with the operational units most closely connected to their operational unit in the business model and ‘value’ creation process. They sought to develop their shared understanding of climate change for their individual areas and for the whole firm. They sought to figure how they could report change in each specialist area and across the whole firm in ways consistent with TCFD guidelines (Di Marco et al 2023).

3.5 Sustainability change in the ‘financial machine’ in ‘critical’ firms

The fourth part of the narrative highlights how ‘Head, House, Community’ changes to the non-financial context alter working conditions in financial asset and liability teams and functions. In ‘critical’ firms, these collectively support the ‘Financial machine’ concerning sustainability-oriented financial decision making, financial products, risk management and financial intermediation. Similarities and differences arose between mutuals and market-based firms.

These similarities are a basis for **‘non-critical’ firms** to develop integrated ‘value’ creation and risk management, during generation of desired sustainability and financial outcomes. This approach is also likely to become more explicit in areas such as **stress testing of risks by regulators**, as individual intangibles and their connections and interactions become increasingly important in generation of, or avoidance of financial risks caused by sustainability change.

Similarities in ‘critical’ firms.

Market based and Mutual financial firms have historically differed in financial regulation and specific heuristics and rules adopted. However, they are increasingly regulated with common regulators and face common regulatory demand for similar response to sustainability risk eg TCFD (2017). The author argues; that despite differences in ownership, products, function, stakeholders, regulation; the common nature of risk management and hence ‘value’ creation in financial intermediation (Scholtens, van Wensveen, 2003), indicates that the heuristic rules and practices used are likely to be similar between market based financial firms and mutual financial firms.

This was reflected in market-based firms such as Schrodgers (PRI, 2022) and NatWest (Rose, 2020), and Mutual financial firms such as Nationwide (2024), and Coventry Building Society (2023) broadly adopting **similar approaches**, to changes in risk management and ‘value’ creation’ and (sustainability, financial), in the firm and ‘financial machine’.

The sustainability oriented BTFF and narrative provides an **explicit** grounded theory in how these ‘critical’ firms used key intangibles in metaphors areas influence business models, financial decisions, ‘value creation’, and risk management in financial firms. The BTFF shows **similarities** in how they identified connected intangibles in ‘Head, House, and Community’ metaphor areas and made explicit their connections and interactions as they collectively contributed to sustainability-oriented changes in the ‘financial machine’ and financial decisions about transactions, portfolios, and the firm. This illustrates the role of integrated intangibles in a business model set in wider firm socio-technic context. All these elements collectively play a role in transforming inputs into desired outputs. This is basis for firms to develop integrated ‘value’ creation and risk management, during generation of desired sustainability and financial outcomes.

For example, sustainability-oriented intangibles in ‘Head’ metaphor areas in **‘critical’ case firms** include **clarity** about financial firm purpose as combined sustainability and financial aims. In ‘House, and Community’ metaphor areas they involve explicit **organising and culture** at all levels to exchange information on value creation and risk. They include explicit risk and challenge culture, in teams at all organisational levels (top, middle management, front line, back office).

In the ‘House’ metaphor area they include incentives, control systems, and technology information support systems aligned with combined sustainability and financial aims. In the ‘Community’ metaphor area they concern training and ‘top tone’

support to teams and individuals. This developed their knowledge about *stranded* assets, and the potential for loss of customer and stakeholder trust, and legal risks. It enhanced their ‘lived experience’ of sustainability change. In ‘critical’ firms these integrated ‘Head, House, and Community’ changes were intended to lead to informed assumptions **about ‘value’ creation and risk** in the ‘Financial Machine’ in financial decision making at transaction, asset and liability portfolio, and financial firm levels. This illustrates the role of integrated intangibles in a business model set in a wider ‘critical’ firm socio-technical context. All these elements collectively play a role in transforming inputs into desired ‘value’ and risk outputs.

As a result, a range of similar ‘solutions’ were adopted for **value creation** and **risk management** (sustainable, financial) in market-based firms such as Schroders (2025; PRI, 2022) and NatWest (Rose, 2020), and in mutual firms such as Nationwide (2024), Coventry Building Society (2023), and ‘Insure’ a Swedish insurance firm (Cederberg et al (2024). This included use of adapted decision logic, risk frameworks, heuristics, and the knowledge and social resources in the wider firm ‘Head, House, Community’ context.

In the case of **decision logic**, financial firms (market based and mutuals) reconciled economic reasoning for financial value and subjective values-based judgment (Donaldson, 2021). They used their sustainability values premises, in tandem with factual sustainability premises, to generate justified financial decision actions.

The market-based firms such as Schroders (PRI, 2022) and NatWest (Rose, 2020), and Mutual financial firms such as Nationwide (2024), and Coventry Building Society (2023) faced the **same problems** of limitations in decision logic and of incomplete metrics and data for **risk and ‘value’** concerning future sustainability and financial outcomes. Donaldson, (2021) noted the problems using conventional financial decision logic and measures together with sustainability decision logic and impact measures. In terms of risk, case firms used approaches such as the TCFD (2017, 2021) scenario stress testing approach to learn about risk and develop responses. However, understanding the risk remained problematic.

In the case of **‘value’ creation** for sustainability outcomes and financial value purpose used this adapted decision logic, set in a sustainability-oriented firm context and purpose, to evaluate financial decisions. These were used to direct and support financial decisions, and the production and delivery of Net Zero, Biodiversity, and CSR oriented products, by teams in asset and liability functions. The latter created and delivered new Net Zero, Biodiversity, and CSR oriented financial assets and liabilities (and derivatives of) in each firm’s specialist domain such as building society, banking, fund management, and insurance sectors.

A key part of the of ‘value’ creation (sustainable, financial) was that case financial firms developed new sustainability-oriented products (e.g., green deposits, mortgages, or insurance contracts) to pursue sustainability aims and deliver their financial functions. **‘Value’ creation also depended on understanding and managing risk.** The front-line teams engaged with customers to create supportive conditions with customers to choose such products and change their behaviour. They also designed the products to create ‘value’ and to share and spread the risks externally with customers or markets. They engaged with customers and market agents so that they and these parties could learn about and understand these sources of risks and ‘value’. This helped financial firms to think how their assets and liabilities were changing and how green financial intermediation could be conducted in way that risks and value creation were understood. These collective sustainability-oriented actions were intended to deliver financial functions, satisfy Net Zero, Biodiversity, and CSR aims, and avoid harms at customer and firm levels.

In the **case of risk**, case financial firms (market based and mutuals) used learning from responding to external change pressures to develop an overall sustainability-oriented risk framework for deeply intertwined sustainability and financial risks. They used this learning to identify ‘risk appetites’ and ‘rules of thumb’ to ‘manage’ risk.

For example, the European Banking Authority (EBA, 2024) provides guidance for banks and other financial institutions on how to develop an overall sustainability-oriented risk framework. This ‘set out requirements for institutions for the identification, measurement, management and monitoring of ESG risks, including through plans aimed at addressing the risks arising from the transition towards an EU climate-neutral economy’.

Financial firms developed intangible heuristics such as ‘risk appetites’ or ‘the organisation’s willingness and ability to take on risk. This is a fundamental first step in an enterprise risk management (ERM) program’ (Bennet, Cusick, 2007). This determines the growth of new sustainability-oriented assets and liabilities onto balance sheets, and overall risks (sustainable, financial) considered acceptable to make a profit and achieve sustainability-outcomes.

In some cases, given problems of understanding risk, and implementing scenario stress testing (TCFD, 2017, 2021), they also developed simple decision ‘rules of thumb’ to ‘manage’ risk (Cederberg, Chua, Strömsten, 2024).

The firms also used sustainability-oriented intangibles (knowledge, social structure) in the ‘House, and Community’ as a ‘values’ based, informed and purposeful context to ameliorate these problems during decision making.

Thus, top teams or ‘Head’ and other employees developed the risk framework, defined the firm’s risk appetite (financial and sustainable) and aims, identified sustainability-oriented logic for financial decisions, and established metrics for financial outcomes (risk and return) and sustainability outcomes. They identified clear financial and sustainable targets, and new green products, for use by middle management and front-line teams (asset and liability). The risk framework, logic, heuristics, metric, and target changes combined with ‘House, and Community’ changes to further embed change in behaviour.

In ‘critical’ firms these were intended to lead to informed assumptions **about ‘value’ creation and risk** in the ‘Financial Machine’ in financial decision making at transaction, asset and liability portfolio, and financial firm levels.

They were intended to support informed and cautious assumptions in **scenario design** in financial models for testing credit, market, and liquidity risk, and for assessing adequate capital and liquidity levels.

As a result, **stress testing in** ‘critical’ firms was expected to include qualitative scenarios about these intangibles. They were expected to show how individually and together, they can help firm decision makers and regulators to assess how problems or failure in intangibles can arise during a stress event, and lead to hidden risks becoming systemic issues.

Differences

‘Critically’ oriented market based and mutual financial firms both take similar *categories* of sustainability change **actions** above (about context, purpose, decision logic, metrics, targets, risk management etc). This is to be expected given the common sustainability change pressures and regulatory changes post GFC.

However, these ‘critical’ firms **differ in the details of these actions** (because of their different history, ownership, purpose, and product-market position).

Market based financial firms focus more on corporate customers and must deal with major GHG emitters. They develop financial products that incentivise customers to improve energy efficiency, and that can potentially be securitised and sold in markets. They operate in international financial markets both wholesale and retail. They operate in a world where financial values remain dominant.

Mutual financial firms such as building societies focus more on retail and small business customers as owners and members, savers, and borrowers. They focus on products such as mortgages that incentivise these customers to improve the energy efficiency of houses and businesses. They must deal with the sustainability change problems of existing housing and new buildings. They exist in a world where social values remain dominant.

Financial firms also differ in terms of being ‘critical’ or ‘non-critical’, believer, or nonbelievers in sustainability change. ‘Critical’ firms adopted sustainability change supported by evidence. Other firms said they were ‘Critical’ firms but used fragmented disclosures and evidence to support this in public.

