Organizational Architectures of Sustainable Investment Funds: Evidence from Private Equity

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Abstract

The contemporary financial system is heavily intermediated by professional organizations whose mandates, negotiated ex ante between asset owners and asset managers, frame their behavior on the financial markets. Reading sustainable investors as organizations whose internal design shapes their capacity to pursue dual financial and sustainability objectives, I analyze the contractual and marketing documentation of 89 French private equity funds raised between 2017 and 2026, hand-code approximately architectural variables across objectives, resources, incentives and governance, and apply three layers of configurational clustering. First, we find that sustainable funds do not form a homogeneous organizational category: eight distinct organizational signatures distribute across three families (weakly structured 28.1%, intermediate 38.2%, complete 33.7%), invisible to existing regulatory and academic classifications. Second, each mechanism takes radically different forms and their combinations follow non-random patterns. The carried interest indexed on extra-financial objectives, present in 47.2% of funds, splits into four configurations ranging from generic indexation to calibrated outcome-based thresholds. Third, the additionality strategy structures the compatibility between financial and sustainability logics: funds pursuing operational additionality, the theoretically most demanding strategy, display the weakest architectures (25% with a dedicated extra-financial committee versus 62% for financial additionality, 24% with a fully structured measurement process versus 44%). This misalignment between strategic ambition and architectural depth creates the conditions for mission drift and undermines the social impact potential of sustainable finance. Grounded in organization theory, these results establish the configurational coherence of investment vehicles, not the presence of isolated mechanisms, as the relevant unit of analysis to evaluate the social impact potential of an intermediated financial system.

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1 Introduction

Despite the growth of sustainable investing — over $35 trillion in assets under management globally (Alliance, 2022) and more than 5,000 signatories to the UN-backed Principles for Responsible Investment — academics, practitioners and regulators increasingly question whether these practices produce real social impact or amount to sophisticated forms of greenwashing (Heath et al., 2023; Schlütter et al., 2023). Most work on this phenomenon has focused on the mechanisms (capital allocation and shareholder engagement) through which investors can influence firm behavior in the financial markets (Kölbel et al., 2020; Marti et al., 2024) and has classified such investors into broad categories such as ESG integration, thematic investing and impact investing (Busch et al., 2021). Yet the contemporary financial system is heavily intermediated by professional organizations whose mandates shape their behavior long before capital reaches companies (Bebchuk et al., 2017). The ex ante design of these mandates, and the resulting organizational architecture, thus frame the actions observable on the market (Denis & Mottis, 2025). This implies that the social impact potential of sustainable finance practices depends on the design of investors' mandates and its organizational consequences.

My data on 89 French private equity funds, a particularly intermediated asset class, confirms this intuition. By shifting the analysis upstream, to the moment when asset owners and asset managers negotiate mandates and design the organizational architecture of investment vehicles, I reveal eight distinct organizational configurations that conventional classifications and previous categories treat as relatively homogeneous. These configurations range from funds with no structured sustainability process to complete architectures combining contractualized dual objectives, dedicated resources, outcome-based incentives and controlling governance bodies. The same mechanism — carried interest[1] indexed on extra-financial objectives — illustrates this heterogeneity: present in 47.2% of my sample, it takes four radically different forms, from a generic indexation without explicit targets to calibrated vesting thresholds tied to system-level KPIs. To understand the impact potential of a sustainable investor, the organizational architecture thus constitutes a more informative unit of analysis than declarations of intent, regulatory classifications or the mere presence of isolated mechanisms. Grounded in organization theory, my analysis suggests that the ex ante design of the investment vehicle builds (or weakens) this potential, before capital and investors' influence reach

[1]Carried interest is the share of a fund's profits allocated to the General Partner (asset manager) above a preferred return to Limited Partners (asset owners). It is the primary performance-based compensation mechanism in private equity.

companies.

Institutional investors are increasingly developing sustainability strategies, with impact investing (the explicit pursuit of social or environmental objectives alongside financial returns) growing to over $1 trillion in assets (Hand et al., 2022). In doing so, these investors become hybrid organizations (Battilana et al., 2017) that combine two potentially conflicting institutional logics, a financial logic and a sustainability logic, within a financial system where mandates negotiated ex ante between asset owners and asset managers frame their behavior (Denis & Mottis, 2025).

Edmans et al. (2024) survey 509 portfolio managers and find that 71% act on the basis of mandate constraints rather than intrinsic motivation, confirming the importance of upstream structuring. Several recent studies have begun to examine this upstream structuring, especially in the context of impact investing. Geczy et al. (2021) provide the first systematic analysis of the contractual documentation of 53 impact funds within a bilateral contracting framework (Holmstrom & Milgrom, 1991), documenting the prevalence of mechanisms such as impact committees (17%) and impact-linked compensation (9%). Bandini et al. (2022) argue conceptually that impact must pervade the entire business model of the asset manager, with governance as a critical dimension. Thirion et al. (2022) focus qualitatively on the role of the carried interest for impact funds, as a tool for "mission locking," examining a single mechanism without an integrative view. Yang and Yasuda (2025) apply NLP to the offering memoranda of listed funds, capturing declared intentions rather than organizational mechanisms. Kaufmann et al. (2025) show that even when an impact measurement process exists, it can serve a relational function (building legitimacy through targeted communication) rather than a disciplining one: the presence of a mechanism does not guarantee its effectiveness.

These studies explore isolated components (contracts, incentives, intentions, measurement) but none proposes an integrative framework for analyzing the complete architecture of investment funds and its variation across a market. An integrative framework is theorized in Denis and Mottis (2025), based on an 18-month ethnography of a single PE impact fund, showing how asset owners and asset managers jointly design the fund's organizational architecture to pursue multiple goals and how it frames the subsequent behavior of the asset manager. Yet two funds can display the same formal mechanisms while giving them radically different scope: an impact committee can be symbolic or endowed with real control rights, an asset manager's compensation can be indexed on means-based or outcome-based objectives, an Impact Management & Measurement

process can discipline portfolio companies or primarily support the fund's legitimacy by focusing on measurement (Kaufmann et al., 2025). Why would funds with similar sustainability ambitions present such different ex ante architectures? And does this variation follow the tensions between financial and sustainability logics that these funds claim to manage?

This paper examines how sustainable investment funds are structured to pursue dual financial and sustainability objectives, and whether and why that organizational architecture varies. I focus on private equity, where agency costs between Limited Partners (or LPs, the Asset Owners) and General Partners (or GPs, Asset Managers) are high due to the illiquidity (Sahlman, 1990) of investments, the structural opacity of the asset class (Phalippou et al., 2018) and the legal template of the *Limited Partnership*. The French PE market provides a particularly informative institutional setting: Europe has been at the forefront of sustainable finance regulation with the EU Green Deal since 2020, and France already had in place several laws (LEC 29, PACTE) forcing asset managers of sustainable funds to disclose their ESG policy. The French PE ecosystem is also very active in worldwide initiatives such as initiative Climat International. I analyze the contractual and marketing documents of 89 French PE funds raised between 2017 and 2026, hand-coding architectural variables across objectives, resources, incentives and governance mechanisms. I apply multiple configurational clustering analyses to derive an empirically grounded typology in three steps. First, on the absence/presence of organizational features and other commercial variables such as the pursuit of a sustainable investment goal, the use of extra-financial incentives (EF Carried Interest), the constitution of a dedicated committee stating on extra-financial issues (EF Committee), and the definition of sustainability objectives given to portfolio companies (IMM Process). Second, on the design of the organizational features themselves, and finally on the use of the different modalities that emerged from the second step. I finally identify eight distinct organizational configurations (also called "signatures") that reveal a systematic heterogeneity invisible to existing classifications and show that the funds pursuing the most demanding sustainability strategies are often the least structurally equipped to manage the tensions between their financial and sustainability logics, potentially undermining their social impact potential. My sample does not claim to be representative of the market as participation in the study was voluntary, but it captures the full diversity of organizational practices deployed by sustainable PE funds in a leading European market.

Four main findings emerge from the analysis. First, sustainable funds do not form a homogeneous organizational category. These funds mobilize four main organizational mechanisms to

pursue their sustainability objective: (i) a formalized sustainable investment objective (contractualized or not), (ii) an impact management and measurement process at the portfolio company level, including the definition of extra-financial objectives for each investee (IMM), (iii) a dedicated extra-financial committee (EF Committee), and (iv) variable compensation (carried interest in the PE context) indexed on extra-financial objectives (EF carried). A first clustering on declared variables and mechanism presence/absence distinguishes three macro profiles: no sustainability process (14.6%), structured sustainability process without dedicated governance (33.7%), and structured sustainability process with dedicated governance (51.7%). Yet when I analyze the actual design of each mechanism and their combinations, eight distinct organizational architectures emerge. The macro-cluster "structured process with governance" alone distributes across six of these eight configurations. Existing studies and regulatory classifications (SFDR, impact label) treat sustainable funds as a relatively homogeneous group. My results show that this homogeneity is an unsupported assumption.

Second, each mechanism takes very different forms, and their combination is not random. The EF committee splits into two profiles (controlling vs. symbolic), the EF carried interest into four configurations (from generic indexation on means-based objectives to calibrated outcome-based thresholds), the IMM process into three levels of structuring, and the sustainable objective into three forms (non-contractualized, contractualized without targets, contractualized with targets). The carried interest illustrates this logic particularly well: very rare in Geczy et al. (2021) (9%), it appears in 47.2% of my sample but in four different modalities. This result invalidates the presence/absence approach and confirms the intuition of Kaufmann et al. (2025): the presence of a mechanism guarantees neither its effectiveness nor its disciplinary scope. Internal fit (Siggelkow, 2002) (the coherence among components, not the sophistication of an isolated mechanism) is the appropriate unit of analysis to determine the impact potential of an investment vehicle. This constitutes the first large-scale configurational test of the framework proposed in Denis and Mottis (2025).

Third, funds pursuing operational additionality[2] are often under-structured. Counter-intuitively, funds that declare an operational additionality strategy, theoretically the most demanding in terms of tensions between logics, are often less structured than those pursuing financial additionality[3].

[2]Funds deploying an operational additionnality strategy deliver social impact by influencing their portfolio companies practices through shareholder engagement

[3]Funds deploying a financial additionnality deliver social impact by investing in impact-native assets (with positive externalities), enabling their scaling.

Among operational additionality funds, only 25% have an EF committee (vs. 62% among financial additionality funds), only 24% display a fully structured IMM process (vs. 44%) and the EF carried interest appears in less constraining modalities. If operational additionality entails real trade-offs between financial and sustainability logics, it should be accompanied by more substantive control mechanisms. This misalignment between strategic ambition and architectural depth is the most salient empirical result of the paper: it points toward an incomplete or symbolic structuring for a significant share of operational additionality funds, opening the path to mission drift and undermining their impact potential.

Fourth, SFDR and impact classifications do not capture the actual organizational architecture. 90% of Article 9 funds and 92% of impact funds belong to the most structured architectures, sending a broadly coherent signal. Yet 4 Article 9 funds (13%) display minimal structuring, 4 Article 8 funds (10%) display a complete architecture, and 11 non-impact funds (16.4%) present an architecturally structured signature around a sustainability objective. The EF carried interest is the most discriminating mechanism (93% of Article 9 funds vs. 44% of Article 8 funds), but the SFDR classification captures neither the modalities of the carried interest, nor the composition and rights of the committee, nor the structuring of the IMM process. Intra-Article 8 heterogeneity is particularly strong: it is the only category represented across nearly all configurations.

This paper contributes to two streams of literature. First, to research on sustainable finance and impact investing. Most of the literature examines the actions happening on the financial markets (capital allocation and shareholder engagement) (Dimson et al., 2015; Flammer, 2021; Heinkel et al., 2001; Kölbel et al., 2020; Marti et al., 2024; Pástor et al., 2021). I shift the analysis upstream in the investment chain, to the interactions between asset owners and asset managers negotiating mandates and structuring funds (Denis & Mottis, 2025; Edmans et al., 2024). The few existing studies making this move analyze the contractual mechanisms of sustainable funds in a presence/absence framework (Geczy et al., 2021), document the role of impact-linked carried interest as a "mission lock" (Thirion et al., 2022) and suggest that managers' sustainable practices are determined by mandates (Edmans et al., 2024). These studies treat mechanisms in isolation, often within a bilateral contracting framework (Holmstrom & Milgrom, 1991), without an integrative view of the architecture. Building on organizational design theory (Siggelkow, 2002), I document that the impact potential of a sustainable investor lies in the configurational coherence of its organizational architecture, not in the isolated adoption of individual features. The additionality

strategy constitutes an empirically structuring variable for the compatibility between financial and sustainability objectives and for the depth of the resulting architecture. I also document a notable misalignment: funds pursuing operational additionality, the theoretically most demanding strategy in terms of inter-logic tensions, are often less structured than those pursuing financial additionality, creating the conditions for mission drift (Ebrahim et al., 2014) and undermining their social impact potential.

Second, the financial system and the shareholder/stakeholder debate. The classic corporate governance debate (Freeman et al., 2004; Jensen, 2001) frames the question of stakeholder enfranchisement at the level of the firm, and neither tradition has systematically asked who the shareholders are and how their organizations form and translate preferences into investment behavior. O. Hart and Zingales (2017) and O. D. Hart and Zingales (2022) begin to answer this question by proposing shareholder welfare maximization, and recent work on shareholder heterogeneity (DesJardine et al., 2023; Goranova & Ryan, 2022) documents behavioral differences across investor categories. Yet these studies treat institutional investors as relatively unitary entities without opening the organizational black box. This paper adds the organizational layer: the internal architecture of the investment organization constitutes a mechanism through which sustainable mandates translate (or fail to translate) the preferences of ultimate beneficiaries into investment behavior, (Denis & Mottis, 2025). More broadly, these findings suggest that the financial system can function as an architect of social impact by embedding stakeholder enfranchisement at the level of investors themselves (O. D. Hart & Zingales, 2022; Stoelhorst & Vishwanathan, 2024): if asset owners and asset managers structure mandates that grant the appropriate rights to the stakeholders of the sustainability logic, these constraints flow downstream to portfolio companies through standard governance mechanisms. System-level sustainability may thus be an organizational design problem before it is a market problem.

Section 2 reviews the related literature on sustainable finance, investors as hybrid organizations and organizational design, and existing sectoral studies on private equity and impact investing. Section 3 describes the empirical context, data collection, variable coding and clustering methodology. Section 4 presents the results: a macro view, micro analysis of mechanism modalities, configurational synthesis, confrontation with the additionality strategy, and the limits of SFDR and impact classifications. Section 5 discusses the contributions to sustainable finance and the shareholder/stakeholder debate, and develops managerial and regulatory implications. Section **??**

concludes with limitations and avenues for future research.

2 Theoretical Framework and Literature Review

This section reviews the literature that motivates and frames my study. I first examine the mechanisms of sustainable finance and argue for shifting the analytical focus from downstream investor-firm interactions to the upstream organizational design of investment vehicles (§2.1). I then develop the theoretical lens of hybrid organizations (§2.2) and establish why architectural coherence becomes critical as hybridization deepens (§2.3). Finally, I operationalize the framework by reviewing existing sectoral studies and identifying their collective gap (§2.4).

2.1 From Market Mechanisms to Organizational Design: Investors as Organizations

2.1.1 Mechanisms of Sustainable Finance and the Additionality Distinction

The literature on sustainable finance identifies two main mechanisms through which investors can influence firm behavior and generate social impact. The first is capital allocation: investors direct capital based on extra-financial criteria through exclusion screens, ESG tilts, best-in-class selection and, at the most ambitious end of the spectrum, impact investing, where the investor explicitly targets financial and social returns (Busch et al., 2021; Kölbel et al., 2020; Marti et al., 2024). Recent work on blended finance extends this logic by showing how catalytic capital structures can mobilize private investment toward high-impact projects in emerging markets (Flammer et al., 2025). Theoretical models predict that capital reallocation toward sustainable assets raises the cost of capital for excluded firms (Heinkel et al., 2001) and lowers it for greener ones (Pástor et al., 2021), but the magnitude and durability of these effects remain debated. The second mechanism is shareholder engagement: investors use their ownership rights (voting, dialogue, operational support) to promote sustainable practices within portfolio companies (Chuah et al., 2024; Goranova & Ryan, 2014, 2022). Empirical evidence suggests that coordinated engagement campaigns can improve firm-level ESG outcomes and increase voluntary disclosure (Dimson et al., 2015; Flammer, 2021), though the conditions under which engagement translates into real impact vary considerably. The effectiveness of both mechanisms depends on the investor's time horizon, competencies and credible

commitment to exit (Broccardo et al., 2022).

These two mechanisms differ in the nature of the impact they produce, a distinction captured by the concept of additionality. Kölbel et al. (2020) identify additionality as the criterion distinguishing "investor impact": it captures the change that would not have occurred without the investor's intervention. Financial additionality (or embedded impact) operates through capital allocation toward companies or assets whose core activity is intrinsically aligned with sustainability objectives. The investor's contribution is indirect: by providing capital to these activities, the investor enables their expansion. Operational additionality operates through active engagement: the investor intervenes in the operations, strategy or governance of portfolio companies to generate sustainability outcomes that would not have materialized otherwise (Marti et al., 2024). This second channel requires the investor to deploy competencies, resources and monitoring capacities beyond the financial investment itself. Financial and operational additionality thus differ not only in their mechanisms but also in the organizational demands they place on the investor: the former can be pursued within a conventional investment process, while the latter implies deeper organizational commitments and a higher potential for tensions between financial and sustainability objectives. I develop this distinction in §2.3.2.

These studies have significantly advanced scholarly understanding of the channels through which investors can serve sustainability objectives. They share, however, a common analytical stance: they treat the investor as a relatively unitary and homogeneous actor interacting with firms in the market, without examining how the investor itself is organized.

2.1.2 Moving Up in the Investment Chain

The contemporary financial system is heavily intermediated (O. Hart & Zingales, 2017). Capital flows through multiple layers of professional organizations (pension funds, insurance companies, asset managers) that manage assets on behalf of ultimate beneficiaries (Aguilera et al., 2025). This intermediation creates a chain of principal-agent relationships in which each layer introduces its own objectives, constraints and information asymmetries. Institutional investors have become the modern equivalent of the Berle and Means corporation, with agency problems between the organization and its own beneficiaries mirroring those traditionally attributed to the firm-shareholder relationship (Fisch, 2010). This structural evolution has given rise to "agency capitalism" (Bebchuk et al., 2017; Gilson & Gordon, 2013): a regime in which the dominant shareholders are themselves

agents, subject to fee structures and competitive dynamics that create systematic underinvestment in governance and monitoring (Bebchuk et al., 2017; McCahery et al., 2016). Shareholders are not a homogeneous group: their organizational form, mandate structure and incentive design produce distinct behavioral patterns (DesJardine et al., 2023; Goranova & Ryan, 2022). Yet the agency capitalism literature remains primarily anchored in an economic framework where mandates function as incentive contracts governing a bilateral relationship (Holmstrom & Milgrom, 1991). This framing captures the incentive dimension but does not address the broader organizational design problem: the question is not only how to align the agent's incentives but how to structure the objectives, resources, governance and control of the entire investment vehicle.

An initial step is taken in Denis and Mottis (2025). On the basis of an 18-month ethnography of a PE impact fund, this work shows that the impact potential of a sustainable investor is built upstream in the investment chain, within the organizational architecture of the fund, rather than downstream through market mechanisms. The mandates negotiated between asset owners and asset managers lock the architecture in place for the fund's entire lifecycle and frame subsequent investment and monitoring behavior. This architecture encompasses the formalization of objectives, the acquisition of dedicated resources and competencies, and the design of governance and control structures. The key insight is that the design problem is not one of bilateral contracting only, but of organizational design under hybridity constraints: the fund must structure itself to sustain the simultaneous pursuit of financial and sustainability logics over the long run.

Complementary evidence supports this conclusion. Edmans et al. (2024) survey 509 portfolio managers and find that 71% report acting on the basis of mandate constraints or firm-wide policies rather than intrinsic motivation, confirming that upstream structuring drives sustainable investment practices. Flammer et al. (2025) document that organizational constraints and mandate limitations of institutional investors constitute a major barrier to the development of blended finance in emerging markets. Lowry et al. (2025) show that the incentives to dedicate resources and engage in sustainable finance vary systematically across investor types and organizational structures.

Tracing the investment chain upstream, sustainable finance appears as an organizational design problem. Investors that pursue sustainability objectives become hybrid organizations combining potentially contradictory logics, where internal tensions can undermine the very objectives they seek to achieve.

2.2 Sustainable Investors as Hybrid Organizations

2.2.1 Organizational Hybridity in Investment Organizations

The coexistence of a financial logic and a sustainability logic within the same organization creates a condition of organizational hybridity (Battilana et al., 2017). Hybrid organizations face specific risks: tensions between logics, coordination problems, legitimation challenges (Battilana, 2018) and the risk of mission drift, the progressive abandonment of one objective under the pressure of the other (Ebrahim et al., 2014).

This theoretical lens has been developed primarily on social enterprises, cooperatives and microfinance organizations (Battilana & Dorado, 2010; Mair et al., 2015). Battilana et al. (2022) extend the framework to dual-purpose companies, showing that governance acts as a filter of institutional pressures: the specificity and explicitness of financial and social objectives reduce the intensity of trade-offs, while moderate incentive structures avoid multitask distortion and crowding-out effects. Investment organizations represent a new empirical domain for hybrid organization theory: unlike social enterprises, they do not grant total primacy to the social objective, they do not offer a clear exit option for beneficiaries, and they operate within a system of nested principal-agent relationships. Yet the core analytical framework (dual accountability, the role of governance as a filter of logics, the conditions under which hybridity can be sustained) is directly transposable. The accountability challenge that Ebrahim et al. (2014) identify for social enterprises ("accountability for what" and "accountability to whom") applies with equal force to sustainable investment funds that claim to serve both financial investors and sustainability beneficiaries.

2.2.2 Centrality and Compatibility of Institutional Logics

The critical variable is not merely the *presence* of a sustainability objective but its *position relative to* the financial objective within the organization's decision-making. Besharov and Smith (2014) propose a framework structured around two dimensions: centrality (whether both logics guide core decisions) and compatibility (whether the logics prescribe consistent behaviors). When centrality is high, tensions are more intense, when compatibility is low, tensions are harder to manage.

The sustainability objective can be instrumental (pursued as a means to enhance financial performance, as in ESG risk integration) or pursued as an end in its own right, as in impact investing. This articulation determines the degree of hybridization and, consequently, the organizational

challenges the fund faces.

Yan et al. (2021) study the compatibility of institutional logics at the field level, showing that compatibility is not a fixed property but depends on how logics are concretely articulated through means (resources, competencies, practices) and ends (normative objectives).

Conceptual framing: degree of hybridization. The articulation between the sustainability objective and the financial objective determines the degree of hybridization of the investment organization. When the sustainability objective is pursued as an end in its own right (and not instrumentally in the service of financial performance), the degree of hybridization is higher and the tensions inherent to hybridity are more intense, because both logics become central to organizational decisions. This framing establishes the main independent variable of the paper. Empirically, it is captured by the formalization of the sustainability objective in contractual documents, and the declared additionality strategy.

