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Beyond allocation : shaping value, organizational identity and markets through public-private finance

Maya Tira

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THESE DE DOCTORAT

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Sciences  conomiques et sciences de gestion - Pays de Loire
Sp cialit  : Sciences de Gestion

Par
Maya TIRA

Beyond allocation.

Shaping value, organizational identity and markets through public-private finance

Th se pr sent e et soutenue   Angers », le 18 novembre 2025

Unit  de recherche : Groupe de Recherche Angevin en  conomie et Management (GRANEM)

Rapporteurs avant soutenance :

St phane Saussier Professeur Titulaire, IAE Paris Sorbonne Business School
Rachida Justo Professeur Associ , IE University

Composition du Jury :

Pr�sident :	Emmanuelle Dubocage	Professeur Titulaire, EM Lyon
Examineur :	Alec Fraser	Reader, King's College London
Dir. de th�se :	Christophe Maurel	Professeur des Universit�s, Universit� d'Angers
Co-dir. de th�se :	Benjamin Le Pendeven	Professeur Associ�, Audencia Business School
	C�line Louche	Professeur Titulaire, Waikato University

Invit (s)

Roland Marion

Directeur Economie Circulaire, ADEME

Saniya, this one is for you.

i. ACKNOWLEDGMENTS

To this day, I still don't have a clear answer to why did I want to pursue a PhD. I just know that I had a stubborn desire to do one. After spending four years as a doctoral student, and as I write these acknowledgments, I've taken some time to reflect and make sense of what brought me where I am. Doing a Ph.D. was certainly not a career move: to be honest, I did not have the long-held dream of becoming a professor at the beginning of this journey. However, school is – and has always been – my happy place. Every time I enter a university, I'm overwhelmed with a sense of calm and serenity, as if walls of the building were protecting me from the noise of the outside world. School is also where PhDs happen. And in a way, I think I was just trying to find my way back to my safe space. I have also always felt an inclination and a deep admiration for people who carry resilience. I think it might be my favorite human trait. Resilience is also what defines Ph.D. students, and I wanted to be one of them. Finally, if you know me personally, you've likely noticed that I'm someone who asks more questions than I give answers. My curiosity knows no limits. Some find it fascinating; others, admittedly, are exhausted by it. The truth is, I'm moved by the desire to learn, and I seek out people who nurture it. And really, what better than the academic community to fuel that part of me?

The realities of being a Ph.D. student turned out to be far more complex and profoundly overwhelming than I had ever imagined. It changed me to the point where I barely remember who I was before I started this journey. On the bright side, doing a Ph.D. taught me rigor, sharpness, and precision – everything I'm naturally drawn to and qualities I aspired to develop. My understanding of the world has unquestionably expanded. I had the opportunity to travel and meet truly inspiring people in academia who challenged me, broadened my thinking, and shifted my perspective. Looking back, I remember moments of intellectual exhilaration and bursts that felt like adrenaline peaks and made me feel intensely alive.

My deepest gratitude goes first to my PhD supervising team. I want to thank Christophe Maurel, for believing in me and giving me the opportunity to pursue a PhD in the first place. I also want to thank Céline Louche, who remained engaged with my PhD despite the distance of being in New Zealand. I am especially grateful for your constant intellectual and personal commitment to me and to my work. I cherished each of our late-night and early-morning calls, which always left me somehow re-energized. I look up to you not only as a brilliant researcher but also as an incredible human being. To Benjamin Le Pendeven, I think you know how much I admire you intellectually because I've never been able to hide it, and because your approval fueled much of this PhD journey. You challenged me in ways no one else ever has, and I like to think I rose to the challenge.

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Throughout the journey, I was supported by the most loving and unwavering support system. Above all, I am endlessly grateful that life gifted me with the most inspiring, and caring parents. Mom, I admire your strength, your openness, your generosity, and your work ethic. As a woman, I feel profoundly lucky to have grown up with you as my example. Dad, you are the most intelligent, curious and sharp-minded person I know, and somehow also the most effortlessly fun, with the biggest heart. Your unique blend of wisdom, lightness, and kindness has been a constant source of inspiration to me. Together, you succeeded in building the strongest, most solid foundation a family could offer. You are my role models, and pretty much everything I strive to live up to. I'm sorry you had to endure all the stress, the anxiety, the doubt that came with this journey. Just know that, at the heart of it all, my greatest purpose is to make you proud.

Selim, I often pride myself on having played a big part in the person you've become. I used to only half-jokingly say that I raised you (no offense to Mom and Dad). You are, without a doubt, my greatest achievement, the most remarkable brother and my favorite person in this world. Thank you for letting me shift that dynamic over the past few years. Though you're the younger sibling, you stepped in and took such good care of me. You carried my self-confidence when I

couldn't find it in myself anymore. You believe in me more than I believe in myself, and you never missed a chance to remind me of that when I needed it most.

To my girls, Amina, Syrine, Sarah, Emna, Emira and Femke, your sisterhood and your consistency through this journey are what kept me going every single day. You held space for me, especially on the hard days where I couldn't hold it for myself. The power of female friendships is hard to put into words. Every day, I look up to you and feel lucky to witness and celebrate the incredible women you've become. Syrine, your dedication to the people you love is remarkable. Your love knows no judgment, no limit. Being your friend is both an honor and a responsibility, one that pushes me to become a better person every single day, just to be worthy of your standards. Amina, I would have never believed I could build a relationship as deep and meaningful as ours. We've walked alongside each other through some of the most defining moments of our lives. You are, without a doubt, part of all my best memories. I'm constantly in awe of your ambition, how fearlessly you dream, how relentlessly you chase those dreams, and how generously you bring others along with you. Sarah, the irony is that we met during a bumpy time in both our lives, yet you turned out to be one of the most valuable additions to mine during one of its most challenging chapters. Your strength is breathtaking, and your commitment to our friendship runs deep. You show up consistently and without hesitation. It's been incredible to witness you blossom into the person you are today.

From opening their homes to me, feeding me, showing up to fill my fridge, taking unexpected late-night calls, making me take much-needed walks or coffee breaks, wiping away my meltdowns, and listening to my existential voids, all the people mentioned above made this PhD possible. Beyond the academic growth, my main takeaway from this PhD journey is that I may be one of the most supported people on this planet—and I need to cherish that and give back in every way I can. I have absolutely no idea where the future will lead me, and to be honest, that feels quite exciting. What I do know is this: school remains my happy place, I ask even more

questions than I used to, and I am now part of the resilient team of people who made it through a PhD. I guess that means: mission accomplished.

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iii. LIST OF ABBREVIATIONS

ADEME: French Agency for Environmental and Energy Management

DIBs: Development Impact Bonds

EIBs: Environmental Impact Bonds

GP: General Partner

IB: Impact Bonds

IRR: Internal Rate of Return

LP: Limited Partner

NPG: New Public Governance

NPM: New Public Management

PbR: Payment by Results

PfP: Pay-for-Performance

PfS: Pay-for-Success

RbF: Results-based Finance

SDGs: Sustainable Development Goals

SIBs: Social Impact Bonds

PES: Payments for Ecosystem Services

PPPs: Public-Private-Partnerships

WTP: Willingness-To-Pay

SE: Social Economy

SME: Small and Medium Enterprise

SSE: Social and Solidarity Economy

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vii. EXECUTIVE SUMMARY (ENGLISH)

In a world facing escalating social and environmental challenges alongside tightening public budgets, public–private finance has become a critical mechanism for channeling capital toward sustainability goals. Extending beyond traditional public–private partnerships (PPPs), it now covers a diverse range of financial instruments that differ in how they structure collaboration between public and private actors. Some create direct contractual and financial arrangements, while others shape private investment indirectly, through certification and signaling mechanisms. This dissertation examines these two complementary approaches through two cases: First, through the study of Impact Bonds, an outcomes-based financing instrument designed to fund innovative social and environmental projects with potential to scale into public policy; then, through the analysis of public support schemes for SMEs, analyzed as levers of credibility and certification that can attract and mobilize private capital.

The dissertation seeks to move beyond a view of public–private finance as mere capital allocation. It demonstrates, first, that Impact Bonds operate as valuation devices that reshape how social and environmental value is calculated and recognized. Second, it conceptualizes investing in Impact Bonds as a hybrid practice, where financial performance and impact creation intersect, leading private investors engaging in impact bonds investing to renegotiate their organizational identities. Third, it positions Impact Bonds as an emergent hybrid market, where investor diversity gives rise to new forms of syndication and participation. Finally, it shows how public funding to SMEs produces certification effects that can influence firms' future access to debt and equity finance.

Chapter 2 reveals the limitations of cost-saving logics in Environmental Impact Bonds and advances a broader, non-market understanding of value creation through the monetization of avoided externalities. Chapter 3 investigates how investors navigate hybrid logics and identity tensions through their engagement in micro-level practices such as Impact Bonds investing,

introducing the concept of an identity–practice compass to capture this reflective process. Chapter 4 uses a unique dataset of 285 investors across 235 deals (2010–2023) to uncover the drivers of reinvestment in the global Impact Bond market. It finds that syndication—particularly in hybrid-dominated configurations—is a key factor sustaining long-term participation. Chapter 5 combines ADEME and Bpifrance data to explore how public funding shapes SMEs’ financial trajectories. It shows that the impact of public support depends on how instruments are combined and on the nature of the public institutions involved, questioning whether an environmental certification effect from a credible actor like ADEME can boost private investors’ confidence.

These findings show that public–private finance is not only about funding flows, but about redefining how value, legitimacy, and collaboration are constructed at the intersection of public and private spheres. The dissertation argues that its transformative potential lies less in the volume of capital mobilized than in the institutional and relational innovations it enables. Public–private finance thus appears as an institutional laboratory where new ways of aligning public goals and private incentives are being tested in practice.

viii. SYNTHÈSE (FRANÇAIS)

Dans un contexte mondial marqué par l'intensification des défis sociétaux et environnementaux et par la contrainte croissante pesant sur les finances publiques, la finance publique-privée s'impose comme un instrument central de mobilisation du capital au service des enjeux de durabilité. Élargissement du modèle traditionnel des partenariats public-privé (PPP), elle s'appuie sur une palette d'instruments financiers qui se distinguent notamment par la nature des interactions qu'ils instaurent entre acteurs publics et privés. D'un côté, des mécanismes directs connectent contractuellement et financièrement les deux parties ; de l'autre, des mécanismes indirects orientent les allocations privées en certifiant la qualité des projets et des entreprises. C'est sur ces deux modalités complémentaires d'interaction que se concentre cette thèse, à travers l'étude de deux dispositifs : (1) le Contrat à Impact (CI), instrument de financement public-privé innovant fondé sur une logique de paiement au résultat, permettant de financer des expérimentations sociales et environnementales à fort potentiel de réplication et d'intégration dans les politiques publiques; (2) les soutiens publics aux PME, envisagés comme des mécanismes de levier et de certification susceptibles d'influencer la participation du capital privé.

L'objectif de cette thèse est d'apporter un éclairage sur les contributions de la finance publique-privée au-delà de la seule allocation de capital. Elle montre, premièrement, comment les Contrats à Impact peuvent être compris comme des dispositifs de valorisation (*valuation devices*) qui redéfinissent la manière dont la valeur sociale et environnementale est calculée et reconnue. Deuxièmement, elle conceptualise l'investissement dans les Contrats à Impact comme une pratique hybride liant performance financière et création d'impact, qui met en tension et va jusqu'à parfois recomposer ou consolider les identités organisationnelles des investisseurs. Troisièmement, elle analyse le marché des Contrats à Impact comme un marché hybride, où la diversité des investisseurs donnent lieu à de nouvelles formes de syndication et

redéfinissent les critères de participation. Enfin, elle examine comment les soutiens publics aux PME produisent à la fois des effets de ressource et des effets de certification susceptibles d'influencer leur accès ultérieur aux à la dette et aux financements par fonds propres.

La thèse s'articule autour de quatre articles, chacun constituant un chapitre distinct. Le Chapitre 2 explore le rôle des contrats à impact comme dispositifs de valorisation (*valuation devices*) de l'impact environnemental. Il remet en question l'hypothèse fondatrice du modèle selon laquelle les paiements au résultat reposeraient exclusivement sur des économies budgétaires réalisées par le secteur public. En s'appuyant sur l'expérimentation des Contrats à Impact Environnemental (CIE) menée par l'ADEME, il montre que cette logique de coûts évités s'avère difficilement transposable aux enjeux environnementaux, dont les effets se mesurent rarement en gains budgétaires immédiats. Le chapitre propose d'élargir la compréhension de la valorisation des résultats dans les CIE en intégrant des approches non marchandes, fondées sur la monétisation des externalités négatives évitées, ouvrant ainsi la voie à une définition plus complète de la valeur environnementale créée par ces dispositifs.

Le Chapitre 3 s'intéresse à la dimension organisationnelle de l'investissement dans les contrats à impact. Il analyse comment l'engagement dans cette pratique hybride, alliant performance financière et impact, agit comme un espace de tension identitaire pour les investisseurs. L'investissement dans des contrats à impact combinant performance financière et création d'impact social ou environnemental constitue une pratique hybride qui conduit les organisations à reconfigurer la manière dont elles définissent leur mission et à redéfinir leur narratif identitaire. En mobilisant la littérature sur la complexité institutionnelle et les micro-pratiques organisationnelles, le chapitre met en évidence un processus réflexif d'identité en miroir de la pratique et introduit le concept de boussole identité–pratique, permettant de comprendre comment les investisseurs réfléchissent et reconfigurent leurs identités organisationnelles à travers leur engagement dans une pratique hybride.

Le Chapitre 4 prolonge cette réflexion en adoptant une approche quantitative visant à comprendre les dynamiques de participation et de réinvestissement dans le marché des Contrats à Impact. En mobilisant un jeu de données inédit portant sur 285 investisseurs engagés dans 235 contrats à impact entre 2010 et 2023, il explore les déterminants du réinvestissement à travers un modèle logistique de Firth et une régression multinomiale. Les résultats mettent en lumière le rôle central de la syndication comme moteur de réengagement : les investisseurs impliqués dans des consortiums sont significativement plus enclins à réinvestir que ceux agissant seuls. Toutefois, la composition de ces syndications importe tout autant : les configurations à domination hybride apparaissent comme les plus propices à une participation durable. Ces résultats contribuent à la compréhension du marché des Contrats à Impact comme un marché hybride, où la stabilité dépend de la capacité à articuler et à faire coexister des logiques d'investissement divergentes.

Le Chapitre 5 élargit la focale en analysant, à partir d'un jeu de données inédit combinant les financements publics octroyés par l'ADEME et Bpifrance, le rôle des soutiens publics aux PME dans leur trajectoire de financement. En mobilisant une approche économétrique fondée sur le *matching* et la méthode des doubles différences, il examine comment la combinaison de différents dispositifs publics – subventions, avances remboursables, prêts à l'innovation – influence l'accès ultérieur des entreprises au financement par dette ou fonds propres. Les résultats montrent que l'octroi de plusieurs dispositifs peut renforcer la probabilité d'accès à la dette et au capital, mais que cet effet dépend fortement du type de combinaison de soutiens mobilisée et des caractéristiques des financeurs publics impliqués. Le chapitre met ainsi en évidence que les soutiens publics n'agissent pas seulement comme des apports de ressources, mais aussi comme des signaux différenciés de légitimité sur le marché du financement des PME. En particulier, il questionne l'existence d'un effet de certification environnemental associé à l'intervention d'un acteur reconnu comme l'ADEME : celle-ci pourrait, en labellisant

des projets jugés techniquement crédibles ou alignés avec les objectifs de transition écologique, renforcer la confiance des financeurs privés.