This section 3 has focussed on ‘critical’, believer financial firms, both market-based and mutual. Mutual firms such as a building society are unlikely to fall into the ‘non-critical’ behaviour category. There is evidence of non-critical’ nonbelievers in market-based firms such as Wells Fargo (Avery, 2016), Deutsche Bank’s DWS (Kowsmann and Brown, 2021), Blackrock (Fancy, 2021), and HSBC (Kirk, 2022a,b; Liang,2022). Problematic behaviours were observed in these firms during unexpected events or disclosures.

Edmans et al (2024) notes problems of focusing on financial value remain for funds managers. They are not ‘willing to sacrifice financial returns for ES (environmental and social) performance, largely due to fiduciary duty concerns, and voting and engagement are mainly driven by financial considerations. A second reason is constraints from clients’.

4. Extending sensitivity analysis of BTFF and behaviour.

Section 4 develops sensitivity analysis of the grounded theory BTFF change themes and behaviour in financial firms. Section 4.1 summarises similarities and differences in diverse ‘critical’ financial firms. Section 4.2 analyses behaviour difference between ‘critical’, ‘waverer’ and ‘non-critical’ variants of financial firms. Section 4.3 uses interdisciplinary analysis to conduct a theoretical analysis of similarities and differences in behaviour in diverse financial firms.

4.1 Summary of similarities and differences in sustainability change in diverse ‘critical’ firms

In section 3, ‘critical’ mutuals and market-based firms show **similarities in** sustainability change. These involved similarities in *both common patterns and conflicts of change* in ‘Head, House, Community, Machine’ metaphor areas. These provided informed purposeful socio-economic contexts for the use of sustainability and finance decision logics.

The mutual and market-based firms adopted **similar** strategies of developing ‘social’ **heuristics** for: socio-economic *organising, decision routines*, and accepted social behaviours (Marsh, 2002) in adapted BTFF metaphor areas; and in their common integrated pursuit of purpose made up of sustainability and financial aims. They developed similar approaches to numeric heuristics for financial *decisions* about risk and ‘value’, to achieve desired sustainability and financial outcomes, and positive contribution to a just transition (Curran et al, 2022). Social *Heuristics* supported learning from experience about using numeric *heuristics* in financial decision *making* (Marsh, 2002; Hertwig et al, 2009). *Decision heuristics* and metrics for ‘value’ and risk were used in financial decision making. ‘Value’ decision heuristics included measures for combined financial outcomes and sustainability impacts. For example, Schroders (PRI, 2022) combined conventional measures of financial ‘Risk and return’ with measures of sustainability ‘Impact’.

Risk heuristics included an insurance firm making assumptions about climate change risk to arrive at assumptions about risk in insured assets, and in financial risk in the insurance contracts (Cederberg, Chua, Strömsten, 2024). Sustainability risk and financial risks occurred together. They assumed four major storms per year instead of two, increased house flood risk, and increased financial risk in insurance contracts. These assumptions were used in social or organising heuristics (Marsh, 2002) or decision routines for risk management at financial transaction and specialist financial portfolio level. At firm level they influenced: risk management in financial intermediation practices (diversify, capital and cash reserves, co-insure/reinsure in markets etc); and internal and external auditing or risk assurance using the ‘three ‘lines of defence’ (IIA, 2020).

Differences between Mutuals and Market based firms; at individual firm level and meso level (say in markets, alliances of similar firms or external ‘community’) had important influences on differences in behaviour. These included

differences between historic socio-economic functions, founder institutional logic (Almandoz, 2012), and firm specific predispositions. They played a role in mediating changes at macro level and their influence *on firm behaviour*.

Variation in predispositions *in financial firms included* predispositions for and against change concerning beliefs, ideology, and knowledge. They included a high pursuit or lack of active learning and critical reflection about sustainability change (Pedler 1997). Thus, differences between ‘critical’ and ‘non-critical’ firms (Holland, EIASM, 2024) also explained differences in firm sustainability behaviour.

A key difference lay in **emphasis and tensions** in change in critical mutual and market based financial firms. **Mutual firms** show high pre alignment or predisposition in systematic way of all four HHCM metaphor areas to **non-financial** change. They were receptive to sustainability change due to their history of jointly managing financial and social aims (Almandoz, 2012). Thus change ‘goes with the grain’ (Levy, 2014) for their culture and values in symbolic **systems**. In contrast, **Market based firms** face continuous pressures in systematic way in all HHCM areas from financial value demands in financial markets. They are aware of the need for sustainability change but experience tensions in achieving this (Battilana and Dorado, 2010). Thus change ‘goes against the grain’. External pressures and internal tensions are reflected in problems in market-based banking firms with firm purpose, disclosure (about green/high carbon loans, carbon emissions) and behaviour (Watts (2025)).

4.2. Problems of Change – ‘Drift’ and Authenticity – in ‘Non-Critical’ and ‘Waverer’ Firms

Section 4.2 extends the sensitivity analysis of sustainability change by analysing behaviour difference among ‘critical’, ‘waverer’, and ‘non-critical’ financial firm variants. The focus here is primarily on the latter two, which predominantly occur in market-based case firms. Problems observed in these firms include ‘non-critical’ behaviour, hypocrisy, and limited progress on sustainability change, often associated with issues in the metaphor areas of Head, House, Community, or Machine (HHCM). The analysis uses the conceptual framework and empirical sources from previous sections to explore how these problems contribute to ‘drift’ to finance values and threaten authenticity.

Waverer Firms and the Fracturing Consensus

‘Waverer’ firms are defined as those that ‘sway with the wind’ between ‘critical’ and ‘non-critical’ positions. These top and middle management teams are easily influenced by the external macro and meso debate and fracturing of consensus on sustainability issues (Thomas, 2025; Catt, 2025). This fracturing, seen in 2025, directly impacts the ‘Head, House, Community’ areas in ‘waverer’ banks, fund managers, and insurance firms. It increases the likelihood that ‘waverer’ firms will combine with ‘non-critical’ firms to continue to finance fossil fuels and attempt to conceal this hypocritical activity in their ‘financial machine’ (Watts, 2025). Evidence of this ‘waverer’ behaviour includes the high initial membership of collective meso-level bodies like NZBA, NZAOA, and GFANZ in 2021, and the declining membership in 2025 (Gayle, 2025).

Pressures, Hypocrisy, and the ‘Drift’ to Finance Values

These problems are particularly prevalent in market-based financial firms, especially those where employees have a high presence in and deep dependence on financial markets and prices. Persuading such agents to embrace sustainability change in HHCM and outcomes, is difficult when they perceive threats to their jobs and potential financial gains, echoing Upton Sinclair’s (1935) famous quote: "It is difficult to get a man to understand something when his salary depends upon his not understanding it." This tension is amplified in market-based firms with wavering tendencies that face an emerging consensus against net zero changes (Thomas, 2025) and a fracturing of consensus on climate change (Catt, 2025).

The conceptual framework developed in this paper, centred on the insights from ‘critical’ firms, provides a means for ‘wavering’ market-based firms and their stakeholders to address their beliefs and the impact of their behaviour on employees,

the firm HHCM areas, and the climate. It suggests ways to preserve employment and financial rewards while successfully implementing sustainability change, supporting them in adapting their purpose and core financial functions (lending, insuring, investing) to reflect sustainability.

Competition and incentives to change.

However, ‘waverer’ or ‘non-critical’ firms are likely to require stronger incentives to change in HHCM and outcomes. This necessitates increased competitive pressures from ‘critical’ firms and new regulatory pressures to stimulate this competition. The paper argues for regulators to expand mutuals significantly relative to market-based firms (Fieth, 2024), and to oblige firms to implement holistic conceptual frames such as the BTFF (Behavioural Theory of the Financial Firm) to make explicit the links they manage between intangibles in HHCM and the financial machine to deliver desired outcomes.

The emerging competition between ‘critical’ and ‘non-critical’ variants of both mutual and market-based firms is driven by changes in their HHCM metaphor areas, decision logics, and aims, as they generate diverse combinations of desirable climate, ethical, social, and financial outcomes for stakeholders. This competition, when fueled by shared knowledge like the BTFF and the concept of a ‘critical’ firm and HHCM metaphor areas, can drive faster and more diverse sustainability-oriented change, contributing to a just transition (Curran et al, 2022). Enhanced sustainability reporting and communications based on the BTFF are required to intensify accountability and pressure for change, requiring the identification of authentic ‘critical’ firms and calling to account those with a tendency to ‘waver’ or ‘drift’ to finance values.

The ‘Drift’ to Finance Values and Authenticity

Despite major changes, many case market-based financial firms still indicate they are maximising financial aims and outcomes within ‘satisfactory’ sustainably outcomes (Edmans et al 2024). This continued focus on financial aims, especially as sustainability issues worsen, raises questions about the authenticity and ethical nature of market-based firm behaviour, as sustainability change in HHCM and outcomes often goes ‘against the grain’ for them (Levy, 2014), leading to tensions in purpose, disclosure, and behaviour (Watts, 2025). Conversely, in mutuals, it ‘goes with the grain’. The paper’s key aim is to use the conceptual framework to promote the transformation from ‘non-critical’ to ‘critical’ firms.

While firms like Schrodgers and quasi-mutuals like Triodos have publicly declared themselves ‘critical’ (PRI, 2022; Harrison, 2019, 2020; Vaccaro, 2019), evidence for others, like NatWest, remains fragmented (Holland, 2010, 2022). Furthermore, fund managers, being market-based firms, are often unwilling to sacrifice financial returns for environmental and social performance due to fiduciary duty and client constraints (Edmans et al, 2024; Crumbie A, 2025). There have also been cases where market-based firms, despite a public ‘critical’ policy, have privately behaved as ‘non-critical’ demonstrating hypocritical behaviour. These include Wells Fargo (Avery, 2016), Deutsche Bank’s DWS (Kowsmann and Brown, 2021), Blackrock (Fancy, 2021), HSBC (Kirk, 2022a,b; Liang, 2022).