2.3 Organizational Design Under Hybridity

I define the *sustainability logic* as an institutional logic that orients action toward the production of extra-financial benefits (social or environmental) for stakeholders beyond financial investors alone. It is distinguished from the *financial logic*, oriented toward the maximization of risk-adjusted returns for asset owners. In the investment industry, this definition encompasses the range of sustainability ambitions observed in practice, from ESG risk management to explicit impact targets.

2.3.1 Hybridization and the Coherence of the Organizational Architecture

The coexistence of multiple logics within a single organization cannot rest on declarations of intent alone. Objectives, resources, measurement systems, incentives, control mechanisms and governance structures must be aligned so that the components of the architecture reinforce one another (Siggelkow, 2002). The productive tensions between logics must be organizationally framed, not eliminated.

The literature on hybrid organizations provides extensive evidence on the conditions under which hybridity can be sustained. Battilana (2018) identify four organizational pillars (the formulation of objectives, the structuring of activities, the selection of members and their socialization) and argue that coherence among these pillars is a condition of sustainability. Smith and Besharov (2019) describe a dynamic of "structured flexibility": sustainable hybrids establish structural com-

mitments (guardrails) that prevent drift toward a dominant logic while maintaining the flexibility necessary to manage tensions in daily operations. Battilana et al. (2022) show that in dual-purpose companies, more specific and explicit financial and social objectives reduce the intensity of trade-offs, and that moderate incentives avoid multitask distortion and crowding out. Mair et al. (2015) distinguish conforming hybrids (prioritizing one logic and superficially adopting the other) from dissenting hybrids (proactively combining both logics), with governance as the central balancing mechanism. Pache and Santos (2013) introduce the concept of selective coupling: hybrid organizations select elements from each logic, and this coupling can be deep (genuine integration) or superficial (ceremonial adoption for legitimacy).

Beyond hybrid organization theory, the broader literature on organizational design provides an analytical vocabulary for understanding architectural coherence. Organizational design theory frames the organization as a configuration of interdependent components whose joint alignment determines performance (Burton & Obel, 2004, 2018). Miller (1996) establishes that effective organizations achieve coherence through configurations in which strategy, structure and processes form mutually reinforcing patterns, not through the optimization of isolated components. Siggelkow (2002) demonstrates, through the case of Vanguard, that internal fit operates through complementarities: each element of the architecture reinforces the others, and the addition or modification of one component affects the entire system. Siggelkow (2011) formalizes this insight through the concept of activity systems, where the unit of analysis is the pattern of interdependencies rather than any single element. Joseph and Sengul (2025) synthesize the field and confirm that organizational design is fundamentally a configurational problem: the question is not whether an organization possesses the right components in isolation but whether these components form a coherent whole. This configurational perspective is directly relevant to hybrid organizations: sustaining dual logics requires not the adoption of individual mechanisms but the design of an internally consistent architecture.

The literature on organizational control provides a complementary perspective on one specific dimension of this design. Cardinal et al. (2017) distinguish behavior-based control (monitoring inputs and processes) from outcome-based control (monitoring results). In hybrid organizations, these two modes serve different functions: behavior-based control orients the agent's activities toward expected practices, while outcome-based control verifies that the objectives of each logic are effectively pursued. The choice between these modes depends on the observability of the agent's

behavior, the measurability of outcomes and the degree of trust between principals and agents (Cardinal et al., 2004).

These theoretical foundations lead to my first proposition:

Proposition 1 (Architectural coherence). *The stronger the degree of hybridization, the more critical the coherence of the organizational architecture becomes: the formalization of objectives, the acquisition of dedicated resources, and the design of incentive and control mechanisms must be aligned to sustain the simultaneous pursuit of both logics.*

2.3.2 Compatibility Between Logics and the Depth of Organizational Design

In hybrid organizations, the need for a sophisticated organizational design depends not only on the degree of hybridization but also on the effective compatibility between the logics combined. Compatibility refers to the extent to which pursuing the objectives of one logic mechanically advances the objectives of the other. When compatibility is strong, tensions are structurally reduced. When it is weak, pursuing one logic creates costs or obstacles for the other.

Besharov and Smith (2014) predict that tensions are most intense when compatibility is low and centrality is high. Yan et al. (2021) confirm that compatibility is not a fixed state but depends on the concrete articulation of practices.

When the logics are strongly compatible, trade-offs are structurally reduced. The architecture can remain more centered on the dominant logic (financial, in the case of investment funds), provided it incorporates measurement and verification devices that confirm the expected benefits of the secondary logic are effectively materializing. Kaufmann et al. (2025) caution, however, that measurement can serve a relational function (alignment, communication, legitimacy) rather than a disciplining one. A complete measurement system does not guarantee effective control: it can function as a "rational myth." When compatibility is strong, this risk is attenuated because performance on the dominant logic tends to pull performance on the secondary logic. But the risk must be acknowledged.

When compatibility is weak, measurement alone does not suffice because it can be decoupled from its ends (Besharov & Smith, 2014; Yan et al., 2021). The architecture requires more substantive control mechanisms (real control rights such as veto, approval and co-decision) along with incentives aligned on both logics and explicit trade-off management devices: arbitration procedures, dedicated expertise and contractualized obligations.

The attention-based view of the firm provides an additional lens for understanding this variation. Ocasio (1997) argues that organizational design channels the attention of decision-makers: the structures, rules and procedures of the organization determine which issues are attended to, by whom, and with what priority. Ocasio and Wohlgezogen (2010) formalize the concept of attention channeling, showing that organizational structures allocate scarce managerial attention across competing demands. In hybrid organizations, the non-dominant logic is structurally disadvantaged in the competition for attention: the dominant logic benefits from established routines, metrics and incentive structures that direct attention toward it by default. When compatibility between logics is strong, a minimal set of monitoring and verification devices may suffice to maintain attention on the secondary logic, because performance on the dominant logic also advances the secondary logic. When compatibility is weak, the organization must deploy formal mechanisms (dedicated governance bodies, contractualized obligations, explicit reporting requirements) that channel attention toward the non-dominant logic and prevent it from being crowded out by the dominant one

Proposition 2 (Compatibility of logics). The form that architectural coherence must take depends on the degree of compatibility between the logics combined by the hybrid organization. When logics are strongly compatible, the architecture can rely primarily on measurement and verification devices. When compatibility is weaker, the management of tensions requires more substantive control and incentive mechanisms, including control rights over the allocation of the agent's resources. In the case of sustainable funds, the additionality strategy operationalizes this compatibility: financial additionality corresponds to strong compatibility, while operational additionality corresponds to weaker compatibility.

In the case of sustainable investment funds, the additionality strategy operationalizes the compatibility between logics. *Financial additionality* (embedded impact) means that the investment targets companies whose core activity is intrinsically aligned with sustainability objectives: pursuing financial returns mechanically advances the sustainability logic. Compatibility is structurally strong. *Operational additionality* means that sustainability impact requires actions beyond the financial investment itself (operational support, transformation of practices, restructuring) that consume resources and can create tensions with financial performance. Pursuing the sustainability logic creates costs for the financial logic. Compatibility is weaker, and real trade-offs arise.

2.4 The Organizational Architecture of Sustainable Investment Funds: Preliminary Evidence

2.4.1 Private Equity and the Observability of Organizational Architecture

Sustainable investment funds provide a privileged setting for observing the theoretical problem developed above. The dissociation between financial stakeholders (LPs) and sustainability stakeholders (impact beneficiaries) is particularly visible and formalized. Rights and mechanisms are observable in the contractual documentation: formalized objectives, dedicated resources (sustainability teams, sustainability processes), incentive mechanisms, and control mechanisms (dedicated governance body with precise rights). Private equity amplifies these characteristics: for LPs, illiquidity and long-term commitment without operational control make the ex ante negotiation of contracts and fund structures paramount (Jensen, 1989; Kaplan & Stromberg, 2009; Sahlman, 1990).

2.4.2 Existing Empirical Evidence and Its Limits

Several recent studies have examined specific aspects of the organizational architecture of sustainable investment funds.

Geczy et al. (2021) provide the foundational empirical contribution: a systematic analysis of 207 legal documents (LPAs, PPMs, term sheets, LOIs) across 53 US impact funds. Their theoretical framework draws primarily on Holmstrom and Milgrom (1991): the problem is framed as a multitask effort allocation by the agent (GP) between financial performance and impact, where compensation rewards only one dimension. Key results: 98% of funds include aspirational impact terms, 70–80% integrate impact in due diligence and measurement, 17% have an impact committee and only 9% index compensation on impact. Geczy et al. (2021) interpret the low prevalence of impact-linked compensation through the complementarity between tasks (when tasks are complementary, compensating one suffices) and through "narrow framing" (contracts are adapted from non-impact funds rather than redesigned). Three features limit this contribution. First, the bilateral contracting framework (principal-agent) misses the organizational implications of pursuing multiple objectives: the question is not only how to incentivize the agent but how to structure the entire organization. Second, the presence/absence coding of mechanisms does not capture their modalities, as a committee can be symbolic or controlling and a carried interest can be means-based

or outcome-based. Third, the sample is dominated by embedded impact (financial additionality), which structurally reduces tensions between logics and makes the complementarity hypothesis more plausible but represents only a subset of sustainable funds.

Thirion et al. (2022) focus on carried interest indexed on impact objectives, conceptualizing it as a "mission lock" that binds the GP's incentives to impact delivery. They document the risks of gaming and the need for third-party validation. The contribution examines a single mechanism without situating it within the broader organizational architecture.

Bandini et al. (2022) argue conceptually that impact must pervade the entire business model and that governance is the dimension where tensions between financial and impact logics are most visible. The contribution remains at the conceptual level, without systematic empirical evidence on the variation in organizational architectures across a market.

Kaufmann et al. (2025) document three mechanisms through which impact measurement can become decoupled from its stated ends: communication on significations (impact framing to align asset owners without guiding decisions), categorization (impact data cited to justify successes but not underperformance), and domain construction (participation in defining sectoral impact norms independently of actual performance). The central insight, that the presence of a measurement process does not guarantee its disciplining function, raises a broader question: under what conditions does measurement discipline the agent rather than serving a relational function?

Edmans et al. (2024) survey 509 portfolio managers across 351 firms and find that sustainable investment practices are primarily mandate-driven rather than conviction-driven. This confirms the importance of upstream organizational structuring but does not examine the architecture that underlies these mandates.

Yang and Yasuda (2025) apply NLP methods to the offering memoranda of listed sustainable funds, capturing the language of sustainability commitments. The contribution documents declared intentions but does not examine the concrete organizational mechanisms that give those declarations operational content.

The collective gap across these studies is clear: they examine isolated components (contracts, carried interest, measurement, intentions) without proposing an integrative framework for analyzing the complete architecture and its variation as a function of the degree of hybridization and the compatibility of logics. The dominant theoretical framework, bilateral contracting (Holmstrom & Milgrom, 1991), treats the problem as an effort allocation trade-off for the agent, ignoring the

organizational context in which this effort happens.

3 Data and Methods

This section presents the empirical context (§3.1), the data collection process (§3.2), the variables collected (§3.3), the clustering methodology (§3.4), and the analytical process (§3.5).

3.1 Empirical Context: Private Equity in France

Private equity provides a particularly informative setting for studying the organizational architecture of sustainable investment funds. The PE industry is heavily intermediated by multiple layers of professional organizations (Sahlman, 1990) that develop complex mechanisms to mitigate the high agency costs inherent to the relationship between limited partners (LPs, asset owners) and general partners (GPs, asset managers) (Jensen, 1989). The structural illiquidity of PE commitments and the typical fund life of 10-12 years force asset owners to rely on governance mechanisms negotiated ex ante with asset managers (Sahlman, 1990), rendering organizational design choices particularly visible and formalized in contractual documentation. PE investors hold a long-term orientation and exercise significant control over portfolio companies (Kaplan & Stromberg, 2009), which confers a high potential for social impact through engagement. PE also represents approximately 65% of global impact investing assets (Hand et al., 2023), having access to impact-native assets such as infrastructure projects, or socially driven start-ups.

The French PE market also provides a particularly relevant setting for several reasons. Europe is at the forefront of sustainable finance regulation, and France has developed an ambitious and early regulatory framework.

The *Loi PACTE* (2019) introduced the concept of "raison d'être" (corporate purpose) and the status of "société à mission" (mission-driven company), signaling an institutional evolution toward the integration of non-financial stakeholders. The *Article 29 of the Loi Énergie-Climat* (2019, application decree 2021) imposes reporting obligations on French institutional investors regarding the integration of climate and biodiversity risks, going beyond the European SFDR framework. The *Sustainable Finance Disclosure Regulation* (SFDR, 2021) requires asset managers to classify their financial products according to their level of sustainability integration (Article 6, 8, 9), creating an observable signal in contractual documentation.

France Invest, the professional association of the French PE industry, has played a structuring role in the integration of ESG criteria (GT Impact, 2021; Invest & iCI, 2022; Invest & PwC, 2021) with the involvement of several GPs. Crifo and Mottis (2016) provide an early overview of socially responsible investment in France, and Crifo and Forget (2013) details this dynamic in the PE industry.

3.2 Data Collection

The sample consists of 89 French PE funds capable of investing in equity, regardless of the maturity or type of underlying companies, raised since 2017. I exclude funds-of-funds and single-LP vehicles to focus on direct funds managed by independent management companies. Over the course of the data collection, 175 GPs were contacted, 91 were interviewed and 43 provided fund-level documentations. 95 funds were initially processed (55 buyout, 31 venture capital, 7 infrastructure, 2 funds-of-funds), after excluding mono-LP funds and fund-of-funds, the final sample consists of 89 direct PE funds. Among these, 22 are classified as impact funds, 42 as SFDR Article 8 and 30 as SFDR Article 9. Table 1 presents the general characteristics of the sample.

Table 1: Sample Description — General

Metric	N	Count / Non-zero	Mean / Share	Median	SD
Buyout funds	89	53	59.6%	–	–
Infrastructure funds	89	7	7.9%	–	–
Mainly majority positions	89	40	44.9%	–	–
Mainly minority positions	88	47	53.4%	–	–
Venture capital funds	89	29	32.6%	–	–
Maximum ticket (€m)	74	–	19.60	15	17.96
Minimum ticket (€m)	75	–	5.08	3	6.20
Impact funds	89	22	24.7%	–	–
SFDR Article 6	89	13	14.6%	–	–
SFDR Article 8	89	42	47.2%	–	–
SFDR Article 9	89	30	33.7%	–	–

3.2.1 Methodological Choice: Direct Analysis of Contractual & Marketing Documents

I analyze the contractual documentation of each fund directly, rather than administering a survey. This choice is motivated by two considerations. First, contractual documents (LPAs, PPMs, side letters) constitute the formalized product of negotiations between asset owners and asset managers. They reflect organizational design choices as they are effectively agreed upon, not as they are declared. Second, direct contract analysis eliminates social desirability bias: in a context of regulatory pressure and impactwashing risk, managers have an incentive to overstate their sustainable practices in survey responses. Contracts, by contrast, are legally binding. Third, it eliminates self-report bias: respondents may not know the exact details of contractual clauses or may interpret them differently.

Geczy et al. (2021) provide the methodological precedent, analyzing 207 legal documents across 53 US impact funds. My approach extends this design to a larger sample (89 funds) and a more diverse population (including non-impact funds). Edmans et al. (2024) illustrate the complementary survey approach but acknowledge that declared practices may diverge from contractualized ones.

The collected documents include PPMs (commercial documentation), LPAs (legal documentation), ESG charters and side letters (supplementary commitments). All variables were manually coded from these documents, yielding approximately 120 variables drawn from academic literature and market frameworks. The complete variable dictionary is presented below (§3.3) in summary form and in full detail in Appendix A.3.

3.2.2 Sample Biases and Limitations

Participation was voluntary, and the sample therefore overrepresents actors sensitive to sustainability issues. The least engaged funds are likely underrepresented. However, I overcame this bias by asking participants to provide the documentation of their earlier vintages (up to 2015). The diversity of strategies observed — from the absence of any sustainability process to complete architectures — suggests that the sample captures a significant range of configurations. The sample covers the French market only and does not claim representativeness of the global PE market. However, the French market is arguably the most informative setting for understanding the diversity of sustainable finance strategies, given its institutional environment. Finally, the collected documents formalize ex ante commitments but do not allow direct observation of effective practices

or financial and extra-financial performance. This limitation is inherent to the PE context: LPs themselves generally do not observe day-to-day practices and rely on the contractual architecture as a minimum control baseline.

3.3 Variables

3.3.1 Two-Level Coding Logic

Variables are organized in two levels of coding, reflecting the distinction between the presence of a mechanism and its design modalities. This two-level structure represents the main methodological advance over Geczy et al. (2021), who code in presence/absence.

Macro level (overall architecture): General characteristics of the vehicle (buyout/VC/infrastructure, ticket sizes) and level of extra-financial structuring — presence of a sustainable investment objective, presence of key ESG processes (screening, monitoring, reporting), and presence of structuring resources and mechanisms (sustainability team, EF committee, EF carried interest). These variables are coded for all 89 funds and capture the "facial" architecture observable in commercial and legal documentation.

Micro/modular level (mechanism design): When mechanisms are present, I code the detailed modalities of their design: (i) characterization of the sustainability objective pursued, (ii) modalities of carried interest indexation, (iii) composition and effective rights of the EF committee, (iv) modalities for defining and monitoring sustainability objectives at the portfolio company level (Impact Management and Measurement, IMM), and (v) degree of contractualization of ESG commitments in the fund's legal documentation. This level captures the depth and substance of each mechanism.

3.3.2 Variable Dictionary

The complete variable dictionary, including general, macro and module-level variables, is provided in Appendix A.3. For each step of the analysis, descriptive tables provide precise definitions of each variables.

The micro-level variables are organized in five modules. The *EF carried module* (10 variables, coded for 42 funds) captures the mechanism of indexation on EF objectives: the share of carried interest indexed, the nature of objectives (outcome-based vs. means-based), their level (PC-specific

vs. fund-global), the vesting mechanics (linear vs. stepwise), trigger and full-vesting thresholds. The *EF committee module* (13 variables, coded for 30 funds) captures the committee's decision rights (validation of KPIs, targets, measurement, carried payout, investment eligibility) and composition (LP representation, independent members). The *sustainable objective module* (9 variables, coded for 52 funds) captures the type of objective pursued (environmental, social), the additionality strategy deployed (financial, operational), and some contractualization practices (intentionality, Impact Management Process). The *IMM module* (6 variables, coded for 70 funds) captures the integration of objectives into PC-level legal documentation, in management package integration.

The comparison with Geczy's variables is provided systematically in the results section for each directly comparable metric.

3.4 Clustering Methodology and Robustness

3.4.1 Configurational Clustering

Cluster analysis is an established method in strategic management for identifying organizational configurations — sets of organizations that are similar on key characteristics (Ketchen & Shook, 1996; Short et al., 2008). I adopt a configurational approach (Misangyi et al., 2017) rather than qualitative comparative analysis (QCA) because my objective is exploratory: I seek to discover empirical configurations without imposing a priori conditions. Clustering is appropriate for this type of inductive exploration, whereas QCA is better suited to the confirmatory search for necessary and sufficient conditions (Greckhamer et al., 2018).

A variable-by-variable analysis of proportions ("x% of funds have an EF committee") describes isolated practices but does not reveal how these practices combine into coherent configurations. Sustainability mechanisms often function as a system: some reinforce one another (complementarities), others substitute, and certain combinations signal more or less developed approaches. Clustering synthesizes this complexity by producing complete and comparable profiles.

3.4.2 Technical Choices

Gower distance. I use the Gower distance (Gower, 1971), which is designed for mixed data types (binary, ordinal, continuous). It treats each variable type according to its own nature. Binary variables use simple matching distance (0 or 1), with a distinction between symmetric variables

(0-0 creates similarity, e.g., buyout flag) and asymmetric variables (0-0 is not informative, e.g., EF carried flag — two funds without carried interest do not resemble each other on this dimension). Ordinal variables (0, 0.5, 1) are treated as normalized ranks. Continuous variables (e.g., carried interest amount, trigger thresholds) use Manhattan distance normalized by range.

PAM algorithm. I use the Partitioning Around Medoids (PAM) algorithm (Kaufman & Rousseeuw, 1990), a robust variant of k-means for mixed data. PAM selects actual observations as cluster centers (medoids), making it more robust to outliers than k-means and producing interpretable results (each cluster has a representative fund). PAM combines naturally with the Gower distance.

Selection of K. I test a grid of K from 2 to 10 (for macro modules) or adapted to the subsample size for micro modules. The primary criterion is maximization of average silhouette width (Rousseeuw, 1987), which measures the quality of each assignment by comparing within-cluster distance to the nearest between-cluster distance. A minimum cluster size constraint (at least 10% of the sample) prevents artefactual clusters. For micro modules, complementary stability criteria (median ARI and Jaccard index of the minority cluster) are applied.

Visualization. Multiple Correspondence Analysis (MCA) projects the funds onto a two-dimensional space and visualizes proximities between profiles. The first two axes explain 56.6% of the variation at the macro level. MCA serves as a complementary visual representation, not as a primary analytical result.

3.4.3 Robustness Tests

Four complementary tests validate the stability of the clustering solutions. Detailed results are reported in Appendix A.5.

Random subsampling. $B = 1{,}000{,}000$ iterations of random 80% subsampling, re-clustering with the same K, and measurement of stability via the Adjusted Rand Index (Hubert & Arabie, 1985). A median ARI > 0.8 indicates a stable solution.

Stratified subsampling. The same procedure preserving cluster proportions in the subsample, testing stability conditional on the detected structure.

Leave-k-out (LKO). Systematic removal of 1, 2 or 5 observations from the minority cluster (the most sensitive), re-clustering and ARI measurement. This tests sensitivity to the most influential observations.

Jaccard index by cluster. For each cluster and subsampling iteration, the Jaccard index between cluster members in the subsample and in the reference solution. A median Jaccard > 0.5 for the minority cluster indicates acceptable stability.

These tests are important given the sample size ($n = 89$ at the macro level, $n = 30$ to 70 for micro modules). They follow the recommendations of Ketchen and Shook (1996) and Short et al. (2008) on the validation of clustering solutions in management research.

3.5 Analytical Process

The analysis follows a three-phase structure, justified by the need to distinguish overall architectural choices from the fine-grained modalities of each mechanism and then to reintegrate them into a configurational view.

Phase 1 — Macro analysis: global sustainability profiles. I first identify the broad sustainability structuring profiles from the macro-level variables (presence/absence of key mechanisms). This phase produces a partition of the 89 funds into 3 macro clusters describing a continuum of sustainability structuring, from the absence of any sustainability process to a complete architecture with dedicated governance. This step is directly comparable with Geczy et al. (2021), whose analysis operates at this level.

Phase 2 — Micro/modular analysis: mechanism design. For each mechanism present (sustainable objective, EF carried, EF committee, IMM process, ESG contractualization), I identify the typical design configurations by analyzing the mechanism variables. This phase produces, for each module, a partition of the relevant funds into modality clusters (e.g., EF carried $\rightarrow$ 4 profiles, EF committee $\rightarrow$ 2 profiles). The clustering is conditional on mechanism presence: micro-level choices are interpreted hierarchically, conditional on the macro-level decision to adopt the mechanism. This avoids imposing artificial distances between a fund without a committee and a fund with a controlling committee.