Cette thèse met en évidence que la finance publique ne se limite pas à une logique d'allocation de ressources, mais qu'elle agit comme un espace d'expérimentation où se redéfinissent les modes de valorisation, de coopération et de légitimation entre acteurs publics et privés. Les contrats à impact apparaissent ainsi comme des dispositifs qui reconfigurent la manière de mesurer et de reconnaître la valeur sociale et environnementale, tout en exposant les investisseurs à des tensions identitaires liées à la cohabitation de logiques d'impact et de performance financière. L'analyse du réinvestissement met en évidence que la stabilité du marché des contrats à impact dépend de la capacité des acteurs à construire des formes de syndication hybrides conciliant ces logiques. Enfin, l'étude des soutiens publics aux PME nuance la vision d'un effet de levier automatique du financement public : elle montre que les effets d'entraînement ou de certification dépendent des combinaisons d'instruments mobilisés et du profil des organismes impliqués, en particulier lorsqu'il s'agit d'un acteur environnemental tel que l'ADEME. Dans son ensemble, la thèse souligne que la capacité de la finance publique-privée à contribuer à la transition écologique et sociale repose moins sur le volume des capitaux mobilisés que sur la qualité des dispositifs et des interactions qu'elle crée entre acteurs. Elle invite ainsi à penser la finance publique-privée comme un champ d'expérimentation institutionnelle où se testent de nouvelles manières d'articuler objectifs publics et intérêts privés.

CHAPTER 1. GENERAL INTRODUCTION

Following the 4th International Conference on Financing for Development (FfD-4), held in July 2025 in Sevilla, the Outcomes Finance Alliance (formerly the Impact Bonds Working Group) issued the *Cali Joint Declaration on Outcomes-Based Financing for Sustainable Development¹ in FfD4* (OFA, 2025). The declaration aims to advance the scaling and institutionalizing of outcomes-based financing instruments, such as Impact Bonds, in response to a global context of tightening public budgets, a widening financing gap for SDGs and rising pressure on official development assistance. Shortly after, on July 14th 2025, the British government announced the launch of the *Better Futures Fund²*, a £500 million fund dedicated to financing social impact bonds in youth services, representing the world largest social outcomes fund established to date (UK HM Treasury, 2025) and signaling a significant policy commitment to outcomes-based contracting. Together, these developments reaffirm the role that governments and international organizations attribute to public-private finance in tackling social and environmental challenges.

Over the past two decades, governments and international organizations have increasingly relied on public-private finance to bridge the widening gap in funding social and environmental needs. The reduction in government spending that followed the 2008 financial crisis coincided with a worsening of pressing social and environmental challenges and intensified the pressure on the public sector (La Torre et al., 2024). One clear example of these pressures is found in climate action (Tira et al., 2024). Capital for environmental conservation is still predominantly provided by public and philanthropic actors (Hamrick, 2016), yet the scale of funding required far exceeds current allocations. To keep global warming below 1.5°C, an estimated \$4.13

¹ <https://outcomesaccelerator.org/endorse-the-cali-joint-declaration/>

² <https://www.gov.uk/government/news/largest-fund-of-its-kind-to-support-vulnerable-kids-families>

trillion is needed annually (Climate Policy Initiative, 2021). In practice, however, climate investment amounted to only \$632 billion per year in 2019–2020 (less than 15% of the target) highlighting both the magnitude of the financing gap and the urgency of finding alternative solutions.

The financing gap is further illustrated by the paradoxes of misallocated public finance: on the one hand, governments struggle to mobilize sufficient resources for climate and biodiversity protection, with current investments falling far short of estimated needs. On the other hand, governments worldwide still dedicate around \$3 trillion³ annually to subsidies detrimental to biodiversity such as fossil fuels and intensive agriculture, generating negative externalities of US\$10.5–22.6 trillion (Reyes-García et al., 2025). This paradox highlights the urgency of rethinking how public finance is mobilized and aligned with sustainability goals.

1.1. MAPPING THE LANDSCAPE OF PUBLIC-PRIVATE FINANCE FOR SUSTAINABLE DEVELOPMENT GOALS

1.1.1. Defining public-private finance

Public–private finance refers to the collaborative arrangements through which governments and private organizations jointly design, finance, and deliver projects or public services. It combines public and private capital and distributes risk and rewards among stakeholders. In this dissertation, the term is used as an umbrella name to describe the mechanisms through which public and private actors collaborate in public value creation. In that sense, public–private finance extends beyond the traditional Public–Private Partnership (PPP) model to encompass a broader spectrum of collaborative mechanisms through which public and private actors co-create societal value.

³ <https://www.novethic.fr/environnement/biodiversite/subventions-nefastes-biodiversite-monde-3000-milliards>

The formalization of the Sustainable Development Goals (SDGs) in 2015 has repositioned sustainability at the core of public policy agendas at both national and supranational levels. In response, governments and international institutions have reinterpreted the PPP framework through a sustainability lens, explicitly linking it to SDG objectives such as poverty alleviation, healthcare, education, climate action, and access to clean water and sanitation. This has led to the development and experimentation of diverse public–private financial mechanisms beyond traditional PPPs designed to channel private investment toward a more inclusive and sustainable economy. Vecchi (2021) conceptualizes public–private collaboration as a multi-level framework that varies in its degree of institutionalization and formality. Building on this perspective, public–private finance can be understood as a continuum operating across three interconnected levels. At the macro-level, informal partnerships can take the form of lobbying to shape and influence public policies and regulations. When public policies are designed to encourage such public-private collaboration to create public value (for example, through grants or tax incentives), they give rise to innovative forms of public-private collaboration operating at the policy level. At the meso-level, institutional partnerships operate through structured programs, including local development initiatives and joint ventures. Here, the goal is to combine financial and non-financial resources to increase effectiveness in the achievement of sustainable objectives. One of the main mechanisms at the meso-level is blended finance, a structuring approach relying on the strategic use of public and philanthropic catalytic capital to crowd-in additional private investment toward SDGs. Blended finance seeks to attract market-rate investors by tailoring risk–return profiles, making opportunities appealing to private actors who would otherwise not participate (Toledano et al., 2025). At the micro level, public-private collaboration takes the form of concession or public procurement where service delivery is carried out by a profit or non-profit service provider. The most recent development of this type of public-private finance mechanism is outcomes-based contracting such as Impact Bonds,

where payment is contingent upon the achievement of social or environmental performance indicators.

1.1.2. Financial instruments for public–private collaboration

The extension of public-private finance to the provision of social services has paved the way for experimentation with financial innovations, as it increasingly relies on a diverse set of instruments to leverage public resources and mobilize private capital. These instruments vary not only in their structure (ranging from concessional grants to equity, debt, mezzanine finance, guarantees, and results-based financing) but also in the way they distribute risks, returns, and responsibilities between public and private actors. They also vary in the nature of interaction between these actors: some instruments involve direct financial engagement, where public institutions act as co-investors, outcome payors, or risk-sharing partners; others operate through indirect mechanisms, influencing private investment decisions via technical support, or market signaling, without entering into formal financial relationships. Table 1.1 provides a typology of these instruments, offering definitions, representative forms, and categorizing them according to the degree of direct or indirect public–private interaction they entail.

Table 1.1 Typology of public-private finance instruments

Instruments	Definition	Forms	Interaction
Grants	Public and philanthropic actors provide concessional capital to catalyze and mobilize additional private capital	<ul style="list-style-type: none"> • Technical assistance • Capacity-building grants • Viability-gap funding 	Indirect
Equity	Public actors take ownership stakes in companies or projects, sharing risks and returns with private investors	<ul style="list-style-type: none"> • Direct equity • Co-investments • Fund-of-funds 	Direct
Debt	Public actors provide loans on concessional or market terms to reduce financing costs and improve access to capital, while crowding in private lenders.	<ul style="list-style-type: none"> • Senior loans • Syndicated loans • Concessional loans • Reimbursable advance 	Direct

General Introduction

Mezzanine	Public, philanthropic, and private investors use hybrid instruments that improve the capital structure of a project or fund by sharing risk more strategically	<ul style="list-style-type: none"> • Convertible debt • Subordinated debt • First-loss capital • Quasi-equity 	Direct
Guarantees / Insurance	Public institutions commit to cover part of the loss in case of default, political instability, or project underperformance, lowering perceived risk for private investors.	<ul style="list-style-type: none"> • Credit guarantees • Political risk insurance • Partial risk guarantees 	Indirect
Results / Outcomes-based	Private investors provide up-front capital for social/environmental interventions. Public commissioner (state or development finance institutions) repays the investors with interest in case of success	<ul style="list-style-type: none"> • Social Impact Bonds (SIBs) • Environmental Impact Bonds (EIBs) • Development Impact Bonds (DIBs) 	Direct

In this dissertation, we focus specifically on two types of instruments that map onto different levels of public-private collaboration. The first are impact bonds, micro-level results-based mechanism where public and private actors are directly connected through contractual and financial ties. In these arrangements, public entities commit to repaying private investors upon the achievement of predefined outcomes. The second type of instrument reflects a macro-level logic of partnership, in which public support shapes subsequent private capital allocation indirectly through public leverage and certification.

1.2. DIRECT PUBLIC-PRIVATE FINANCE INSTRUMENTS: FOCUS ON IMPACT BONDS

1.2.1. Definition and stakeholders

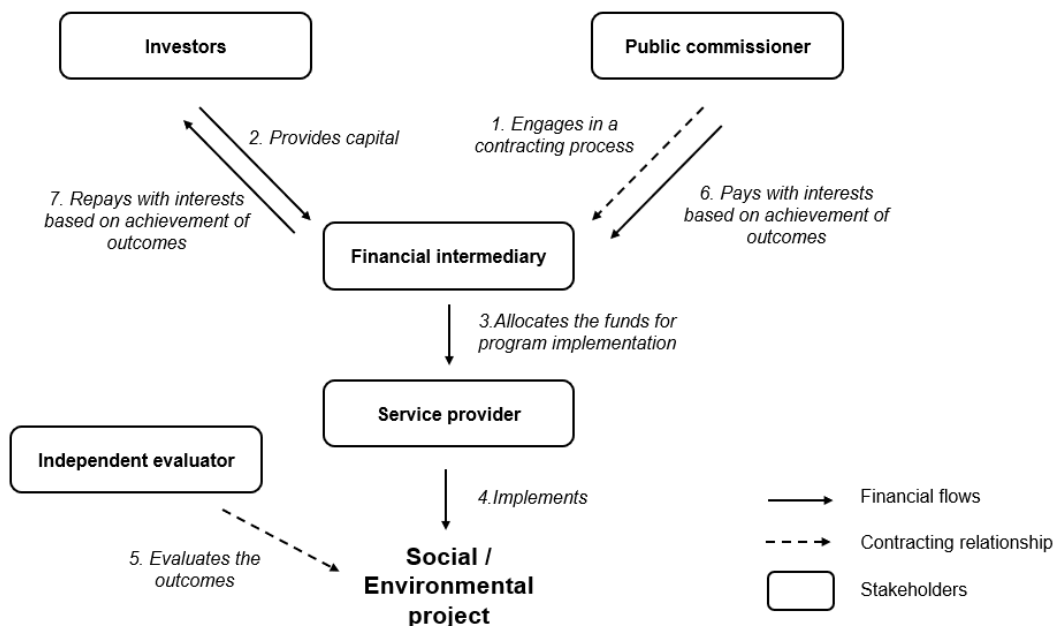
The term *impact bond* is somewhat misleading: despite their name and fixed maturity, IBs are not conventional bond issuances. Rather, they are multi-stakeholders' *Outcomes-Based Contracting* (OBC) mechanisms that fall under the broader umbrella of *Results-based Finance* (RbF), a family of instruments also referred to as *Pay-for-Success* (Pfs), *Payment by Results* (PbR), or *Pay-for-Performance* (Pfp) schemes. RbF refers to any program or intervention where a principal links financial or non-financial incentives to the achievement of predefined

outputs or outcomes, rewarding the agent once these results have been independently verified (Grittner, 2013). In an impact bond, private investors provide upfront capital for a program carried out by a social or environmental service provider (such as an NGO or a social enterprise). The program runs for a fixed period (usually three to five years) and its success is measured against pre-defined impact performance indicators. If the targets are met, the public commissioner repays the investors with interest; if not, the investors bear part or all of the loss.

Typically, an impact bond involves the following stakeholders (see figure 1.1):

- One or multiple service provider in charge of designing and implementing an intervention intended to tackle one or multiple social or environmental challenges.
- Private investors that provide up-front capital in order to finance the program;
- One or multiple public commissioner(s) or final payor(s) that repays the investors in case of success
- A financial intermediary that structures the deal, structure a financial model and coordinate the private fundraising
- An independent evaluator that assesses the project outcomes have been reached

Figure 1.1 The Impact Bonds model (Inspired from Tira et al., 2024)



Six main criteria emerge to set IBs apart from other RbF instruments: their innovative design as multi-stakeholder public-private partnerships for delivering social services (Hangl, 2014; Jackson, 2013; Nicholls & Tomkinson, 2013; Stoesz, 2014); their focus on preventive interventions (Arena & al., 2016); their risk transfer from the public sector to the private investors (Maier & Meyer, 2017); their reliance a pay-for performance logic; their potential to generate cost-savings for the public sector (Dey & Gibbon, 2018) and financial returns for private investors determined by a rigorous evaluation of achieved outcomes (Nicholls & Tomkinson, 2013).

1.2.2. Situating Impact Bonds' emergence

1.2.2.1. The public management paradigm: IBs as a development of PPPs

Since the 1980s, public service reform has been shaped by the rise of New Public Management (NPM), which introduced market discipline, competition, and performance-based contracting into government provision (Dunleavy et al., 2005). More recently, New Public Governance (NPG) has emphasized collaboration, trust, and cross-sector partnerships in the co-creation of public value (Osborne, 2010). From a public management perspective, IBs have emerged as part of the wave of public service reform (French et al., 2023). Their positioning within the reform paradigm has been debated: while some scholars view them primarily as an extension of NPM (Fraser et al., 2018; Warner, 2013), introducing public sector innovation into a performance-driven framework (Le Pendeven, 2019), others see them as sitting at the intersection of NPM and NPG, combing the performance management focus of NPM with the collaborative aspirations of NPG. However, recent studies suggest that although IBs may initially balance these two logics, they tend over time to shift toward a stronger emphasis on NPM, as investor influence, contracting and performance measurement increasingly outweigh collaborative governance (French et al., 2023).

IBs are often positioned as an evolution of the public–private partnership (PPP) model within the social sector (Vecchi & Casalini, 2018; Broccardo et al., 2019; Tiikkainen et al., 2022) that intended to address the shortcomings of NPM. In this context, scholars have framed IBs within the broader paradigm of NPG (Albertson et al., 2020; Joy & Shields, 2013; Ormiston et al., 2020), emphasizing how they focus on cross-sector collaboration, multi-actor coordination, and outcome-oriented delivery (Vecchi & Casalini, 2018; Schinckus, 2017). IBs also share important structural features with PPPs: they rely on formalized contracts, clearly defined performance metrics, and a logic of risk transfer from public to private actors. (Warner, 2013). However, unlike traditional PPPs, which often rely on long-term infrastructure projects and input-based funding, IBs were viewed as more flexible outcomes-based instruments, with shorter time horizons and a stronger focus on the delivery of measurable social and environmental outcomes (Warner, 2013).