This ‘drift’ to finance values and hypocritical behaviour is often triggered by intense time pressures, significant events, and changes in bonus circumstances (Jackson-Obot, 2024). Market-based firms with ambiguous and varying purpose may experience intense time pressures, significant events, and changes in bonus circumstances. They may ‘drift’ to finance values and hypocritical behaviour. This may encourage major market-based firms such as the cases above to privately downgrade sustainability concerns and focus on financial aims, using their Net Zero, Biodiversity, and CSR story as a ‘cloak’ or facade to pursue financial aims at the point of decision making. Highly significant events such as Covid-19, wars, and problematic economic circumstances (high inflation, rising interest rates) amplify this pressure.

‘Non-critical’ firms are associated with persistent scepticism regarding claims of sustainability change in HHCM and outcomes. As Watts (2025) of Triodos bank observes, a significant part of ‘sustainable ethical’ banking is currently not working, with many large banks continuing to increase investments in fossil fuels and failing to demonstrate sufficient change

aligned with Paris climate goals. Hypocrisy is noted, such as banks donating to debt charities while using business practices that fuel debt (Watts, 2025). This stems from the fact that social and sustainability change in HHCM and outcomes goes ‘against the grain’ (Levy, 2015) for the culture and values of market-based firms, which face continuous and intense financial value pressures. Watts (2025) argues that most positive action from bigger banks is still under ‘corporate social responsibility’ rather than a purpose-led business model, leading to the noted hypocrisy.

Mutuals as a Counter Example and the Limits of Market-Based Models

In stark contrast, mutuals are different. Their strong ethical/social/sustainability-orientation means they are likely to maintain a critical stance and have not faced the same reputation problems or financial value pressures as market-based firms. Consequently, they are making more progress on complex aims in HHCM change and outcomes, which is a significant competitive advantage. Established mutuals and quasi-mutuals like Triodos have long histories as socially oriented, ethical, and sustainable institutions, providing examples of how such firms can manage change for integrated aims. Their embeddedness in social or community settings is likely to maintain their combined Net Zero, Biodiversity, CSR, social sustainability, and Finance aims as their combined ‘dominant logic’ in financial decision-making, even under increasing financial pressures.

In circumstances encouraging ‘drift’, mutuals are unlikely to change, creating new opportunities for them to attract funds and members. ‘Critical’ market-based firms such as Schrodgers and quasi-mutuals like Triodos are also likely to behave more like mutuals, maintaining their ethical stance by managing the ongoing tensions between a logic for social responsibility/green change and a financial logic, by conducting this in a sustainability oriented in HHCM context. However, even these ‘critical’ market-based firms still indicate they are maximising financial aims and outcomes within satisfactory sustainability outcomes, rather than prioritising positive Net Zero, Biodiversity, and CSR impacts over financial outcomes. This continued financial emphasis in ‘critical’ market-based firms, as sustainability issues intensify, may still raise questions about the authenticity and ethical basis of their behaviour.

The insights gained about common HHCM change areas are valuable for rethinking the future of financial firms, as both types can learn from each other. However, the problems with purpose, culture, and focus in market-based firms demonstrate the limits of using that market model to guide change in mutuals. Using market-based examples to guide mutual change could be at odds with the aims of mutuals, potentially promoting market-based ideas of risks and financial value that could undermine mutual values. However, the paper finds no evidence for this dysfunctional influence in the case building societies.

4.3. Explaining Change in Mutual and Market-Based Financial Firms

Section 4.3 further develops the sensitivity analysis of sustainability change by conducting a theoretical analysis of similarities and differences in behaviour across diverse financial firms, including Mutuals and Market-based firms, and their ‘critical’ and ‘non-critical’ variants, using interdisciplinary literature sources. This analysis is grounded in the empirical observations from section 3 concerning sustainability change in firm ‘Head, House, and Community, Machine’ or HHCM context and associated purpose, organization, culture, and decision logic, and their impact on behaviour.

Theoretical Framework and Explanatory Sources

The similarities and differences are summarized within the grounded theory HHCM themes of the Behavioural Theory of the Financial Firm (BTFF) (Chen et al 2014; Holland, 2016, 2022, 2024) and connected themes about changing external systems (macro, meso, micro). The theoretical interpretation of these empirical phenomena draws on literature sources such as Institutional theory (DiMaggio & Powell, 1991; Scott & Meyer, 1994), Institutional logics (Thornton et al, 2012; Almandoz, 2012), and the work of Donaldson (2021), alongside literature on historic function and behavioural predispositions. The similarities and differences are understood to arise from their differing experiences of similar external

socio-economic contexts (macro and meso) and the impact on internal micro firm HHCM contexts, purposes, and logics (Almandoz, 2012).

Explaining Similarities: Mimetic Forces and Learning Organizations

Similarities in external sustainability change at macro and meso levels reflect mimetic change forces (DiMaggio & Powell, 1991), which influenced organizational contexts in ‘critical’ mutual and market-based firms. These mimetic forces stem from both firm types facing the same external macro-level challenges from climate change and associated social and biodiversity problems. These stem from shared meso level learning. Mimetic change forces are present in shared learning and agreed guidance by meso-level sector-wide alliances such as GFANZ and BSA (reflecting Institutional theory). These factors collectively promoted similar changes in financial firm HHCM context and associated purpose, values, structures, processes, and activities.

At the firm level, similarities arose in HHCM changes because both types of firms are formal organizations with similar tangible and intangible resources in the same metaphor areas, and function as financial intermediaries (Scholtens, van Wensveen, 2003) managing financial risks and using financial decision logic and metrics.

Crucially, similarities occurred because ‘critical’ case market-based and mutual financial firms (e.g., Schroders, Triodos, Nationwide) operated as ‘learning organizations’ (Pedler et al 1997; Martineau et al 2014). They learned how to critically reflect changes in ‘material practices and symbolic systems’ (Thornton et al, 2012) at macro and meso levels into similar sustainability-oriented changes in their purpose, socio-economic context, and activities.

Specifically, top teams (‘Head’) in ‘critical’ firms sought to create these ‘learning organizations’ to develop knowledge and purpose and promote dynamic and coherent connections between BTFF metaphor areas (‘Head, House, and Community’) to change decision logics and behaviour in the financial ‘Machine’. The resultant changes in Material practices in both firm types included: sustainability-oriented changes to socio-economic structures and processes in internal and external governance (Casu, 2023), use of heuristics as decision logics for ‘value’, and the application of financial decision logic and metrics.

Bourdieu (1990) provides insights into **similar change processes**. He argues that agent habitus, as knowledge of, and a way of perceiving and experiencing, the everyday familiar social world, is both a structuring structure and a structured structure. In Bourdieu’s terms (1990), the Net Zero and CSR awareness activities and interactions within field context as ‘Head’, House’ and ‘Community’ are combined means to structure habitus, expertise, and social and symbolic capitals in new ways. They structure individual cognitive biases, and shared values and ethical viewpoints in teams. These in turn structure ‘lived experience’ and working conditions for employees in ‘Community’ and influenced behaviour and decisions in the financial ‘Machine’. These combined experiences contributed to further structuring of ‘Head’, House’ and ‘Community, and ‘Machine’. Given variation in ownership, historic experience, and purpose between mutual and market based financial firms, the initial starting point of this common change process varied, as did the outcomes.

Explaining Differences: Historic Function and Behavioural Predispositions

Differences between Mutuals and Market-based firms are explained by differences in logics and predispositions. Differences in historic function/founder institutional logic at firm and meso levels (e.g., GFANZ vs. BSA) mediated the influence of external (three systems) and internal (HHCM) socio-economic contexts and internal decision logics (Almandoz, 2012) in varying ways. Different behavioural predispositions exist in critical, ‘waverer’, and ‘non-critical’ firms, including differences in beliefs, ideology, knowledge, learning (Pedler 1997), and critical reflection about sustainability change.

As a result of these differences, change ‘went with the grain’ in mutual firms, but ‘against the grain’ (Levy, 2014) in ‘non-critical’, normally market-based firms. These predispositions were influenced positively or negatively by external framing

contests ('t Hart, 1993; Boin, et al 2009) and their impact on firm HHCM metaphor areas. In terms of Institutional Logics, this led them to develop differences in their 'material practices' and the adaptation of their 'symbolic systems' (Thornton et al, 2012).

In Donaldson's (2021) terms, 'critical' market-based and mutual firms both reconciled competing logics (economic reasoning and subjective values-based judgment). They 'combined' financial and sustainability metrics in financial decisions, not through formal analytic connections but by developing heuristics and metrics set within an informed and purposeful firm HHCM context. In sharp contrast, 'non-critical' firms (typically market-based) face problems arising from the continuing dominance of finance logic, allowing financial metrics to prevail and failing to reconcile financial and sustainability logics. This contributes to the problems of competing logics (Battilana & Dorado, 2010) observed in 'non-critical' firms.

The analysis concludes that the conflict between finance and sustainability logics is likely to be better managed in Mutual firms due to their history of managing conflicting logics (Battilana & Dorado, 2010; Almandoz, 2012), and in 'Critical' market-based firms operating as 'learning organizations'. Both 'critical' market-based firms and Mutuals offer valuable insights for 'non-critical' and 'waverer' market-based firms on managing these conflicts more effectively, by creating informed sustainability oriented HHCM context and purpose to do this. This provides insights into how stakeholders can think about and demand that management teams and employees deliver such deep rooted change to potentially overcome the persistent problems of authenticity and hypocrisy.

5. Influencing Macro and Meso Systems through Financial Firm Sustainability Change

Section 5 explores how sustainability-oriented change at the financial firm (micro) level, particularly using the Behavioural Theory of the Financial Firm (BTFF, Version 3), can be strategically leveraged to influence and drive necessary change in the meso (firm clusters, sectors) and macro (regulatory, systemic) financial and physical systems.