Phase 3 — Configurational synthesis: organizational signatures[4]. I integrate the macro and micro results to identify complete organizational configurations — configuration-types combining overall architectural choices with mechanism modalities. This phase produces a final typology of 8 organizational signatures. Complementary tools include the analysis of inter-module associations (Cramér's V) to document the interdependence of design choices, an alluvial diagram

[4]In the empirical section, "organizational configurations" and "organizational signatures" have the same meaning

to visualize the distribution of macro clusters across signatures, and cross-tabulations with SFDR and impact classifications.

This three-phase structure reflects the theoretical logic of the paper: what matters is not the isolated presence of a mechanism (Geczy's level of analysis) but its precise modalities and the way it combines with others in a coherent architecture. The analysis demonstrates this progressively.

4 Results

This section documents the organizational heterogeneity of French PE funds developing sustainable finance strategies. I develop the analysis in five steps. First, a macro view of sustainability structuring profiles, compared with Geczy et al. (2021) (§4.1). Second, a micro analysis of the modalities of each organizational mechanism (§4.2). Third, a configurational synthesis crossing mechanisms to produce organizational signatures (§4.3). Fourth, a cross-cutting analysis by additionality strategy and type of sustainable objective (§4.4). Fifth, a confrontation of these signatures with SFDR and impact classifications (§4.5).

4.1 Macro View: Three Sustainability Structuring Profiles

4.1.1 Clustering Variables and Descriptive Statistics

Table 2 presents the variables used in the macro clustering, their definitions and descriptive statistics. These variables capture the overall sustainability architecture of each fund as observable in its commercial and legal documentation.

The majority of funds share a common ESG procedural baseline: 89.9% integrate sustainability indicators in their investment screening, 80.9% have an annual measurement process and 78.7% set extra-financial objectives at the portfolio company level. Yet this shared baseline does not imply homogeneous organizational structuring. The variables that differentiate funds concern the formalization of a sustainable investment objective (58.4%), the presence of a dedicated sustainability team (53.9%), an EF carried interest (47.2%) and an EF committee (33.7%).

Table 3 compares the prevalence of directly comparable macro-level mechanisms across my sample and Geczy et al. (2021).

The most striking differences concern the EF committee (33.7% vs. 17%) and the EF carried interest (47.2% vs. 9%). On impact funds only, these rates rise to approximately 76% and 91%

Table 2: Macro Clustering Variables — Definitions and Descriptives

Variable	Definition	Source type	N	Mean / Share	Std. dev.
Aspirational ESG Statement	Aspirational ESG statement	Marketing	89	84.3%	–
ESG Consulting	Mention of the use of an ESG consulting firm	Marketing	89	42.7%	–
ESG Screening Process	Mention of a screening process in the PPM	Marketing	89	65.2%	–
ESG Support Process	Mention of an ESG support process in the PPM	Marketing	89	50.6%	–
Sustainability Team	Dedicated sustainability team	Marketing	89	53.9%	–
Sustainable Investment Objective Flag	Fund aims to contribute to environmental or social objectives	Marketing	89	58.4%	–
Focused	Fund is focused on a specific sector or theme	Legal	89	48.3%	–
IMM: Screening	Flag for sustainability indicators integrated into investment analysis	Marketing	89	89.9%	–
IMM: Objectives	Flag for the setting of EF objectives at the portfolio company level	Marketing	89	78.7%	–
IMM: Measurement Process	Flag for annual measurement process	Marketing	89	80.9%	–
Functions Covered	Number of functions covered through frameworks	Marketing	89	2.61	2.03
EF Committee	External governance body in the form of an impact committee or equivalent	Legal	89	33.7%	–
EF Carried Flag	The fund has a carried interest linked to EF objectives	Legal	89	47.2%	–

Table 3: Macro Descriptives Compared with Geczy (2021)

Mechanism	Geczy 2021	Our sample (89)
Aspirational terms / intentionality	98%	84.3%
Explicit sustainable objective	implicit, all impact	58.4%
Impact in DD / screening	70-80%	89.9% / 65.2%
Impact metrics / measurement	70-80%	80.9%
Impact committee	17%	33.7%
Impact-linked compensation	9%	47.2%
Dedicated sustainability team	not coded	53.9%

respectively. This gap can reflect (i) temporal evolution (the funds in my sample are post-2017 vs. earlier vintages in Geczy), (ii) the European regulatory context (SFDR, Green Deal), (iii) sampling differences, and (iv) the composition of samples in terms of additionality strategy: Geczy's sample is dominated by embedded impact (financial additionality), for which trade-offs between financial and sustainability performance are structurally weaker, reducing the need for carried interest and dedicated committees. My sample includes a significant share of funds pursuing operational additionality, for which these trade-offs are more intense.

4.1.2 Three Macro Clusters

A PAM clustering on the macro-level variables produces three stable clusters describing a continuum of sustainability structuring (Table 4).

Table 4: Three Macro Sustainability Clusters

Cluster	n	%
No sustainability process	13	14.6%
Sustainability process without governance mechanisms	30	33.7%
Sustainability process with governance mechanisms	46	51.7%

Table 5: Macro Clusters — Signature Variables

	C1		C2		C3	
Variable	p_c	score	p_c	score	p_c	score
Focused	30.8%	-0.16	26.7%	-0.22	67.4%	+0.39
EF Committee	7.7%	-0.24	3.3%	-0.31	60.9%	+0.55
ESG Consulting	0.0%	-0.47	30.0%	-0.02	63.0%	+0.48
EF Carried Flag	0.0%	-0.49	16.7%	-0.24	80.4%	+0.72
Sustainability Team	7.7%	-0.50	36.7%	-0.06	78.3%	+0.56
ESG Support Process	0.0%	-0.55	36.7%	-0.00	73.9%	+0.56
Aspirational ESG statement	30.8%	-0.61	83.3%	+0.18	100.0%	+0.43
Sustainable Investment Objective Flag	0.0%	-0.62	33.3%	-0.12	91.3%	+0.75
IMM: Screening	30.8%	-0.69	100.0%	+0.35	100.0%	+0.35
ESG Screening Process	0.0%	-0.74	63.3%	+0.21	84.8%	+0.53
Functions Covered	-1.09	-1.18	-0.36	-0.09	0.55	+1.28
IMM: Measurement Process	0.0%	-0.94	93.3%	+0.46	95.7%	+0.49
IMM: Objectives	0.0%	-0.91	86.7%	+0.39	95.7%	+0.52

Reading note. For continuous variables, p_c represents the cluster mean. The score measures the difference between the cluster mean and the out-of-cluster mean, normalized by the overall range.
Robustness. Random subsampling (10^6 iterations): median ARI = 0.94. Full results in Appendix A.5.

Table 5 presents the signature variables for each cluster.

Cluster 1 (no sustainability process, 13 funds) groups funds with no formalized sustainability architecture. Even basic ESG processes are largely absent, and none has an EF carried interest or sustainable investment objective.

Cluster 2 (structured process without governance mechanisms, 30 funds) displays a strong ESG procedural infrastructure. These funds apply screening (100%), measure ESG KPIs annualy (93%) and frequently set objectives at the investee level (87%). Yet virtually no dedicated organizational mechanism accompanies this procedural baseline: only 3% have an EF committee and 17% have an EF carried interest. These funds build sustainability processes but do not create organizational mechanisms to govern the sustainability logic. Only 37% have a dedicated sustainability team and only 33% formalize a sustainable investment objective.

Cluster 3 (structured process with governance mechanisms, 46 funds) adds organizational features on top of the shared procedural baseline: 91% have a sustainable investment objective, 78% a dedicated sustainability team, 80% a carried interest indexed to sustainability objectives and 61% an EF committee. Yet even within this cluster, heterogeneity persists: not all funds have all four mechanisms.

The MCA projection of the 89 funds and the three clusters is provided in Appendix B.3.

These three macro clusters describe a continuum of hybridization: C1 represents the absence of hybridization, C2 a partial hybridization limited to resources and processes, C3 a more complete hybridization engaging objectives, resources and formal governance mechanisms (incentives and control). This gradient illustrates Proposition 1: as the degree of hybridization increases, the architecture becomes more complex and the coherence among components becomes critical. The result also confirms that sustainable funds do not form a homogeneous organizational category: they present multiple shades of structuring, and the organizational architecture constitutes a more informative lens than binary classifications (sustainable vs. non-sustainable) or regulatory labels, or the use of isolated mechanisms (EF carried, EF committee, etc.).

Yet these macro clusters describe surface-level structuring and reveal nothing about how mechanisms are actually designed when they are used. The next section analyzes the design modalities of each mechanism.

4.2 Micro View: Design of Organizational Mechanisms

Beyond the presence of a mechanism, its precise modalities determine the degree of coercion, control and alignment it exerts on the asset manager. Two funds can display the same mechanism while giving it a radically different scope.

4.2.1 Sustainable Investment Objective (52 Funds)

Among the 89 funds, 52 indicate that they contribute to a sustainable objective (environmental or social) through their investment activities. Table 6 presents the variables used to characterize the design of this objective. The majority of these 52 funds pursue an environmental objective (88.5%), and 28.8% pursue a social objective. Financial additionality dominates (67.3%), with 38.4% pursuing operational additionality. Among the contractual variables, 64% formalize their intention to generate positive impact in the investment policy and 62% embed the IMM process in the fund's legal documentation, beyond the SFDR annex. Funds with a broad sustainability objective backed by a scientific or industrial framework remain a minority (9.6%).

Table 6: Sustainable Objective — Variables, Definitions, and Descriptives

Variable	Definition	Source type	N	Mean / Share
Financial Additionality	Fund primarily allocates capital toward virtuous assets	Marketing	52	67.3%
Operational Additionality	Fund primarily supports the transformation of non-virtuous assets	Marketing	52	38.4%
Impact Analysis	Obligation to conduct an analysis of impact criteria before each transaction	Legal	50	52.0%
Has Any Target	Fund has a global extra-financial objective backed by a market framework	Legal	52	9.6%
Impact Intentionality	Intention to contribute to an EF objective in the investment policy	Legal	50	64.0%
Environmental Objective	Fund has an environmental objective	Marketing	52	88.5%
Social Objective	Fund has a social objective	Marketing	52	28.8%
Process IMM	IMM process reflected in the fund's legal documentation	Legal	50	62.0%
Impact Reporting	Obligation to produce a dedicated report on the achievement of the EF objective	Legal	50	46.0%

Note. Variables with a "Legal" source type are observed in the body of the fund's regulation (LPA). The SFDR annex, which is almost systematically non-binding, is not used as a source.

Three clusters emerge from the clustering on these variables (Table 7).

Table 7: Sustainable Objective — Signature Variables

Variable	C1		C2		C3	
	p_c	score	p_c	score	p_c	score
Environmental Objective	85.7%	+0.02	66.7%	-0.26	100.0%	+0.24
Has Any Target	0.0%	-0.10	0.0%	-0.10	19.2%	+0.19
Social Objective	21.4%	-0.24	83.3%	+0.69	7.7%	-0.45
Impact Reporting	0.0%	-0.69	83.3%	+0.56	54.2%	+0.12
Impact Analysis	0.0%	-0.73	75.0%	+0.40	70.8%	+0.33
Process IMM	7.1%	-0.80	100.0%	+0.59	75.0%	+0.21
Impact Intentionality	7.1%	-0.82	100.0%	+0.57	79.2%	+0.26
Categorical variables — Additionality strategy (p_c, standardized residuals)						
Financial Additionality	14.3%	-2.25	75.0%	+0.59	80.8%	+1.25
Operational Additionality	85.7%	+3.47	8.3%	-1.48	15.4%	-1.54
Mixed Additionality	0.0%	-0.90	16.7%	+1.57	3.8%	-0.41

Robustness. Bootstrap stability (10^6 iterations): median ARI = 1.00, median Jaccard = 1.00. Full results in Appendix A.5.

Cluster 1 — Mixed focus, non-contractualized, support-oriented (14 funds, 26.9%). These funds target primarily environmental objectives (86%), with limited social orientation (21%). They rarely contractualize their impact intentionality (7%) or their IMM process (7%). The dominant additionality strategy is operational (85.7%). These funds pursue sustainability through operational support without formalizing the objective in legal documentation, even when they claim to contribute to a sustainability objective through their investment activities.

Cluster 2 — Social focus, contractualized, solutions-oriented (12, 23.1%). These funds pursue a social objective (83%) and universally contractualize their impact intentionality (100%) and their IMM process (100%). Most commit to publish an impact report (83%), but none set explicit targets tied to an external framework (0%). The dominant additionality strategy is financial (75%). The absence of targets likely reflects the limited availability of standardized target-setting frameworks for social objectives.

Cluster 3 — Environmental focus, contractualized with targets (26, 50%). All funds in this cluster pursue an environmental objective (100%) and most contractualize it (79%). A significant minority set explicit targets tied to an external framework (19%). The dominant additionality strategy is financial (80.7%). Target-setting in this cluster is facilitated by the existence of environmental reference frameworks (Paris Agreement, SBTi, NZI, EU Taxonomy).

These three clusters operationalize the continuum of hybridization introduced in Proposition 1. Cluster 1 (non-contractualized) corresponds to an instrumental hybridization: the sustainability

objective is not formalized in legal documentation, which may be characteristic of funds following sustainability issues with the expectation that this pursuit enhances the financial value of the underlying assets. Clusters 2 and 3 contractualize their intention to pursue a sustainable objective, placing the sustainability logic at the same level as the financial logic. The increasing formalization of the sustainability logic across clusters reflects distinct degrees of commitment to the extra-financial objective, even if all of these funds claim to contribute to it.

Geczy et al. (2021) report 98% aspirational terms, 83% social objective and 63% environmental objective, in a sample biased toward embedded impact (financial additionality). The 52 funds in my sample with a sustainable objective show 88.5% environmental and 28.8% social, reflecting the French market's environmental emphasis and the regulatory pressure on climate. The underrepresentation of social objectives also reflects a sampling effect: several social impact funds did not participate in this study.

4.2.2 EF Committee (30 Funds)

Table 8 presents the variables used to characterize EF committee design. In almost all cases (29 out of 30), the committee is advisory and non-binding.

The most common responsibilities are the validation of sustainability KPIs monitored at portfolio-company level (66.7%) and the associated targets (66.7%). Composition varies: 60% of committees grant voting seats to LPs and 63.3% to independent members. The independent members are usually experts (academics, politicians, business people) in the sustainability issues the fund aims to address.

Among the 30 funds with an EF committee, two clusters emerge (Table 9).

The *controlling* committee (20 funds, 67%) concentrates substantive explicit decision rights: validation of KPIs monitored (100%), of the associated targets (100%), of the measurement results (72%), of methodology changes (61%) and of carried interest payout (56%). Independent members are present in 72% of controlling committees. This committee exercises substantive control: it validates what is measured, how targets are set and whether the carried interest is delivered.

The *symbolic* committee (10 funds, 33%) has few substantive rights. Its role is limited to providing expertise and broad orientation on impact direction (25%), beneficiary selection (33%) and investment eligibility (33%). It does not validate KPIs, targets, measurement or carried payout. This committee operates as a behavior-based advisory body rather than a governance mechanism

Table 8: EF Committee — Variables, Definitions, and Descriptives

Variable	Definition	Source type	N	Mean / Share
Advisory EF Committee	Decisions are not binding on the management company	Legal	30	96.7%
Decision: Change in method	Validates any change in method, KPIs, or targets	Legal	30	36.7%
Decision: EF KPI targets	Validates the targets to be reached for EF KPIs	Legal	30	66.7%
Decision: EF Carried payout	Validates the payout of EF Carried	Legal	30	13.3%
Decision: Investment eligibility	Validates the eligibility of the investment for the fund's EF thesis	Legal	30	26.7%
Decision: EF KPIs monitored	Validates the EF KPIs monitored for each portfolio company	Legal	30	66.7%
Decision: Beneficiary organizations	Validates the choice of beneficiary if EF Carried is not vested	Legal	30	20.0%
Decision: Impact orientation	Gives a simple opinion on the fund's extra-financial orientation	Legal	30	13.3%
Decision: OTI measurement	Validates the independent third party carrying out EF reporting	Legal	30	10.0%
Decision: Weighting of impact score	Validates KPI weighting / the definition of the EF score	Legal	30	50.0%
Decision: Validation of measurement	Reviews and validates the final achievement of EF objectives	Legal	30	43.3%
Committee: Independent members	Includes independent members	Legal	30	63.3%
Committee: LPs	LPs represented on the committee	Legal	30	60.0%

Table 9: EF Committee — Signature Variables

Variable	Controlling p_c	Controlling score	Symbolic p_c	Symbolic score
Decision: EF KPIs monitored	100.0%	+1.00	0.0%	-1.00
Decision: EF KPI targets	100.0%	+1.00	0.0%	-1.00
Decision: Weighting of impact score	75.0%	+0.75	0.0%	-0.75
Decision: Change in method	55.0%	+0.55	0.0%	-0.55
Decision: EF Carried payout	20.0%	+0.20	0.0%	-0.20
Decision: Impact orientation	5.0%	-0.25	30.0%	+0.25
Decision: Investment eligibility	25.0%	-0.05	30.0%	+0.05
Decision: OTI measurement	10.0%	+0.00	10.0%	-0.00
Decision: Validation of measurement	65.0%	+0.65	0.0%	-0.65
Decision: Beneficiary organizations	15.0%	-0.15	30.0%	+0.15
Committee: LPs	60.0%	+0.00	60.0%	-0.00
Committee: Independent members	65.0%	+0.05	60.0%	-0.05

Robustness. Bootstrap stability (10^6 iterations): median ARI = 1.00, median Jaccard = 1.00. Full results in Appendix A.5.

with real control rights.

The distinction between controlling and symbolic committees matters for the depth of governance: the controlling committee holds substantive rights (validation of KPIs, targets, measurement results and EF score), while the symbolic committee limits itself to advisory and orientation functions, without decision-making power over outcomes. In organizational design terms, the controlling committee exercises primarily outcome-based control.

Geczy et al. (2021) report 17% of impact funds in their sample with an impact committee, without detail on its rights or composition. Over 90% have an LP advisory committee, but this is the standard advisory body present in all PE funds (100% in my sample), not a dedicated impact committee.

4.2.3 EF Carried Interest (42 Funds)

The EF carried interest conditions a portion of the GP's carried interest on the achievement of an extra-financial score calculated from sustainability KPIs. The detailed waterfall logic and a schematic representation of the mechanism are provided in Appendix C.4.

Table 10 presents the variables used to characterize EF carried design. A critical distinction concerns the nature of objectives: *outcome-based* objectives measure actual results (e.g., tonnes of CO_2 emissions avoided or eliminated), while *means-based* objectives measure the implementation of processes (e.g., the portfolio company has an environmental policy, conducts a carbon footprint

assessment or fills in the sustainability reporting). In my sample, 61.9% of funds index their carried interest on outcome-based objectives. The average share of carried interest indexed to sustainability criteria is 33.4% (SD = 0.21), with substantial heterogeneity across funds. The trigger threshold averages 30.1% (SD = 0.30), indicating that the point at which the EF carried starts vesting varies widely.

Table 10: EF Carried — Variables, Definitions, and Descriptives

Variable	Definition	Source type	N	Mean / Share	Std. dev.
Linear EF Carried	Linear vesting between trigger and full-vesting thresholds	Legal	42	76.2%	–
Global objectives	EF objectives are the same for all portfolio companies and measured at fund level	Legal	42	33.3%	–
Outcome-based objectives	EF objectives are outcome-based objectives	Legal	42	61.9%	–
Offsetting across objectives	Possible offsetting across lines or objectives	Legal	42	42.9%	–
Weighting by amount invested	Portfolio-level weighting based on investment ticket sizes	Legal	42	57.1%	–
EF Carried amount	Share of carried interest indexed to sustainability criteria (% of carried interest)	Legal	42	33.4%	0.21
EF Carried trigger score	Threshold from which extra-financial carried interest starts being paid (% EF score)	Legal	42	30.1%	0.30
EF Carried paid at trigger	Share of EF Carried paid at the trigger threshold (% of EF Carried)	Legal	42	20.7%	0.30
Intermediate vesting tier	Share of EF Carried paid at the intermediate threshold (% of EF Carried)	Legal	8	81.3%	0.22
Full vesting cap for EF Carried	Threshold from which EF Carried is fully vested (% EF score)	Legal	42	91.0%	0.11

Among the 42 funds with EF carried interest, four clusters emerge (Table 11).

Cluster 1 — Specific outcome targets, thresholds, high indexation (15, 35.7%). This cluster represents the most substantive configuration. These funds target outcome-based objectives (93%) defined at the portfolio company level (not fund-global: 7%), with offsetting across objectives (93%) and weighting by amount invested (93%). The carried indexation is high (mean 44.3%), with a demanding trigger (mean 48.7%) and a full vesting cap at 84%. This configuration creates strong incentives tied to measurable outcomes at the portfolio company level.

Cluster 2 — Global outcome targets, linear (10, 23.8%). These funds define outcome-based objectives (90%) measured at the fund level (80%), with linear vesting (100%), a low trigger (mean

Table 11: EF Carried — Signature Variables

Variable	C1		C2		C3		C4	
	p_c	score	p_c	score	p_c	score	p_c	score
Offsetting across objectives	93.3%	+0.80	40.0%	+0.09	0.0%	-0.44	0.0%	-0.44
Weighting by amount invested	93.3%	+0.58	0.0%	-0.67	40.0%	-0.13	66.7%	+0.22
Outcome-based objectives	93.3%	+0.47	90.0%	+0.43	40.0%	-0.24	8.3%	-0.66
EF Carried trigger score	48.7%	+0.21	11.0%	-0.29	62.0%	+0.39	9.6%	-0.31
EF Carried amount	44.3%	+0.15	36.8%	+0.05	34.0%	+0.01	16.7%	-0.22
EF Carried paid at trigger	34.0%	+0.12	6.0%	-0.25	60.0%	+0.47	0.0%	-0.33
Linear EF Carried	66.7%	+0.00	100.0%	+0.44	0.0%	-0.89	100.0%	+0.44
Full vesting cap for EF Carried	84.0%	-0.08	98.0%	+0.11	80.0%	-0.13	98.3%	+0.11
Global objectives	6.7%	-0.49	80.0%	+0.48	80.0%	+0.48	8.3%	-0.47

Robustness. Bootstrap stability (10^6 iterations): median ARI = 0.84, median Jaccard = 1.00. Full results in Appendix A.5.

11%) and a near-full vesting cap (mean 98%). The incentive is outcome-oriented but less constraining than C1: the low trigger means delivery begins almost immediately.

Cluster 3 — Mixed global targets, stepwise (5, 11.9%). A mixed profile: only 40% have outcome-based objectives, mostly fund-global (80%), with stepwise (non-linear) vesting (0% linear), a high trigger (mean 62%) and significant initial payout (60% at trigger). The high trigger combined with stepwise mechanics creates a demanding threshold before any delivery, but the initial payout is substantial once the threshold is crossed.

Cluster 4 — Generic (12, 28.6%). This cluster is the least substantive. These funds overwhelmingly use means-based objectives (8% outcome-based) at the fund level (8% global, suggesting many have no explicit reference level), with linear vesting (100%), low indexation (mean 16.7%), a near-zero trigger (mean 9.6%) and a full vesting cap at 98.3%. This configuration amounts to a bonus linked to process compliance rather than outcome achievement.