Table 1.2 Comparison of the PPP and IB models

Features	PPP model	IB model
Formal contractual arrangement	✓	✓
Risk transfer to private investors	✓	✓
Use of predefined performance metrics	✓	✓
Long-term duration	✓	
Application to infrastructure projects	✓	
Application in social services		✓
Outcomes-based logic		✓
Social or environmental metrics		✓
Independent evaluation tied to repayment		✓

1.2.2.2. The sustainable finance paradigm: IBs as a development of Impact Investing

From the private perspective, the financial gap and the scale of social and environmental challenges have opened an avenue for private actors to participate and complement public spending. In recent years, sustainable finance has known a trend of ‘mainstreamization’, underlying not only its societal but also its financial relevance (Edmans & Kacperczyk, 2022).

At the same time, private actors are aware of growing pressure from civil society and the reputational risks associated with controversies over unsustainable investment practices. Regulatory frameworks such as the European Taxonomy, the Sustainable Finance Disclosure Regulation (SFDR) or the Taskforce on Nature-related Financial Disclosures (TNFD) have further incentivized their participation by embedding sustainability considerations into disclosure and investment standards. Sustainable finance has also emerged as a space for financial innovation (United Nations, 2019) with new instruments and mechanisms designed to align capital flows with sustainability objectives.

From a sustainable finance perspective, Impact Bonds are positioned as a distinct class and one of the recent financial innovations within the realm of Impact Investing (Jackson, 2013; Warner, 2013; Trotta et al., 2015, Gustafsson-Wright et al., 2015; Casanovas & Jones, 2022; Trotta, 2024). Over the past two decades, Impact Investing has progressively gained traction as an approach that deliberately aims to generate positive social or environmental outcomes alongside financial returns (Agrawal & Hockerts, 2021; Boric et al., 2021; Cohen, 2020; FIR & France Invest, 2021; Höchstädter & Scheck, 2015).

Impact investing is typically distinguished by four pillars: its *intentionality* (investments must be clearly motivated, *ex-ante*, by a contribution to the resolution of a social or environmental challenge); its *additionality* (the impact would not have occurred without the investments); its commitment to *impact measurement, management and reporting*, and the pursuit of *financial returns* ranging from below-market to market rate. A key feature of this investment model is a shift in the traditional risk–return framework toward a risk–return–impact logic, where financial performance is systematically balanced against the measurement of social and environmental outcomes (Boric et al., 2021). Impact investing often takes the form of equity investments in unlisted or early-stage companies, an approach commonly referred to as social venture capital

(FIR & France Invest, 2021; Miller & Wesley, 2010; Vecchi et al., 2015). It can also be pursued through debt instruments, direct investments by foundations and development finance institutions, or through shareholder activism.

Conceptually, IBs align with the core principles of impact investing (Vélez-Valencia et al., 2025), such as intentionality, additionality, and measurable impact and the possibility of a financial return. However, key structural distinctions limit their integration into mainstream impact investing. Unlike most impact investments, which are typically equity-based and aimed at scaling mission-driven enterprises offering ownership and scalable returns tied to business growth, IBs are outcome-based contracts with no ownership stake, where returns are paid only if predefined social or environmental outcomes are achieved. As such, they rely on debt-like contractual arrangements and are narrowly project-specific in nature. Moreover, the pool of investors engaged in Impact Bonds is not representative of the broader impact investing market, which increasingly includes finance-first investors such as mainstream asset owners and financial institutions (Agrawal & Hockerts, 2021). In contrast, Impact Bonds primarily rely on philanthropic or mission-driven investors (Mazzuca et al., 2023) that primarily align with governmental policy objectives and long-term social value generation (Vélez-Valencia et al., 2025) Therefore, Impact Bonds remain a niche within a niche in terms of assets under management, accounting for less than 0.06% of the global impact investing market, which is estimated at \$1.571 trillion USD (GIIN, 2024).

Table 1.3 Comparison of the PPP and IB models

Features	Impact Investing	IB model
Intentionality	✓	✓
Additionality	✓	✓
Impact measurement	✓	✓
Financial return expectation	✓	✓
Primarily equity-based instruments	✓	
Capital dilution	✓	
Project-based		✓

Public-private contractual arrangement	✓
Repayment strictly contingent on outcomes achievement	✓

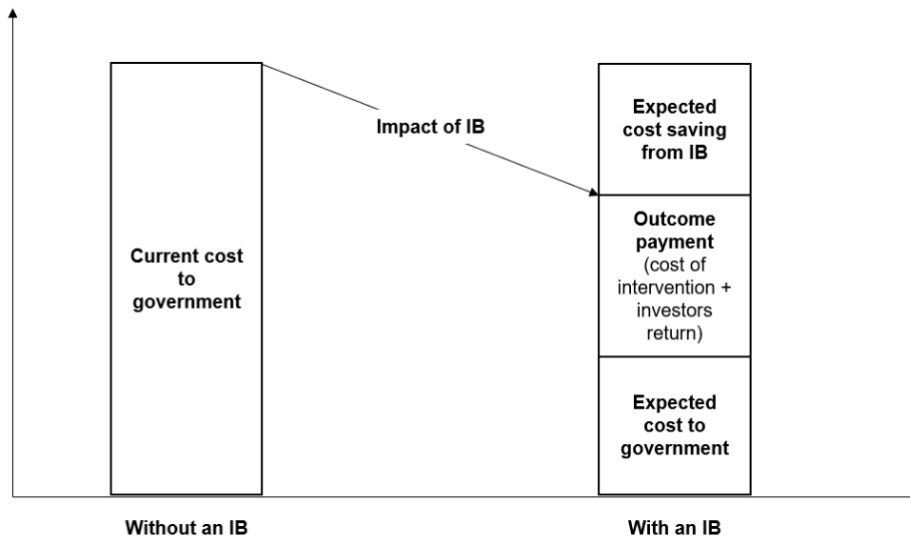
1.2.3. Impact Bonds: Promises versus realities

1.2.3.1. *The promise: aligning interests*

In theory, Impact Bonds were presented as instruments capable of aligning the interests of governments, private investors, and the social economy sector. Built on the promise of a *win-win-win* arrangement (Giacomantonio, 2017; Maier & Meyer, 2017), they were expected to generate multiple benefits for every stakeholder involved:

From the public sector perspective: the emergence of the austerity paradigm in recent years (Roy et al., 2017) has placed governments under increasing pressure to do more with less. It has also highlighted the shortcomings of public intervention in terms of design, delivery, and accountability (Fraser et al., 2018) and promoted the adoption of private-sector management techniques and market incentives to professionalize public services (Mulgan et al., 2011; Liebman, 2011). In response, governments have increasingly turned to evidence-based policymaking approaches, emphasizing a shift from measuring outputs to focusing on outcomes (Balboa 2016; Batty 2015; Pauly & Swanson 2017) as the central focus of evaluation (Gertler et al., 2016). Within this context, impact bonds have been promoted as outcomes-based instruments that relieve governments of the need to pay upfront and require payments only if the intervention succeeds, transferring financial risk from the public sector to private investors (Maier & Meyer, 2017). They have also been framed within an invest-to-save rationale, where successful interventions are expected to generate cost-savings for the public commissioner (Dey & Gibbon, 2018). These cost-savings must exceed the outcome payment, which includes both the cost of intervention and the investors' return (see figure 1.2).

Figure 1.2 Cost-savings in Impact Bonds (Tira et. al, 2024)



Source: Author's creation (inspired by Balboa, 2016)

From the service provider perspective: although Social Economy (SE) actors are increasingly recognized as key drivers of positive social and environmental change (Nicolaescu et al., 2012), they often remain grant-dependent. Reliance on grants and donations not only undermines the development of sustainable business models, thus excluding them from mainstream debt and equity finance, but also limits their growth, as such funding is often too small, fragmented, or misaligned with their needs (Arena et al., 2018). By channeling upfront capital to fund their programs, impact bonds were presented as a way to break this cycle and strengthen the capacity of the SE sector to scale its impact. For service providers, the model carries little direct financial risk, with no dilution of ownership, no debt burden, and no forced investor exit of other impact investment instruments. Unlike other forms of impact investing, service providers in IBs do not need to be ‘investment ready’ in the traditional sense: funding depends on a contracting phase, where projects are structured and refined through negotiations between providers, public commissioners, intermediaries, and evaluators. This negotiation does not revolve around financial dimensions like firm valuation, profitability, or expected returns. Instead, the process centers on non-financial impact metrics, which plays a decisive role in

determining both the scale of risk involved and how that risk will be allocated among stakeholders.

From the private investors perspective: impact bonds were framed as a novel opportunity within the impact investing landscape for investors seeking to combine financial returns with demonstrable social or environmental impact. This positioning reflects a belief that financial markets can be leveraged to achieve social good by embedding accountability, discipline, and innovation into the allocation of capital (Fraser et al., 2018). Impact Bonds promised to offer investors a clearly structured, time-bound sustainable financial product in which returns were linked directly to independently verified outcomes, reducing ambiguity about impact performance.

1.2.3.2. The reality: Practical challenges of Impact Bonds

Despite an initial enthusiasm for impact bonds, the reality of their development has proven to be more complex than initially envisioned. Over the years, the academic debate on impact bonds has shifted from a mainly ethical and highly polarized discourse between the optimistic and the cautionary views on IBs (Fraser et al., 2018) to one that is more empirically grounded. Beyond the ethical concerns associated with the financialization of public services (Chiapello & Knoll, 2020; Tan et al., 2021), the growing body of literature on impact bonds has extensively documented the challenges associated with the model and has shed light on the reasons why impact bonds have not been more widely adopted neither by public commissioners nor by private investors.

At the design stage, impact bonds operate within a complex contractual environment involving multiple stakeholders. This complexity constitutes both a technical and a political challenge. From a technical perspective, such contractual arrangements complicate coordination among parties, leading to high transaction and administrative costs (Pandey et al., 2018; Fitzgerald et

al., 2019; Burand, 2019; Lowe, 2020). From a political perspective, they may generate information asymmetries that reinforce power imbalances between stakeholders (Pandey et al., 2018). This contractual complexity is intensified by the need to reconcile the paradoxical promises inherent to the impact bond model, such as such as combining flexibility with evidence-based rigor or risk transfer with cost-efficiency (Maier et al., 2017). Regarding financial modelling, impact-bonds are particularly challenging instruments to design due to the high uncertainty arising from the difficulty to perform risk estimation (Giacomantonio, 2017). To mitigate that uncertainty for private investors, multiple risk mitigation mechanisms are included in the contracts (Vecchi & Casalini, 2018), reducing de facto the risk transfer to private investors – a core rationale of the impact bonds model.

Recent research on IB discriminant features also highlights that IBs tend to deviate from the prototypical model in practice (Arena et al, 2016; Carter, 2020, Economy et al, 2022; Ronicle et al., 2022), emphasizing the model ‘stretchiness’ from the original reliance on cost-savings logics (Government Outcomes Lab, 2018; Carter, 2020; Economy et al, 2022; Tira, 2025). The rigorous measurement of social or environmental outcomes was also supposed to be a cornerstone of the IB model. Yet, in practice, IBs evaluations have mainly focused on outputs rather than outcomes (Fox & Morris, 2019) Moreover, due to misaligned incentives among stakeholders, the evaluation robustness praised by the model is often abandoned or diluted, with proxies or administrative metrics replacing rigorous counterfactual methods like randomized controlled trials (Hevenstone et al., 2022). In addition to the challenges related to evaluation protocols, the literature also highlights the difficulty of credibly attributing observed outcomes to the specific IB interventions (Rosamond, 2016; Vecchi & Casalini, 2018), particularly in the case of environmental outcomes (Tira, 2025).

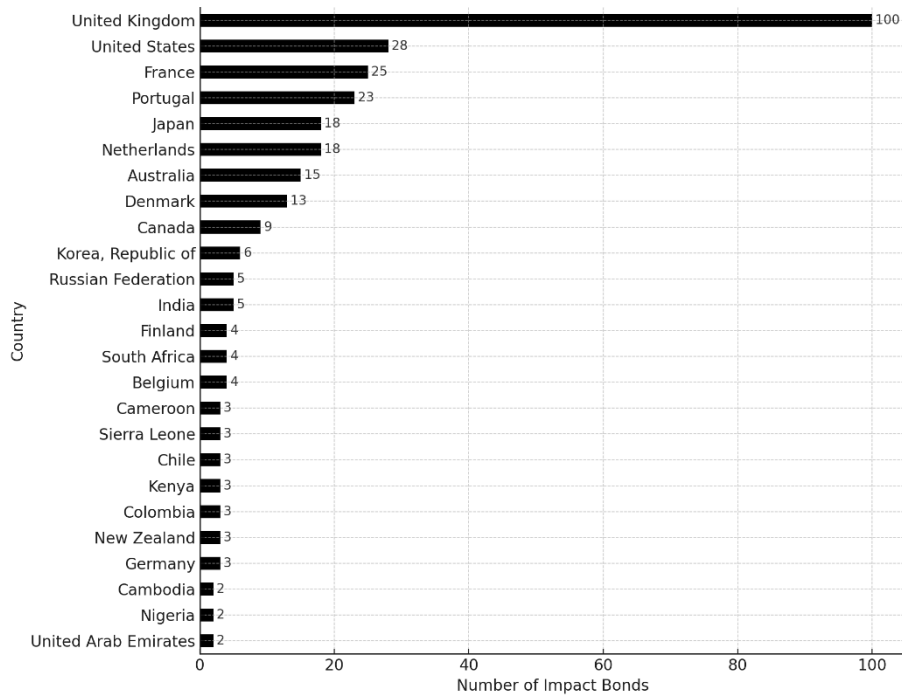
1.2.4. Impact bonds at a crossroads: state of the market

1.2.4.1. *The impact bonds market by the numbers*

Since their emergence in 2010 and as of June 2025, a total of 320 impact bonds has been launched or are in development across the world, mobilizing \$861 million in upfront capital (GOLAB, 2025) across 40 countries (Brookings, 2025). The main social public policy sectors targeted by the interventions include employment and training (96 SIBs), health (55 SIBs), education (51 SIBs), child and family welfare (47), homelessness (38 SIBs) and poverty reduction (3 SIBs) (GOLAB, 2025). Beyond their initial application in social services, the IB model has evolved into several variations. These include Development Impact Bonds (DIBs), designed to finance programs in low- and middle-income countries (Alenda-Demoutiez, 2020) and Environmental Impact Bonds (EIBs) which adapt the IB framework to address environmental challenges such as wastewater management, circular economy and wildlife conservation (Hall, 2018; Brand et al., 2021).

Yet, the development of Impact Bonds remains uneven across countries: at the roundtable *Mapping the Evolution and Challenges of Social Outcomes Contracts in Europe* (Social Outcomes Conference, University of Oxford, September 3rd, 2025), impact bonds practitioners from 13 European countries reported widely varying stages of development ranging from experimentation and pilot projects to scaling and institutionalization. Figure 5 illustrates the heterogeneity of Impact Bond investments across countries: the United Kingdom hosts the largest number of projects, consistent with its pioneering role in the development of the model. Other countries, including France, Portugal, the United States, and the Netherlands, also account for a relatively high number of initiatives. By contrast, many countries have only one or two projects, indicating that the adoption of Impact Bonds remains geographically uneven.