The core argument is that micro-level solutions, such as the BTFF V3, act as a bridging construct. This framework links external systemic change pressures to internal firm changes (in intangibles and financials) and ultimately connects these to both sustainable and financial outcomes and risks at the firm, firm cluster, and wider system levels. This firm-level analysis is part of the foundation for proposing specific policy changes for regulators and stakeholders concerned with systemic risks.

Policy Responses and Mechanism for Systemic Change

The section proposes three combined policy responses to systemic risks, which, along with the BTFF conceptual framework, narrative, and prescriptions, serve as a mechanism to modify risk conditions across individual firms and clusters of connected firms. The repetition of these changes across the system increases system-wide resilience and reduces systemic risks (financial, behavioural, physical).

The three policy responses are:

1. Increasing the role of 'critical' financial firms, especially mutual firms.
2. Developing combined intangibles-financials information on systemic risks, specifically regarding financial risks, GHG emissions, climate temperature, and other planetary boundary impacts.
3. Overcoming barriers to change and creating active drivers for change.

These combined efforts are intended to firstly, promote sustainability-based competition across sectors (banking, insurance, investment), ownership types (mutual, market-based), and 'critical' versus non-critical and waverer firms. Secondly, they seek to change risk conditions (financial, behavioural, intangible) in individual firms, ultimately leading to greater system-wide resilience and a reduction in systemic risks.

5.1 Increasing the Role of ‘Critical’ Financial Firms Especially Mutual Firms

It is likely that firms that are waverer or non-critical will require strong incentives to change. The paper argues that this requires increased competitive pressures from ‘critical’ firms, as well as new regulatory pressures to encourage sustainability competition.

Regulators and stakeholders concerned about systemic risk must actively intervene and lobby to increase the proportion of ‘critical’ financial firms as those with strong sustainability orientations to diversify business models and intensify sustainability competition.

Firm categorisation and sustainability competition

The BTFF V3 is crucial here, as it helps identify, define, and publicise the three firm types based on their ‘critical’ sustainability stance and ownership (mutual, market).

These include ‘Critical’ Firms or firms successfully making effective changes to achieve both sustainability and financial aims, contributing to a just transition. These include well-tested mutual firms and certain market-based firms. Mutuals are a basis to promote competition on sustainability-oriented change (Fieth, 2024, BSA conference) in the real economy and wider society.

They include ‘Waverer’ and ‘Non-critical’ Firms. These are firms that face or create barriers to effective sustainability change. ‘Non-critical’ firms are typically market-based and often have high dependence on financial markets, leading to inauthentic sustainability changes and increased systemic risk.

Prescriptive Policy Recommendations

The policy proposals focus on solving the problem of pursuing financial and non-financial aims together, using both established and novel solutions. Regulators and governments should intervene with established solutions and novel solutions.

Established Solutions	Novel Solutions
Return to ‘Conservatism’: ‘Critical’ market-based firms must manage risks and serve customers first before focusing on profit, reversing the financialisation-era decision order.	Promote ‘Critical’ Stance: Use the BTFF to radically reduce the proportion of ‘waverer’ and ‘non-critical’ firms (currently estimated at around 70% due to factors like the exit of major banks from NZBA) to a much lower level (e.g., 30%).
Expand Mutual Sector: Regulators (e.g., UK BOE & FCA) should use the conceptual frame to increase the mutuals’ role (e.g., facilitating large, listed companies to become mutuals).	Incentives and Directives: Provide financial incentives (e.g., via tax or national green banks) for mutual and ‘critical’ firms, and use directives to demand increased green orientation from ‘non-critical’ firms (e.g., stop coal funding).
Changes in sustainability Reporting using BTFF and established Integrated Reporting templates	Direct Change: The BTFF offers a mechanism for regulators to direct ‘non-critical’ and ‘waverer’ firms in managing sustainability-oriented change and developing authentic sustainability narratives.

Risk Mitigation and System Resilience

Reducing the dominance of ‘non-critical’ and ‘waverer’ firms enhances system resilience by preventing the concentration of similar risk profiles and diversifying business models. The high current proportion of ‘non-critical’ and ‘waverer’ firms (estimated at around 70% due to a fracturing consensus against net zero, evidenced by the exit of major US and Canadian

banks from NZBA in 2024-2025 creates a very dangerous situation a high exposure to sudden, unanticipated climate tipping point risks and linked financial risks, which is analogous to conditions before the GFC in 2008.

The analysis offers a structured way to understand and influence the future mix of 'Critical' and 'non-critical' market-based and Mutual firms to reduce 'drift to finance' values and inauthenticity.

5.2 Developing Combined Intangibles-Financials Information on Systemic Risks

UK and EU regulatory bodies like the EBA, ECB, BoE, and PRA and standard setters (SBTi) already qualitatively assess the role of intangibles when conducting financial stress tests (EBA, 2025; Rogers et al, 2025). However, this is a piecemeal and fragmented approach compared to the integrated model of connected, interacting intangibles in the BTFF.

Regulators and standard setters must require firms to explicitly link intangible risks and shocks to financial and climate-related risks to improve disclosure and transparency. Future resilience depends on understanding how sustainability-oriented intangibles (e.g., culture, capabilities, purpose) in BTFF HHCM metaphor areas shape financial outcomes and climate exposures.

Integrated Stress Testing and Reporting

The paper advocates for integrating qualitative intangibles-based scenarios and stress tests with existing financial stress-testing frameworks (EBA, PRA). Making explicit connections between a firm's net-zero orientation, intangibles metrics, financial metrics, greenhouse-gas (GHG) implications (SBTi), and broader planetary boundary breaches (Crona et al.2024, 2025) strengthens foresight and risk management.

The paper argues for distinguishing firm types and scenario analysis. The analysis of diverse 'critical' firms provides a form of 'best-case' scenario analysis, while the study of 'non-critical' and 'waverer' firms offers a 'worst-case' scenario analysis (see below). The BTFF framework facilitates developing these qualitative worst-case scenarios about problematic intangibles that could lead to new systemic financial risks (reminiscent of pre-GFC issues).

The paper advocates standard alignment of approaches across systemic risks that are financial, GHG emissions, and concern impact on planet boundaries. Quantitative standards like the SBTi's Net-Zero Standard need to include explicit metrics about the Net-Zero orientation of connected intangibles, linking them to metrics about NZ outcomes in the firm's financials, GHG emissions, and climate change risks.

Thus, the paper argues that making financial firm intangibles visible and measurable, and connecting them to risks (financial, sustainable); are key to a sustainable future for individual firms, firm clusters, and finance system.

This reflects a regulatory precedent, where ideas of intangibles are used in an integrated business model for sustainability reporting and for connecting these to financial reporting numbers (IFRS f, 2025). Holland (2025) discusses how the concepts in this paper can enhance this approach to sustainability reporting. This approach provides ways for specialised approaches to problems (eg EBA, PRA; SBTi; IFRS/ISSB & FRC) to develop new links via the common 'Intangibles and Financials' analysis in this paper.

The above seeks to overcome limitations of conventional stress testing. Conventional risk scenario analysis and stress testing (Walker 2024; TCFD, 2017, 2021) focus on measurable numeric metrics (capital adequacy, liquidity, credit exposures) and neglect the formal and explicit inclusion of intangibles. This ignores the crucial lessons of the GFC, where problematic intangibles like risk culture, top management experience, and hubris were central to firm failures (Holland 2010, 2017). Intangibles are vital because they are interconnected and directly impact financial tangibles. Conventional methods also cannot fully control problematic risks that can transform into uncertainty and crisis (BOE, 2024).

A 'worst case' intangibles scenario based on the BTFF.

It should be noted that regulatory bodies (EBA, ECB, BoE, PRA) are beginning to assess intangibles implicitly or qualitatively (e.g., governance, corporate culture, management ability) during stress testing. They recognise in a piecemeal

and fragmented way that intangibles in business models affect financial risk. Improving their understanding of these intangibles can help maintain financial stability and system resilience. The BTFF framework is intended to offer a more integrated model for understanding how these connected intangibles in a business model impact risk, moving beyond the current piecemeal and fragmented approach.

This paper argues that financial firms, especially those with a ‘non-critical’ history, must assess **worst case scenarios** with intangibles. **Qualitative scenarios** about these intangibles can be based on the BTFF narrative as follows.

For example, problems with intangibles in ‘Head’ metaphor areas could include ambiguity about financial firm purpose as combined sustainability and financial aims. They could include top management skills based on limited experience of sustainability change, high risk culture, hubristic attitudes to knowledge of others, inflated top team reputation on boards and in financial markets, a narrowly conceived focus on financial value as the core of strategic purpose, and the ‘gaming’ of financial communications and sustainability reporting to conceal other problematic intangibles and behaviour. These can lead to ‘tone from the top’ implicitly promoting a high-risk and financial value maximizing culture, whilst publicly supporting sustainability change.

Problems with intangibles in ‘House, and Community’ metaphor areas could include problems in organising to exchange risk information, in risk culture and challenge, and in teams at all organisational levels (top, middle management, front line, back office). In the ‘House’ metaphor area they could include misaligned incentives, control systems, and technology information support systems. In the ‘Community’ metaphor area they could include a fractured ‘lived experience’ of sustainability change, lack of shared knowledge about stranded assets, and the potential for loss of employees, customer and stakeholder trust, and legal risks.

These may lead to flawed assumptions in the ‘Financial Machine’ in financial decision making at transaction, asset and liability portfolio, and financial firm levels. This can weaken the quality and credibility of risk management and censor critical warnings. They may lead to overly optimistic assumptions in scenario design in financial models for testing credit, market, and liquidity risk, and for assessing adequate capital and liquidity levels. This can lead to the creation of very risky asset and liability portfolios, and historically low cash liquidity and low adequate capital level, and high exposures in financial markets. When a GFC style liquidity freeze occurs, financing dries up and key assets become worthless, and the financial firm fails.

Table 3 (Appendix 1) illustrates two short financial firms case vignettes where an intangible shock is mapped onto financial stress-test inputs, and these are related to potential financial outcomes.