Geczy et al. (2021) report only 9% of funds with impact-linked compensation, without any detail on modalities. The gap between 9% and 47.2% is the most striking result of the comparison. Geczy et al. (2021) interpret the low prevalence through the task complementarity hypothesis (Holmstrom & Milgrom, 1991): for embedded impact funds, financial and impact tasks reinforce each other, making separate impact compensation redundant. My data challenge this conclusion as a general result: as the market matures and the palette of sustainability strategies broadens beyond embedded impact, actors develop calibrated incentive mechanisms. The absence of carried interest in Geczy's sample reflects a state of the market, not a structural property of impact funds.

Beyond the nature of objectives, the threshold structure itself raises a design question. The presence of material trigger and vesting thresholds creates discontinuities in the GP's payoff function, potentially introducing gamification effects: GPs may concentrate effort around the thresholds rather than pursue continuous improvement. Thirion et al. (2022) identify a similar concern in their qualitative analysis of impact-linked carried interest, noting that the mechanism can serve as a "mission lock" but also creates opportunities for strategic behavior around the scoring formula. The coexistence of outcome-based and means-based indexation, combined with heterogeneous threshold structures, suggests that the disciplining effect of the carried interest varies substantially across modalities. The vesting curves by cluster are provided in Appendix C.4.

4.2.4 IMM Process (70 Funds)

Table 12 presents the variables used to characterize the IMM process, i.e. how are objectives set to portfolio companies enforced and monitored. A majority of funds adopt independent measurement of sustainability objectives (51.4%) and include them in the contractual documentation of portfolio companies (52.1%). A minority systematically use frameworks to define objectives (19.3%), integrate them into managers' compensation packages (18.6%) or account for their continuity at exit (11.4%).

Table 12: IMM Process — Variables, Definitions, and Descriptives

Variable	Definition	Source type	N	Mean / Share
IMM: Frameworks	Systematic use, where applicable, of a framework to define objectives (0.5 = scientific advisor but no framework)	Marketing	70	19.3%
IMM: EF Committee Validation	Flag for systematic validation of objectives and measurement method by an EF Committee	Marketing	70	30.0%
IMM: Doc Transaction	Flag for systematic integration of sustainability objectives in companies' contractual documentation (0.5 = generic ESG clause)	Marketing	70	52.1%
IMM: ManPack	Flag for systematic integration of sustainability objectives into managers' incentive mechanism	Marketing	70	18.6%
IMM: Independent Measurement	Flag for measurement performed by an independent party	Marketing	70	51.4%
IMM: Exit Management	Flag for systematic consideration of continuity of the sustainability strategy in the exit strategy	Marketing	70	11.4%

Among the 70 funds that set extra-financial objectives at the portfolio company level, three clusters emerge (Table 13).

Table 13: IMM Process — Signature Variables

Variable	C1		C2		C3	
	p_c	score	p_c	score	p_c	score
IMM: Doc Transaction	50.0%	-0.03	66.7%	+0.22	38.9%	-0.19
IMM: Exit Management	6.5%	-0.08	23.8%	+0.18	5.6%	-0.10
IMM: ManPack	8.1%	-0.19	23.8%	+0.04	30.6%	+0.15
IMM: Frameworks	3.2%	-0.29	31.0%	+0.13	33.3%	+0.16
IMM: EF Committee Validation	0.0%	-0.50	100.0%	+1.00	0.0%	-0.50
IMM: Independent Measurement	0.0%	-0.93	85.7%	+0.36	100.0%	+0.57

Robustness. Bootstrap stability (10^6 iterations): median ARI = 1.00, median Jaccard = 1.00. Full results in Appendix A.5.

Cluster 1 — Low structuring (31, 44.3%). IMM is limited to basic processes: half integrate objectives into PC-level transaction documents (50%), but virtually none uses independent measurement (0%), committee validation (0%) or systematic frameworks to set targets (3%).

Cluster 2 — Complete structuring (21, 30%). This cluster displays the most complete architecture. These funds achieve independent measurement (86%), universal committee validation (100%), higher documentation integration (67%) and moderate framework use to set targets (31%). Even in this cluster, some practices remain rare: framework use (31%), management package integration (24%) and exit management (24%).

Cluster 3 — Intermediate structuring (18, 25.7%). These funds achieve universal independent measurement (100%) but have no committee validation (0%). This cluster relies on external verification (third-party measurement) without organizational governance over the IMM process. The use of frameworks (33%) and management packages (31%) is comparable to the complete cluster.

Geczy et al. (2021) report 70–80% of funds integrating impact in due diligence and requiring impact metrics, and approximately 30% with third-party measurement. My rates are broadly comparable (80.9% measurement, 78.7% objectives), and the finding that impact clauses formalized at fund level translate into portfolio-company-level objectives is consistent with Geczy et al. (2021). Yet the process of objectives settings and monitoring is not uniform: committee validation, framework use, management package integration and exit management create different levels of structuring.

4.3 Configurational Synthesis: From Mechanisms to Organizational Signatures

As for any organization, what matters is not the isolated presence of a mechanism in a specific modality but the way mechanisms combine into a coherent architecture. This section constitutes the analytical pivot of the results. I proceed in two steps. First, I test whether the modalities identified in each mechanism combine randomly or follow a structured pattern, using Cramér's V[5] to measure the degree of association between modules. Second, given that these associations are non-random, I perform a final clustering on the joint micro-level modalities to identify organizational signatures that capture the full configuration of each fund.

4.3.1 Interdependence of Mechanisms

The four organizational mechanisms (sustainable objective, IMM, EF committee, EF carried) are associated in a non-random manner. Figure 1 presents the Cramér's V heatmap across micro modules.

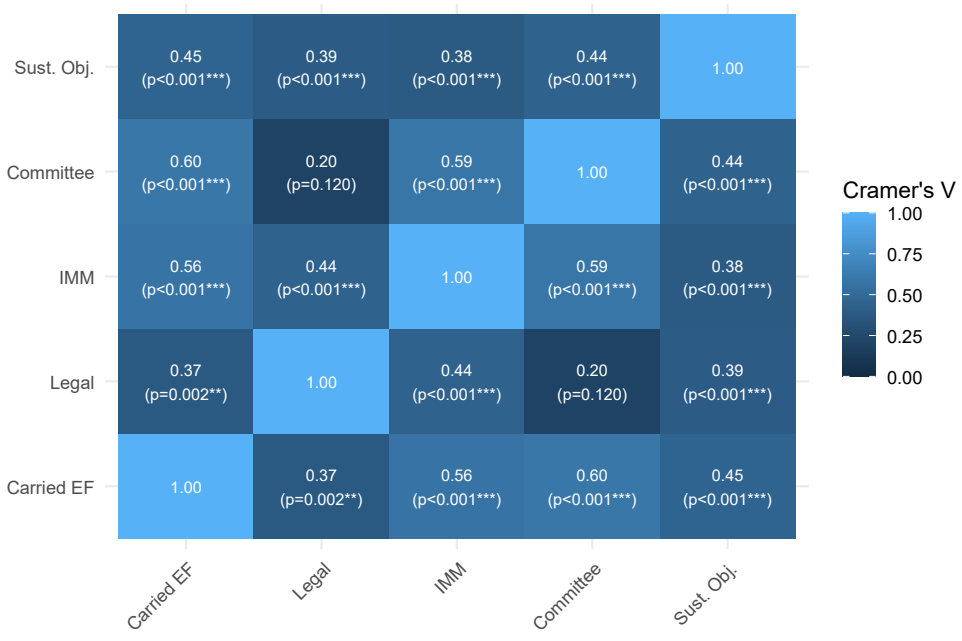


Figure 1: Cramér's V Across Micro Modules.

Note. Moderate to strong associations indicate that mechanism design choices are interdependent.

The three organizational mechanisms form a strongly associated block: Committee × Carried

[5]Cramér's V measures the strength of association between two categorical variables. It ranges from 0 (complete independence) to 1 (perfect association). Values of 0.1, 0.3 and 0.5 correspond respectively to weak, moderate and strong associations.

EF ($V = 0.60$, $p < 0.001$), Committee × IMM ($V = 0.59$, $p < 0.001$) and IMM × Carried EF ($V = 0.56$, $p < 0.001$). Moderate associations link the Sustainable Objective module to these mechanisms: Sust. Obj. × Carried EF ($V = 0.45$, $p < 0.001$), Committee × Sust. Obj. ($V = 0.44$, $p < 0.001$) and Sust. Obj. × IMM ($V = 0.38$, $p < 0.001$). The ESG contractualization module (Legal) is moderately associated with IMM ($V = 0.44$, $p < 0.001$) and Sust. Obj. ($V = 0.39$, $p < 0.001$), but its association with the EF Committee is weak and non-significant ($V = 0.20$, $p = 0.120$), consistent with the transversal character of ESG contractualization, which operates independently from the dedicated sustainability governance structure.

The detailed co-occurrence heatmap is provided in Appendix D.2. Several co-occurrence patterns are worth noting. All funds with a controlling committee also have EF carried interest, predominantly on outcome targets (75%). Among funds with complete IMM structuring, 96% have EF carried interest, predominantly on outcome targets (76%). Funds with a contractualized social objective use more demanding modalities than those with an environmental objective (carried outcome targets: 75% vs. 54%, controlling committee: 58% vs. 46%). Three quarters of funds with generic carried interest have no committee, suggesting a potential substitution effect. Funds with a mixed, non-contractualized objective have frequent carried interest (57%) but in simple modalities (means-based 43%) and few committees, consistent with an instrumental approach to sustainability.

4.3.2 Eight Organizational Signatures

A final clustering on the micro-level modalities and the sustainability team variable produces eight organizational signatures (Table 14).

Table 14: Final Organizational Typology

Signature	n	%
No structured approach	14	15.7%
Env. focus - symbolic structuring	7	7.9%
Social focus - comprehensive architecture	11	12.4%
Env. focus - comprehensive architecture	11	12.4%
Minimal IMM Process - no E&S focus	11	12.4%
Internal Resources	18	20.2%
Mixed focus - generic EF carried + IMM	9	10.1%
Env. focus - robust incentive	8	9.0%

Three families emerge. *Weakly structured architectures* (signatures 1 and 5: 25 funds, 28.1%) lack formal sustainability mechanisms or have only a minimal IMM process without a sustainability

objective. *Intermediate forms* (signatures 6, 7 and 2: 34 funds, 38.2%) display partial adoption of mechanisms: internal resources without governance devices, generic carried interest, or symbolic structuring around an environmental objective. *Complete architectures* (signatures 3, 4 and 8: 30 funds, 33.7%) combine contractualized dual objectives, dedicated resources and substantive governance and incentive mechanisms.

For each signature, the table presents the dominant modality of each mechanism in the cluster. The percentage indicates the frequency of this modality among funds in the cluster. The standardized adjusted residual (r) measures how much more (or less) this modality is represented in the cluster compared to the full sample: $r > 2$ indicates a particularly distinctive trait. Variables are sorted by decreasing residual. The table also reports under-represented modalities ($r < -2$) and the distribution of additionality strategies within the cluster when available.

Table 15: Signature 1

Variable	Dominant modality
IMM	Absent/NA (100%, r=+6.37)
Sust. Team	No (100%, r=+2.97)
Sust. Obj.	Absent/NA (85.7%, r=+2.56)
EF Carried	Absent/NA (100%, r=+2.43)
EF Committee	Absent/NA (92.9%, r=+1.22)
Under-represented ($r < -2$)	
IMM	Low (r=-2.21)
Additionality	
Absent / NA	12 / 14 (85.7%)
Financial	2 / 14 (14.3%)

Signature 1 — No structured approach (n = 14, 15.7%). This signature corresponds to the least structured funds in the sample. Sustainability mechanisms are almost systematically absent: no dedicated team, no EF carried, no committee and no formalized IMM process. Most funds have no sustainable objective (85.7%). The remaining 14.3% pursue a sustainable objective without any dedicated resource or governance mechanism, a configuration that raises questions about the operational capacity to deliver on the stated intention. Low IMM structuring is significantly under-represented ($r = -2.21$), confirming that these funds do not even reach the minimal measurement baseline.

Table 16: Signature 2

Variable	Dominant modality
EF Committee	Symbolic (85.7%, r=+5.88)
Sust. Obj.	Env. contract. (85.7%, r=+2.77)
IMM	Absent/NA (42.9%, r=+1.23)
EF Carried	Absent/NA (71.4%, r=+0.68)
Sust. Team	Yes (71.4%, r=+0.63)
Additionality	
Absent / NA	1 / 7 (14.3%)
Financial	6 / 7 (85.7%)

Table 17: Signature 3

Variable	Dominant modality
Sust. Obj.	Social contract. (81.8%, r=+6.17)
EF Committee	Controlling (81.8%, r=+4.15)
IMM	Complete (81.8%, r=+3.98)
EF Carried	Specific outcome (45.5%, r=+2.31)
Sust. Team	Yes (72.7%, r=+0.85)
Under-represented ($r < -2$)	
Sust. Obj.	Absent/NA (r=-2.14)
EF Committee	Absent/NA (r=-2.70)
EF Carried	Absent/NA (r=-2.41)
Additionality	
Financial	7 / 11 (63.6%)
Operational	2 / 11 (18.2%)
Mixed	2 / 11 (18.2%)

Signature 2 — Env. focus, symbolic structuring (n = 7, 7.9%). The defining trait of this signature is the symbolic EF committee (r = +5.88), which concentrates advisory and orientation functions without substantive decision rights. These funds contractualize an environmental objective (85.7%) but accompany it with minimal governance: the majority have no EF carried (71.4%) and no IMM process (42.9%). This structuring could be sufficient for funds deploying a purely financial additionality strategy where environmental and financial objectives are naturally aligned.

Signature 3 — Social focus, complete architecture (n = 11, 12.4%). These funds combine a contractualized social impact objective (r = +6.17), the most complete IMM process in the sample (81.8%, r = +3.98), a controlling EF committee (81.8%, r = +4.15) and EF carried indexed to specific outcome targets (45.5%, r = +2.31). The absence of sustainability objective, EF committee and EF carried are all significantly under-represented, confirming the completeness of the architecture. This configuration appears characteristic of funds pursuing a demanding social objective for which no standardized framework exists and whose legitimacy and monitoring require a complete architecture, including a controlling EF committee.

Table 18: Signature 4

Variable	Dominant modality
EF Committee	Controlling (100%, r=+5.42)
IMM	Complete (90.9%, r=+4.60)
EF Carried	Specific outcome (72.7%, r=+4.51)
Sust. Obj.	Env. contract. (100%, r=+4.34)
Sust. Team	Yes (72.7%, r=+0.85)
Under-represented ($r < -2$)	
Sust. Obj.	Absent/NA (r=-2.14)
EF Committee	Absent/NA (r=-2.70)
EF Carried	Absent/NA (r=-2.41)
Additionality	
Financial	8 / 11 (72.7%)
Operational	2 / 11 (18.2%)
Mixed	1 / 11 (9.1%)

Signature 4 — Env. focus, complete architecture (n = 11, 12.4%). The environmental equivalent of Signature 3, with an even sharper profile. All funds have a controlling committee (r = +5.42) and a contractualized environmental objective (r = +4.34). The complete IMM process (90.9%, r = +4.60) and specific outcome-based carried (72.7%, r = +4.51) confirm that this signature deploys the full range of governance and incentive mechanisms. This structuring appears suited to vehicles deploying an operational or mixed additionality strategy, where potential tensions between environmental and financial performance require substantive governance.

Table 19: Signature 5

Variable	Dominant modality
IMM	Low (100%, r=+3.66)
Sust. Team	No (100%, r=+2.64)
EF Carried	Absent/NA (100%, r=+2.15)
Sust. Obj.	Absent/NA (72.7%, r=+1.60)
EF Committee	Absent/NA (100%, r=+1.37)
Additionality	
Absent / NA	8 / 11 (72.7%)
Financial	2 / 11 (18.2%)
Operational	1 / 11 (9.1%)

Signature 5 — Minimal IMM process (n = 11, 12.4%). These funds rely on minimal structuring, limited to a low-level process for measuring ESG indicators (r = +3.66). They have no dedicated team (r = +2.64), no EF carried (r = +2.15) and no committee. While the majority have no sustainable objective, 27.3% do pursue a mixed or environmental objective without any governance mechanism or incentive device. This raises questions about their operational capacity and their incentives to deliver on the stated objective, especially under an operational additionality strategy.

Table 20: Signature 6

Variable	Dominant modality
IMM	Low (83.3%, r=+3.49)
Sust. Team	Yes (100%, r=+2.66)
EF Carried	Absent/NA (94.4%, r=+2.43)
Sust. Obj.	Absent/NA (72.2%, r=+2.02)
EF Committee	Absent/NA (100%, r=+1.76)
Under-represented ($r < -2$)	
EF Committee	Controlling (r=-2.01)
IMM	Complete (r=-2.06)
Additionality	
Absent / NA	13 / 18 (72.2%)
Financial	2 / 18 (11.1%)
Operational	3 / 18 (16.7%)

Signature 6 — Internal resources without governance (n = 18, 20.2%). The largest cluster. All funds have a dedicated sustainability team (r = +2.66) but rely on low IMM structuring (83.3%, r = +3.49) with no EF carried (94.4%), no committee and, for the majority, no formalized sustainability objective (72.2%). Controlling committees (r = −2.01) and complete IMM (r = −2.06) are significantly under-represented. While these funds invest in internal resources, the absence of governance mechanisms raises the question of the incentive to pursue the sustainability objective when it conflicts with financial performance. Five funds (27.8%) pursue such an objective without any incentive mechanism.

Table 21: Signature 7

Variable	Dominant modality
EF Carried	Generic (77.8%, r=+5.25)
IMM	Interm.: targets (77.8%, r=+3.84)
Sust. Obj.	Mixed non-contr. (55.6%, r=+3.01)
Sust. Team	No (77.8%, r=+1.40)
EF Committee	Absent/NA (88.9%, r=+0.83)
Under-represented ($r < -2$)	
EF Carried	Absent/NA (r=-2.18)
Additionality	
Absent / NA	3 / 9 (33.3%)
Financial	1 / 9 (11.1%)
Operational	5 / 9 (55.6%)

Signature 7 — Mixed focus, generic carried + IMM (n = 9, 10.1%). The defining trait of this signature is the generic EF carried (r = +5.25): means-based targets defined for each portfolio company, combined with intermediate IMM centered on independent measurement (r = +3.84). These funds pursue a mixed sustainable objective that is not contractualized (r = +3.01), have no dedicated team (77.8%) and no EF committee (88.9%). This structuring leaves the EF targets associated with the carried entirely in the hands of the GP, without validation by an EF committee or adherence to external frameworks. The dominant additionality strategy is operational (55.6%), suggesting that these funds treat the sustainability objective as secondary to financial objectives, in an instrumental manner.

Table 22: Signature 8

Variable	Dominant modality
EF Carried	Global outcome (62.5%, r=+4.33)
IMM	Robust interm. (75%, r=+3.44)
Sust. Obj.	Env. contract. (75%, r=+2.40)
Sust. Team	Yes (87.5%, r=+1.29)
EF Committee	Absent/NA (100%, r=+1.17)
Under-represented ($r < -2$)	
EF Carried	Absent/NA (r=-2.06)
Additionality	
Financial	4 / 8 (50%)
Operational	4 / 8 (50%)

Signature 8 — Env. focus, robust incentive ($n = 8$, 9.0%). These funds contractualize an environmental objective (75%) and rely primarily on a strong incentive mechanism: carried indexed to global outcome targets ($r = +4.33$), combined with a robust intermediate IMM process centered on independent measurement of indicators backed by frameworks ($r = +3.44$). No fund in this signature has an EF committee. The governance of the sustainability objective operates entirely through the incentive mechanism (carried) and the measurement infrastructure (IMM), without a dedicated governance body. This is consistent with contexts where potential trade-offs between environmental and financial performance are predictable and can be managed through calibrated incentives rather than deliberative governance.

Several stylized facts emerge from this typology. First, some funds pursuing a sustainability objective display weak structuring around that objective and limited governance (signatures 5, 6 and 7), a pattern potentially consistent with decoupling between stated intentions and organizational implementation. Second, some funds with financial additionality display complete architectures (signatures 3 and 4) even though lighter structuring would theoretically suffice where trade-offs are limited, suggesting a possible signaling or legitimacy function. Third, the observed configurations differ not only in terms of degree of equipment but also in the specific association of mechanism modalities, confirming that the organizational architecture of sustainable funds cannot be reduced to a simple "more vs. less structured" continuum.

Figure 2 visualizes the distribution of the three macro clusters across the eight organizational signatures.

Macro-cluster 2 (process without governance) distributes across five organizational signatures. Macro-cluster 3 (process with governance) distributes across six. The types "internal resources," "mixed focus — generic carried + IMM" and "env. focus — symbolic structuring" are shared be-

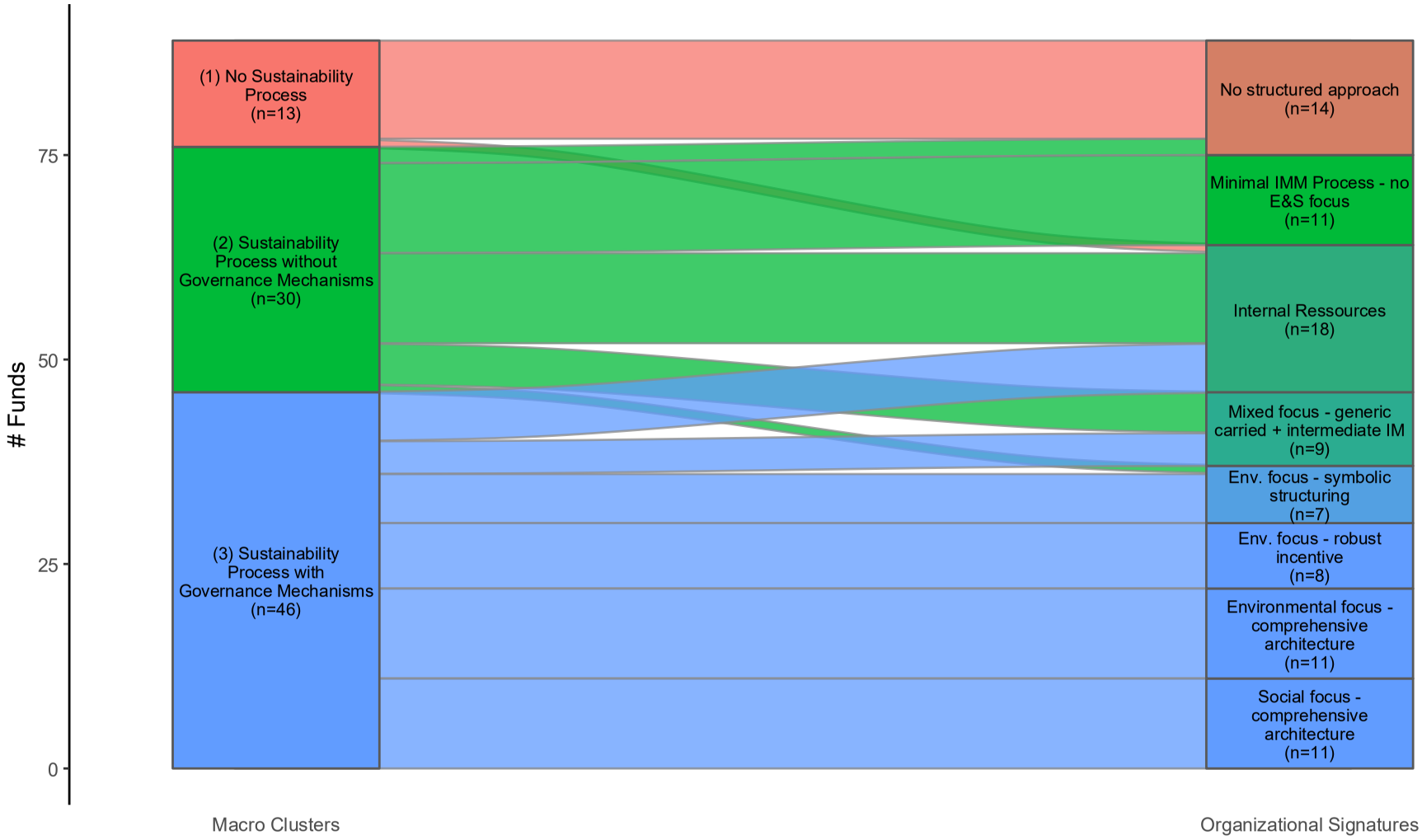


Figure 2: Alluvial Diagram — From Macro Clusters to Organizational Signatures.