Figure 1.3 Top 25 countries by number of Impact bonds



Source: Compiled by the author by collecting information from Indigo database (GOLAB)

1.2.4.2. Investors in the IB market:

The INDIGO database identifies 416 disclosed investors that have participated at least once in the impact bond market (GOLAB, 2025). The investor landscape is highly heterogeneous, ranging from impact-first to profit-first organizations. It is clearly dominated by philanthropic organizations, including foundations, charities, and non-profits (Gustafsson-Wright et al. 2020; Mazzuca et al., 2023). The investors base also include financial institutions (banks, insurance companies and pension funds), corporations, development finance institutions and impact funds. Figure 1.4 illustrates investors’ diversity in IBs, by providing examples of impact bonds organizations according to their positioning on the impact-first to finance-first spectrum and their degree of persistency in the IB market.

Figure 1.4 Investors' diversity in the IB market



Source: Author's creation

Despite their initial promise of creating a robust investment market, IBs have, in reality, shifted towards embodying more of a philanthropic venture capital model than a traditional investment approach attracting primarily mission-aligned investors who are willing to accept below-market commercial returns (Giacomantonio, 2017). Information on investor returns, including the methods used for their calculation, remains limited in the public domain. This lack of transparency may point to a broader reluctance among both outcome payers and investors to disclose or openly debate returns (World Bank, 2019). Available information on successful IBs allows to determine that investor returns range from 1.3% to 20% percent of the initial investment, with some cases resulting in losses (Gustafsson-Wright et al. 2020). Impact bonds investors persistency on the IB market, understood as their willingness to reinvest after a first investment, also remains particularly low. Building on this observation, *Chapter 4* investigates the determinants of investors' reinvestment decisions.

1.2.5. Impact bonds: the French context

1.2.5.1. The French impact bond model

The French IB model was deliberately designed to differ from the UK original IB model and to reflect the specific features of the national social economy sector. For example, they were intentionally dissociated from the PPP designation (Pellizzari, 2022). In France, the social economy sector was formally structured by the 2014 Hamon Law⁴ ('Loi Hamon' or 'Loi ESS'), which provided a legal definition of the French Social and Solidarity Economy (SSE) sector. SSE guiding principles include pursuing a purpose that goes beyond profit-sharing to serve the social or environmental mission, ensuring democratic and participatory governance, and promoting responsible management with limited profit distribution. The law also broadened the scope of the SSE beyond traditional actors (such as associations, cooperatives, mutual insurances and foundations) to include commercial enterprises that commit to these guiding principles. In 2023, the SSE sector in France included around 155 000 organizations and represented 10% of total employment in the country (AVISE, 2025).

In that context, impact bonds were meant to exclusively target social innovation within the SSE sector and were presented as a potential tool to address their lack of access to finance by complementing public sources of funding. In its attempts to protect the welfare state dominance in the provision of public services, the French IB model relied on safeguards. As such, the French IB doctrine has been built under the assumption of a high level of state implication in IB design and governance, a strict requirement to demonstrate the generation of cost-savings and relatively low and capped (around 5%) internal rates of returns (IRRs) compared to the UK IRRs (up to 20%).

⁴ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000029313296/>

1.2.5.2. From experimentation to scaling: the French impact bonds experience

In France, Impact Bonds have gained notable political momentum in recent years, although this dynamic has been somewhat hindered by recent political instability. Launched by Martine Pinville, the Secretary of State for Trade, Crafts, Consumption and the Social and Solidarity Economy with the political support of former President cabinet office François Hollande, an initial experimental phase took place between 2016 and 2019, resulting in the launch of 10 Social Impact Bonds and one Development Impact Bond across four intervention sectors: employment, social assistance, housing, and international development (II-Lab, 2019; Cazenave, 2021). Since 2021, the development of Social Impact Bonds has benefited from increasing institutional support, particularly through the publication of a strategic report commissioned by the High Commissioner for the Social and Solidarity Economy and Social Innovation (Lavenir, 2019). This document laid the groundwork for a more structured national approach to impact bond implementation. A key feature of the French model emerging from this initiative is the introduction of thematic calls for expressions of interest (or call for proposals) as a method for identifying and selecting programs suitable for impact bond funding instead of going through the traditional public procurement process (Tira et al., 2024). Prior to this shift, the burden fell largely on service providers to advocate for IBs to relevant public actors, a process that was often lengthy and complex, resulting in a very limited number of IBs being launched before 2019 (Cazenave, 2022). Furthermore, a semantic evolution has occurred: rather than using the term ‘Social Impact Bonds’, French public authorities now refer more broadly to ‘Impact Bonds’ (IBs), reflecting a desire to take into account both social and environmental objectives, and to foster the development of environmental oriented impact bonds (Le Pendeven & Leandri, 2021)

As a result, France launched three major calls for proposals between late 2020 and 2021 to promote the deployment of Impact Bonds across various policy areas. Each initiative was led

by a distinct public commissioner and reflected a growing government interest in leveraging outcomes-based finance to address complex social and environmental challenges. Between September and December 2020, the French Agency for Environmental and Energy Management (ADEME) launched a call for project focused on circular economy. This was followed, between November 2020 and February 2021, by a call from the Ministry of Economic Affairs and Finance seeking innovative approaches to promote equal economic opportunity (Ministry of Economic Affairs and Finance, 2021). Finally, from March to June 2021, the Ministry of Labor invited proposals aimed at fostering employment access (Ministry of Labor, 2021). ADEME and the Ministry of Labor even expanded their initially allocated budgets in order to pre-select a larger number of interventions. Out of the 20 Impact Bonds pre-selected by public commissioners through the calls for proposals, 16 have been effectively implemented to date.

1.2.5.3. Challenges of the French IB ecosystem

The experience of Impact Bonds in France has, de facto, diverged from the British model. Published in 2022, the Cazenave report⁵ provides an overview of the current state and challenges of the impact bond market in France. First, the French IB model relies heavily on centralized public actors as public commissioners, while local authorities have struggled to adopt the instrument. This reliance on central government bodies has led to significant administrative delays that have slowed down the development of the instrument. Unlike the UK model, France has also never established an Outcomes Fund to centralize budgetary allocations dedicated to repaying investors. Moreover, to fit into the state doctrine of IB, the French model has evolved into a ‘low-risk, low-reward’ scheme. As a result, it has attracted only a very limited number of investors.

⁵<https://www.economie.gouv.fr/files/Propositions%20pour%20le%20d%C3%A9veloppement%20des%20contrats%20C3%A0%20impact%20vdef.pdf>

The French investor ecosystem is dominated by two main organizations: one banking institution, BNP Paribas and the *Caisse des Dépôts et Consignations*, a public financial institution that acts as the financial arm of the public state. Because of the complexity of impact bonds and the difficulty of valuing them within their portfolios, the French impact investing landscape have also shown limited interest in the instrument. Unlike in the UK, where the philanthropic sector has actively engaged with Impact Bonds, the French SSE ecosystem has been only marginally mobilized. Some actors within the SSE sector have even expressed criticism and strong reluctance toward Impact Bonds, perceiving them as a form of marketization of public services. Intermediary actors, particularly project structurers and evaluators, are also very few in number, as they can only be compensated once the contract is officially signed. Given the length of the contracting phases, intermediaries often end up working *pro bono* for several months. BNP Paribas also holds a near-monopoly over deal structuring, reinforced by the fact that it only invests in an Impact Bond if it has acted as the structurer itself.

For service providers, these extended contracting periods have sometimes led to pressures on cash-flow, putting organizations under financial strain. In addition, due to the banking monopoly rule in France (which prohibits loans in investments involving non-banking investors), most IBs have been structured as bond issuances (*émissions obligataires*). This rule places a burden on service providers' balance sheets, even though they were initially meant to be protected from any financial risk. In some cases, particularly for associations, the use of trust mechanisms (*fiducies*) allowing the service provider to be removed from the financial arrangement has offered a limited alternative, although their use remain relatively uncommon.

1.2.5.4. The ADEME Impact Bonds experiment

The case of ADEME's experiment with impact bonds represents an original and pioneering case within the realm of IBs. First, it is among the earliest impact bonds to be launched through a

call for proposal, which enabled a more structured and regulated process for project selection while also introducing a portfolio-based approach to impact bonds. Second, it represents an adaptation of a mechanism originally designed and implemented to tackle social issues. In that sense, it stands as one of the very few experiments worldwide that directly addresses environmental challenges, as the adaptation of the IB model to environmental outcomes is still anecdotal (Trotta, 2024). Table 1.5 provides an overview of the 12 EIBs issued or currently under development worldwide besides the ADEME experiments. Most of these EIBs have taken place in the United States (Brand et al., 2021). However, the US model differs significantly from the French approach, both in terms of design and the type of projects supported. While US EIBs have typically focused on financing large infrastructure projects with a strong emphasis on scientific and regulatory risk, the French model has concentrated on supporting smaller-scale service-based initiatives developed by the SSE sector (Tira et al., 2024). Moreover, the contractual structure and scope of performance indicators vary substantially between the two models. Table 1.6 below highlights the main distinctions between DC Water, the first EIB launched in the US tackling stormwater management through green infrastructure, and the French model that arose from the ADEME experiment.

General Introduction

Table 1.5 Overview of impact bonds targeting environmental outcomes worldwide

Impact Bond	Location	Environmental focus	Issuance year	Capital raised (\$)	Commissioner	Disclosed investors	Intermediaries	Status
<i>Asháninka IB*</i>	Peruvian Amazon, Peru	Sustainable cocoa and coffee production	2015	110 000	• The Common Fund for Commodities	• The Schmidt Family Foundation	• The Royal Tropical Institute	Complete
<i>DC Water EIB</i>	Washington DC, USA	Combined Sewer Overflow	2016	25M	• DC Water	• Goldman Sachs • Calvert Foundation	• Quantified Ventures	Complete
<i>Yuba Forest Resilience Bond I</i>	California, USA	Wildfire and water supply	2018	4M	• Yuba Water Agency • State of California • U.S. Forest Service	• CSAA Insurance Group • Calvert Impact Capital	• Blue Forest • World Resources Institute • Encourage Capital	Complete
<i>Deshkan Ziibi Conservation Impact Bond</i>	Canada	Biodiversity conservation	2019	97,74k	• Environment and Climate Change Canada • Pollinator Partnership • 3M Canada	• Verge Capital	• Carolinian Canada	Complete
<i>Atlanta Flood Bond</i>	Georgia, USA	Flood control	2020	14M	• Atlanta Department of Watershed Management	• The Rockefeller Foundation	• Quantified Ventures	Complete
<i>Hampton EIB</i>	Virginia, USA	Flood control	2020	12M	• City of Hampton	The Kresge Foundation	• Quantified Ventures	Complete
<i>Yuba Forest Resilience Bond II</i>	California, USA	Wildfire and water supply	2021	25M	• Yuba Water Agency • US Forest Service	• CSAA Insurance Group • Calvert Impact Capital • The Rockefeller Foundation's • Zero Gap Fund • The Gordon and Betty Moore Foundation • The Inherent Foundation • Hall Capital • Impact Assets • RSF Social Finance	• Blue Forest Conservation	Implementation
<i>Buffalo EIB</i>	New York, USA	Combined Sewer Overflow	2021	54M	• Buffalo Sewer Authority	• The Ralph C. Wilson Jr Foundation	• Quantified Ventures	Implementation

General Introduction

						<ul style="list-style-type: none"> • The Community Foundation for Greater Buffalo • The Great Lakes Protection Fund 		
Wildlife Conservation Bond (Rhino Bond)*	South Africa	Species conservation	2022	150M	<ul style="list-style-type: none"> • World Bank (International Bank for Reconstruction and Development) 	<ul style="list-style-type: none"> • Nuveen • The Valeur Group • Alliance Bernstein, • ASN Impact Investors • Azimut Investments • BlueBay Asset Management • INGKA Investments • Mackenzie • High net worth clients of Credit Suisse and Citi 	• /	Implementation
Mine Fields to Rice Fields DIB*	Preah Vihear, Cambodia	Landmine clearance and agricultural development	2023	410k	<ul style="list-style-type: none"> • UK Foreign, Commonwealth and Development Office 	<ul style="list-style-type: none"> • The Hawk Rock Foundation • Blue Parasol Investments • The FJC Foundation of Philanthropic Funds 	• Social Finance UK	Implementation
Wecyclers Outcomes Partnership*	Lagos, Nigeria	Waste management	2023	1.62M	<ul style="list-style-type: none"> • Unilever Nigeria 	<ul style="list-style-type: none"> • UBS Optimus Foundation • Ferd • United States International Development Finance Corporation • British International Investment • Legatum • Tsao Family Office 	<ul style="list-style-type: none"> • Bridges Outcomes Partnerships • Société Générale 	Implementation
Nutrient-EIB	Finland	Eutrophication reduction	/		• /	• /	• /	In preparation

Sources: Author's compilation based on GO Lab's INDIGO database, Quantified Ventures and academic literature (Trotta, 2024; Tiikkainen et al., 2022; Brand et al., 2021).

Note: * indicates a Development Impact Bond (DIB).

Table 1.6 EIBs: French vs US model.

	US model	French model
Type of structure financed	Big infrastructure projects	Small businesses or NGOs designing service-based projects
Type of risk	Scientific risk	Type of service provider Regulatory risk
Bond Structure	Three-scenario based on one environmental performance indicator	Three-scenario based on three to five environmental and/or social (up to 20%) performance indicators
Type of impact	Environmental and social	Environmental and/or social
Post-implementation trajectory	Replication on a municipality level	Scaling on a national level

Source: Author's creation (Tira et al, 2024)

The ADEME EIB experiment illustrates a willingness to overcome the limitations of the French IB model, while remaining consistent with the established doctrine. First, ADEME is a state-owned industrial and commercial entity and operates as a semi-independent public financing agency (called ‘*EPIC*’ in the French law). Therefore, it is not subject to the same accounting, budgetary and bureaucratic constraints as those faced by traditional public ministries when issuing impact bonds. This institutional flexibility helped accelerate the IB pre-contracting phases compared to the average duration observed in France. ADEME impact bonds also benefited from the direct involvement of two senior executives in the process: its former Secretary General, Noam Leandri, and its Director of Circular Economy, Roland Marion, which brought significant resonance to the experimentation. The ADEME contracting phases also reflected greater rigor in both financial structuring and evaluation than the first wave of IBs launched in France, by prioritizing outcome-based over output-based performance indicators and by placing stronger demands on service providers and intermediaries regarding the evaluation design of their interventions.

Although the formalization of IB portfolios represented a significant step forward in the institutionalization of the instrument, it also generated certain organizational tensions. As the

ecosystem of IBs in France remains relatively limited, the same actors and organizations are frequently involved across several impact bonds. This collective approach transformed some negotiations that should have remained project-specific into generalized discussions affecting all IBs. This shift sometimes complicated decision-making and slowed down processes, diluting the case-by-case logic in favor of a cross-cutting approach. Moreover, an unanticipated saturation of investment capacity also emerged as an unintended consequence of launching multiple IBs. The implicit assumption that a critical mass of investors would be available to support multiple projects simultaneously proved inaccurate. In a still-nascent ecosystem, fundraising efforts encountered difficulties, substantially lengthening the contracting phases. This strain on available financial resources highlighted the need to better align the pace and volume of calls for projects with the actual capacity of the impact investment market. During the contracting phase, the launch of two dedicated financial vehicles, *Citizen CIS* (launched by the impact fund Citizen Capital and SB Factory and backed by the European Investment Fund as well as corporate philanthropies) and the *BNP Paribas European Impact Bonds Fund II* (supported by the *Caisse des Dépôts et Consignations* and the European Investment Fund) helped to unlock additional capital and ease this constraint.