Table 4 (Appendix 2) illustrates measurable HHCM indicators. These can link intangibles changes to changes in financial decisions and to financial outcomes.

As a result, stress testing by regulators and firm decision makers must include **qualitative scenarios** about these intangibles illustrating how they interact together. This can help to assess how problems or failure in intangibles can arise during a stress event and lead to hidden risks in clusters of financial firms becoming systemic issues.

The sustainability oriented BTFF and narrative thus provides a means to integrate many of the ideas of intangibles used by regulators in a holistic grounded theory framework. They provide means for EU and UK regulators to formalise and make explicit key intangibles in the financial firms and how they are connected and interact in a business model and financial intermediation. They provide means for both regulators and individual financial firms, to do their own scenario analysis and stress testing of connected intangibles and financials, when in dialogue with each other.

This clarification provides new means to think about metrics for connected intangibles, and their impact on metrics like risk and value (both sustainability and financial). Such connections are not, at present, formally made by EU and UK regulators, but the conceptual frame in this paper suggests how this can be done.

These can be used by regulators to require financial firms to make integrated changes in intangible areas such as purpose, organisation, culture, business model to control the riskiness of behaviour of financial decisions, and their impact on financial risk and financial value of portfolios of financial transactions. It is a means for regulators to require firms to develop sustainability reporting based on these ideas (Holland, 2025).

5.3 Overcoming Barriers and Creating Drivers for Change

While implementing these changes is difficult, the BTFF offers an explicit, integrated framework to accelerate existing, fragmented change, which is urgent due to the increasing potential for GFC-like crises linked to continuous climate change. It offers means to overcome, in part, barriers to implementation, and to actively promote drivers for change.

The primary barrier to sustainability change in firms is the shareholder-focussed contract (Sjafjell et al, 2015), which legally requires managers to act in shareholder interest. This can hinder the pursuit and disclosure of sustainability change if shareholders perceive financial losses. Political will and legislation are required to change this contract to recognise wider citizen and planet obligations. Regulatory bodies like the ISSB are also legally bound to investor interests.

Drivers for Change

Various drivers can stimulate the transition to critical sustainability oriented financial firms and financial systems. These include intensification of litigation using existing law. For example, litigation using existing law against firms such as ING and BNP Paribas (Bosman & Blom, 2025) may help create a legal duty on financial firms to act on climate change. Change in case law may allow greater variation in interpretation of the shareholder contract in wider stakeholder and sustainability change interests.

The socio-political and regulatory climate post-GFC reflects low esteem for market-based firms and a history of social support for mutuals. This means governments and regulators are likely to continue demanding that financial firms play a full role in climate change adaptation. UK and EU regulators (PRA, FCA, EBA) are actively developing relevant guidelines.

Regulators can use existing good practice models and 'in-house' conceptual frames of 'critical' firms as models for regulatory change to control risk. For example, Schrodgers, 2025, explicitly assesses intangibles like control culture and relationships through technology and information tools like Sustainex. Schrodgers' use of financial and sustainability outcome measures (SBTi, 2023) highlights what is possible, although it has been argued such standards don't fully consider the cumulative impact on planetary boundaries (Crona et al, 2024, 2025).

The changes proposed can cause problems with cognitive overload in decision making in financial firm teams at all levels. The BTFF V3 provides a system thinking framework to integrate complex information (like planetary boundary metrics proposed by Crona et al) into decision-making without increasing cognitive overload (Lejarraga et al, 2020). It also provides a means to reflect and learn about the impact of HHCM context. This can be achieved by conducting post-decision analysis on batches of decisions and feeding clearer narrative and simpler metrics back into future single decisions in a continuous learning cycle. This process could also inform the creation of an extra financial capital buffer or risk-capital equivalent for financial risks, GHG emissions and earth system boundary impacts.

6. Discussion: Relating Research to Literature and Theory in the Wider Field

Section 6 places the research findings within the wider research and theory contexts, illustrating innovative ideas for developing the literature and relevant theories cited. It explores the conceptual framework's role in generating new research, holistic hypotheses, and empirical tests. This paper develops a conceptual framework combining:

- * Three systems – macro, meso, micro
- * Sustainability BTFF (Behavioural Theory of the Financial Firm)
- * Ideas of 'critical' firms
- * Sustainability change narrative
- * Categories of diverse firms and comparisons.

This knowledge provides new ways to think about the future of financial firms and highlights potential policy changes by governments and regulators. The paper's approach has the potential to influence learning, knowledge creation, policy, research, and integrated thinking among practitioners and academics regarding the future of financial firms during sustainability change. The discussion demonstrates new avenues for developing existing literature and theories. It highlights the framework's utility in fostering new research and holistic hypotheses for empirical testing.

6.1. Knowledge to Reflect on the Future of Financial Firms

The conceptual framework forms a new knowledge means to encourage sceptics to believe that ideas can make a difference in financial firms delivering authentic and ethical Net Zero change and reporting (Schoeneborn et al, 2020; Brunsson, 1993).

The sustainability BTFF and holistic internal/external change narratives (in metaphors, intangibles, financials, connected systems) offer a means to continuously question sustainability change behaviour in both mutual and market-based firms across banking, insurance, and investing. This approach helps decision-makers "stand back" and comprehend the bigger picture and central strategic issues (King and Kay, 2020), promoting integrated thinking and holistic action in practice and academia (VRF, 2021; Gendron, & Smith-Lacroix, 2013). This provides a holistic basis to address ethics and authenticity.

The holistic approach is means to help financial firms and stakeholders address the difficulty in linking sustainability and financial aims (Sedovs et al, 2025). This is necessary to understand the complex interdependencies between the aims and can form the basis for a dynamic, iterative learning and search process regarding the link between sustainability and financial performance. This process must be openly disclosed and debated with diverse stakeholders to find a socially or politically acceptable, albeit interim, solution.

Newlands, (2024) notes that that fund managers struggle with inconsistent ESG data generated internally by the financial firm, and externally by client or customer firms. Section 5 has argued that a coherent model and narrative of sustainability change in financial firms is essential for identifying key factors and associated metrics driving ESG change. It is a way to establish metrics that have meaning in this narrative and potentially reduce problems of inconsistency. This narrative and embedded metrics are a basis for financial firms to connect internal organizational and resource changes (intangible, tangible, financial) to financial decisions and performance (sustainability and financial). This model allows financial firms to demand similar coherence in narrative and metrics from their clients.

The framework's narrative approach is an extended knowledge, ethics, and behavioural risk management strategy. It has the potential to limit the contagion (Shiller, 2019) of uninformed or oversimplified ideas about climate change and socio-economic change, thus limiting their impact on internal intangibles and connections between firms. This also helps limit mimetic changes in business models (Fligstein, 2021) and reduces the potential for systemic risk in clusters of financial firms. It supports reliance on robust and resilient reference narratives that embrace uncertainty (King and Kay, 2020).

The framework as the BTFF V3, connected to the 'three systems' theory (macro, meso, micro), offers a means to consider how to transform organizational change processes and business models to meet sustainability objectives across the financial system and thus transform the financial system (Fligstein and Huang, 2025): It provides a basis to standardize regulatory frameworks (for reporting, risk, emissions) and reduce reliance on voluntary measures, thereby removing systemic barriers to sustainable finance.

Ameli et al, (2025) argue that structural changes are needed to activate positive tipping points for a fast net-zero transition. This paper explores how a key structural factor is a shared system-wide understanding of the nature of the financial firm and how it changes. This requires a shared understanding of common, connected sustainability change factors and authentic reporting and disclosure. Policy interventions are crucial to initiate these learning and knowledge dynamics to activate positive sustainability tipping points and prevent backsliding.

The framework in the paper shows how existing literature and theories can be used in new ways to reflect on sustainability change in financial firms. For example, the common framework is new way to explore how both mutual and market-based financial firms respond to climate uncertainties and threats (Nyberg, Wright, 2016) through the performance of different 'risks' (market, reputational, regulatory, physical).

It demonstrates how similarities and differences in responses between mutual and market-based firms can be explored using theories like institutional logics (Thornton et al, 2012) and the problems of competing logics (Battilana & Dorado, 2010) in differing socio-economic contexts (Almandoz, 2012). Both types of firms faced similar issues in defining purpose, decision logic, and developing metrics for risk and 'value' for combined sustainability and financial outcomes.

It illustrates how diverse 'critical' financial firms used their in-house holistic view, as social decision heuristics (Marsh, 2002) to link numeric heuristics for risk and 'value' in a whole-firm socio-economic context, effectively building 'Sustainable Hybrid Organizations' (Battilana and Dorado, 2010).

In Power's (2016) terms, the connection of individual heuristics, across decision teams and firm levels, within one conceptual frame is seen as rational, representing a form of 'riskwork'. The latter is the situated human effort and material infrastructure that constructs risk management and governance practices.

6.2 Contributing to Debate About Purpose of Financial Firm During Sustainability Change

The analysis provides a foundation for new research on financial mutuals, and market based financial firms. The paper calls for intensive field research to further extend the 'three system' and BTFF insights for both market-based firms and mutual financial firms. An integrated investigation of change in both types of financial firms, and their 'critical' and non-critical variants, is the basis to developing a new research paradigm in the field of finance. This requires research on the role of 'Head' in governance, developing purpose, and researching change in human/social capital, culture, and incentives in 'House' and 'Community' as drivers for each type of financial firm's 'financial machine' and the delivery of specialist sustainability oriented financial products.

This paper contributes to ongoing debates about changing financial firms for wider public purpose (British Academy, 2018; Collier & Kay, 2020; Mayer, 2019). The grounded theory insights are the basis for new research on socio-economic sustainability-oriented change in BTFF HHCM metaphors areas and how this is a new to think how to deliver public purpose by financial firms.

The research approach provides new means to explore questions of whether mutuals are more effective and have more impact than market-based firms in driving financial access and sustainability change across income groups, housing sectors, and the wider economy. Specific questions can address changes in green energy use/cost across regions/income groups and access to funds for the younger generation (20-45). It is basis to question how and why comparative sustainability performance and financial performance varies between mutuals and market-based firms.