Note. Macro-cluster 2 (process without governance) distributes across five signatures. Macro-cluster 3 (process with governance) distributes across six. The color of each organizational signature is a weighted average of its constituent macro-cluster colors, where the weights are the proportions of funds originating from each macro cluster. A signature whose color closely matches a single macro cluster draws most of its funds from that cluster, while a blended color indicates a mixed composition.

tween macro-clusters 2 and 3. Displaying a sustainability process and using governance mechanisms does not suffice to capture organizational reality: the design of each mechanism and its combination with others determines the architecture's depth. Surface-level structuring (macro) does not predict in-depth structuring (signatures).

4.4 Organizational Architectures and Additionality Strategies

Proposition 2 predicts that the form of architectural coherence depends on the degree of compatibility between the logics combined by the hybrid organization: financial additionality corresponds to strong compatibility, while operational additionality corresponds to weaker compatibility. If this argument is correct, the additionality strategy should be a major factor differentiating organizational architectures. This section confronts the results with the additionality strategy and the type of sustainable objective.

4.4.1 Overview: Modalities by Additionality and Sustainable Objective

Table 23 presents the cross-tabulation of all modalities by additionality strategy and sustainable objective type.

Table 23: Modules by Additionality and Sustainable Objective

Module	Modality	N	No obj.	Fin. add.	Op. add.	Mixed add.	Mixed focus	Social contract.	Env. contract.
Sustainable objective	Absent / NA	37	37 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Mixed, non-contract.	14	0 (0%)	2 (6%)	12 (71%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
	Social, contract.	12	0 (0%)	9 (28%)	1 (6%)	2 (67%)	0 (0%)	12 (100%)	0 (0%)
	Env., contract.	26	0 (0%)	21 (66%)	4 (24%)	1 (33%)	0 (0%)	0 (0%)	26 (100%)
EF Committee	Absent / NA	59	35 (95%)	12 (38%)	12 (71%)	0 (0%)	10 (38%)	11 (79%)	3 (25%)
	Controlling	20	0 (0%)	14 (44%)	4 (24%)	2 (67%)	11 (42%)	2 (14%)	7 (58%)
	Symbolic	10	2 (5%)	6 (19%)	1 (6%)	1 (33%)	5 (19%)	1 (7%)	2 (17%)
EF Carried	Absent / NA	47	32 (86%)	11 (34%)	4 (24%)	0 (0%)	8 (31%)	6 (43%)	1 (8%)
	Specific outcome	15	0 (0%)	13 (41%)	1 (6%)	1 (33%)	9 (35%)	0 (0%)	6 (50%)
	Global outcome	10	0 (0%)	4 (12%)	5 (29%)	1 (33%)	5 (19%)	2 (14%)	3 (25%)
	Mixed, tiered	5	0 (0%)	3 (9%)	2 (12%)	0 (0%)	1 (4%)	2 (14%)	2 (17%)
	Generic	12	5 (14%)	1 (3%)	5 (29%)	1 (33%)	3 (12%)	4 (29%)	0 (0%)
IMM Process	Absent / NA	19	14 (38%)	5 (16%)	0 (0%)	0 (0%)	4 (15%)	1 (7%)	0 (0%)
	Low	31	18 (49%)	7 (22%)	6 (35%)	0 (0%)	5 (19%)	7 (50%)	1 (8%)
	Intermediate	18	5 (14%)	6 (19%)	7 (41%)	0 (0%)	5 (19%)	4 (29%)	4 (33%)
	Comprehensive	21	0 (0%)	14 (44%)	4 (24%)	3 (100%)	12 (46%)	2 (14%)	7 (58%)

4.4.2 Key Results by Module

EF committee × additionality. Funds pursuing operational additionality have *fewer* EF committees (25%) than those pursuing financial additionality (62%). This result is counter-intuitive from the perspective of Proposition 2: operational additionality implies weaker compatibility between logics and stronger tensions, which should theoretically require more substantive governance. When present, the committee is more frequently controlling for funds with a social objective (58%) than for those with an environmental objective (42%). The absence of a controlling committee among operational additionality funds, where the sustainability logic faces stronger tensions, points to a governance deficit in the funds that would theoretically need it most. Three non-exclusive interpretations open the discussion. First, financial additionality funds may use the committee to signal credibility to LPs. Second, the committee may serve an expertise function on themes without established frameworks (particularly social). Third, operational additionality funds may be structurally under-equipped in governance, creating conditions for decoupling and mission drift.

EF carried × additionality. Funds pursuing operational additionality have more frequently an indexed carried interest (76%) than those with financial additionality (66%), which is consistent with Proposition 2. However, this hides very heterogeneous modalities (35% outcome targets, 45% means-based or mixed). Funds with financial additionality use outcome targets more frequently (53%). Among the specific outcome target cluster, 87% of funds pursue financial additionality. This result challenges Proposition 2: one would expect the most finely calibrated incentive mechanisms (outcome-based, specific targets) when compatibility is weakest, i.e. for operational additionality. The opposite pattern reveals a potential under-structuring of operational additionality funds and a symbolic use of the carried interest mechanism, where means-based indexation operates as a process-compliance device rather than a genuine outcome incentive. Outcome-based carried interest directly links the GP's compensation to measurable sustainability results, the strongest available form of incentive alignment on the sustainability dimension. The concentration of this configuration among financial additionality funds further suggests a signaling function when trade-offs are structurally limited. Five funds without an explicit sustainability objective nonetheless have generic EF carried interest (14%), centered on risk management processes.

IMM × additionality. Funds pursuing operational additionality have lighter IMM structuring (24% complete) than those with financial additionality (44%). Analysis by sustainable objective type invalidates an explanation based on the availability of standardized frameworks or the nature

of targeted assets: funds with a support-oriented strategy (almost exclusively operational additionality) have the weakest structuring (57% in the two least structured modalities, vs. 34% for social focus and 8% for environmental focus). Proposition 2 predicts that weaker compatibility between logics requires more demanding target setting, measurement and verification processes to detect trade-offs. The opposite pattern observed here extends the under-structuring diagnosis already documented for the EF committee and the EF carried: operational additionality funds, which face the strongest tensions between financial and sustainability logics, display the lightest IMM process.

Table 24 presents the distribution of organizational signatures by additionality strategy and sustainable objective type.

Table 24: Signatures by Additionality and Sustainable Objective

Signature	N	No obj.	Fin. add.	Op. add.	Mixed add.	Mixed focus	Social contract.	Env. contract.
No structured approach	14	12 (32%)	2 (6%)	0 (0%)	0 (0%)	1 (7%)	0 (0%)	1 (4%)
Minimal IMM Process - no E&S focus	11	8 (22%)	2 (6%)	1 (6%)	0 (0%)	2 (14%)	0 (0%)	1 (4%)
Internal Resources	18	13 (35%)	2 (6%)	3 (18%)	0 (0%)	3 (21%)	1 (8%)	1 (4%)
Mixed focus - generic EF carried + IMM	9	3 (8%)	1 (3%)	5 (29%)	0 (0%)	5 (36%)	1 (8%)	0 (0%)
Env. focus - symbolic structuring	7	1 (3%)	6 (19%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6 (23%)
Env. focus - robust incentive	8	0 (0%)	4 (12%)	4 (24%)	0 (0%)	1 (7%)	1 (8%)	6 (23%)
Env. focus - comprehensive architecture	11	0 (0%)	8 (25%)	2 (12%)	1 (33%)	0 (0%)	0 (0%)	11 (42%)
Social focus - comprehensive architecture	11	0 (0%)	7 (22%)	2 (12%)	2 (67%)	2 (14%)	9 (75%)	0 (0%)

Signatures × additionality. Three patterns emerge from crossing organizational signatures with additionality strategies.

Financial additionality and complete architectures. Financial additionality is associated with the most complete signatures (28.1% in complete architectures), but also with weakly structured funds investing in impact-native assets without formalizing a sustainability architecture. This polarization is striking: funds with a contractualized objective and financial additionality combine high compatibility with high centrality of the sustainability logic. Proposition 2 predicts that high compatibility allows the architecture to rely primarily on measurement and verification devices, which is consistent with the prevalence of complete IMM in these signatures. Yet the completeness of the architecture exceeds what Proposition 2 would predict as necessary: the presence of controlling

committees and specific outcome carried in a context of limited trade-offs suggests that these mechanisms may serve a signaling function toward LPs, beyond their strict governance utility.

Operational additionality and dispersed, intermediate structuring. Operational additionality is associated with dispersed signatures, concentrated on intermediate configurations (signatures 5, 6 and 7) with the notable absence of EF committees in the dominant signatures. From the perspective of Propositions 1 and 2, these funds combine low compatibility with the financial logic and, in some cases, high centrality of the sustainability objective. This combination should call for a coherent and demanding architecture to manage the resulting tensions. The observed under-structuring, particularly the absence of controlling committees and the prevalence of means-based carried, creates conditions for decoupling between stated intentions and organizational implementation (Ebrahim et al., 2014).

Overall reading. The results are broadly consistent with Proposition 1: the intensification of hybridization generates a response at the organizational design level. Yet the design observed is not always coherent with the degree of tension it is meant to manage. The theoretical implications of this finding, in particular the two-dimensional reading of organizational heterogeneity (centrality of the sustainability logic and compatibility with the financial logic) and the associated risks of mission drift, are developed in the discussion.

4.5 SFDR and Impact Status: The Limits of Existing Classifications

SFDR classifications and the "impact" label provide a useful global signal but do not capture the dispersion of organizational architectures (Appendix D.4). Article 9 and impact funds concentrate strongly in the most complete architectural families, while Article 6 and unclassified funds concentrate in weakly structured signatures. Yet Article 8 is highly heterogeneous, spanning almost the entire typology, and a few Article 9 funds display minimal or symbolic structuring. These results show that regulatory and market labels operate primarily on declarations of intent: they are informative at the aggregate level but insufficient to infer the concrete organizational modalities through which funds govern sustainability objectives.

5 Discussion

My results yield several implications for the study of sustainable finance, hybrid organization design and corporate governance. First, studying the design of investment organizations with a configurational approach reveals substantial heterogeneity in the architecture of sustainable investment funds, ranging from minimal structuring without a formal sustainability objective to complete architectures with multiple interacting organizational mechanisms. This finding reinforces the intuition that the design of investment organizations builds the social impact potential of sustainable finance upstream in the investment chain. Second, institutional theory allows reading sustainable funds as hybrid organizations, and the compatibility between logics, operationalized by the additionality strategy, orients the form and depth of architectural coherence. My results suggest a frequent under-structuring of operational additionality funds relative to the tensions they claim to manage. Third, the organizational architecture of investors constitutes a plausible micro-mechanism for understanding how sustainable mandates translate (or fail to translate) the preferences of ultimate beneficiaries into investment behavior, opening new perspectives on the shareholder/stakeholder debate and the question of how the financial system transfers individual preferences through the intermediary chain.

I discuss the implications of my results in two sections: sustainable finance and impact investing (§5.1) and the financial system and the shareholder/stakeholder debate (§5.2). I discuss managerial and regulatory implications separately (§5.3).

5.1 Sustainable Finance and Impact Investing

Building on the theoretical framework developed in Denis and Mottis (2025), which conceptualizes the mechanisms through which asset owners and asset managers jointly design the organizational architecture of investment funds on the basis of a single-case ethnography, the present study constitutes the first large-scale configurational test of that framework on a population of 89 French PE funds with diverse sustainability strategies. It reinforces the intuition that the impact potential of sustainable finance is built upstream in the investment chain, in the design of investment organizations, not downstream through market mechanisms alone (Kölbel et al., 2020; Marti et al., 2024). This section discusses what my results imply for the study of sustainable investor organizations and their social impact potential, building on hybrid organization theories.

5.1.1 A Configurational Reading of Sustainable Investor Organizations

Surveying 509 fund managers engaging in sustainable investing activities, Edmans et al. (2024) find that 71% act on the basis of the constraints of their mandates or firm-wide policies, rather than individual preferences. Yet the study of mandates alone does not suffice to understand how investment organizations actually structure themselves around sustainability objectives. As shown in Denis and Mottis (2025), mandates produce organizational consequences: the contractual negotiation between asset owners and asset managers generates a set of design choices (objectives, resources and capabilities, governance and control) that configure the fund's architecture. The relevant analytical question should therefore not be whether an organization holds a sustainable mandate, but what organizational architecture follows from it.

My results show that this architectural heterogeneity takes the form of coherent configurations rather than the adoption of sophisticated isolated mechanisms. Incentive mechanisms, dedicated governance bodies, measurement processes and contractualized objectives co-occur in non-random patterns across eight organizational signatures (§4.3). The strong co-occurrence of controlling governance bodies, outcome-based incentive mechanisms and complete measurement processes in the most structured architectures signals an integrated design logic: the coherence and complementarity among components, not the presence of an isolated mechanism, structures organizational depth. This finding is consistent with the internal fit argument in organizational design studies (Joseph & Sengul, 2025): in particular, Siggelkow (2002) show that complementarities among elements create configurations that are more than the sum of their parts, and Siggelkow (2011) argue that activity systems constitute the appropriate unit of analysis for understanding organizational coherence.

Several studies examined isolated aspects of the organizational architecture of sustainable investors. Geczy et al. (2021) document the presence or absence of individual mechanisms in 53 impact funds through the bilateral contracting lens of Holmstrom and Milgrom (1991): they find that only 9% have impact-linked carried interest and 17% an impact committee. Their interpretation holds that for funds pursuing financial additionality, financial and impact tasks are complementary, so that standard alignment suffices. The limitation of this framework lies in its presence/absence coding, which does not capture the modalities through which mechanisms operate nor how they interact within a configuration. Thirion et al. (2022) show that asset owners and managers co-construct the incentive mechanism to lock in the "mission" of the fund, but examine a single mechanism in isolation. Bandini et al. (2022) argue conceptually that impact must pervade the entire business

model. Kaufmann et al. (2025) document three mechanisms through which impact measurement can become decoupled from its intended ends. My contribution integrates these partial insights into a configurational framework that captures simultaneously the three components of the architecture (objectives, resources and capabilities, governance and control), in their modalities rather than mere presence or absence.

The organizational architecture of investment vehicles therefore constitutes a necessary unit of analysis for the study of sustainable finance. The majority of investors today are organizations, intermediating the relationship between ultimate beneficiaries and portfolio companies through multiple layers (Bebchuk et al., 2017; Gilson & Gordon, 2013; Jensen & Meckling, 1976). In the context of sustainable finance, this architecture is what generates systematically the practices of shareholder engagement and capital allocation that produce the ultimate social impact (Kölbel et al., 2020; Marti et al., 2024).

5.1.2 Sustainable Investors as Hybrid Organizations

Investors that develop sustainability strategies combine a financial logic and a sustainability logic within a single organizational architecture: they become hybrid organizations (Battilana, 2018; Battilana et al., 2017). The literature on hybrid organizations provides analytical tools to interpret the diversity of architectures I observe and the tensions they manage.

Besharov and Smith (2014) identify two dimensions structuring inter-logic relations in hybrid organizations. *Centrality* measures whether both logics effectively guide core decisions: when the sustainability logic is not central (risk management, ESG screening without binding targets), it remains peripheral and the fund's architecture is unlikely to produce social impact independent of its financial returns. *Compatibility* measures whether the logics prescribe coherent behaviors: when incompatibility is high, organizational design must actively manage the resulting tensions. Four configurations result from the combination of these two dimensions: *aligned* (high centrality, high compatibility), *contested* (high centrality, low compatibility), *estranged* (low centrality, low compatibility) and *dominant* (low centrality, high compatibility).

The additionality strategy operationalizes the compatibility dimension in my empirical context. Financial additionality (impact embedded in the investment thesis) articulates the two logics in a pattern of strong compatibility: pursuing the financial logic mechanically allows pursuit of the sustainability logic, because the investment universe is restricted to assets whose core activity is

inherently impactful. When compatibility is strong, the central organizational challenge is one of measurement, verification and credibility: the Holmstrom and Milgrom (1991) thesis applied by Geczy et al. (2021) is partially valid. Operational additionality (impact generated through operational resources deployed beyond capital) articulates logics that are potentially incompatible: objectives can come into real tension during investment, monitoring and exit decisions. When compatibility is weak, measurement alone does not suffice and must be complemented by more substantive control and incentive mechanisms to manage trade-offs explicitly.

The literature on hybrid organizations identifies four design principles that address these tensions. Battilana (2018) specify objective formulation, activity structuring, member selection and socialization as the pillars of hybrid design, and argue that coherence among them conditions the sustainability of hybridity. Smith and Besharov (2019) develop the concept of structured flexibility: hybrid organizations that sustain a dual logic establish structural commitments that function as guardrails preventing drift toward a dominant logic while maintaining the flexibility to manage daily tensions. Battilana et al. (2022) show that governance functions as a filter of institutional pressures, selecting and amplifying certain logics at the expense of others. In my empirical context, these principles translate into specific architectural mechanisms: the formalization of sustainability objectives in contractual documents (objective formulation), the development of dedicated teams and measurement processes (activity structuring and member selection), an incentive mechanism aligned on both logics through impact-linked carried interest (socialization and incentive alignment), and a dedicated governance body with real decision rights (governance as filter and guardrail). The most coherent architectures in my sample implement all four principles simultaneously. The weakly structured architectures implement none or one.

My results map onto this framework of Centrality/Compatibility. The most coherent architectures (§4.3) combine contractualized objectives, dedicated resources, hybrid governance and outcome-based incentive mechanisms: both the financial and the sustainability logic guide core decisions, and the organizational architecture ensures that they do so coherently. This corresponds to an *aligned configuration* where productive tensions are managed through negotiation spaces (Battilana et al., 2015) and structural guardrails (Smith & Besharov, 2019). The weakly structured architectures declare a sustainability dimension in their objectives but do not support it through contractualization, governance or control mechanisms: the sustainability logic is not central in the Besharov and Smith (2014) sense. These correspond to a *dominant* or *estranged configuration* where

the financial logic absorbs the sustainability logic, undermining the social impact potential of the investment organization. The intermediate architectures adopt mechanisms partially, corresponding to a *contested configuration*: productive tensions may emerge but the organizational architecture does not contain the full structural capacity to prevent drift under performance pressure. Yan et al. (2021) study the compatibility of logics at the macro level and explicitly call for research at the firm level. My results provide the first micro-organizational evidence that compatibility *within* investment organizations, as measured by architectural configuration, determines whether hybrid mandates translate into coherent architectures.

5.1.3 Decoupling, Mission Drift and the Additionality Puzzle

When the structuring principles identified above are not applied, the fund creates organizational conditions conducive to decoupling and mission drift. Meyer and Rowan (1977) argue that organizations adopt formal structures to gain institutional legitimacy without necessarily connecting them to their actual activities. DiMaggio and Powell (1983) show that isomorphic pressures push toward ceremonial adoption of field practices without modifying core behaviors. Beyond this classic policy-practice decoupling, Bromley and Powell (2012) identify a distinct form of means-ends decoupling, where organizations adopt policies and implement them, but the means deployed remain disconnected from the ends pursued. Kaufmann et al. (2025) document three specific mechanisms of means-ends decoupling in impact investing: communication on meanings (pre-investment impact framing without the measurement guiding decisions), categorization (impact data cited to justify successes but not underperformance), and domain construction (participation in defining sectoral norms independently of actual performance).

Two contrasting patterns emerge from my results and invite a sharper diagnosis through these theoretical lenses. Investors pursuing financial additionality deploy architectures whose depth exceeds what the level of inter-logic tension would seem to require: controlling governance bodies, outcome-based incentive mechanisms and complete measurement processes, even though the strong compatibility between logics makes trade-off management less demanding. This pattern is consistent with a signaling function toward asset owners and external stakeholders. Pache and Santos (2013) theorize selective coupling in hybrid organizations: some elements are deeply integrated (genuine implementation), others are adopted superficially (ceremonial adoption for legitimacy). The risk here is not mission drift but institutional illegibility: when symbolic structuring coex-

ists with genuine compatibility, external stakeholders cannot distinguish deep commitment from signaling, which reduces the informational value of organizational architecture for the market.

Investors pursuing operational additionality present the opposite pattern, which constitutes the most salient result of the discussion (§4.4). These investors face the highest inter-logic tensions yet display the weakest architectures: fewer formal dedicated governance bodies with real decision rights (25% vs. 62%), incentive mechanisms in less constraining modalities, and less structured measurement processes (24% complete structuring vs. 44%). This misalignment between the level of logical tension and architectural depth signals a genuine risk of means-ends decoupling: the fund declares an operational additionality ambition but does not build the organizational infrastructure necessary to manage the tensions this ambition creates. Findlay and Moran (2019) identify "purpose-washing" in this context: funds presented as impact investments without satisfying a rigorous definition. Without governance guardrails (Smith & Besharov, 2019), the financial logic may take over by default, leading to what Ebrahim et al. (2014) characterize as mission drift. The framing effect of the architecture (Mechanism 3, Paper 1) then operates in reverse, orienting decisions primarily toward financial criteria.

These two patterns can be read against the broader literature on sustainable investment strategies. Busch et al. (2021) distinguish between impact-aligned strategies (where the financial vehicle is directed toward impact-generating activities) and impact-generating strategies (where the investor actively contributes operational resources beyond capital). Yang and Yasuda (2025) apply NLP to fund prospectuses and identify three types of goals (financial, moral and impact), but their analysis captures stated intentions, not the organizational architecture that translates them into practice. My configurational approach adds this organizational layer. When the sustainability logic is not central to core decisions and serves primarily instrumental purposes (risk management, ESG screening), the fund architecture does not need to manage inter-logic tensions because the financial logic dominates: the weakly structured signatures in my typology correspond to this pattern. When both logics are central and compatible (financial additionality), the architecture needs measurement and verification mechanisms but does not necessarily need strong governance to manage trade-offs: the environmentally focused signatures in my typology with incentive mechanisms and complete measurement correspond to this pattern. When both logics are central and incompatible (operational additionality), the architecture needs the full set of structuring principles, including governance bodies with real decision rights: my results suggest that this third configuration is

frequently under-institutionalized, creating conditions for decoupling and mission drift.