1.2.5.5. EIBs financial structure: illustrative case

The following section presents the case of Label Vie, an environmental impact bond launched as part of the ADEME experiment. This example is used to describe in detail the way in which recent environmental impact bonds have been structured in France.

Label Vie is a non-profit organization that has developed a program and certification aimed at reducing the environmental impact of day care centers. The EIB supports the scaling, digital transformation, and territorial expansion of this initiative, with the goal of significantly increasing participation among day care centers and extending the program to new regions in France. A key component is the creation of a digital platform providing managers and

professionals with tools and resources to independently reduce their center’s environmental footprint. Table 6 provides an overview of the main characteristics of the Label Vie impact bond

Table 1.7 *Key Characteristics of the Label Vie Environmental Impact Bond*

<i>Service provider</i>	Label Vie / Echos
<i>Financial intermediaries</i>	BNP Paribas So Impact
<i>Disclosed investors</i>	BNP Paribas INCO Citizen CIS
<i>Evaluator</i>	Goodwill Management
<i>Operational cost of intervention</i>	2 600 000,00 €
<i>Estimated cost-savings</i>	6 200 000,00 €
<i>Program duration</i>	4 years
<i>Program launch</i>	July 2023

Following its pre-selection under the ADEME call for projects, Label Vie entered a pre-contracting phase involving negotiations with the public provider, financial intermediaries, and the evaluator to structure the bond. These negotiations resulted in the following financial structure, organized around three environmental performance indicators:

Indicator 1: Number of day care centers participating in the program

- The target required to achieve full repayment of investor capital is 1400 participating daycare centers.
- Bonus payments start above this threshold and reach 100% once participation hits 1,800 centers.
- This indicator carries the same weight (40%) for both capital repayment and bonus calculation.

Indicator 2: Reduction in electricity consumption among newly participating centers

- The target required to achieve full repayment of investor capital is a 15% reduction in electricity consumption among newly participating centers.
- Bonus payments start above this threshold and reach 100% at a 20% reduction.
- This indicator carries a weight of 30% for both capital repayment and bonus calculation.

Indicator 3: Reduction in water consumption among newly participating centers

- The target required to achieve full repayment of investor capital is a 14% reduction in water consumption among newly participating centers.
- Bonus payments start above this threshold and reach 100% at a 17% reduction.
- This indicator carries a weight of 30% for both capital repayment and bonus calculation.

Additional impacts such as food waste, gas consumption, greenhouse gas emissions, and prolonged absences among staff and children are also monitored, even though they are not tied to payment triggers.

Table 1.8 Label Vie IB result-based payment model

Indicator	Capital Weight	Capital repayment threshold	Bonus threshold	Bonus weight
<i>Number of day care centers participating in the program</i>	40%	1 400 centers	1 900 centers	40%
<i>Reduction in electricity consumption among newly participating canters</i>	30%	15% reduction	20% reduction	30%
<i>Reduction in water consumption among newly participating centers</i>	30%	14% reduction	17% reduction	30%

Table 1.9 provides an illustrative case of target performance payments from the commissioner to investors linked to Indicator 1 (the figures reported have been adjusted for confidentiality purposes). Payments are structured in two parts: the first consists of capital repayments, which increase progressively as participation thresholds are reached. The second consists of capped bonus payments, which are activated only when performance exceeds the predefined targets, thereby rewarding over-performance.

Table 1.9 Example of result-based payment per indicator

Indicator	Payment threshold	% of the commissioner payment	% of the investor bonus paid by the commissioner
<i>Number of day care centers participating in the program</i>	300	20%	
	550	50%	
	800	70%	
	1100	80%	
	1400	100%	
	1500		50%
	1900		100%

1.3. INDIRECT PUBLIC-PRIVATE FINANCE INSTRUMENTS: FOCUS ON PUBLIC LEVERAGE

1.3.1. Financing constraints of SMEs

Small and Medium Enterprises (SMEs) account for a substantial share of private sector activity and employment in most economies (Ou & Haynes, 2006). In France, SMEs represented 99% of all firms in 2018, generated 43% of total value added, and employed more than 6.3 million full-time equivalent workers (INSEE, 2020). While access to finance is essential for their growth and performance, SMEs often face significant obstacles in securing private funding. Access to external finance is widely recognized as the most significant barrier to SMEs' growth and development (Beck & Demirguc-Kunt, 2006; Ardic et al., 2012). Those barriers include the difficulty to assess SMEs creditworthiness due to information asymmetry (De Maeseneire & Claeys 2012) and high perceived risk from the investors' perspective. Relative to larger firms, SMEs are also particularly disadvantaged because they tend to have little or no collateral (Bakhtiari et al., 2020), are often unlisted, and may lack a track record, making external capital only accessible at a premium (Berger & Udell, 2006; Revest & Sapio, 2012). This financing gap is even more pronounced for young firms, which cannot rely on retained earnings and whose growth potential requires significant external resources (Storey, 1994; Myers, 2000). Innovative SMEs are especially vulnerable: their investments are typically uncertain, idiosyncratic, and based on intangible assets such as intellectual property rights, which

exacerbate information asymmetries and limit the willingness of traditional lenders to provide credit (Hall, 2009; Mina et al., 2021).

Already critical for private and for-profit SMEs, the lack of perceived investment readiness and financial constraints is even more exacerbated in the context of SMEs operating within the Social Economy (SE) sector. Prior literature has identified that the structures operating within the social economy sector lack clear and detailed business plans (Howard, 2012), solid governance structure and knowledge of the social investment mechanisms (Hazenberget al., 2014). They also experience issues related to their legal status and their inability to prove their impact robustly (Arena et al., 2018). On the supply-side, investors complain about the poor quality and lack of investment readiness for most of the projects presented for funding (Mason & Kwok, 2010).

Those obstacles justify the intervention of government to foster innovation and economic growth and moderate the debt and equity gap among SMEs and the SE sector. The concept of public leverage refers to the strategic deployment of government resources to stimulate private sector investment. Governments use their resources to create favorable conditions in order to incentivize private investors to engage in investments that may otherwise seem too risky or uncertain. A variety of policy instruments, including direct loans, interest subsidies, and loan guarantees, have been introduced to ease the financial constraints faced by SMEs (Cressy, 1996; Cressy, 2002)

1.3.2. The dual role of public leverage

Public funding schemes aim to affect both the supply and demand sides through two different but non-mutually exclusive mechanisms:

The resource effect: one the firm side, public funding schemes increase the available capital for SMEs and help foster growth, innovation and competitiveness. The resource effect

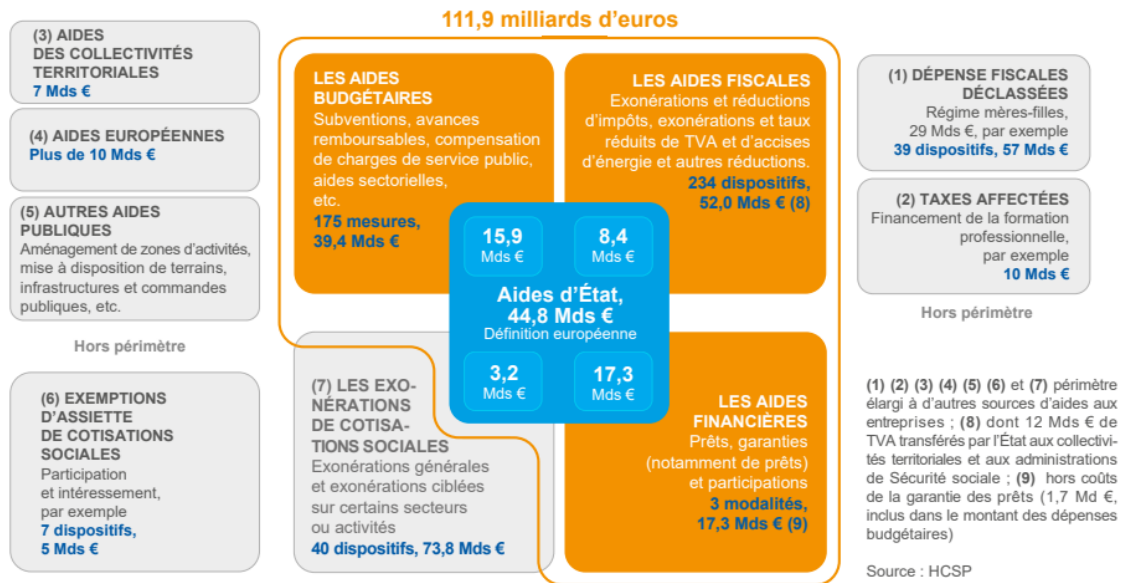
operates through two channels. In the funding channel, it enables firms to prove the viability of their technology and invest in R&D (Santoleri et al., 2020). In that sense, it may reduce investor uncertainty and increasing the likelihood of follow-on equity (Howell, 2017). In the liquidity channel, subsidies strengthen firms' solvency, which provides a risk buffer for external investors (Meuleman and De Maeseneire, 2012; Hottenrott et al., 2018; Hottenrott and Richstein, 2020). In contrast to the certification effect, the grant amount and frequency directly shape a firm's ability to secure additional financing (Lerner, 1999).

The certification effect: on the investor side, public funding schemes can act as certification mechanisms (Chiappini et al., 2022; Galope, 2016; Söderblom et al., 2015; Lerner, 1999; Takalo & Tanayama, 2010; Toole & Czarnitzki, 2009). By selecting and funding the most promising firms for a public funding, public agencies aim to reduce information asymmetries and signal firm quality to future private investors. Contrary to the resource effect, the grant amount and frequency do not directly shape a firm's ability to secure additional financing (Lerner, 1999). R&D subsidies reshape firms' debt structure toward long-term financing (Meuleman & De Maeseneire, 2012) and contribute to lowering the cost of debt, especially for young SMEs (Bellucci et al., 2019).

1.3.3. Public support to SMEs in France

In 2022, public funding schemes for companies in France amounted to €111.9 billion, distributed across different financing instruments (Harfi, 2025). Budgetary support such as subsidies, repayable advances, sectoral aid represented €39.4 billion. Fiscal aid (tax exemptions, reduced VAT or energy-related tax rates) accounted for €52 billion while loans, guarantees, and equity participation represented €17.3 billion. (se figure 1.5).

Figure 1.5. Overview of public funding schemes for companies in France (2023)



Source: *Les aides aux entreprises en France : de quoi parle-t-on ?* (Harfi, 2025)

Bpifrance, the French Public Investment Bank, represents the main provider of direct innovative support to SMEs (Chiappini et al., 2022). It was established in 2012 through the merger of several pre-existing public entities supporting SMEs (including OSEO, CDC Entreprises, the Strategic Investment Fund and FSI Régions). Bpifrance was created with the ambition to provide a single access point for public support to French firms. Since then, it has become a cornerstone of the country's entrepreneurial and innovation ecosystem and has supported over 500 000 firms over the last ten years, representing around 40% of French SMEs⁶. In 2024, Bpifrance allocated more than €60 billion into the French economy⁷.

Bpifrance relies on a strong regional network across the country and offers a wide range of financial and non-financial services. As the national public investment bank, it provides financing solutions to firms of all sizes through loans, co-financing schemes, and guarantees that facilitate access to credit. Beyond traditional banking instruments, Bpifrance can also act as an equity investor and a fund-of-fund, taking direct or indirect stakes in innovative

⁶ https://www.bpifrance.fr/sites/default/files/2025-01/Bpifrance_PLAN%20STRAT%202025-2029_110x177_112024_NUM_CL10.pdf

⁷ <https://www.caissedesdepots.fr/actualites/bpifrance-60-mdeu-en-2024-pour-booster-leconomie-et-linnovation>

companies and investment funds. It is also a key driver of innovation policy, offering grants, repayable advances, and innovation loans to support R&D and technology transfer. In addition, it also supports firms' internationalization by providing export guarantees, credit insurance, and advisory services. Bpifrance also delivers a range of non-financial advisory and capacity-building services, such as mentoring, accelerators, and training programs for entrepreneurs. Finally, Bpifrance operates as an implementing agency for public policy, translating national priorities such as industrial renewal, innovation, and sustainability into concrete financial and strategic support for the private sector.

In addition to public funding dedicated to growth and innovation, a set of schemes has been introduced to support specifically SMEs in their ecological transition. Among these, ADEME stood out as the main public funder of the ecological and energy transition in France, providing €1.3 billion out of €1.7 billion of public support in 2022⁸ mainly through grants, with nearly 40% of these funds directed to SMEs. In 2024, more than 30 mechanisms operated mainly by ADEME, Bpifrance and the Chambers of Commerce (CCI) were proposed to SMEs⁹ to reduce their energy use, adopt cleaner technologies, and invest in more sustainable practices. These include project assessments and advisory programs (such as *Climatomètre*, *Diag Éco-Flux*, and *Diag Décarbon'action*)), grants and tax incentives (for instance the Tremplin scheme, ADEME investment aid, or tax credits for energy-efficient renovation), and financial instruments like preferential loans and guarantees (*Prêt Vert*, *Prêt Économies d'Énergie*, *Prêt Action Climat*). Bpifrance alone dedicated €7 billion in 2024 to support the decarbonization and energy-efficiency projects of more than 4 000 firms.

⁸ https://www.igf.finances.gouv.fr/files/live/sites/igf/files/contributed/Rapports%20de%20mission/2023/2023-M-007-06_Rapport_Aides_transition_ecologique.pdf

⁹ <https://www.entreprises.gouv.fr/files/files/Publications/2024/Guides/transition-ecologique-guide-des-aides-pour-les-tpe-pme.pdf>

The multiplication of public funding support mechanisms highlights the challenge of ensuring coherence and complementarity among them and to understand how these schemes play a role fostering innovation and ecological transition, but also in alleviating SMEs' financial constraints. Beyond their immediate financial contribution, such schemes may also produce indirect effects by signaling firm quality to private investors. In this dissertation, *chapter 5* explores this question by examining how access to public funding, and particularly the combination of multiple funding sources from generalist and specialized public bodies, shapes SMEs' subsequent access to private debt and equity financing.