This research and argument could help mutuals such as Building Societies develop their reputation and highlight their significance to the younger generation (Fieth, 2024; Shepperd, 2024), especially when allied with improved technology for measuring sustainability change. It could aid 'critical' market-based firms to do the same. This new message could portray

them as a new kind of disruptor, which are relevant, economic, and safe, due to their strong social/sustainability purpose and stable financial function.

6.3 Hypothesis Testing of Conceptual Model

A key aim of the paper is to use case empirical sources, grounded theory, and interdisciplinary analysis to explore and influence the emerging future of financial firms. This involves identifying connected change drivers and mechanisms between the external world and the BTFF metaphor areas, and their impact on sustainability and financial outcomes for the firm, and wider external systems.

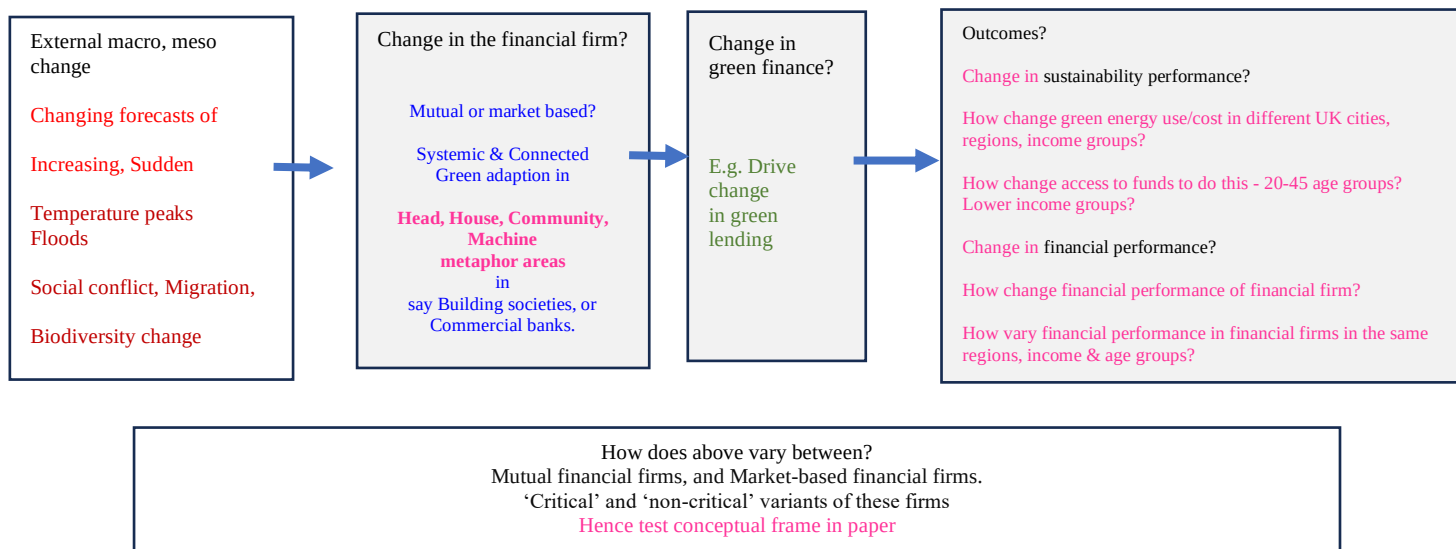
Influencing the future of financial firms can be developed further by creating metrics and using more conventional hypotheses testing. This conventional empirical hypothesis testing approach, based on many cumulative tests, may take some time to influence the change process. In contrast, the paper's holistic approach offers more immediate research possibilities and policy proposals.

Metrics can be developed in all the above areas of external change, metaphor area change, whole firm change, financial decision, and outcomes. Table 4 (Appendix 2) illustrates measurable HHCM indicators. These can link intangibles changes to changes in financial decisions and to financial outcomes. **Figure 1** shows how to test these BTFF connected hypotheses.

Figure 2 (Appendix 3) provides more detail on these ideas and the link between HHCM Process metrics (Head, House, Community, Machine) and Outcome metrics (sustainability and financial outcomes), suggesting a methodology for testing authenticity by seeing if firm HHCM context and process changes translate into claimed results.

These show that holistic, integrated tests are feasible. Metrics can be developed in all areas (external change, metaphor change, whole firm change, financial decisions, and outcomes) and connected in holistic, integrated tests of whole firm systems, avoiding partial or ad hoc 2 or 3-variable tests.

Figure 1 Testing BTFF connected hypotheses.



The conceptual frame combined with metrics is a basis for new empirical tests on sustainability change in diverse financial firms, allowing comparisons between mutual and market-based firms, and between 'critical' and 'non-critical' variants. This supports research on 'sustainability-oriented' Finance.

The conceptual frame allows for firm-wide connected (holistic) hypotheses (Poterba, 2021) to test performance. Evidence of how the four metaphors ('Head, House, Community, Machine') change together to produce desired outcomes is a way to test the whole BTFF model and provide a basis for more specific tests of authenticity or inauthenticity ('greenwash').

The combination of the BTFF and metrics can also structure and provide measures for 'Integrated Reporting' (IIRC, 2013) and support specific tests of authenticity in reporting (Holland, 2025). This indicates a path for mixed methods research (Chen et al, 2023), supporting an academic research program on 'sustainability-oriented finance' across non-finance disciplines.

6.4 Developing Links to Established Theories of the Firm – Widening the Theory Debate

The change narrative is interpreted within four overlapping theoretical frames: Theory of the firm (Peng, 2001), Systems theory (Mumford, 2000; Mitleton-Kelly, 2003), 'Behavioural Theory of the Firm'(BTF) (Cyert and March, 1963), and 'Behavioural finance' (Statman, 1999). This highlights the continuing relevance of these theories and opportunities for their development and challenge, aiding thought on the future of financial firms.

The empirical evidence shows financial firms, and their stakeholder networks form complex systems (Mitleton-Kelly, 2003). The firm is a socio-technical system (Mumford, 2000) consisting of purpose ('Head'), contextual resources ('House'), interactions ('Community'), and connected financial decisions ('Machine'). This integrated system of resources transforms inputs into outputs and outcomes in business models, fulfilling strategic purposes (IIRC, 2013; VRF, 2021).

The Resource-Based View (RBV) (Barney, 1991; Hart, 1995) applies as market-based firms, such as NatWest/RBS, Lloyds, Schroders, and Baillie Gifford, develop unique firm-specific sustainability-oriented competitive advantages and sector alliance co-operation advantages within the BTFF elements. These advantages, coupled with dynamic capabilities (Teece, 2007), shape their competitiveness, legitimacy, and ability to adapt to special challenges in diverse markets, cultures, and regions.

The original 'Behavioural Theory of the Firm'(BTF) (Cyert and March, 1963) is reflected in the BTFF. The BTFF moves away from the traditional, purely rational economic BTF model of the firm to focus on internal complexity, bounded rationality, and conflicting goals (aims) and logics, as the main drivers of financial firms' behaviour and their varying approaches to sustainability. Clearly structured organisational context (four metaphors areas); with organisational processes, like top-down, bottom-up, and multi-dimensional social interactions; are used by top teams for uncertainty avoidance and conflict resolution. In the case firms, these BTFF contexts and processes are the basis to develop, allocate, mobilize, and exploit context-based resources and financial resources for Net Zero aims and financial aims. In line with the original BTF, financial firms are viewed as intendedly rational but constrained by bounded rationality. Decisions are not made to find the single best outcome (maximisation) but to find an outcome that is "good enough" (satisficing) for the internal and external coalition of groups (managers, employees, shareholders). In the sustainability context, this means firms may satisfice on sustainability goals if achieving a perfect outcome is perceived as too costly or complex relative to financial goals (aims), potentially leading to inauthentic change in 'non-critical' firms.

The paper forms a basis to connect 'sustainability-oriented finance' to non-finance academic disciplines (management, sociology, systems) (Hirshleifer, 2015; Shiller, 2019) and to 'Behavioural finance' (Statman, 1999) concerning individual behaviours assumed to aggregate to market behaviour. It is a basis to explore links between intangibles in the BTFF and the conventional (macroeconomics) financial intermediation theory (Holland, 2019).

6.5 New Theory Development from established sources.

The paper provides a new perspective for developing theories such as Stakeholder theory, socially oriented theory of the financial firm, theory of sustainability reporting, and finance theory (e.g., financial intermediation).

Stakeholder Theory (Freeman et al, 2018; Fiordelisi et al. 2022), is highly relevant to both mutual and market-based firms, highlighting the significance of diverse stakeholders (shareholders, campaigners, governments, etc.) in establishing the appropriate mix of sustainability, ethical, social, environmental, and financial goals. The BTFF's context (organization, culture, technology) can support informed decision-making to agree on the meaning of 'value and risk' heuristics for combined aims. The development of Stakeholder theory must incorporate these empirical insights, especially concerning mutual firms (Fiordelisi et al. (2022), and explore how organizations manage conflicting logics (Almandoz, 2012).

The paper suggests that rethinking finance theory ideas to reflect sustainability change is desirable. This includes ideas like 'risk' and 'value' (Gendron et al, 2014) and financial intermediation theory (Scholtens et al, 2003). Finance theory was originally based on a micro-economic perspective in a stable and optimistic socio-economic period from 1945 to 1970. The new world of climate and technology change is more turbulent, challenging established ideas of 'value,' 'risk,' and the pursuit of shareholder wealth alone. Mutuals, with their long-term, intergenerational social and financial aims combined with sustainability aims, are a major source of resilience in the financial system (Fieth, 2024). They are a critical working example for market-based firms of how complexity in competing aims and logic can be managed. They provide empirical insights into how the insightful analytic deductive work of Donaldson (2021) on competing aims can be applied in practice.