A cascading implication follows. Asset owners need to develop the organizational capabilities to evaluate the architectural coherence of the funds in which they invest. In a financial system intermediated by multiple layers (Gilson & Gordon, 2013), a coherent hybridization of the last node in the chain (the fund) requires a coherent hybridization of all preceding nodes (the asset owners). An asset owner that has not integrated the sustainability logic into its own architecture cannot evaluate, nor demand, a coherent hybrid architecture at the fund level.

5.2 The Financial System and the Shareholder/Stakeholder Debate

The preceding section analyzed the organizational architecture of sustainable investment vehicles at the level of the individual fund. This section raises the level of analysis to the financial system as a whole and draws implications for the shareholder/stakeholder debate.

The classic debate in corporate governance opposes shareholder supremacy (Jensen, 2001) and stakeholder theory (Freeman et al., 2004). Both perspectives frame the question at the level of the firm: who should the firm serve, and how should it allocate the value it creates? This debate has produced new models of governance, from purpose-driven organizations (Battilana et al., 2022; McGahan, 2023) to stakeholder governance design principles (Bridoux & Stoelhorst, 2022; Stoelhorst & Vishwanathan, 2024). Yet both sides implicitly assume an homogeneous shareholder base whose preferences are given and known: financial return. Neither tradition has systematically asked: who are the shareholders, what are their preferences and how do their organizations form and translate these preferences into behavior?

O. Hart and Zingales (2017) and O. D. Hart and Zingales (2022) begin to answer this question. The contemporary capitalist system is entirely intermediated: capital flows through several layers of professional organizations (pension funds, insurance companies, mutual funds) that manage assets on behalf of ultimate beneficiaries (Aguilera et al., 2025; Bebchuk et al., 2017; Gilson & Gordon, 2013). If this system functioned well, it should reflect the preferences of its final beneficiaries, including extra-financial ones. O. Hart and Zingales (2017) propose to replace shareholder value maximization (SVM) with shareholder welfare maximization (SWM), in which prosocial shareholders can rationally support policies that reduce market value but increase their overall welfare. The debate then becomes: how does the financial system transfer the preferences of individuals,

including their social and environmental preferences, through the intermediary chain?

Research on shareholder heterogeneity documents part of the answer. Goranova and Ryan (2022) review how different types of institutional shareholders exercise their ownership differently. DesJardine et al. (2023) document behavioral differences across investor categories, showing that investor identity shapes engagement and voting patterns. These studies explain heterogeneity through incentives, preferences and time horizons, but they treat institutional shareholders as relatively unitary entities within each category, without fully opening the organizational black box. My contribution adds the organizational layer. The framework developed in Denis and Mottis (2025), applied here on 89 vehicles, shows that the internal architecture of the investment organization constitutes a micro-mechanism for explaining part of this behavioral variation. Two organizations with identically declared sustainability strategies can have radically different architectures, and therefore potentially different dispositions when exercising their shareholder power.

The attention-based view provides the theoretical mechanism linking architecture to behavior. Ocasio (1997) and Ocasio and Wohlgezogen (2010) argue that the organizational architecture distributes the attention of decision-makers across issues. Crilly and Sloan (2014) show that organizational architecture determines toward which stakeholders decision-makers direct their attention. Applied to the financial system, the design of the investment organization determines toward what its shareholder power is effectively oriented, independently of declarations of intent. Klein et al. (2019) and Foss and Klein (2018) identify the allocation of property rights as the central problem of organizational design: the design of the investing entity determines toward what its shareholder powers (exit, voice, engagement, capital allocation) are effectively directed.

This analysis yields a broader implication. Institutional investors today constitute the majority of shareholders in large listed corporations (Aguilera et al., 2025). It is therefore possible to enfranchise stakeholders at the level of the shareholders themselves, that is, at the level of the organizations that exercise ownership rights on behalf of ultimate beneficiaries. This approach preserves the aggregation of individual preferences and the allocative efficiency of the market while directing shareholder power toward the stakeholders that the organizational architecture enacts. The question for system-level investing is close to this idea. The bottom line is : it not about how many organizations declare a sustainability objective, but how many have built the organizational architecture that channels decision-maker attention toward that objective at every decision (Ocasio, 1997). System-level sustainability could thus be an organizational design problem before it is a

market problem.

5.3 Managerial and Regulatory Implications

For asset owners and limited partners. During fundraising, the level of requirement regarding the organizational architecture should match the additionality strategy of the fund. Financial additionality requires a credible measurement process. Operational additionality requires strong control mechanisms (dedicated governance body with real decision rights, impact-linked incentive mechanism) to manage real trade-offs. This presupposes that asset owners themselves are sufficiently structured to evaluate and demand these architectural features.

For asset managers and general partners. Architectural coherence is not a compliance cost but the mechanism that maintains alignment on the sustainability objective over the fund's lifetime. An architecture that is incoherent with the chosen additionality strategy creates a risk of mission drift, destructive of trust and long-term reputation. The question is not to accumulate devices, but to build an architecture whose configurational coherence matches the strategy actually pursued.

For regulators (SFDR and impact labels). The SFDR classification operates at the level of mandate declarations but does not capture the ex ante architecture. My results (§4.5) suggest two reforms. First, integrating the additionality strategy as a mandatory reporting dimension: it determines governance needs and allows an assessment of architectural coherence. Second, requiring minimum disclosure on key architectural mechanisms: the structure and effective rights of the dedicated governance body (advisory vs. controlling), the modalities of the indexed incentive mechanism (outcome-based vs. means-based) and the measurement process. An Article 9 fund without impact-linked incentive mechanism, without a dedicated governance body and without a contractualized measurement process satisfies current requirements while presenting a minimal architecture.

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A Methodology

A.1 Coding Rules

The sample, scope and exclusions are described in §3.2. This subsection complements the main text with the detailed coding rules applied to the contractual and marketing documents. Binary variables are coded as 0/1. Ordinal variables (e.g., degree of contractualization) are coded on a three-point scale (0, 0.5, 1). Continuous variables (e.g., carried interest share, trigger thresholds) are coded in their natural units. Missing values are treated as structural absences when the mechanism is not present in the fund (e.g., no carried interest variables for a fund without EF carried interest). The Gower distance handles mixed data types natively (§A.4.1).

A.2 Frameworks and Functional Classification

The frameworks mobilized by funds in their documentation are too heterogeneous to be compared by name. I adopt a functional classification that maps each framework reference to one or more analytical functions. This produces a harmonized fund-by-function representation.

Nine functions are identified: commitment frameworks (CMT), goal-setting frameworks (GOAL), classification systems (CLAS), disclosure and reporting standards (DISC), impact measurement and management (IMM), metrics libraries (MET), climate-specific tools (CLIM), policy frameworks (POL), and regulatory frameworks (REG). Each framework reference observed in the documentation is mapped to one or more of these functions, producing a binary fund $\times$ function matrix that serves as input for the "Functions Covered" variable in the macro analysis. Table A.1 presents the complete list of function codes and their definitions. Table A.2 presents the complete list of frameworks observed in fund documentation, with the sponsoring organization and associated functions.

Table A.1: Analytical Function Codes and Definitions

Code	**Definition**
CMT	Participation in a collective initiative, charter, or coalition structuring the market
GOAL	Framework used to formulate, frame, or align sustainability or transition objectives
CLAS	Tool used to label, classify, or qualify assets, funds, or activities
DISC	Framework for transparency, disclosure, or external reporting
IMM	Doctrine, principles, or process structuring impact management in investment
MET	Tool used to measure, quantify, or account for externalities, emissions, or impact
CLIM	Framework centered on climate, decarbonization, alignment, or transition
POL	Framework producing a public or scientific knowledge, expertise, or framing base
REG	Public, quasi-regulatory framework, or one directly anchored in a regulatory architecture

Table A.2: Frameworks Observed in Fund Documentation

Framework	**Sponsoring Organization**	**Functions**
iCI	Initiative Climat International (PRI)	CMT, CLIM
UNPRI	Principles for Responsible Investment	CMT, DISC
SDGs	United Nations	GOAL
SASB	IFRS Foundation / ISSB	DISC, MET
IMP	Impact Management Project	IMM
Operating Principles for Impact Mgmt	IFC / Impact Principles	CMT, IMM
France Invest / FIR Charter	France Invest + FIR	CMT, IMM
Paris Agreement	UNFCCC / United Nations	GOAL, CLIM, REG
European Taxonomy	European Union / European Commission	CLAS, DISC, GOAL, REG
Greenfin	Ministry for the Ecological Transition	CLAS, REG
GIIN	Global Impact Investing Network	MET, DISC
ISR Label	French State / Treasury Directorate	CLAS, REG
NEC	NEC Initiative	MET, CLIM
SBTi	Science Based Targets initiative	CLIM, GOAL
ACT (Ademe)	ADEME + CDP	CLIM, MET
Business Convention for the Climate	CEC	CMT, CLIM
FREC	French Government / Ministry for Ecology	POL, GOAL
Institut de la Finance Durable Charter	Institut de la Finance Durable	CMT
Impact Frontiers	Impact Frontiers	IMM
2X Challenge	2X Challenge / 2X Global	CMT, MET
Relance Label	French State / Treasury Directorate	CLAS, REG
Net Zero Initiative	Carbone 4	CLIM, GOAL
IPBES	IPBES	POL, GOAL
LuxFlag ESG	LuxFLAG	CLAS, REG
GHG Protocol	WRI + WBCSD	MET, DISC
Global Biodiversity Score	CDC Biodiversité	MET
GRI	Global Reporting Initiative	DISC
OECD Due Diligence Toolkit	OECD	IMM, REG
B Corp Assessment	B Lab	CLAS, MET
CDC ESG Toolkit for Fund Managers	CDC Group / British Int'l Investment	IMM, DISC

A.3 Complete Variable Dictionary

The main text presents a selection of variables in the results section. This section provides the complete dictionary for all variables used in the analysis. All binary variables are coded 1 if the element is present and 0 if absent. Ordinal variables are coded on a three-point scale (0, 0.5, 1). Continuous variables are coded in their natural units.

A.3.1 General and Macro Variables

Table A.3: Variables Dictionary — General and Macro

Variable	Module	Source doc	Definition
Flag BO	General	Legal	Buyout fund flag. Criteria = profitable / mature targets
Flag Infra	General	Legal	Infrastructure fund flag
Flag Majo	General	Legal	Fund mainly takes majority positions (>50% of commitments)
Flag Mino	General	Legal	Fund mainly takes minority positions (>50% of commitments)
Flag VC	General	Legal	Venture capital fund flag. Criteria: unprofitable / young targets
Ticket Max	General	Legal	Maximum ticket size (EUR m)
Ticket Min	General	Legal	Minimum ticket size (EUR m)
EF Committee	Macro	Legal	External governance body in the form of an impact committee or equivalent
Sustainability Team	Macro	Commercial	Dedicated sustainability team
EF Carried Flag	Macro	Legal	The fund has a carried interest linked to EF objectives
Sustainable Investment Objective Flag	Macro	Commercial	Fund aims to contribute to environmental or social objectives
Focused	Macro	Legal	Fund is focused on a specific sector or theme
IMM: Objectives	Macro	Commercial	Flag for the setting of EF objectives / EF business plan
IMM: Measurement Process	Macro	Commercial	Flag for annual measurement process
IMM: Screening	Macro	Commercial	Flag for sustainability indicators (ESG and/or impact) integrated into investment analysis
Aspirational ESG Statement	Macro	Commercial	Aspirational ESG statement
ESG Advisory Support	Macro	Commercial	Mention of the use of ESG advisory support
Functions Covered	Macro	Commercial	Number of functions covered through frameworks
Financial Objective	Macro	Commercial	Fund aims to deliver market-rate financial returns
ESG Support Process	Macro	Commercial	Mention of an ESG support process in the PPM
ESG Screening Process	Macro	Commercial	Mention of a screening process in the PPM

A.3.2 EF Carried Module (10 variables, 42 funds)

Table A.4: Variables Dictionary — EF Carried

Variable	Module	Source doc	Definition
Linear EF Carried	EF Carried	Legal	Linear vesting between trigger and full-vesting thresholds
EF Carried paid at trigger	EF Carried	Legal	Share of EF Carried paid at the trigger threshold (% of EF Carried)
Offsetting across objectives	EF Carried	Legal	Possible offsetting across lines or objectives
EF Carried amount	EF Carried	Legal	Share of carried interest indexed to sustainability criteria (% of carried interest)
Global Carried objectives	EF Carried	Legal	EF objectives are the same for all portfolio companies and measured at fund level
Outcome-based Carried objectives	EF Carried	Legal	EF objectives are outcome-based objectives
Intermediate vesting tier	EF Carried	Legal	Share of EF Carried paid at the intermediate threshold (% of EF Carried)
Full vesting cap for EF Carried	EF Carried	Legal	Threshold from which EF Carried is fully vested (% EF score)
Weighting by amount invested	EF Carried	Legal	Portfolio-level weighting based on investment ticket sizes
EF Carried trigger score	EF Carried	Legal	Threshold from which extra-financial carried interest starts being paid (% EF score)

A.3.3 EF Committee Module (13 variables, 30 funds)

Table A.5: Variables Dictionary — EF Committee

Variable	Module	Source doc	Definition
Advisory EF Committee	EF Committee	Legal	Committee decisions are not binding on the management company
Decision: Change in method	EF Committee	Legal	EF Committee validates any change in method, KPIs, or targets
Decision: EF KPI targets	EF Committee	Legal	EF Committee validates the targets to be reached for EF KPIs
Decision: EF Carried payout	EF Committee	Legal	EF Committee validates the payout of EF Carried
Decision: Investment eligibility	EF Committee	Legal	EF Committee validates the eligibility of the investment for the fund's EF thesis
Decision: EF KPIs monitored	EF Committee	Legal	EF Committee validates the EF KPIs monitored for each portfolio company
Decision: Beneficiary organizations	EF Committee	Legal	EF Committee validates the choice of beneficiary if EF Carried is not vested
Decision: Impact orientation	EF Committee	Legal	EF Committee gives a simple opinion on the fund's extra-financial orientation
Decision: OTI measurement	EF Committee	Legal	EF Committee validates the independent third party carrying out EF reporting
Decision: Weighting of impact score	EF Committee	Legal	EF Committee validates KPI weighting / the definition of the EF score
Decision: Validation of measurement	EF Committee	Legal	EF Committee reviews and validates the final achievement of EF objectives
Committee: Independent members	EF Committee	Legal	EF Committee includes independent members
Committee: LPs	EF Committee	Legal	LPs represented on the EF Committee

A.3.4 Sustainable Objective Module (9 variables, 52 funds)

Table A.6: Variables Dictionary — Sustainable Objective

Variable	Module	Source doc	Definition
Financial Additionality	Sust. Objective	Commercial	Fund primarily characterized by financial additionality
Operational Additionality	Sust. Objective	Commercial	Fund primarily characterized by extra-financial additionality
Impact Analysis	Sust. Objective	Legal	Obligation to conduct an analysis of impact criteria before each transaction
Has Any Target	Sust. Objective	Legal	Fund has a global extra-financial objective backed by a market framework
Impact Intentionality	Sust. Objective	Legal	Mention of the intention to generate positive impact in the investment policy
Environmental Objective	Sust. Objective	Commercial	Fund has an environmental objective
Social Objective	Sust. Objective	Commercial	Fund has a social objective
Process IMM	Sust. Objective	Legal	IMM process reflected in the fund's legal documentation (not only in the SFDR annex)
Impact Reporting	Sust. Objective	Legal	Obligation to conduct periodic impact reporting

A.3.5 ESG Contractualization and IMM Modules (14 variables)

Table A.7: Variables Dictionary — Transversal and IMM

Variable	Module	Source doc	Definition
ESG Analysis	Transverse	Legal	Obligation to conduct a general ESG analysis before each investment.
ESG DD	Transverse	Legal	Reference to external ESG due diligence (1 if yes, 0 if no, 0.5 if case by case)
ESG in Shareholder's Agreement	Transverse	Legal	Mention of ESG criteria being included in shareholder agreements (1 if yes)
Exclusions	Transverse	Legal	Fund has a classic sectoral exclusions list (tobacco, oil, illegal activity, alcohol, gambling, pornography, etc.)
ESG Integration	Transverse	Legal	Mention of ESG criteria being integrated into investment analysis
Systematic ESG Process	Transverse	Legal	Mention of an ESG process to be implemented systematically (1 if yes)
ESG Reporting	Transverse	Legal	Obligation to conduct periodic reporting on extra-financial criteria
Share Contractual	Transverse	Legal	Share of frameworks included in the fund's legal documentation (%)
IMM: Doc Transaction	IMM	Commercial	Flag for systematic integration of sustainability objectives in companies' contractual documentation (0.5 = scientific advisor, no framework)
IMM: Exit Management	IMM	Commercial	Flag for systematic consideration of continuity of the sustainability strategy in the exit strategy
IMM: ManPack	IMM	Commercial	Flag for systematic integration of sustainability objectives into managers' incentive mechanism
IMM: Independent Measurement	IMM	Commercial	Flag for measurement performed by an independent party
IMM: Frameworks	IMM	Commercial	Systematic use, where applicable, of a framework to define objectives (0.5 = scientific advisor but no framework)
IMM: EF Committee Validation	IMM	Commercial	Flag for systematic validation of objectives and measurement method by an EF Committee

A.4 Analytical Pipeline and Clustering Methodology

The analysis follows a three-phase pipeline. Phase 1 (macro) clusters all 89 funds on macro-level variables (presence/absence of key mechanisms) to identify broad sustainability structuring profiles. Phase 2 (micro) clusters the funds within each module on modality-level variables to identify typical design configurations, conditional on mechanism presence. Phase 3 (synthesis) integrates macro and micro results by constructing a combined profile for each fund and clustering on the resulting multi-module representation to produce the final typology of organizational signatures.

The distinction between mechanism presence and mechanism modality is central. A fund with an EF committee (macro = 1) can have a controlling or symbolic committee (micro modality). The micro-level clustering is hierarchical in this sense: it is conditional on the macro-level decision to adopt the mechanism. This avoids imposing artificial distances between a fund without a committee and a fund with a controlling committee.

For the synthesis clustering, certain macro variables that are strongly correlated with micro modalities are excluded to avoid double counting. The synthesis input is the vector of micro-module cluster assignments (one categorical variable per module), combined with the macro-level variables that are not redundant with the micro assignments.

A.4.1 Clustering Methodology

Gower distance. The clusterings rely on a dissimilarity matrix in which each cell $d(i, j)$ measures the gap between two funds i and j on the basis of the retained variables. The distance used is the Gower distance (Gower, 1971), which enables the joint treatment of binary, ordinal, and quantitative variables. For two funds i and j:

$$d(i,j) = \frac{\sum_h w_{ijh}\, \delta_{ijh}}{\sum_h w_{ijh}}$$

The term δ_{ijh} denotes the contribution of variable h to the dissimilarity between funds i and j. For a *symmetric binary* variable, this contribution equals 0 if both funds share the same value and 1 otherwise. For an *asymmetric binary* variable, the same logic applies, except that the case $(0, 0)$ is not treated as an informative similarity. For a *quantitative* variable, the contribution is the absolute difference between the two values, scaled by the observed range of the variable: $\delta_{ijh} = |x_{ih} - x_{jh}|/R_h$. For an *ordinal* variable, the modality is first repositioned on an ordered scale and then compared as a normalized numerical variable.

The term w_{ijh} indicates whether the contribution of variable h is valid. In practice, $w_{ijh} = 0$ when one of the two values is missing, or when the variable is asymmetric binary and both funds take value 0. Gower distance is therefore the weighted average of valid contributions only. This choice prevents a shared absence of mechanism, frequent in the database, from artificially bringing two funds closer together.

Because I work on marketing and contractual documentation, I cannot rule out that some GPs

implement certain practices without explicitly mentioning them. It is therefore useful not to treat co-absence as informative for these variables. The distinction between symmetric and asymmetric binary variables is documented for each clustering in §A.5.

PAM / k-medoids. Clustering is estimated using PAM (Partitioning Around Medoids) / k-medoids (Kaufman & Rousseeuw, 1990). Unlike k-means, which assumes a Euclidean space and summarizes each group by an artificial average center, k-medoids works directly on the distance matrix and anchors each group around a real observation (the medoid). This method is better suited to mixed data and more robust to atypical observations. It also produces an analytically useful output: one "typical" observation per cluster.

Silhouette index. The silhouette index (Rousseeuw, 1987) measures the quality of separation of a partition. For a fund i, let $a(i)$ denote the average distance to the other funds in its own cluster and $b(i)$ the smallest average distance to any other cluster. The silhouette score is:

$$s(i) = \frac{b(i) - a(i)}{\max\{a(i),\, b(i)\}}$$

A silhouette close to 1 indicates that a fund is clearly closer to its own cluster than to the others. A value close to 0 signals a fuzzy boundary. A negative value suggests that assignment to another cluster would be more plausible. The average silhouette across all funds serves as the primary criterion for evaluating a given partition.

Adjusted Rand Index (ARI). The Adjusted Rand Index (Hubert & Arabie, 1985) compares two partitions in terms of pairs of observations classified together or separately. Let n denote the total number of funds, n_{ij} the number of funds placed in cluster i of the first partition and cluster j of the second, a_i the size of cluster i in the first partition, and b_j the size of cluster j in the second. The index is:

$$\mathrm{ARI} = \frac{\displaystyle\sum_{ij}\binom{n_{ij}}{2} - \frac{\displaystyle\sum_i \binom{a_i}{2} \cdot \sum_j \binom{b_j}{2}}{\binom{n}{2}}}{\displaystyle\frac{1}{2}\left[\sum_i \binom{a_i}{2} + \sum_j \binom{b_j}{2}\right] - \frac{\displaystyle\sum_i \binom{a_i}{2} \cdot \sum_j \binom{b_j}{2}}{\binom{n}{2}}}$$

An ARI close to 1 indicates that almost the same partition is recovered. A value close to 0 corresponds to random similarity. A negative value signals strong partition instability.

Jaccard index of the minority cluster. The Jaccard index measures the overlap between the smallest cluster of the reference partition (A) and its best analogue after re-estimation (B):

$$J(A, B) = \frac{|A \cap B|}{|A \cup B|}$$

This indicator complements the ARI because a partition may remain globally stable while still being fragile in its smallest groups. Values close to 1 indicate strong stability of the minority cluster.

Robustness testing protocol. Robustness is assessed through subsampling: I randomly remove part of the sample, re-estimate the clustering, and compare the new partition to the reference partition. For each iteration, I compute the ARI and the Jaccard index of the minority cluster, then analyze the distribution of these indicators to assess partition stability.

For the macro clustering, robustness is assessed through $B = 1{,}000{,}000$ iterations of random 80% subsampling without replacement, plus stratified subsampling (removing the same proportion from each cluster of the reference partition), plus targeted leave-k-out (LKO) tests on the minority cluster (removal of 1, 2, or 5 funds). For the micro clusterings, robustness is assessed through $B = 1{,}000{,}000$ iterations of 80% subsampling without replacement, with a minimum size threshold and a stability filter requiring a median ARI ≥ 0.55 and a median Jaccard ≥ 0.50.