1.4. OVERARCHING RESEARCH QUESTION

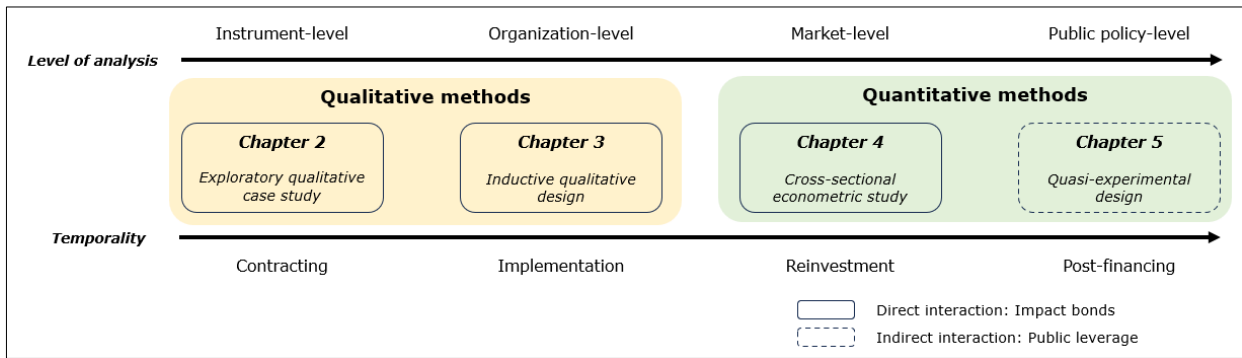
Public-private finance is built on the primary assumption that public stakeholders lack the resources or flexibility to address pressing societal challenges on their own. Within this logic, it is primarily conceived as a capital allocation solution, designed to mobilize private investment to supplement public funding. However, neither impact bonds nor public finance schemes alone can bridge the rapidly widening financial gap needed to achieve sustainability goals. In fact, they were never designed to do so. The structural requirements of impact bonds make them particularly suited to very specific types of social or environmental interventions that are innovative, preventive and have the potential to be scaled into public policies. Public funding schemes are explicitly designed to address the financing gap faced by firms at the early stages of their development and to support them in overcoming the so-called 'valley of death'. This makes them particularly relevant mechanisms through which to observe what public-private finance does beyond capital allocation

This dissertation aims to address the following question: *What does public-private finance do beyond capital allocation? To what extent does it construct social and environmental value, shape organizational identities, and influence investment decisions and market trajectories?*

I conceptualize public–private finance mechanisms across four analytical levels and situate them within the main phases of the public–private finance process. It begins with *contracting* (Chapter 2), examined at the *business model level*, where those mechanisms are framed as valuation frameworks. It then moves to *implementation* (Chapter 3), at the *organizational level*, where they are enacted as hybrid practices. The analysis continues with the *reinvestment* phase (Chapter 4), at the *market level*, where investors’ reinvestment decisions contribute to the formation of a hybrid market. Finally, it turns to the *post-financing* stage (Chapter 5), at the *policy level*, where instruments function as signaling and certification tools, shaping subsequent private participation through the indirect use of signals.

We examine two types of public-private interaction: a direct form at the instrument level through impact bonds, and an indirect form through public funding schemes and their potential to leverage future private capital. Chapters 2, 3, and 4 analyze impact bonds from three perspectives. At the instrument level, Chapter 2 shows how impact bond business models operate as social and environmental valuation devices, moving beyond narrow cost-savings logics to monetize outcomes and reframe how value is attributed to public-private interventions. At the organizational level, Chapter 3 explores how engaging in a hybrid practice such as impact-bond investing leads investors to question their organizational through a practice–identity mirroring process. At the market level, Chapter 4 investigates the factors that influence investors’ willingness to reinvest in the impact bond market. Finally, Chapter 5 broadens the scope by analyzing public finance scheme and their potential to mobilize private finance, investigating their signaling effects on subsequent private debt and equity financing for SMEs.

Figure 1.6 Visual representation of the dissertation



Source: Author's creation

1.5. THEORETICAL FRAMEWORKS

1.5.1. Chapter 2: Impact bonds as valuation devices

1.5.1.1. Valuation as a social construction

This chapter draws on the economic valuation and OBC literature to conceptualize IBs as frameworks for valuing social and environmental outcomes. Valuation studies do not treat value as an inherent attribute of goods and services. Instead, they argue that value is socially constructed and materially enacted through calculative devices, discourses, and practices (Muniesa, 2011; Callon et al., 2007). Doganova & Muniesa (2015) introduce the notion of capitalization devices, referring to configurations such as business models, contracts, and impact metrics that allow actors to project and assign value to uncertain future outcomes.

1.5.1.2. Impact bonds business models as valuations frameworks

This insight is directly relevant to OBCs and specifically impact bonds. In order for this model to function, the outcomes themselves must first be defined, measured, and priced. The OBC literature often assumes that this valuation is straightforward, especially when outcomes lead to cost-savings for public authorities (Marsh et al., 2011). However, in practice, especially in environmental domains, outcomes are often long-term, diffuse, and not easily linked to budget lines. This makes valuation a central challenge in OBCs. By combining these two perspectives,

the study treats Impact Bonds as valuation frameworks: they do not simply respond to existing definitions of social and environmental value, but actively participate in constructing it through contractual design.

1.5.2. Chapter 3: Impact bonds investing as a hybrid practice

This chapter mobilizes insights from both the organizational identity literature and research on hybridity, focusing specifically on how these dynamics unfold at the micro-level.

1.5.2.1. From structural to practice-based understanding of hybridity

The concept of hybridity has become central in institutional theory for understanding how organizations navigate multiple, often conflicting, institutional logics (Battilana et al., 2017; Kumar Hota et al., 2023). Originally developed to analyze the tensions within hybrid organizations, hybridity describes the attempt to reconcile incompatible demands from different institutional orders (D'Aunno, Sutton, & Price, 1991; Kraatz & Block, 2008; Pache & Santos, 2010). These logics shape organizational priorities, structures, and norms (Thornton et al., 2012). Hybrid organizations, such as social enterprises, operate at the intersection of these logics and must constantly negotiate the tensions they produce (Battilana & Dorado, 2010; Jay, 2013).

The literature on hybridity has predominantly focused on how organizations structurally manage competing institutional logics, classifying hybrids by looking at their business models and framing them as either structurally 'differentiated' or 'integrated': organizations either maintain separate units for social and commercial functions or integrate both logics throughout their operations (Ebrahim et al., 2014; Battilana et al., 2017). This dual typology of hybrids has been extended by Gamble et al. (2020) who argue that some organizations have partially integrated business models where the revenue model is aligned but not directly related to the social and environmental mission. However, research on organizational paradoxes provide

evidence that some organizations simultaneously manifest feature of both differentiation and integration, suggesting that hybrid configurations can be multilevel and fluid (Andriopoulos & Lewis, 2009; and Smith, 2014). This evolving discourse challenges scholars to move beyond static representations of organizational form to understand hybridity as a continuum, where organizations strategically recalibrate the balance between differentiated and integrated elements in response to changing environmental pressures. Notably, several studies have observed that hybrids frequently oscillate between social and economic priorities (Battilana & Dorado, 2010; Tracey et al., 2011; Jay, 2013) or may drift toward favoring one mission over another (Ebrahim et al., 2014; Ramus & Vaccaro, 2014).

While much of this research emphasizes structural configurations of hybridity, recent studies on hybrid organizing acknowledge the significance of micro-level practices in managing institutional complexity (Shams, 2021; Smets et al., 2015). Within the institutional logics' perspective, practices are the patterned, material and symbolic activities through which multiple logics can be enacted (Thornton et al., 2012). Because practices can embody multiple logics, they are sites where logics interact, compete, or blend. While the combination of multiple logics can create friction, it can also encourage innovation and lead to the creation of novel practices (Reay & Hinings, 2009; Stark, 2009). This makes them particularly relevant for the study of hybridity and opens the way for the conceptualization of hybrid practices:

This conceptual turn has particular relevance in sustainable finance, where investment practices increasingly embody hybrid logics. Scholars have already conceptualized certain investment approaches such as green investing (Yan et al., 2021) and impact investing (Gautier et al., 2023, Jones et al., 2025) as hybrid practices. In the example of green investing, the authors conceptualize hybridity through the articulation of means and ends. Seemingly incompatible logics at the level of ends, such as financial and environmental objectives, may in fact become

complementary when the financial logic is subordinated as a means to advance environmental ends (Yan et al., 2021).

Building from Yan et al. (2019) perspective, impact bond investing can be conceptualized as a hybrid practice in which financial, social, and state logics are simultaneously enacted. Financial logics structure the investment through risk–return mechanisms and contractual arrangements, while social logics define and prioritize the achievement of measurable outcomes, and state logics anchor the practice in public accountability. Hybridity arises from the articulation of these logics within the same investment practice. In this sense, impact bonds embed hybridity at the level of the practice, making them “hybrid financial instruments par excellence” (Maier & Meyer, 2017).

1.5.2.2. Hybrid practices and organizational identity

Despite the growing interest in hybrid organizing, the relationship between hybridity and organizational identity remains undertheorized. Scholars have increasingly called for research that bridges these literatures to better understand how organizations construct and sustain coherent identities while operating under competing institutional logics (Battilana et al., 2017). From an identity perspective, hybrid organizations embody multiple identities that are not typically expected to coexist: Albert & Whetten (1985) distinguish between ideographic hybrids, in which discrete subgroups hold distinct identities, and holographic hybrids, in which all organizational elements simultaneously reflect multiple identities. Subsequent research has shown that most hybrids tend toward the ideographic form, where tensions and conflicts between subgroups are a defining feature (Glynn, 2000; Ashforth & Reingen, 2014).

1.5.3. Chapter 4: Impact Bonds as a hybrid market

1.5.3.1. From organizational hybridity to market hybridity

Hybrid organizations, particularly social enterprises, have long been the focus of organizational research. However, Bonfim and Segatto (2024) call for a shift in perspective from organizations to markets, encouraging scholars to examine how hybrid markets emerge and operate. They define hybrid markets as those that integrate both market-oriented and non-market logics, regulating transactions by incorporating social, environmental, and cultural considerations. In these markets, firms allocate resources beyond profit to address societal needs, while market boundaries expand to include outsiders who gain legitimacy as participants. Evaluation moves beyond economic performance to encompass broader societal impact, redefining value at a collective societal level.

The literature highlights key differences in the hybridization process between established and nascent markets. McKague et al. (2015) argue that market development stages influence the balance between social and economic priorities, with social structuring playing a greater role in early phases and durable economic exchanges emerging later. As a result, hybridization in established markets often involves change and disruption efforts to embed competing logics, whereas in nascent or emerging markets, it requires more foundational work to create and legitimize hybrid structures (Vedula et al., 2022). The development of hybrid markets is frequently driven by carefully coordinated institutional work. Market creation requires the development of temporary cultural and material infrastructure, shaped through a process of collective learning. Casanovas and Ferraro (2022) illustrate how the UK social and impact investing markets emerged from collaborative stakeholder efforts to construct social investment infrastructure, thereby facilitating the convergence of commercial and social logics. This perspective shows that market emergence is not solely the by-product of spontaneous entrepreneurial activity but also a consequence of organized institutional work that actively

shape market conditions. This view is complementary to the observation that the readiness and type of institutional work are themselves contingent on market maturity and in particular, that nascent markets necessitate foundational creation work that evolves as the market matures and its challenges shift.

One of the main features of hybrid markets is their ability to redefine the classification of market actors by integrating firms, institutions, and stakeholders that traditionally operate under different logics. In these markets, diverse logics that once delineated rigid boundaries among market participants are deliberately combined, enabling new modes of legitimacy and participation. This integration of antagonist logics goes beyond a juxtaposition. Instead, it involves an active process of market shaping in which actors engage in institutional work to create, maintain, or disrupt prevailing norms (Demsar et al., 2023). Dalpiaz et al. (2016) further argue that hybrid organizations can leverage the interplay of multiple logics to transform their agency and capture novel market opportunities, suggesting that the unification of disparate logics allows for a reclassification of stakeholders and a redefinition of what constitutes a market actor.

1.5.3.2. Conceptualizing Impact Bonds as a hybrid market

Drawing on Bonfim and Segatto's (2024) definition and characterization of hybrid markets, I argue that the Impact Bonds market exemplifies an emergent hybrid market structure. First, the market is regulated by logics that go beyond purely financial considerations. Multiple stakeholders (including governments, social and environmental service providers, investors) co-regulate the market through a multi-logic framework. At the investment level, contracts explicitly tie financial returns to the achievement of social and/or environmental outcomes, embedding non-market objectives within market mechanisms within the financial product itself.

Second, the IB market attracts a highly diverse range of actors seeking both financial and social returns (Carè et al., 2020). Some of these are non-traditional market participants, such as philanthropic foundations or mission-driven organizations. As such, the IB market redefines the classification of investors, not solely based on their financial allocation capacities or technical expertise, but also on their willingness and ability to contribute to social and environmental outcomes.

Finally, investment evaluation in the IB market is typically carried out by independent third-party verifiers. This process redefines value creation by moving beyond conventional measures of financial performance to recognize and reward measurable societal impact. In doing so, the IB market allocates value to social and environmental change, further reinforcing its hybrid nature.

Table 1.10 *Conceptualizing the Impact Bond market as a hybrid market*

Hybrid market criteria	Application to IB market
<i>Regulation</i>	The IB market introduces non-market logics into the regulation of investment through a multi-stakeholder perspective and the design of contracts tying paying to social/environmental outcomes
<i>Allocation</i>	In the IB market, capital allocation decisions are not solely based on profit generation, but are driven by expected positive externalities/reduction of negative externalities
<i>Classification</i>	The IB market broadens participation criteria to include non-traditional actors (philanthropic actors, social enterprises). Classification of actors is based on criteria beyond technical and financial capacity to operate on the market
<i>Evaluation</i>	The IB market redefines value beyond standards of traditional market, by recognizing and allocating value for the achievement of social and environmental impact at the societal level. Evaluation relies on independent verification to ensure credibility.

Source: Author's creation

1.5.4. Chapter 5: public private interactions through public funding signals in venture financing

1.5.4.1. Signaling theory

Chapter 5 examines a more indirect channel through which public intervention leverages private capital. Whereas earlier chapters analyzed IBs as an instrument of direct interactions between public and private actors, this chapter considers how public funding schemes shape venture financing by influencing future private investors' perceptions.

The entrepreneurial finance literature shows that public funding schemes help reduce the information asymmetries characteristic of SMEs. Drawing on signaling theory (Spence, 1973; Connelly et al., 2011), public funding instruments such as grants, subsidies, and loans are understood as signals that certify venture quality and, in turn, increase the likelihood of follow-on private investment (Lerner, 1999; Toole & Turvey, 2009; Meuleman & De Maeseneire, 2012; Söderblom et al., 2015; Conti, 2018; Stevenson et al., 2021; Chiappini et al., 2022). Yet, this effect is not universal: the signaling value of public funding varies depending on the type of public funding scheme (Hottenrott & Richstein, 2020; Giraudo et al., 2019), investor type (Berger & Hottenrott, 2021; Chiappini et al., 2022), firm characteristics (Meuleman & De Maeseneire, 2012; Fini et al., 2023; Zhao & Ziedonis, 2020), and institutional context (Wang et al., 2017; Howell, 2017; Islam et al., 2018). Chapter 5 provides a more detailed overview of the literature on the signaling effects of public funding schemes, emphasizing how this effect is conditional.