The BTFF and external change ideas illustrate how co-operative alliances and networks between financial firms at meso level, are becoming important in defining behaviour codes. Competition is becoming more intangible (focused on reputation, social relations, knowledge) as well as concerned with financial resources. Competition is now concerned about sustainability change activity. Financial firms are becoming more aware of the role of intangibles in the business model (Chen et al, 2014) and their sustainability orientation in the BTFF metaphor areas (Holland, 2022). Heuristics in financial decisions are changing, relying on firm-wide intangibles for shared meaning and use. This suggest that competitive analysis about financial firms, such as the 'conduct, structure, performance' research paradigms (McKillop and Ferguson, 1993), must change to reflect this new reality.

Existing explorations of how intangibles change the use of financial resources in financial firms (Chen et al, 2014; Holland, 2016, 2019) can be further developed by considering the role of intangibles in metaphor areas in sustainability change, thus changing the financial intermediation process and theory itself. Given the urgency of climate change, the case-based grounded theory approach offers one of many new ways to adapt financial intermediation theory (Scholtens and van Wensveen, 2003) to the new empirical reality.

7. Conclusions

Paraphrasing Carl Sagan (1980), 'To understand the future, we must understand the present and past'. This paper argues that appreciating the future and present of mutual and market based financial firms, as banks, insurance and investing firms, concerns understanding external change from climate, sustainability, and socio-economic issues. Section 7 argues that understanding the future of financial firms (banks, insurance, investing firms) requires comprehending their internal evolution in response to external pressures from climate, sustainability, and socio-economic issues. The core contribution is a common conceptual framework—the Behavioural Theory of the Financial Firm (BTFF) Version 3—used to define, identify, and promote 'critical' sustainability-oriented financial firms. The conclusion synthesises the paper's findings into two main areas: the development of a conceptual framework and its implications for the future of financial firms and systemic policy.

7.1 Conceptual Contribution: The BTFF V3 Framework

The paper's central achievement is the development and application of the 'Behavioural Theory of the Financial Firm' (BTFF) Version 3. The BTFF V3 acts as the 'missing link' or bridging construct; required to connect external system change (macro and meso levels, e.g., climate, regulation, market consensus) with internal firm change (micro level); and to connect these to further external change.

The BTFF framework uses the four connected metaphors: Head, House, Community, and Machine (HHCM) to make the invisible intangibles (e.g., knowledge, values, culture, beliefs) and the organizational change process explicit. The framework is used to define and promote 'critical' sustainability-oriented financial firms. These are firms that authentically achieve both their sustainability and financial aims. By comparing 'critical' firms with problematic 'non-critical' and 'waverer' firms, the framework provides a structured way for non-critical firms to focus on changing their values and conducting sustainability activities in more authentic and ethical ways.

In terms of diversity and learning the paper exploits the natural experiment in finance (Iyer, Peydró, 2011) by comparing the sustainability change activities of mutual and market-based financial firms and their 'critical' and non-critical variants. This comparison shows how they are both similar and different in their change journeys, allowing them to learn from each other. For example, mutuals' methods of combining sustainability and financial aims can be adopted by likeminded market-based firms seeking to become 'critical'.

7.2. Implications for the Future of Finance and Systemic Change

The BTFF V3 framework leads to concrete insights about controlling a 'drift' towards dominant finance values and influencing the future of the financial system.

Countering Threats and Influencing Change

The framework provides a means to resist the pressures of dominant finance logic and values from the financial system and markets, which threatens the authenticity of sustainability-oriented decisions and reporting. The insights provide a basis for enhanced sustainability reporting and more intensive accountability and pressure for change. It helps firms control a 'drift' to finance values and resist threats to authenticity.

The analysis indicates that new forms of sustainability-based competition are emerging. External changes threaten the socio-economic function and reputation 'space' of both market based and mutual financial firms, and how they respond to these changes and threats. Stimulating this competition by expanding the number of 'critical' firms (both mutual and market-based) creates a diverse, resilient financial system (Fligstein, 2021).

Policy Proposals for Systemic Resilience

The conclusions identify two key policy proposals that micro-level 'solutions' (BTFF V3) can contribute to at the macro and meso system levels.

Firstly, they can increase firm diversity and competition. Regulators should aim to increase the proportion of 'critical' financial firms; especially mutuals (Fieth, 2024), and 'critical' market-based firms; relative to 'waverer' and 'non-critical' firms. This diversifies business models in the system, which is essential for resilience to systemic risk. (Fligstein, 2021).

Secondly, regulators and standard setters should demand that firms connect the risks and shocks associated with their intangibles (the invisible world of values, knowledge, etc.) to financial risks. This involves integrating qualitative intangibles scenario generation and stress testing with existing 'financials' stress testing to address systemic risks like "green swan" events. Ultimately, the paper argues that making financial firm intangibles visible, and connecting them to risks, are key to a sustainable future for individual firms, firm clusters, and the entire financial system.

The future of finance

The paper concludes that sustainability-oriented transformation is critical to the future of finance. The BTFF V3 provides a necessary conceptual tool to analyse this transformation, highlighting that authenticity, diversity (mutual vs. market-based, ‘critical’ and noncritical), and transparency (making intangibles visible) are the keys to building a resilient financial system that truly supports a just transition in the wider economy and society for diverse stakeholders (Curran et al, 2022; ILO & UNEP, 2023; Thomas, 2025).

This approach is part of a research programme to develop new ideas about financial firms and their central roles in promoting sustainability change in ‘real’ businesses, economies, and societies (Holland 2022, 2024a). This paper contributes to the ongoing debate on how to change purpose and behaviour in all financial firms (British Academy, 2018,2019; Collier & Kay, 2020; Edmans, 2020; Mayer, 2019; Marois, 2018). It provides a new way of thinking about theory such as: Stakeholder theory (Fiordelisi et al. (2022; Freeman et al, 2018), socially oriented theory of the financial firm (Holland, 2016, 2022, 2024a), theory of sustainability reporting and social communications (Gray, 2007; Bebbington & Unerman, 2018; Schoeneborn et al, 2020; Holland, 2005; Holland, 2025), and finance theory (about say financial intermediation processes; Scholtens and van Wensveen, 2003).

This ontological viewpoint (Valentinov & Chia, 2022) reflects the new reality of social and sustainability change in financial firms. This capture aspects of ‘what is going on’ (King and Kay, 2020) and can overcome the dominance of financial values in constraining thinking about these issues (Gendron et al 2015; Holland, 2010, 2019b).

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Appendix 1

Table 3

Two short case vignettes: intangible shock → mapped stress-test inputs → financial outcomes

Vignette 1 — Reputational contagion and customer flight at a **retail bank**

- Shock narrative: A leaked report exposes aggressive financing of high-emission projects despite the bank's public net-zero claims; social media amplifies the story, major corporate clients and retail customers begin to move deposits and cancel services.
- Relevant HHCM triggers and indicators:
 - Community: negative media sentiment spike; customer Net Promoter Score drop; surge in complaint volume.
 - Head: divergence between public purpose statement and lending portfolio (purpose operationalisation index falls).
 - Machine: slow cross-unit escalation; delayed senior response (escalation frequency metric low).
- Mapping to stress-test inputs:
 - Liquidity outflow: increase projected retail deposit run rate (e.g., +5–15% over 30 days) driven by customer churn metric.
 - Funding cost shock: wholesale funding spread widens proportional to reputational index change.
 - Credit quality: accelerated roll-off of sustainability-exposed corporate clients; raise PD for affected sectors by stress multiplier.
 - Operational loss: legal and remediation expense shock linked to reputational event magnitude.
- Measurable stress-test scenarios (best/worst):
 - Best: 5% deposit runoff, PD increase 50% in targeted corporates, minimal funding spread widen.
 - Worst: 15% deposit runoff, PD increase 200% for vulnerable sectors, funding spread spike causing covenant breaches.
- Expected outcomes to quantify: liquidity coverage ratio erosion, increase in NPLs from affected sectors, capital ratio decline, short-term solvency stress and increased cost of capital.
- Supervisory/management actions triggered: contingency funding activation, targeted communication plan, asset rebalancing, accelerated write-downs of exposed loans.

Vignette 2 — Governance failure and stranded-asset recognition at an **asset manager**

- Shock narrative: Internal audit reveals the investment committee failed to incorporate updated climate transition scenarios; a major sovereign policy shift accelerates coal phase-out, sharply re-pricing energy holdings and triggering client redemptions.
- Relevant HHCM triggers and indicators:
 - House: absence of transition-risk oversight committee; governance alignment score low.
 - Head: leadership lacks documented climate expertise; no SBTi-aligned targets.
 - Machine: ESG metrics not integrated into risk models; % of portfolios with ESG scores integrated = low.
- Mapping to stress-test inputs:
 - Market shock: sudden re-pricing of carbon-intensive assets — apply sectoral haircuts (e.g., 30–60% on valuations) to affected holdings.
 - Redemption shock: redemption rate stress tied to client trust index fall (e.g., 10–25% redemptions over 60 days).
 - Liquidity mismatch: forced asset sales into illiquid markets → higher realised losses; raise LGD for affected asset classes.
 - Contagion: correlated holdings across funds increase systemic exposure; increase concentration shock parameter.
- Measurable stress-test scenarios (best/worst):
 - Best: moderate re-pricing (30% haircut), 10% redemptions, manageable margin calls.
 - Worst: severe re-pricing (60% haircut), 25% redemptions, fire-sale losses that breach liquidity buffers.
- Expected outcomes to quantify: NAV declines across funds, margin calls, client redemptions causing cascade into other funds, reputational costs reducing new inflows, possible regulatory intervention on liquidity or capital adequacy.
- Supervisory/management actions triggered: immediate portfolio de-risking, communication and governance reforms, recalibration of risk models to incorporate transition pathways, potential temporary suspension of redemptions or gating.