A.5 Decision of K and Robustness

For each clustering, I test a grid of K values. The choice of the number of clusters is based on four criteria: average silhouette width (quality of separation), partition stability (ARI and Jaccard under subsampling), a minimum size for the smallest cluster (to avoid a multitude of clusters with 2 or 3 funds), and the interpretability of the partition. This section presents the variables used, the K-selection grid, the robustness results, and the justification for the retained solution for each clustering.

A.5.1 Macro Clustering ($K = 3$, 89 funds, 13 variables)

Table A.8 presents the 13 variables entering the macro clustering. A variable is marked "symmetric" when co-absence (both funds taking value 0) is treated as informative similarity in the Gower distance.

Table A.8: Macro Clustering: Variables Used and Symmetry

Variable	**Symmetric**
EF Committee	Yes
Carried EF Flag	Yes
Sustainability Team	No
ESG Screening Process	No
ESG Support Process	No
Aspirational ESG Statement	No
ESG Advisory Support	No
IMM: Screening	No
IMM: Objectives	No
IMM: Measurement Process	No
Sustainable Investment Objective Flag (derived)	No
Functions Covered (derived)	n.a.
Focused (derived)	n.a.

Table A.9 presents the K-selection grid with average silhouette and cluster sizes for each value of K.

Table A.9: Macro K Selection Grid

K	Silh.	Min size	Max size
2	0.320	43	46
3	0.329	13	46
4	0.290	13	35
5	0.289	11	35
6	0.293	9	31
7	0.279	9	25
8	0.267	7	25
9	0.284	4	25
10	0.298	4	25

Table A.10 presents the stability results under subsampling and leave-k-out tests.

Table A.10: Macro Robustness Tests

Test	n	Avg. ARI	P10	Median ARI	P90	% > 0.80
Random subsampling	1,000,000	0.842	0.564	0.944	1.000	63.4
Stratified subsampling	1,000,000	0.829	0.560	0.919	1.000	62.0
LKO – 1	1,000,000	0.593	0.593	0.593	0.593	0.0
LKO – 2	1,000,000	0.591	0.590	0.590	0.590	0.0
LKO – 3	1,000,000	0.581	0.580	0.580	0.590	0.0

I retain the $K = 3$ solution, which has the highest average silhouette (0.329). This partition is also robust, with a median ARI of 0.944 under random subsampling (63.4% of iterations above 0.80). The residual instability concentrates on the smallest cluster (13 funds, 14.6% of the sample): the leave-k-out tests show that removing even a single fund from this group substantially reduces the ARI. The two larger clusters are stable under all testing regimes.

A.5.2 Sustainable Objective Module ($K = 3$, 52 funds, 8 variables)

Table A.11: Sustainable Objective Clustering: Variables Used and Symmetry

Variable	**Symmetric**
Impact intentionality	No
IMM Process	Yes
Impact reporting	No
Impact analysis	No
Has Any Target (derived)	n.a.
Type of additionality (derived)	n.a.
Social objective	No
Environmental objective	No

Table A.12: Sustainable Objective K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
2	0.531	21	31	0.777	1.000	0.878	1.000
3	0.310	12	26	0.934	1.000	0.932	1.000
4	0.389	4	24	0.853	0.966	0.702	1.000
5	0.430	4	20	0.773	0.713	0.806	1.000
6	0.521	4	15	0.889	0.929	0.891	1.000
7	0.521	4	15	0.852	0.865	0.597	0.429
8	0.508	4	16	0.866	0.869	0.735	1.000
9	0.538	1	15	0.918	0.929	1.000	1.000
10	0.537	1	15	0.921	0.929	1.000	1.000

I retain the $K = 3$ solution because it preserves excellent robustness (median ARI = 1.000, median Jaccard = 1.000) while revealing interpretable heterogeneity across types of sustainable objectives. The $K = 2$ solution produced a clearer split (silhouette of 0.531) but at the cost of an overly simple interpretation that only separates impact funds from non-impact funds. The $K = 3$ solution allows a finer classification by differentiating funds with social objectives from those with environmental

objectives.

A.5.3 EF Carried Module ($K = 4$, 42 funds, 10 variables)

Table A.13: EF Carried Clustering: Variables Used and Symmetry

Variable	**Symmetric**
Outcome-based Carried objectives	Yes
Global Carried objectives	Yes
Weighting by amount invested	Yes
Offsetting across objectives	Yes
Linear Carried EF	No
Carried EF amount	n.a.
Carried EF trigger score	n.a.
Carried EF paid at trigger	n.a.
Full vesting cap for Carried EF	n.a.
Intermediate vesting tier	n.a.

Table A.14: EF Carried K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
2	0.377	20	22	0.937	1.000	0.968	1.000
3	0.375	12	16	0.792	0.903	0.847	1.000
4	0.427	5	15	0.828	0.839	0.804	1.000
5	0.427	5	12	0.736	0.738	0.624	0.600
6	0.441	5	10	0.804	0.830	0.742	0.833
7	0.418	4	9	0.780	0.787	0.540	0.500
8	0.376	3	8	0.779	0.785	0.547	0.500
9	0.359	1	8	0.799	0.806	0.926	1.000
10	0.388	1	8	0.813	0.822	0.981	1.000

I retain the $K = 4$ solution because it clearly improves average separation relative to $K = 2$ and $K = 3$ (silhouette of 0.427 vs. 0.377 and 0.375) while remaining in an acceptable stability

zone (median ARI = 0.839, median Jaccard = 1.000). The $K = 6$ solution offers slightly greater granularity with a marginally higher silhouette (0.441) by isolating "purely linear" versus "tiered" configurations. However, this gain comes with weaker stability of the small clusters and substantial redundancy across certain groups linked to secondary modalities rather than structural differences. I therefore prefer the $K = 4$ solution, which is more interpretable and more stable.

A.5.4 EF Committee Module ($K = 2$, 30 funds, 13 variables)

Table A.15: EF Committee Clustering: Variables Used and Symmetry

Variable	**Symmetric**
Advisory EF Committee	Yes
Decision: impact KPIs monitored	Yes
Decision: EF KPI targets	Yes
Decision: weighting of impact score	Yes
Decision: change in method, indicators	Yes
Decision: Carried EF payout	Yes
Decision: impact orientation	Yes
Decision: investment eligibility	Yes
Decision: OTI measurement	Yes
Decision: validation of measurement	Yes
Decision: beneficiary organizations	Yes
Committee: LPs	No
Committee: independent members	No

Table A.16: EF Committee K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
2	0.468	10	20	0.908	1.000	0.940	1.000
3	0.416	7	13	0.820	0.783	0.784	0.833
4	0.427	3	11	0.719	0.710	0.529	0.286
5	0.376	3	10	0.715	0.705	0.676	0.750
6	0.348	2	8	0.738	0.737	0.651	0.667
7	0.354	1	8	0.694	0.703	0.908	1.000
8	0.406	1	8	0.681	0.666	0.991	1.000
9	0.417	1	8	0.673	0.668	1.000	1.000
10	0.439	1	5	0.743	0.753	1.000	1.000

I retain the $K = 2$ solution. It offers both the best average separation (silhouette of 0.468) and the best stability (median ARI = 1.000, median Jaccard = 1.000). Finer solutions quickly introduce more fragile groups without sufficient interpretive gain. The $K = 3$ solution produces a picture similar to $K = 2$, with one cluster of funds with symbolic committees, one cluster with controlling committees composed only of LPs, and one cluster with controlling committees including exclusively independent members.

A.5.5 IMM Module ($K = 3$, 70 funds, 6 variables)

Table A.17: IMM Clustering: Variables Used and Symmetry

Variable	**Symmetric**
IMM: Frameworks	No
IMM: Transaction Documentation	No
IMM: EF Committee Validation	No
IMM: ManPack	No
IMM: Independent Measurement	No
IMM: Exit Management	No

Table A.18: IMM Process K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
2	0.411	25	45	0.832	1.000	0.894	1.000
3	0.416	18	31	0.874	1.000	0.867	1.000
4	0.380	6	31	0.728	0.725	0.464	0.333
5	0.373	6	20	0.681	0.678	0.535	0.400
6	0.409	6	20	0.672	0.668	0.517	0.400
7	0.438	6	14	0.701	0.694	0.729	0.833
8	0.486	4	14	0.793	0.796	0.708	1.000
9	0.489	4	14	0.811	0.806	0.827	1.000
10	0.543	4	11	0.852	0.856	0.729	0.750

I retain the $K = 3$ solution. It slightly improves separation relative to $K = 2$ (silhouette of 0.416 vs. 0.411) and allows a finer interpretation while preserving excellent stability (median ARI = 1.000, median Jaccard = 1.000). Finer solutions ($K \geq 4$) weaken the robustness of the smallest groups substantially (median Jaccard drops to 0.333 at $K = 4$).

A.5.6 ESG Contractualization Module ($K = 3$, 89 funds, 8 variables)

Table A.19: ESG Contractualization Clustering: Variables Used and Symmetry

Variable	**Symmetric**
Sector exclusions	No
ESG reporting	No
ESG risk integration	No
ESG DD	No
ESG analysis	No
Systematic ESG Process	No
ESG in SHA	No
Share Contractual (derived)	n.a.

Table A.20: ESG Contractualization K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
2	0.390	28	61	0.758	0.835	0.809	0.885
3	0.359	14	54	0.834	0.875	0.750	0.750
4	0.376	10	53	0.832	0.916	0.751	0.778
5	0.290	10	39	0.697	0.671	0.819	0.875
6	0.291	5	37	0.710	0.698	0.359	0.200
7	0.272	4	37	0.712	0.708	0.650	0.600
8	0.268	4	39	0.772	0.757	0.759	1.000
9	0.275	3	39	0.751	0.754	0.588	0.500
10	0.318	3	33	0.862	0.890	0.677	1.000

I retain the $K = 3$ solution. It preserves strong stability (median ARI = 0.875, median Jaccard = 0.750) while revealing richer heterogeneity than at $K = 2$. Finer solutions ($K \geq 4$) do not sufficiently improve substantive readability relative to the additional complexity.

A.5.7 Synthesis Clustering ($K = 8$, 89 funds, 5 variables)

The synthesis clustering takes as input categorical variables representing the retained modalities of the micro modules, together with the presence of a Sustainability Team. It therefore no longer compares raw variables but rather the use of the different organizational modules as characterized by the previous clustering processes. The IMM screening and measurement variables are excluded because they are almost perfectly correlated with the modalities of the IMM Process mechanism.

Table A.21: Synthesis Clustering: Variables Used and Symmetry

Variable	**Symmetric**
EF Committee modality	n.a.
Carried EF modality	n.a.
IMM Process modality	n.a.
Sustainable objective modality	n.a.
Sustainability Team	No

Table A.22: Organizational Signatures K Selection Grid

K	Silh.	Min size	Max size	Avg. ARI	Median ARI	Avg. Jacc.	Median Jacc.
3	0.310	21	38	0.784	0.865	0.792	1.000
4	0.357	15	30	0.743	0.725	0.815	1.000
5	0.395	13	22	0.813	0.797	0.758	0.846
6	0.383	11	19	0.804	0.776	0.859	0.900
7	0.385	10	19	0.847	0.849	0.680	0.700
8	0.412	7	18	0.878	0.881	0.684	0.833
9	0.439	3	18	0.877	0.889	0.500	0.333
10	0.449	3	18	0.834	0.862	0.601	0.500

I retain the $K = 8$ solution. The silhouette continues to improve relative to more aggregated solutions (0.412 at $K = 8$ vs. 0.310 at $K = 3$), while the stability of the smallest cluster remains acceptable (median ARI = 0.881, median Jaccard = 0.833). A $K = 6$ solution was also conceivable: it simply merges the clusters of funds with a comprehensive architecture (whether they have a social or environmental objective) and the clusters relying on a single internal capability (with or without a Sustainability Team). The $K = 8$ solution therefore provides a more fine-grained interpretation and a better silhouette while remaining very stable. The alluvial diagram (Figure 2) confirms that the macro cluster "structured process with governance" alone distributes across six of the eight signatures, confirming that the synthesis captures heterogeneity invisible at the macro level.

B Sample Descriptives

B.1 General Sample Description

Table 1 in the main text presents the general characteristics of the 89 funds, including the distribution by investment strategy (buyout, venture capital, infrastructure), position type (majority, minority) and ticket sizes.

B.2 Macro-Level Description with Geczy Comparison

Table 3 in the main text presents the prevalence of key macro mechanisms in my sample alongside comparable metrics from Geczy et al. (2021).

B.3 MCA Axis Construction and Complementary Macro Visualizations

The MCA (Multiple Correspondence Analysis) transforms each macro variable into binary modalities (e.g., "IMM: Screening = 1" vs. "= 0") and seeks the axes that best separate fund profiles in terms of distances between configurations of modalities. The first two axes explain 56.6% of the variation in the data. Because each axis is a linear combination maximizing explained inertia, it has no a priori label: interpretation relies on the modalities that contribute most to its construction.

Tables B.1 and B.2 present the modalities contributing most to Dimensions 1 and 2 respectively. The "Contrib" column indicates the relative contribution of each modality to the dimension: the highest contributions identify the modalities that structure the axis. The "Coord Dim 1" and "Coord Dim 2" columns correspond to the factor coordinates of the modalities on the first two dimensions. The sign indicates the side of the axis, and the amplitude indicates the distance from the center.

Table B.1: MCA Modality Contributions to Dimension 1: "Operational Sustainability Structuring"

Modality	**Contrib (%)**	**Coord Dim 1**	**Coord Dim 2**
IMM: Objectives = 0	11.24	−1.615	0.388
IMM: Measurement Process = 0	10.67	−1.663	0.032
IMM: Screening = 0	9.29	−2.133	0.396
Aspirational ESG Statement = 0	8.50	−1.636	0.726
ESG Screening Process = 0	6.62	−0.970	0.492
Sust. Investment Obj. Flag = 0	4.65	−0.744	−0.708
Flag EF Carried = 1	4.64	0.698	0.395
ESG Support Process = 0	4.27	−0.654	0.274
ESG Support Process = 1	4.17	0.639	−0.268
Flag EF Carried = 0	4.15	−0.624	−0.353
ESG Advisory Support = 1	3.99	0.681	−0.088
ESG Screening Process = 1	3.54	0.518	−0.263
Sust. Investment Obj. Flag = 1	3.31	0.529	0.504
IMM: Objectives = 1	3.05	0.438	−0.105
Sustainability Team = 0	3.01	−0.569	0.090

Dimension 1 is mainly driven by modalities linked to the IMM base (IMM: Objectives, Measurement Process, Screening) and by the existence or absence of operational ESG processes. Funds to the left of the center have no operational sustainability process. Those to the right display the most structured process.

Table B.2: MCA Modality Contributions to Dimension 2: "Sustainable Governance Formalization"

Modality	**Contrib (%)**	**Coord Dim 1**	**Coord Dim 2**
EF Committee = 1	15.44	0.604	0.917
Flag Focused = 1	15.19	0.162	0.760
Flag Focused = 0	14.20	−0.151	−0.710
Sust. Investment Obj. Flag = 0	11.36	−0.744	−0.708
Sust. Investment Obj. Flag = 1	8.08	0.529	0.504
EF Committee = 0	7.85	−0.307	−0.466
ESG Screening Process = 0	4.59	−0.970	0.492
Aspirational ESG Statement = 0	4.52	−1.636	0.726
Flag EF Carried = 1	4.01	0.698	0.395
Flag EF Carried = 0	3.59	−0.624	−0.353
ESG Screening Process = 1	2.45	0.518	−0.263
ESG Support Process = 0	2.02	−0.654	0.274
ESG Support Process = 1	1.98	0.639	−0.268
IMM: Objectives = 0	1.75	−1.615	0.388
IMM: Screening = 0	0.86	−2.133	0.396

Dimension 2 captures dimensions of organizational architecture and governance. The strongest contributions come from the EF Committee and the degree of sectoral/thematic focus (Focused), followed by the formalization of a sustainable investment objective. This axis therefore reflects the extent to which a fund has formalized dedicated governance for sustainability, independently of the operational IMM base that mainly structures Dimension 1.

B.4 Module-Level Descriptives

B.4.1 EF Carried Interest (42 funds)

Among the 42 funds with EF carried interest, 69% have outcome-based objectives and 74% have fund-global (rather than PC-specific) objectives. The mean share of carried interest indexed on EF objectives varies across clusters. Vesting mechanics split between linear (57%) and stepwise (43%) schedules. Offsetting (EF underperformance offset by financial overperformance) is present in 36%

of funds.

B.4.2 EF Committee (30 funds)

Among the 30 funds with an EF committee, 60% include LP representatives and 47% include independent members. The controlling/symbolic distinction is sharp: controlling committees validate KPIs (100%), set targets (100%), weight impact in decisions (75%) and validate measurement methodology (65%). Symbolic committees are limited to impact orientation (30%) and investment eligibility assessment (30%).

B.4.3 IMM Process (70 funds)

Among the 70 funds with an IMM process, 53% integrate EF objectives in PC-level documentation, 39% integrate them in management packages, 57% use independent measurement and 44% subject IMM results to committee validation. Exit management integration (29%) remains the least prevalent feature.

B.4.4 Sustainable Objective (52 funds)

Among the 52 funds with a sustainable investment objective, 62% have an environmental dimension and 71% a social dimension. Financial additionality is the dominant strategy (58%), with operational additionality at 42%. Contractualization rates vary: 65% contractualize the objective, 19% set quantitative targets.

B.4.5 ESG Contractualization (89 funds)

Across all 89 funds, exclusion lists are nearly universal (92%). ESG analysis clauses appear in 74% of legal documents, ESG process requirements in 62%, and ESG reporting requirements in 58%. ESG clauses in shareholder pacts (28%) and binding ESG clauses (22%) are less common, distinguishing funds with deeper contractual integration.

C Detailed Results by Module

C.1 Transversal Module: ESG Contractualization

The ESG contractualization module covers all 89 funds. Three clusters emerge. Cluster 1 (low ESG integration) groups funds with exclusion lists but minimal contractual formalization. Cluster 2 (high process integration) groups funds with ESG analysis, process requirements and reporting fully integrated in legal documentation. Cluster 3 (selective contractualization) groups funds that selectively contractualize structuring clauses (ESG in shareholder pacts, binding ESG clauses) without necessarily covering the full spectrum of process clauses.

Table C.1: ESG Contractualization — Signature Variables

	C1		C2		C3	
Variable	p_c	score	p_c	score	p_c	score
esg_dans_le_pacte	0.0%	-0.16	32.7%	+0.33	0.0%	-0.16
exclusions_sectorielles	76.2%	-0.16	92.5%	+0.08	92.9%	+0.09
dd_esg	0.0%	-0.34	46.2%	+0.35	21.4%	-0.02
Share Contractual	2.4%	-0.43	25.5%	-0.08	65.2%	+0.51
process_esg_impose_aux_p_es	4.8%	-0.43	75.0%	+0.62	21.4%	-0.18
reporting_esg	9.5%	-0.44	92.5%	+0.81	14.3%	-0.37
integration_risques_esg	38.1%	-0.62	100.0%	+0.31	100.0%	+0.31
analyse_esg	0.0%	-0.91	82.7%	+0.33	100.0%	+0.59

C.2 Sustainable Investment Objective (52 funds)

Three clusters are identified (see Table 7 in the main text for the signature table). Cluster 1 groups funds with a mixed-focus objective, minimal process formalization and low intentionality. Cluster 2 groups funds with a strong social dimension (83.3%), strong IMM processes and formalized intentionality. Cluster 3 groups funds with the most comprehensive profiles: quantitative targets (19.2%), dedicated impact reporting (54.2%) and impact integration in investment analysis (70.8%).

C.3 EF Committee (30 funds)

Two clusters emerge, corresponding to a controlling vs. symbolic distinction (see Table 9 in the main text for the signature table). Controlling committees (60% of funds with committees) validate KPIs, set targets, weight impact in investment decisions, validate measurement methodology and include LP representatives. Symbolic committees are limited to providing impact orientation and assessing investment eligibility, without formal decision or veto rights.

C.4 EF Carried Interest (42 funds)

In a PE fund, LPs and GP receive first the return of their capital invested, and then the LPs get a preferred return ("hurdle rate", typically 6–8% for buyout funds or 1.2–1.25× for VC funds). Beyond this threshold, profits are shared between LPs and the GP, typically 80/20. The GP's 20% share constitutes the "carried interest," the primary incentive mechanism aligning the GP's interests with those of LPs.

In my sample, every fund with a carried interest indexed on sustainability objectives has the same waterfall mechanic. For such funds, the payout of a portion of the carried interest (e.g., 20% of the total carried, or 4% of profits above the hurdle) is conditional on the achievement of an extra-financial score (EF score). This EF score is calculated from sustainability KPIs according to a formula predetermined in the LPA. The "EF" portion (20% of total carried) is delivered only if the EF score exceeds a trigger threshold, and delivery increases (linearly or in tiers) up to a full vesting cap. If the score falls below the full vesting cap, the portion not vested is typically redirected to a non-profit organization designated by the EF committee or the LPs. This mechanism creates a direct incentive for the GP to pursue sustainability objectives, as a material share of its compensation depends on their achievement. It is important to note that this extra-financial incentive is activated only when the carried interest is "in the money," meaning the fund has already generated sufficient financial performance. This means that the sustainability objectives are always treated after the financial objectives in my sample.

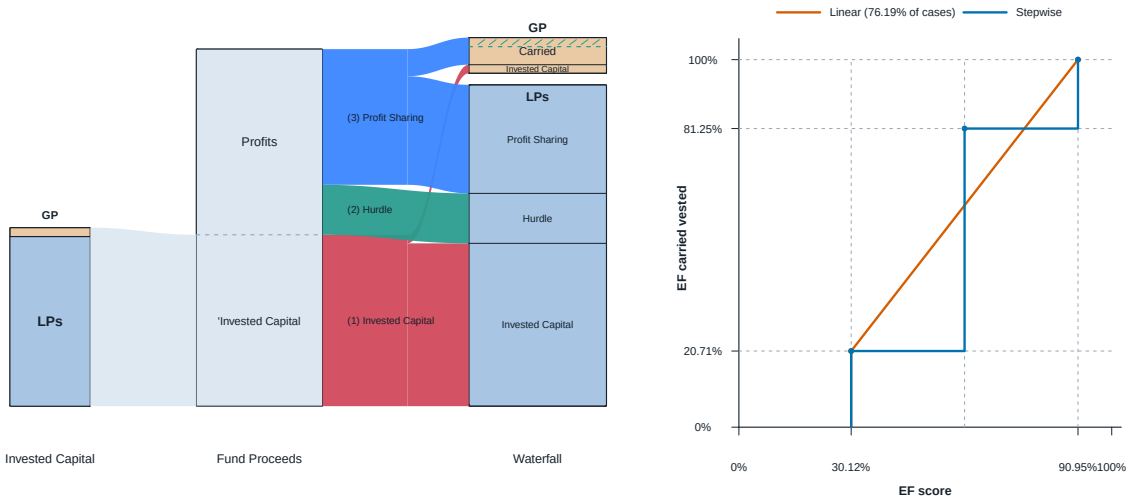


Figure C.1: Mechanics of the EF Carried Interest

Note. In a standard PE fund, LPs and GP first receive the return of their capital, then LPs receive a preferred return (hurdle rate, typically 6–8% for buyout or 1.2–1.25× for venture capital). Beyond this threshold, profits are split between LPs and GP, typically 80/20. The GP's 20% share constitutes the carried interest. For funds with an EF carried interest, a portion of this carried (the "EF portion") is conditionally vested on the achievement of an extra-financial score (EF score), calculated from sustainability KPIs according to a formula predetermined in the fund's legal documentation. *Left panel:* profit distribution cascade showing the standard and EF portions of the carried interest. *Right panel:* vesting schedule as a function of the EF score. Below the trigger threshold, no EF carried is paid. Between the trigger and the full vesting cap, delivery increases linearly or in tiers. If the score falls below the full vesting cap, the unvested portion is typically redirected to a non-profit organization. The EF carried interest is activated only when the fund has generated sufficient financial performance for the carried interest to be "in the money," meaning sustainability objectives are always subordinated to financial objectives in the waterfall.