1.6. RESEARCH GAPS

1.6.1. Research gaps on OBCs and IBs

Chapter 2 advances the literature that challenges the theoretical model of Impact Bonds by testing its underlying assumptions in a new empirical context. Building on the contributions of

Carter (2020) and Economy et al. (2022) on the notion of ‘IB stretchiness’ in practice, it provides new evidence on how the model operates in practice. Specifically, the paper examines two dimensions of this practical deviation from the prototypical SIB model: the extent to which the financial model EIBs relies on a cost-saving logic and the robustness of their evaluation and performance management frameworks. *Chapter 2* also directly responds to several research avenues identified by Carè et al. (2023) in their bibliometric review of impact bonds research. First, it contributes to the stream on the structure of IB deals, addressing calls to understand how contractual design can overcome institutional challenges and how country-specific contexts shape IB implementation beyond the UK-centric approach (Arena et al., 2016). Through the analysis of the first French EIB experiment, *chapter 2* also highlights the structural inadequacy between the institutional constraints of public commissioners and the theoretical model of impact bonds. Second, it engages with the research stream on the contribution of IBs to the SDGs, specifically examining how the IB model can be extended to environmental issues. In doing so, it provides an empirical and conceptual response to calls for aligning IBs with environmental challenges. Finally, the chapter also answer the call for more research on IB uncertainty evaluation and impact measurement (Scognamiglio et al., 2019) by showing how environmental outcomes challenge existing IB model of impact valuation through a cost-saving approach and proposing the integration of non-market valuation tools such as WTP. Together, these contributions expand the theoretical boundaries of the IB model and reposition impact bonds within a broader framework of economic valuation and environmental policy, framing IBs as social or environmental valuation devices.

Chapter 3 and *chapter 4* also respond to the call for more research on the finance-based dimensions of Impact Bonds, addressing a gap in the literature that has largely overlooked their financial sector reform narrative (Fraser et al., 2018) and the role and motivations of private investors in favor of a more systematic focus on the public side of Impact Bonds (Carè et al.,

2023). *Chapter 3* offers a qualitative and organizational identity perspective on investors engaging in impact bond investing, examining how organizational identity shapes their engagement with such a hybrid practice, and how the practice, in turn, triggers organizational identity work. *Chapter 4* complements this analysis by quantitatively investigating the determinants of investors' willingness to reinvest in the Impact Bonds market, addressing the question of how hybrid markets retain private capital over time.

1.6.2. Research gaps on organizational identity and hybrid practices

While the literature at the intersection of organizational identity and hybridity has highlighted the tensions that hybrid identities often generate, less attention has been paid to the processes through which hybridity is actively navigated and identities are reshaped over time. In particular, the role of hybrid practices remains underexplored. First, prior research tends to view hybrid practices as inherent to hybrid organizations (Gulbrandsen et al., 2015). By contrast, our empirical setting makes it possible to explore how hybrid practices emerge outside formally hybrid organizational forms. We show that organizations can adopt hybrid practices when pursuing hybrid goals, even without embodying hybrid structures. In doing so, this work contributes to a growing stream of research that conceptualizes hybridity not as a fixed organizational category but as a continuum that varies in degree and expression (Battilana et al., 2017).

Second, while previous studies have studied how organizational identity shapes practices, and, conversely, how practices can influence identity, these relationships have often been examined separately. The dynamic, recursive interplay between the two remains insufficiently understood. We adopt a processual perspective to unpack how identity and hybrid practices continuously co-evolve and mutually shape one another over time.

Third, existing research has shown that practices can reinforce organizational identity inertia (Nag et al., 2007; Tripsas, 2009). We extend this research direction by suggesting that hybrid practices can also serve as catalysts for identity change. As organizations experiment with new forms of practices, it stimulates reflection on ‘who we are’ and ‘what we do’, introducing new meanings, norms, and routines that gradually redefine how identity is constructed and enacted.

By focusing on investors participating in Impact Bonds deals, this study also brings the analysis of organizational identity into the field of impact investing, a context where hybridity has been primarily theorized in terms of motives rather than identity work. The empirical setting is also particularly relevant because it goes beyond categorical identity claims (Ashforth et al., 2020) to explain why organizations belonging to the same organizational category differentially adopt new practices.

1.6.3. Research gaps in the literature on public signaling on venture financing

Chapter 5 addresses two key research gaps in the literature on venture financing and signaling theory. First, while much of the existing research on signaling in entrepreneurial finance focuses on early-stage or high-growth, innovation-driven startups, less attention has been paid to more traditional SMEs despite their dominance in many national economies. This study helps bridge this gap by drawing on a unique dataset covering publicly supported SMEs in France, enabling an empirical analysis of how public signals operate outside the tech and venture capital sectors.

Second, there remains a limited understanding of how multiple, overlapping signals from different certifying bodies interact in shaping future private funding. In particular, this chapter explores how the combination of both sustainability-oriented non-sustainability-oriented public funding bodies produce distinct signaling effects. Rather than treating all public support as homogeneous, this analysis considers how the identity of the certifier shape investor perceptions. Building on this, the chapter interrogates the idea that ‘what matters is not the

financial product, but the issuer', examining how public institutions can exercise different certification power.

The research gaps identified in this section led to four specific research questions related to each chapter of the dissertation:

Chapter 2: How does the adaptation of the Social Impact Bond model to environmental outcomes challenge the cost-savings assumption underpinning outcomes-based contracting?

In what ways does the valuation of environmental outcomes broaden the understanding of economic value in outcomes-based finance?

Chapter 3: How does the adoption of a new hybrid practice shape organizational identity, and how does organizational identity, in turn, condition the adoption of the new practice?

Chapter 4: What are the deal-level and investor-level characteristics that drive reinvestment in the impact bonds market?

Chapter 5: How do multiple signals conveyed from multiple public funding bodies influence SMEs' access to future private debt financing?

1.7. RESEARCH CONTEXTS

Chapter 2:

This chapter emerges from a research partnership between the *Finance for Innovation Chair* at *Audencia Business School* and ADEME, following the launch of the first cohort of environmental impact bonds. In March 2021, ADEME announced the winners of its call for proposals designed to finance the first experimentation with Environmental Impact Bonds in France. A total of eight projects were selected, representing €27.3 million in potential funding. However, selection did not automatically guarantee financing for the service providers: eligible

organizations first had to engage in a contracting process to define the parameters of these contracts.

Benjamin Le Pendeven, the lead researcher of the project had already been involved in the preliminary phase of the experimentation, contributing both to the drafting of the call for proposals and to the selection jury. The research project therefore builds on an established collaboration between ADEME and the Audencia team. It began immediately after the announcement of the winning projects and was marked by my strong operational involvement during the contracting phases of each potential impact bond, representing ADEME in negotiations with the various stakeholders. This collaboration continued throughout the research project, particularly in monitoring the implementation of the six finalized IBs (through participation in steering committees and involvement in subsequent contractual renegotiations).

I was involved early on in the contracting phases in April 2021, participating in the initial launch meetings that brought together ADEME (represented by its former Secretary General, Noam Leandri), the service providers, the financial intermediaries, the evaluators, and representatives of the French Treasury. Once the contracting process was officially started, I revisited the proposals submitted to the call for proposals with the aim of refining the shortlisted projects. Drawing on both academic research and the growing body of grey literature on impact bond experiments worldwide, my objective was to bring these projects as closely as possible into alignment with the core principles of the impact bond model.

Throughout the contracting phase, I engaged in regular written exchanges and meetings with service providers to help advance and reshape their proposals. These discussions focused on issues such as the allocation of operational budgets, the choice of payment indicators, the justification of targets and payment thresholds (both capital and premiums), the determination of the internal rate of return for investors, the evaluation methodologies to be applied, the potential for generating cost savings for the state, and the prospects for scaling or replication.

In addition to contributing substantively to these negotiations, I was also responsible for their coordination. I was in charge of planning meetings, facilitating exchanges, and serving as the primary point of contact for the stakeholders involved. In parallel, I took part in the governance meetings that brought together ADEME and the French Treasury, which were designed to provide overarching oversight of the ongoing negotiations and to develop a shared framework for the principles and practices guiding the impact bond model.

After the contracting phases were formally concluded, I took an active role in reviewing and negotiating the legal documents governing the impact bonds. This pre-launch stage involved ensuring consistency between the legal agreements and the elements settled during contractualization, as well as renegotiating specific clauses. Once the impact bonds were officially launched, I was actively involved in the steering committees overseeing all six interventions. I also represented ADEME in the contractual renegotiations that emerged during their operationalization.

Chapter 3:

The IB community has the specificity of being a small ecosystem that bridges the gap between practitioners and researchers. As a PhD student working on impact bonds, I was able to attend and organize both research and practitioner events as a way to stay closely connected to the developments in the field. Despite the diversity of national contexts, one of the common challenges of the European IB ecosystem is its capacity to attract investors. As part of my involvement in the ADEME EIBs, I had extensive interactions with the stakeholders engaged in the experiment. One particularly striking observation was the high level of commitment demonstrated by some investors, who were so dedicated to the practice that they were recognized as essential to the IB process in France. This observation was further confirmed through my broader involvement in the IB community: in each of the countries that have

launched a significant number of IBs, a core group of investors can be identified who show strong commitment to the practice.

This reveals a contradiction that emerged from the field: on the one hand, IBs face significant challenges in attracting private investors; on the other hand, some investors already involved show strong commitment to the practice. This contradiction cannot be explained simply by the type or category of investor, as those who are most committed come from very diverse types of organizations, including so. This suggests that commitment to IB investing as a practice goes beyond organizational form or category and cannot be reduced to which actors are more ‘fit’ for the mechanism.

This study initially began in February 2024 with a round of exploratory interviews to understand investor motivations for engaging in impact bonds. It revealed that decision-making takes place at three levels: first, at the project level, where investors evaluate social and financial outcomes against initial expectations, often using an evidence-based approach. Then, at the organizational level, where they assess the relevance of IBs for their own institution; Finally, at the market level, where they reflect on the broader state and development of the IB market. Interestingly, the organizational level of decision-making was consistently associated by respondents with a broader reflection on organizational identity. Drawing on these early insights, we decided to focus our study of investors’ participation in impact bond investing through the lens of organizational identity.

Chapter 4:

Another insight that emerged from the IB practitioner community is the limited availability of data on impact bond investments. Although the Government Outcomes Lab has played a key role in developing the INDIGO database to centralize information on impact bonds, several important data points remain missing. In particular, data on the financial performance of impact bond investments is still very difficult to access in most countries. However, one of the

observations that could be made through the INDIGO database was the low level of investor persistency in the IB market. According to the database, around 70% of investors who made an initial investment in an impact bond did not reinvest in a subsequent IB project (GOLAB, 2025). This led us to further explore the question of investor reinvestment in impact bonds, while being fully aware that we did not have access to data on financial returns.

Instead, we relied on the limited academic literature addressing investor participation in IBs (Del Giudice et al., 2018; Gruyter et al., 2020; Mazzuca et al., 2023). These sources suggest that financial returns are not the main driver for most investors in impact bonds. Based on this, we asked whether reinvestment decisions could be explained by other factors, either deal characteristics (such as the amount, duration, or syndication of the initial investment), or organizational characteristics (such as the investor's institutional type or impact orientation).

Chapter 5:

Apart from impact bonds, which represent only a very small share of ADEME's activities, the agency mainly provides grants and subsidies to support SMEs. Beyond impact bonds, we also wanted to take a broader look at other forms of public-private interactions. The research collaboration between the Finance for Innovation Chair and ADEME allowed us to expand our analysis to study other types of financing instruments provided by ADEME. by giving us access to data on ADEME's funding interventions since 2010.

Besides ADEME, another public institution plays a central role in the French public funding landscape: Bpifrance, the national public investment bank. Both institutions provide substantial financial support to SMEs across a range of sectors. Bpifrance focuses more broadly on innovation, investment, and growth, while ADEME concentrates on funding projects related to ecological and energy transition. In France, firms often combine several forms of public support by several public institutions. For example, a report by the *Cour des Comptes* (the French Supreme Audit Institution) shows that 58% of firms that received innovation support from

Bpifrance between 2016 and 2019 also benefited from at least one other form of public innovation aid. More specifically, out of the 15,613 firms supported by Bpifrance during this period, 446 also received funding from ADEME (*Cour des Comptes*, 2021, Table 5).

An empirical setting combining both data from Bpifrance and ADEME also allows us to compare the signaling effects of a generalist versus a specialist certifier. While Bpifrance acts as a generalist agency, offering a broad range of financial instruments to firms from various sectors, while ADEME plays the role of a specialist institution, focused on supporting the ecological and energy transition.

1.8. ONTOLOGICAL AND EPISTEMOLOGICAL POSITIONING

This dissertation adopts a multi-level research design rooted in a pluralistic ontological and epistemological stance. By combining interpretive and positivist approaches, the dissertation is able to capture both the socially constructed meanings of public-private finance mechanisms and the observable conditions that sustain their use. Ontologically, the dissertation is primarily constructivist, assuming that valuation practices and organizational identities are socially constructed and embedded phenomena, whose meaning and effects are context dependent. At the same time, it incorporates a realist and post-positivist approach at the market level to capture structural patterns of reinvestment. This positioning reflects the pluralist ambition of the dissertation to understand both the meaning-making processes and structural conditions in hybrid markets.

Chapter 2 takes an instrument-level perspective and adopts a constructivist and pragmatic ontology, viewing environmental value as socially constructed through impact bonds as valuation devices. Value is materialized through practices such as business model construction and monetization of negative externalities. Epistemologically, the chapter adopts an interpretivist approach, analyzing how actors interpret and perform these valuation practices.

Chapter 3 adopts an organization-level perspective and builds on a constructivist and processual ontology (Langley et al., 2013), where organizational identity is dynamic, continually constructed and negotiated (Gioia et al., 2000; Nag et al., 2007) through engagement with impact bonds as a practice. Epistemologically, this chapter adopts an interpretative and inductive stance (Creswell, 2007), as knowledge is generated by analyzing how actors make sense of a practice and uncovers that impact bonds are a site of identity work through which organizations can reinforce or reframe their identity narrative.

Chapter 4 adopts a market-based perspective and takes a realist and post-positivist ontological positioning, assuming that reinvestment behavior at the market level follows structural patterns linked to deal characteristics and organizational features. Epistemologically, the chapter adopts an empirico-positivist stance, generating knowledge through the statistical analysis of an original dataset of investors and deals. Given the novelty of the impact bond market, the analysis is both explanatory and exploratory, identifying associations predicted by theory while also uncovering patterns that refine our understanding of reinvestment in hybrid markets.

Chapter 5 adopts a policy-level perspective, combining a realist ontological positioning with a post-positivist epistemology. Ontologically, the chapter assumes that public funding schemes and certification effects have a real and observable impact on firms' financing trajectories, even if the meaning attributed to these signals by public and private actors is socially constructed. It thus bridges structural and interpretive dimensions by examining how public schemes function both as financial instruments and as carriers of institutional meaning. Epistemologically, the chapter takes a positivist and explanatory stance, using econometric analysis to identify causal and correlational patterns between multiple certifications and access to private finance. At the same time, it maintains an interpretive sensitivity to the institutional context in which these mechanisms operate, acknowledging that the credibility and salience of public signals depend on shared norms and policy narratives.

1.9. DATA COLLECTION AND ANALYSIS

The four chapters of this dissertation combine qualitative and quantitative approaches to examine the role of public–private mechanisms beyond capital allocation, exploring how they shape organizational behavior, investment practices, and policy outcomes.