Appendix 2

Table 4 – Measurable HHCM

HHCM Element	Indicator	Measurement Method	Data Source	Example Metric
Head	Board / Executive team sustainability expertise	Count of board members / Executive team with sustainability qualifications or experience	Board disclosures; annual reports	% of Board / Executive team with sustainability-related experience
Head	Purpose clarity and operationalisation	Existence of published purpose plus evidence of operational targets tied to it	Corporate purpose statements; strategic plans	Purpose low -high sustainability orientation index (1-10)
Head	Leadership commitment to net-zero	Public net-zero targets plus measurable interim milestones	Climate commitments; SBTi alignment docs	SBTi-aligned target in use (Yes/No)
Head	Board oversight of transition risk	Dedicated board committee or documented oversight processes	Board minutes; committee charters	Existence of transition-risk committee (Yes/No)
House	Organisation structure for joint sustainability and financial aims	Explicit connections and shared connections and processes between decision teams for these aims	Company charter, board minutes	Existence of explicit, regular meetings in and between decision teams on how achieving joint aims (Yes/No)
House	Governance alignment in all decision teams with joint sustainability and financial aims	Presence of explicit incentives and decision rules linking strategy and operational decisions to sustainability and financial outcomes in all decision teams	Remuneration reports; governance charters	Existence of sustainability-linked pay (Yes/No) Existence of pay incentives to achieve joint sustainability and financial aims (Yes/No)
House	Technology to collect and analyse sustainability change data	Expenditure on technology	Board disclosures; annual reports	Explicit statement of decision rules in transaction, portfolio, firm decision teams (Yes/No) £ Expenditure on technology – absolute & % - at board, portfolio managers, front line, back-office teams
House	Information system to supply sustainability information with financial information throughout firm.	Frequency of use at all levels, frequency of summary reports on	Sustainability reports	Existence of Sustainability reports, (Yes/No) Reports on use information, analysis of effectiveness, internal audit of (Yes/No)
Community	Stakeholder trust and external legitimacy	Aggregate sentiment and stakeholder engagement frequency with Customers, clients, campaigners	Customer surveys; media sentiment; ESG stakeholder reports	Customer / client / campaigner satisfaction indices on sustainability change
Community	Ownership structure risk orientation	Share of mutual versus shareholder ownership; investor horizon measures	Ownership registers; filings	% assets under mutual ownership
Community	Use of external financial markets for financing	Focus on and activity in external financial markets	Balance sheets	% financing liabilities (debt, equity) from markets
Community	Employee voice and challenge	Whistleblower reports; independent challenge mechanisms; staff survey on psychological safety	HR/ESG disclosures; staff surveys	Whistleblower reports per 1,000 employees Employee turnover amongst sustainability specialist managers
Machine	Internal risk-information flow quality	Frequency and breadth of cross-unit risk reporting; number of formal escalation events	Internal governance logs; audit reports	Monthly cross-unit risk reports per business line
Machine	Sustainability risk-data integration	Degree to which ESG metrics are linked to financial dashboards and risk models	Risk systems documentation; data architecture maps	% of financial decisions where ESG scores integrated
Machine	Internal audit - three lines of defence - for sustainability and financial risks	Degree to which internal focuses on both risk areas	Internal audit reports	Internal audit - sustainability and financial risks (Yes/No)

Appendix 3. Figure 1

Connecting metrics - Is this evidence for authenticity?

HHCM Process metrics

HEAD
 % of Board / Executive with sustainability-related experience
 Purpose low -high sustainability orientation index (1-10)
 SBTi aligned target in use yes/no
 Existence of transition risk committee yes/no
 Existence of Sustainability reports at firm level (Yes/No)

HOUSE
 Existence of Sustainability reports at unit level (Yes/No)
 Reports on use information, analysis of effectiveness, internal audit of (Yes/No)
 Existence of sustainability-linked pay (Yes/no)
 Existence of pay incentives to achieve joint sustainability and financial aims (Yes/No)
 Explicit statement of decision rules in transaction, portfolio, firm decision teams (Yes/no)
 £ Expenditure on technology – absolute & % - at board, portfolio managers, front line, back-office teams

COMMUNITY
 % assets under mutual ownership
 % financing liabilities (debt, equity) from markets
 Whistleblower reports per 1,000 employees
 Employee turnover amongst sustainability specialist managers

Financial MACHINE - process metrics
 Monthly cross-unit risk reports per business line
 % of financial decisions where ESG scores integrated
 Internal audit - sustainability and financial risks (yes/no)



Outcome metrics

Financial MACHINE – performance metrics
Financial performance Metrics
 For Return, risk, liquidity
 +
Sustainability performance metrics Eg climate change
Eg Metrics for emission tonnes GHG -per £s loaned, invested, insured – or -per value portfolio -as metrics of Carbon footprint of finance portfolio (s)
Eg Metrics for % portfolio firms with SBTi verified targets – scopes 1,2,3.
Eg Metrics for alignment of portfolio with Implied temperature rise of say 1.5 or 2 degrees C by 2025/2050
Metrics for Sustainability engagement with users of capital loans, equity etc – say large client or investee firms.
 Eg in finance portfolio.
 Number firms engaged with.
 Issues engaged on, Explicit transition plans.
 Similar critical changes to SR.
 Changes attributed to this – client firm, financial firm portfolio.

USE ABOVE METRICS TO - ADVANCE 'EMPIRICAL' STUDIES

Use above to test hypotheses about intangible and financial decisions as drivers of financial performance and sustainability outcomes.

Use above to connect intangibles stress test to financials stress tests.

Use above to connect intangibles, financials, to impacts on GHGs, Biodiversity, Social systems.

Use above to connect intangibles, financials, to impacts on planetary boundaries.

Appendix 4

Table 5 Purpose, learning, authenticity, and disclosure

It is not realistic to assume financial firms embedded in financial market systems and owned by shareholders, will stop pursuing financial functions, risk management, and value. Mutual financial firms must also still deliver financial functions (lending, investing, insuring) and make a financial surplus to survive and continue to achieve sustainability and socio-economic aims.

None of the 'critical' case firms pursued sustainability aims as the dominant goal. No cases were found where financial aims and sustainability aims were treated as co-equal as in *impact* focussed firms. However, firms such as Triodos were approaching this position.

Both mutual and market-based case firms ('critical' variants of) pursued financial aims as the first goal. These included delivering established financial functions such as banking, insurance or investing as well as creating financial value and managing financial risk. These financial aims were set within clear targets and aims for GHG emissions, and for social and other beneficial ESG outcomes.

In market-based firms the latter sustainability aims were treated as material factors that influenced financial function, risk and return but not as independent aims or constraints to override financial functions and value. In market-based firms they only reduced financial value when significant emissions or social justice problems were expected to arise and impair their stock price. In mutual based firms they reduced financial value when social justice and emissions problems were impairing their mutual functions and credibility.

The ethical norms and values of sustainability change were effectively transformed into £/Euro/\$ impacts on financial functions, returns, and risk. In market-based firms, they were not treated as ends in themselves, but as means to financial ends in firms with established financial functions. In market-based firms, integration and balance concepts were seen as instrumental rather than normative or moral. In mutual firms, financial value was important, but integration and balance concepts had higher normative and moral components. Thus, concepts of integration and balance of financial and sustainability aims in the 'critical' case firms were reflected in varying ways in this frame.

However, it was possible to set up a dynamic learning process to ameliorate these finance value pressures. Within the primacy of financial aims, 'critical' firms sought to achieve sustainability targets whilst delivering financial products required by customers. They sought to manage sustainability and financial risks in decisions about transactions, portfolios, and the whole firm. This conservative approach ameliorated the dominance of finance values.

This approach, combining a primary goal and supporting goals (constraints), provided a means to learn over time about the relationship between financial and sustainability aims and the competing logics and metrics to achieve them. It provided a way to learn how to improve setting and achievement of sustainability targets and aims over time, consistent with stakeholder demands. This was done to avoid creation of systemic financial risks and systemic sustainability risks (firm level, and external impact). This sought to avoid impairing capabilities to pursue joint aims in the firm. This learning went 'with the grain' (Levy, 2014) for mutuals, but market based critical firms faced difficulties in doing this and in changing practices.

The learning about combining sustainability and financial aims was a means to create new information about a wider information set and investment opportunity set. This held the potential for creating a larger 'cake' of financial value and positive sustainability outcomes (Edmans, 2022, 2023).

This can be interpreted as a **heuristic approach** (Marsh, 2002) to dealing with complexity and uncertainty, and the need to use new metrics and logic in decision making. This approach if adopted by a wide range of financial firms can create an iterative learning process across the world of finance and speed up a sustainability change.

Demanding that all 'critical' financial firms pursue sustainability aims as co-equal or dominant goal is unlikely to gain this support and may create barriers to change. However, this paper argues that increasing the proportion of 'critical' financial firms to this impact role is critical to change.

Thus, learning must include how the subjective sustainability change values and norms play a role in influencing decision behaviour, and how the above heuristic transformation of these into material £ factors impede or support this. **Sustainability reporting on these issues is required so that stakeholders can assess and demand progress.**

The paper notes that it is difficult to fully identify criteria for authenticity and to enforce authenticity on these matters. However, the paper suggests ways to increase the **likelihood** of increased authenticity and to enhance perceptions of credibility of authenticity.

The pursuit of primary aims plus targets in the 'critical' case firms can be interpreted as a form of satisficing (Simon, 1957) or exploring available alternatives acceptable solution is found without maximizing any specific aim.

The 'Head' as board and executive teams in 'critical' case firms may think it is not possible to achieve sustainability aims first, or as coequal with financial aims may prefer to adopt a form of 'public interest' hypocrisy. This is where they say they are fully pursuing sustainability aims, but in practice are only putting in enough to 'satisfice' most stakeholders. The intention is to make progress on sustainability aims and learn how to improve this whilst pursuing financial aims.

This continues to create problems of hypocrisy and inauthenticity as 'Heads' in financial firms seek to control the agenda. As a result, 'critical' firms must disclose degrees of equality or inequality between aims, the nature of conflicts, and the reasons for prioritising one aim over another in varying circumstances. Disclosure learning, especially at 'Head' level is critical to effective accountability.