Four clusters emerge (see Table 11 in the main text for the signature table). Cluster 1 (offsetting-heavy, outcome-based): 93.3% outcome-based objectives with offsetting rules allowing financial overperformance to compensate EF underperformance. Cluster 2 (linear, full vesting, outcome-based): 100% full vesting with linear schedules and 90% outcome-based objectives. Cluster 3 (mixed, fund-global): 80% fund-global objectives with mixed outcome/means orientation. Cluster 4 (sparse, means-based): only 8.3% outcome-based, predominantly means-based objectives with minimal calibration.

C.5 IMM Process (70 funds)

Three clusters emerge (see Table 13 in the main text for the signature table). Cluster 1 (minimal IMM): no committee validation, no independent measurement, limited documentation. Cluster 2 (committee-validated IMM): 100% committee validation, 85.7% independent measurement, strong documentation. Cluster 3 (independently measured IMM): 100% independent measurement, 38.9% documentation, moderate committee validation. The key trade-off is between committee-driven validation and third-party independent measurement.

D Configurational Synthesis

D.1 Macro × Micro Analysis

Figure D.1 presents the cross-tabulation of macro clusters with micro-module modalities. The heatmap shows how the three macro profiles distribute across the modality clusters of each module, revealing the internal heterogeneity of each macro cluster.

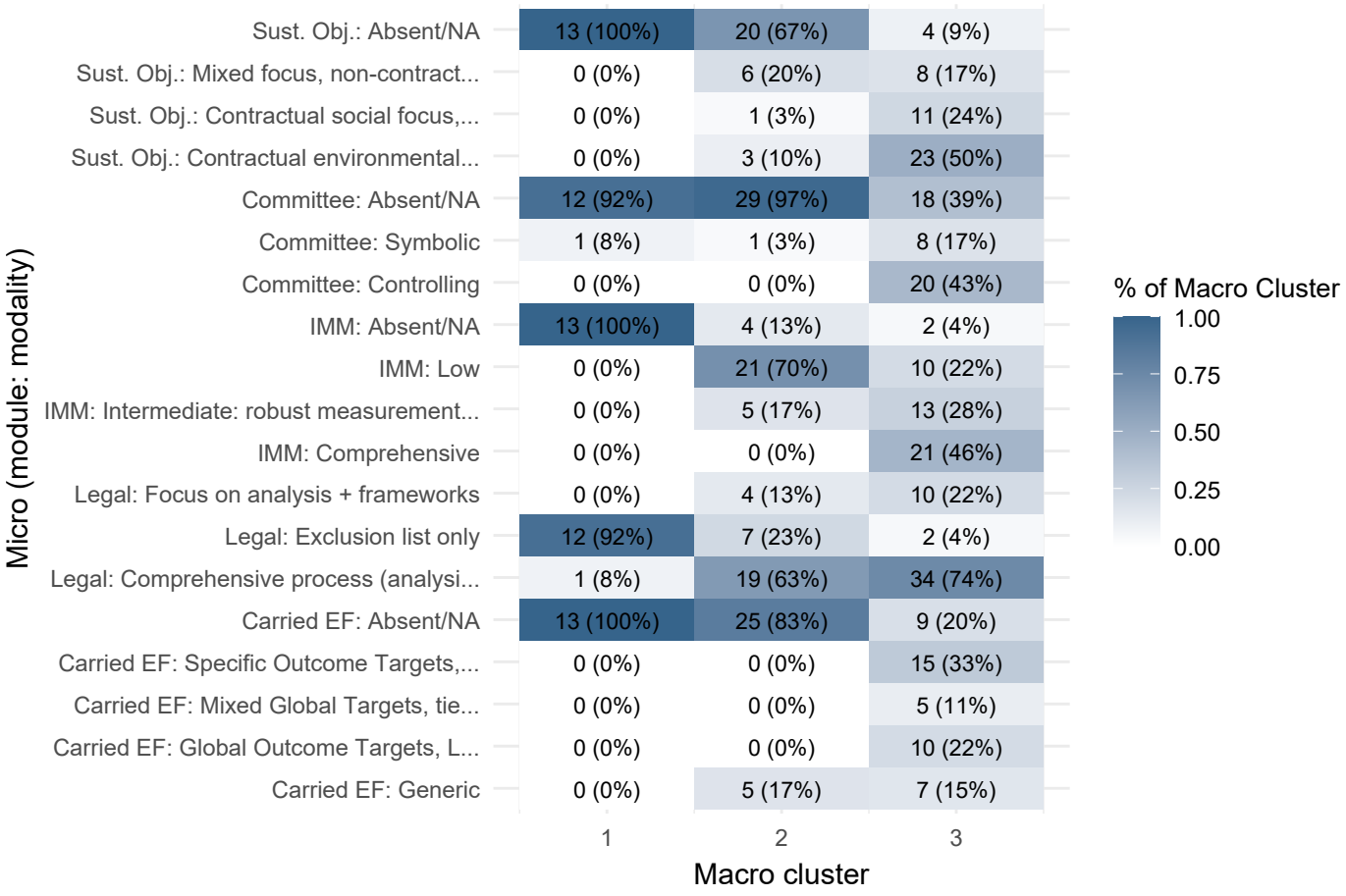


Figure D.1: Macro × Micro Heatmap: Distribution of Macro Clusters Across Module Modalities

D.2 Micro × Micro Interdependence

D.2.1 Statistical Association Between Modules

The Cramér's V heatmap (Figure 1 in the main text) summarizes the statistical association between module-level cluster assignments. High values indicate non-random co-occurrence of modalities across modules. The strongest associations are between the EF committee and EF carried modules and between the sustainable objective and IMM modules.

D.2.2 Co-Occurrence Patterns

Figure D.2 presents the detailed co-occurrence heatmap between all pairs of micro-module modalities. This visualization complements the Cramér's V summary by showing the specific modality pairs that drive the associations.

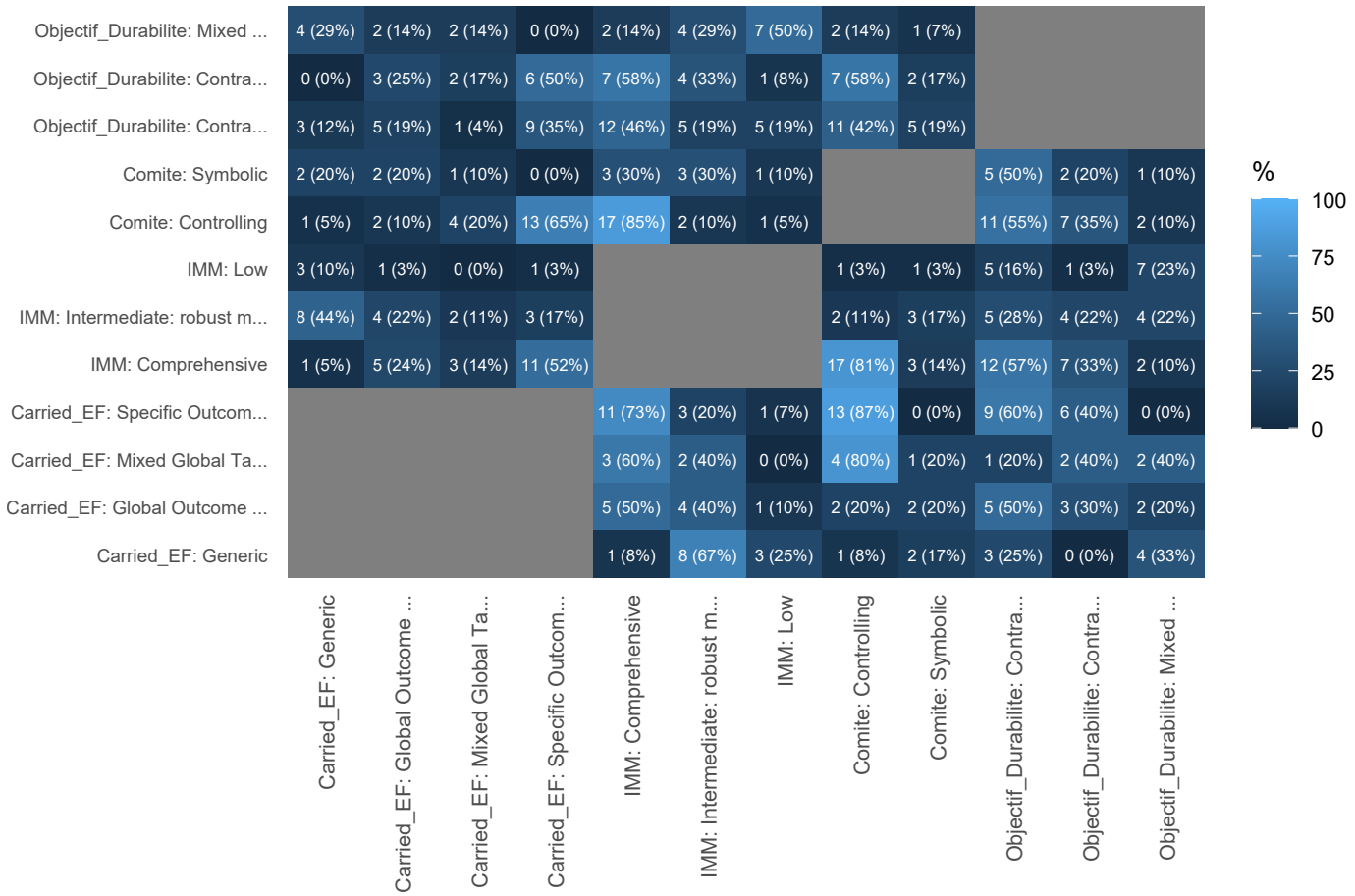


Figure D.2: Micro × Micro Heatmap: Co-Occurrence of Module Modalities

D.3 Organizational Signatures: Construction and Detailed Profiles

D.3.1 Methodological Approach

The synthesis clustering takes as input a combined profile vector for each fund. This vector includes the macro-level cluster assignment and the micro-level cluster assignments for each module (sustainable objective, EF carried, EF committee, IMM, ESG contractualization). Macro variables already captured in the micro modalities are excluded to avoid double counting. PAM/Gower clustering is applied to this combined vector, and $K = 8$ is retained based on silhouette analysis and interpretability (see §A.5 for detailed robustness results).

D.3.2 Detailed Signature Profiles

Tables D.1 through D.8 present the detailed profile of each organizational signature.

Table D.1: Cluster 1 — No structured approach

Variable	Dominant modality
IMM	Absent/NA (100%, r=+6.37)
Sust. Team	No (100%, r=+2.97)
Sust. Objective	Absent/NA (85.7%, r=+2.56)
EF Carried	Absent/NA (100%, r=+2.43)
EF Committee	Absent/NA (92.9%, r=+1.22)
Under-represented modalities (r < -2)	
IMM	Low (r=-2.21)
Additionality distribution within signature	
Absent / NA	12 / 14 (85.7%)
Financial additionality	2 / 14 (14.3%)
Operational additionality	0 / 14 (0.0%)
Mixed additionality	0 / 14 (0.0%)

Table D.2: Cluster 2 — Environmental Objective - Symbolic Structuring

Variable	Dominant modality
EF Committee	Symbolic (85.7%, r=+5.88)
Sust. Objective	Contractual environmental objective (85.7%, r=+2.77)
IMM	Absent/NA (42.9%, r=+1.23)
EF Carried	Absent/NA (71.4%, r=+0.68)
Sust. Team	Yes (71.4%, r=+0.63)
Under-represented modalities (r < -2)	
Module	None identified below threshold
Additionality distribution within signature	
Absent / NA	1 / 7 (14.3%)
Financial additionality	6 / 7 (85.7%)
Operational additionality	0 / 7 (0.0%)
Mixed additionality	0 / 7 (0.0%)

Table D.3: Cluster 3 — Social Objective - Complete Architecture

Variable	Dominant modality
Sust. Objective	Contractual social objective (81.8%, r=+6.17)
EF Committee	Controlling (81.8%, r=+4.15)
IMM	Complete (81.8%, r=+3.98)
EF Carried	Specific outcome targets (45.5%, r=+2.31)
Sust. Team	Yes (72.7%, r=+0.85)
Under-represented modalities (r < -2)	
Sust. Objective	Absent / NA (r=-2.14)
EF Committee	Absent / NA (r=-2.70)
EF Carried	Absent / NA (r=-2.41)
Additionality distribution within signature	
Absent / NA	0 / 11 (0.0%)
Financial additionality	7 / 11 (63.6%)
Operational additionality	2 / 11 (18.2%)
Mixed additionality	2 / 11 (18.2%)

Table D.4: Cluster 4 — Environmental Objective - Complete Architecture

Variable	Dominant modality
EF Committee	Controlling (100%, r=+5.42)
IMM	Complete (90.9%, r=+4.60)
EF Carried	Specific outcome targets (72.7%, r=+4.51)
Sust. Objective	Contractual environmental objective (100%, r=+4.34)
Sust. Team	Yes (72.7%, r=+0.85)
Under-represented modalities (r < -2)	
Sust. Objective	Absent / NA (r=-2.14)
EF Committee	Absent / NA (r=-2.70)
EF Carried	Absent / NA (r=-2.41)
Additionality distribution within signature	
Absent / NA	0 / 11 (0.0%)
Financial additionality	8 / 11 (72.7%)
Operational additionality	2 / 11 (18.2%)
Mixed additionality	1 / 11 (9.1%)

Table D.5: Cluster 5 — Minimal IMM Process

Variable	Dominant modality
IMM	Low (100%, r=+3.66)
Sust. Team	No (100%, r=+2.64)
EF Carried	Absent/NA (100%, r=+2.15)
Sust. Objective	Absent/NA (72.7%, r=+1.60)
EF Committee	Absent/NA (100%, r=+1.37)
Under-represented modalities (r < -2)	
Module	None identified below threshold
Additionality distribution within signature	
Absent / NA	8 / 11 (72.7%)
Financial additionality	2 / 11 (18.2%)
Operational additionality	1 / 11 (9.1%)
Mixed additionality	0 / 11 (0.0%)

Table D.6: Cluster 6 — Internal capacity without governance mechanism

Variable	Dominant modality
IMM	Low (83.3%, r=+3.49)
Sust. Team	Yes (100%, r=+2.66)
EF Carried	Absent/NA (94.4%, r=+2.43)
Sust. Objective	Absent/NA (72.2%, r=+2.02)
EF Committee	Absent/NA (100%, r=+1.76)
Under-represented modalities (r < -2)	
EF Committee	Controlling (r=-2.01)
IMM	Comprehensive (r=-2.06)
Additionality distribution within signature	
Absent / NA	13 / 18 (72.2%)
Financial additionality	2 / 18 (11.1%)
Operational additionality	3 / 18 (16.7%)
Mixed additionality	0 / 18 (0.0%)

Table D.7: Cluster 7 — Mixed focus - generic EF carried + IMM

Variable	Dominant modality
EF Carried	Generic (77.8%, r=+5.25)
IMM	Intermediate: Targets Measurement (77.8%, r=+3.84)
Sust. Objective	Non-contractual mixed objective (55.6%, r=+3.01)
Sust. Team	No (77.8%, r=+1.40)
EF Committee	Absent/NA (88.9%, r=+0.83)
Under-represented modalities (r < -2)	
EF Carried	Absent / NA (r=-2.18)
Additionality distribution within signature	
Absent / NA	3 / 9 (33.3%)
Financial additionality	1 / 9 (11.1%)
Operational additionality	5 / 9 (55.6%)
Mixed additionality	0 / 9 (0.0%)

Table D.8: Cluster 8 — Environmental objective - Robust incentive

Variable	Dominant modality
EF Carried	Global outcome targets (62.5%, r=+4.33)
IMM	Robust intermediate (75.0%, r=+3.44)
Sust. Objective	Contractual environmental objective (75.0%, r=+2.40)
Sust. Team	Yes (87.5%, r=+1.29)
EF Committee	Absent/NA (100%, r=+1.17)
Under-represented modalities (r < -2)	
EF Carried	Absent / NA (r=-2.06)
Additionality distribution within signature	
Absent / NA	0 / 8 (0.0%)
Financial additionality	4 / 8 (50.0%)
Operational additionality	4 / 8 (50.0%)
Mixed additionality	0 / 8 (0.0%)

D.4 SFDR and Impact Status

SFDR classifications and the "impact" label provide a useful signal but do not capture the dispersion of organizational architectures.

D.4.1 Organizational Signatures by SFDR and Impact Status

Table D.9 presents the distribution of the eight organizational signatures by SFDR classification and impact status.

Table D.9: Signatures by SFDR and Impact Status

Signature	N	Non-impact	Impact	SFDR NA	SFDR 6	SFDR 8	SFDR 9
No structured approach	14	14 (21%)	0 (0%)	2 (50%)	8 (62%)	4 (10%)	0 (0%)
Minimal IMM Process - no E&S focus	11	11 (16%)	0 (0%)	1 (25%)	3 (23%)	7 (17%)	0 (0%)
Internal Resources	18	17 (25%)	1 (5%)	1 (25%)	2 (15%)	13 (31%)	2 (7%)
Mixed focus - generic EF carried + IMM	9	8 (12%)	1 (5%)	0 (0%)	0 (0%)	8 (19%)	1 (3%)
Env. focus - symbolic structuring	7	6 (9%)	1 (5%)	0 (0%)	0 (0%)	6 (14%)	1 (3%)
Env. focus - robust incentive	8	5 (7%)	3 (14%)	0 (0%)	0 (0%)	2 (5%)	6 (20%)
Env. focus - comprehensive architecture	11	2 (3%)	9 (41%)	0 (0%)	0 (0%)	0 (0%)	11 (37%)
Social focus - comprehensive architecture	11	4 (6%)	7 (32%)	0 (0%)	0 (0%)	2 (5%)	9 (30%)

The overall signal is broadly coherent: 90% of Article 9 funds and 92% of impact funds concentrate in the most complete architectural families (signatures 3, 4 and 8). Article 6 and unclassified funds concentrate in the weakly structured signatures (No structured approach, Minimal IMM process). Yet the boundaries between categories are imperfect. Four Article 9 funds (13%) display minimal or symbolic structuring around their sustainability objective. Four Article 8 funds (10%) display a complete architecture. 11 non-impact funds (16.4%) present a signature structured around a sustainability objective. The distinction between impact and non-impact funds, and between SFDR 8 and 9 classifications, is not fully reflected in the organizational signatures.

Intra-Article 8 heterogeneity is particularly strong: Article 8 is the only SFDR category represented across nearly all organizational signatures, from the most weakly structured to the most complete. This confirms that Article 8 operates as a catch-all category that groups funds with fundamentally different organizational realities.

D.4.2 Mechanism Modalities by SFDR and Impact Status

Table D.10 cross-tabulates all mechanism modalities by SFDR classification and impact status.

Table D.10: Modules by SFDR and Impact Status

Module	Modality	N	Non-impact	Impact	SFDR NA	SFDR 6	SFDR 8	SFDR 9
Sustainable objective	Absent / NA	37	37 (55%)	0 (0%)	4 (100%)	13 (100%)	20 (48%)	0 (0%)
	Mixed, non-contract.	14	14 (21%)	0 (0%)	0 (0%)	0 (0%)	14 (33%)	0 (0%)
	Social, contract.	12	3 (4%)	9 (41%)	0 (0%)	0 (0%)	0 (0%)	12 (40%)
	Env., contract.	26	13 (19%)	13 (59%)	0 (0%)	0 (0%)	8 (19%)	18 (60%)
EF Committee	Absent / NA	59	54 (81%)	5 (23%)	4 (100%)	13 (100%)	33 (79%)	9 (30%)
	Controlling	20	5 (7%)	15 (68%)	0 (0%)	0 (0%)	2 (5%)	18 (60%)
	Symbolic	10	8 (12%)	2 (9%)	0 (0%)	0 (0%)	7 (17%)	3 (10%)
EF Carried	Absent / NA	47	45 (67%)	2 (9%)	4 (100%)	13 (100%)	28 (67%)	2 (7%)
	Specific outcome	15	1 (1%)	14 (64%)	0 (0%)	0 (0%)	0 (0%)	15 (50%)
	Global outcome	10	8 (12%)	2 (9%)	0 (0%)	0 (0%)	2 (5%)	8 (27%)
	Mixed, tiered	5	3 (4%)	2 (9%)	0 (0%)	0 (0%)	2 (5%)	3 (10%)
	Generic	12	10 (15%)	2 (9%)	0 (0%)	0 (0%)	10 (24%)	2 (7%)
IMM Process	Absent / NA	19	19 (28%)	0 (0%)	2 (50%)	10 (77%)	7 (17%)	0 (0%)
	Low	31	27 (40%)	4 (18%)	2 (50%)	3 (23%)	22 (52%)	4 (13%)
	Intermediate	18	13 (19%)	5 (23%)	0 (0%)	0 (0%)	10 (24%)	8 (27%)
	Comprehensive	21	8 (12%)	13 (59%)	0 (0%)	0 (0%)	3 (7%)	18 (60%)

EF committee. Among impact funds, 76% have an EF committee, almost systematically in its controlling form (15 out of 17 committees). The distinction between Article 8 and Article 9 is sharp: 79% of Article 8 funds have no committee, and 95% either have no committee or have it only in its symbolic form. Among Article 9 funds, a majority (70%) use the mechanism, predominantly in its controlling dimension (60%).

EF carried interest. The EF carried interest is the most discriminating mechanism between SFDR categories. Among impact funds, 91% have an indexed carried interest (20 funds), with 64% on outcome targets. Article 6 and unclassified funds have no carried interest. Among Article 8 funds, 33% use the mechanism, often in its generic form (24%). Among Article 9 funds, 93% have indexed carried, with outcome targets dominating (77%), but lighter modalities also exist.

IMM process. All impact funds have an IMM process, and 59% display the most complete structuring. Article 6 and unclassified funds either have no IMM or only a low-structuring version. Among Article 8 funds, 93% have absent or low structuring. Article 9 funds display more heterogeneity, with 60% achieving complete structuring.

D.4.3 Assessment

These results confirm that SFDR and the impact label operate on declarations of intent, not on the ex ante organizational architecture. They send a useful signal but do not allow inference about the organizational depth of a fund, neither at the aggregate level of signatures nor at the level of each mechanism individually. This finding carries particular weight given the theoretical argument of this paper: the organizational configuration of the fund, not its regulatory classification, determines its capacity to sustain the simultaneous pursuit of financial and sustainability objectives.