Chapter 2 adopts an exploratory qualitative case-study design to analyse the early dynamics of the first EIB experiment commissioned by ADEME. The chapter draws on data collected between April 2021 and May 2022, during the pre-implementation and contracting phase of the project. The analysis combines three years of participant observation and 22 semi-structured interviews with a diverse range of stakeholders, including public commissioners, investors, intermediaries, evaluators, service providers, and policymakers. My direct involvement in ADEME’s EIB contracting process facilitated access to this ecosystem, enabling attendance at all contracting meetings and observation of the negotiation process. This position also provided access to extensive secondary materials, including service providers’ applications, evaluation grids, negotiation documents, and legal contracts. The use of multiple and complementary sources allowed for systematic triangulation across interviews, observations, and documentary evidence. Through thematic coding, the chapter develops an in-depth understanding of how the EIB model was adapted to an environmental policy context

Chapter 3 relies on a combination of primary, secondary, and observational data to examine how organizations engage with and make sense of impact bond investing as a hybrid practice. Data triangulation (Creswell, 2007) was achieved through the integration of interviews, archival documents, evaluation reports, and field observations. Between February 2024 and July 2025, I conducted 29 interviews with 31 individuals involved in impact bond investing. Interviews were conducted in two rounds—an exploratory phase (January–February 2024) and a more structured phase (June 2024–July 2025)—using a purposive, criterion-based sampling strategy to ensure diversity in organizational type, investment frequency, geography, and market entry.

Respondents were identified through the GOLAB Indigo database and my active involvement in the impact bond practitioner and research community.

To complement the interviews, I collected 71 secondary documents to reconstruct each organization's engagement trajectory. In parallel, my field involvement in structuring a portfolio of six impact bonds in France provided direct observational insights into how investors participate in and interpret the practice. The analysis followed an inductive and iterative approach (Creswell, 2007) aimed at uncovering the dynamic interplay between organizational identity and engagement. Using a narrative strategy (Langley, 1999), I reconstructed each organization's trajectory across four analytical phases: pre-engagement, engagement, reflection, and post-reflection. Data were coded following the Gioia methodology (Gioia et al., 2013) in two successive rounds: one focused on engagement, the other on identity, through iterative cycles linking empirical evidence and theoretical concepts (Murphy et al., 2017).

Chapter 4 relies on a cross-country dataset of 285 investors across 235 impact bonds launched between 2010 and 2023, manually compiled from the Government Outcomes Lab Indigo database and complemented with investor-level information. The final sample includes 766 investment observations covering deal and investor characteristics. Investors were classified along an impact–finance continuum—impact-first, hybrid, and finance-first—based on motivation, capital source, return expectations, and funding approach, following a structured coding protocol. To examine reinvestment drivers, we estimated a Firth bias-reduced logistic regression, addressing small-sample bias in binary outcomes. The dependent variable indicates whether an investor reinvests or exits, with predictors capturing investor and deal-level features. Finally, a multinomial ridge regression explored investors' persistence profiles (one-time, occasional or serial-investors), testing how syndication composition and investor motivation jointly shape sustained participation.

Finally, *Chapter 5* employs a hypothetico-deductive, quasi-experimental design to examine the causal relationship between public funding interventions and SME financing outcomes. The analysis combines Propensity Score Matching (PSM) and Difference-in-Differences (DiD) estimation methods, leveraging project-level administrative data from ADEME and Bpifrance between 2010 and 2019. These data are merged with firm-level accounting and performance information from the FARE database, allowing for a robust estimation of how multi-source public funding affects subsequent access to debt financing.

The following table summarizes, for each chapter, the methodological approach, the sources of data collected and the data analysis strategy.

Table 1.11 *Methodological overview of the four thesis papers*

	<i>Chapter 2</i>	<i>Chapter 3</i>	<i>Chapter 4</i>	<i>Chapter 5</i>
<i>Methodological approach</i>	<ul style="list-style-type: none"> • Exploratory qualitative case-study 	<ul style="list-style-type: none"> • Inductive qualitative design 	<ul style="list-style-type: none"> • Quantitative, cross-sectional econometric study 	<ul style="list-style-type: none"> • Quantitative, hypothetico-deductive quasi-experimental design
<i>Primary qualitative data</i>	<ul style="list-style-type: none"> • 3 years of participant observation • 22 interviews with stakeholders involved in the ADEME Environmental Impact Bonds (EIB) experiment (public commissioners, investors, intermediaries, evaluators, service providers, policymakers) 	<ul style="list-style-type: none"> • 29 interviews with impact-bonds investors • 170 hours of field observations 		<ul style="list-style-type: none"> • /
<i>Primary quantitative data</i>	<ul style="list-style-type: none"> • / 	<ul style="list-style-type: none"> • / 	<ul style="list-style-type: none"> • Original dataset of 285 investors investing across 235 Impact Bonds worldwide from 2010 to 2023, manually 	<ul style="list-style-type: none"> • Project-level administrative data covering public funding interventions by ADEME and

			compiled from the GOLAB Indigo database and complemented by additional data from secondary sources	Bpifrance from 2010 to 2019
<i>Secondary data</i>	<ul style="list-style-type: none"> • Service providers' application forms and evaluation grids • Written documents of the contracting process Legal documentation (impact bonds contracts) 	<ul style="list-style-type: none"> • Case studies and internal reports provided by interviewees • Industry reports on IB investing • Press releases and articles 	<ul style="list-style-type: none"> • IB investors reports • IB evaluations • Press releases and articles 	<ul style="list-style-type: none"> • FARE database of firm-level accounting and performance data for French SMEs
<i>Data analysis</i>	<ul style="list-style-type: none"> • Thematic coding • Triangulation 	<ul style="list-style-type: none"> • Narrative strategy • Inductive coding using the Gioia methodology • visual mapping to identify identity–practice dynamics 	<ul style="list-style-type: none"> • Bias-reduced logistic regression • Multinomial regression 	<ul style="list-style-type: none"> • Propensity Score Matching (PSM) and • Difference-in-Differences (DiD) estimation

1.10. DISSEMINATION AND RELATED OUTPUTS

Throughout this doctoral journey, I was able to benefit from the constructive feedback of the academic community throughout multiple seminars and conferences. The following section summarizes, for each article, their presentation in conferences and their current status in the publication process.

Table 1.12. Summary of dissemination and publication activities by chapter

Chapter 2	
Presentation in seminars	<ul style="list-style-type: none"> • <i>July 2022</i>: “Finance for Innovation” chair seminar (Audencia Business School, Nantes, France) • Journées des Doctorants (GRANEM, Angers University, France)
Presentation in conferences	<ul style="list-style-type: none"> • <i>May 2023</i>: Outcomes-Based Contracting Workshop (Audencia Business School, Nantes, France) • <i>September 2023</i>: Social Outcomes Conference 2023 (Government Outcomes Lab, University of Oxford, UK)
Publication status	<ul style="list-style-type: none"> • Published • <i>July 2024</i>: Submission to Public Money & Management • Two rounds of peer review • <i>July 2025</i>: Published in Public Money & Management https://doi.org/10.1080/09540962.2025.2536630
Chapter 3	
Presentation in seminars	<ul style="list-style-type: none"> • <i>May 2024</i>: Summer School in Sustainable Entrepreneurship, Innovation, and Entrepreneurial Finance (Como, Italy) • Journées des Doctorants 2024 (GRANEM, Angers University, France) • <i>May 2024</i>: Workshop EDGE (Angers University, GRANEM) • <i>February 2025</i>: King’s Business School seminar (London, UK)
Presentation in conferences	<ul style="list-style-type: none"> • <i>April 2025</i>: Impact Investing Days 2025 (Audencia Business School, Nantes, France)
Publication status	<ul style="list-style-type: none"> • Working paper
Planned submission to conferences	<ul style="list-style-type: none"> • Academy of Management 2026 • European Academy of Management 2026 • EGOS Colloquium 2026
Targeted journal	<ul style="list-style-type: none"> • Organization Studies
Chapter 4	
Presentation in seminars	<ul style="list-style-type: none"> • <i>March 2025</i>: Paper and Idea Development Workshop (Center for Sustainable Business, King’s Business School, UK) • <i>June 2025</i>: GOLAB Seminar (University of Oxford, UK)
Presentation in conferences	<ul style="list-style-type: none"> • <i>May 2024</i>: Outcomes-Based Contracting Workshop (King’s College London, UK)
Publication status	<ul style="list-style-type: none"> • Working paper
Planned submission to conferences	<ul style="list-style-type: none"> • Outcomes-Based Contracting Workshop 2026
Targeted journal	<ul style="list-style-type: none"> • TBD
Chapter 5	
Presentation in seminars	<ul style="list-style-type: none"> • /
Presentation in conferences	<ul style="list-style-type: none"> • Submitted to the Nordic Conference on Small Business Research
Publication status	<ul style="list-style-type: none"> • Working paper
Planned submission to conferences	<ul style="list-style-type: none"> • ENTFIN 2026
Targeted journal	<ul style="list-style-type: none"> • <i>Research Policy</i>

In addition to the four chapters of this dissertation, my doctoral journey has led to several academic and professional contributions.

Other publications: My research has led to multiple publications in diverse formats. I published a book chapter titled *Environmental Impact Bonds: an innovative public-private approach to tackle climate challenges* in the *Handbook of Environmental and Green Finance: Toward a Sustainable Future* (World Scientific Publishing, 2024), alongside my supervisors Benjamin Le Pendeven and Céline Louche. I also co-authored a peer-reviewed article in *Public Money & Management*, titled *From Social Impact Bonds to Impact Bonds: An Outcomes-Based Framework*.

Engagement with practitioners: On top of my direct involvement in the ADEME EIB experiment in France, I have actively engaged with practitioners to bridge the gap between research and practice. Among those projects, I was involved in a project commissioned by WWF France. This project happened in two phases: first, I was tasked to determine all the projects within WWF pipeline that would be ‘EIB compatible’ according to an evaluation grid that I created as a result of my research on EIB in France. Then, among the 4 projects that were pre-selected, I conducted a more thorough feasibility study. This involved proposing result-based payment indicators, conducting an avoided-cost analysis and identifying a set of relevant public and private stakeholders for the project.

Teaching: I also had the opportunity to develop and teach courses on Sustainable Finance and Impact Investing. Within Gaia School of Ecological and Social Transitions, I fully designed a ‘Financing the Future’ Masters elective and an Executive MBA module on ‘Impact Finance and Management Control’. I also created original teaching material, including a case study on ‘how to determine an *Environmental Impact-Bond compatible* project?’ inspired by my own experience working with WWF France.

Academic conferences: The Finance for Innovation Chair at Audencia Business School has co-created the first edition of the *Outcomes-Based Contracting Workshop* in May 2023 and hosted the *Impact Investing Days 2025*. These events brought together researchers from renowned universities including Oxford University, King's College London, Politecnico di Milano, Copenhagen Business School, IE Business School and ESADE Barcelona. The *Outcomes-Based Contracting Workshop* has now become one of the key academic gatherings for the OBC and IB research community. Since its launch in Nantes, it has been hosted at King's College London and the Politecnico di Milano, and will take place at WU Vienna in 2026.

CHAPTER 2. NEW DEVELOPMENT: SO CLOSE, YET SO FAR? CHALLENGING THE COST-SAVINGS ASSUMPTION IN ENVIRONMENTAL IMPACT BONDS

Author: Maya Tira^{10/11/12}

Impact

This article broadens the notion of the financial benefits provided by outcomes-based contracts such as environmental impact bonds (EIBs). Instead of focusing on cost-savings, it offers an alternative model for practitioners based on the inclusion of non-market valuation methods to support the rationale behind the impact bond (IB) model.

Abstract

This article examines the impact bond (IB) model, focusing on cost-savings and environmental outcomes. Looking at the first environmental impact bond (EIB) experiment in France launched by the French Agency for Environmental and Energy Management (ADEME), the author found that linking environmental outcomes to direct and cashable public savings is difficult to achieve in practice. Instead, the value of these outcomes relies on a theoretical monetization of avoided negative externalities. This article's findings highlight the need to broaden the approach to outcomes valuation in EIBs and to adapt their financial structuring to the specific challenges of measuring environmental impact.

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¹¹ Entrepreneurship, Strategy and Innovation Department, Audencia Business School, Nantes, France/GRANEM, Angers University, Angers, France. mtira@audencia.com

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Keywords: Avoided negative externalities; cost-savings; environmental impact bonds; environmental impact evaluation; non-market valuation; outcomes-based contracting; social impact bonds, willingness-to-pay

2.1. INTRODUCTION

Throughout the world, governments are increasingly inclined to use outcome-based contracting mechanisms to fund interventions within social services (De Pieri et al., 2022) to tackle unemployment, homelessness or criminal reoffending. Among those outcome-based instruments, social impact bonds (SIBs) have received a growing interest from the public sector, and some governments recently started to extend their application to other types of outcomes, resulting in the creation of environmental impact bonds (EIBs), a variation of a SIB including environmental outcomes (Dey & Gibbon, 2018). Examples include DC Water, the pioneering EIB tackling storm water management through green infrastructure in Washington, D.C. (Appel et al., 2017); the Wildlife Conservation Bond funding conservation outcomes through the protection of the Black Rhino population in South Africa (Medina & Scales, 2024); and the Nutrient-EIB in Finland fighting eutrophication in the Baltic Sea through the reduction of nutrient emissions (Tiikkainen et al., 2022). In France, the public Agency for Environmental and Energy Management (ADEME) launched an EIB experiment focused on the circular economy in 2020, selecting eight projects in March 2021 as potential service providers.

EIBs may have the potential to enhance the set of instruments used by public services to tackle environmental challenges worldwide, especially given the current context of global climate emergency. The existing literature on EIBs portrays them as an adaptation of the SIB model with different settings (Dey & Gibbon, 2018). Thus, it is necessary to understand the specifics of this new tool in light of two elements:

- First, the impact bond (IB) model is still mainly perceived as a tool dedicated to *social* interventions.
- Second, the application of the SIB model to environmental outcomes is still novel, quite anecdotic, and struggles to be widely adopted in the realm of environmental impact financing (Tira et al., 2024).

This article contributes to the literature on IBs by exploring how payment-by-result mechanisms apply to environmental outcomes. Recent literature has highlighted a research gap in the understanding of the quantifiable characteristics of environmental outcomes in the context of EIBs, as well as a lack of research based on case studies and empirical evidence (Trotta, 2024). I fill these two gaps by analyzing how the emergence of EIBs in France questions the IB model and reliance on an invest-to-save logic. Building on the ADEME experiment, this article highlights how environmental outcomes push the boundaries of the IB model, requiring new approaches to outcomes valuation and financial structuring that reflect the complexities of environmental impact assessment.

2.2. THE ADEME EIB EXPERIMENT

The French Agency for Environmental and Energy Management (ADEME) initially planned a budget of 10 million euros for EIBs. However, the financial support was later tripled, reaching 27.3 million euros for up to eight projects (ADEME, 2021). From April 2021 to May 2022, stakeholders—including environmental service providers, financial intermediaries, evaluators and the public commissioner—engaged in pre-contractual negotiations. During this pre-implementation stage, negotiations aimed to determine the environmental KPIs tied to potential investor repayment and agree on evaluation methodologies to assess the impact performance of each program. Six of the eight preselected interventions reached an agreement by managing to build a business model relying on measurable outcomes and to secure up-front capital from private investors.

2.3. METHODOLOGY

This study used data collected from April 2021 to May 2022 during the pre-implementation stages of the first EIB experiment commissioned by ADEME. I used a qualitative approach based on semi-structured interviews of 22 stakeholders involved in the design of the ADEME EIBs and actors of the French SIB ecosystem (see Tables 2.1 and 2.2). Some of the interviewees who took part in the ADEME EIBs experiment had also previously been involved in the design of SIBs. The interviewees include public commissioners, private investors, evaluators, service providers, financial intermediaries, technical advisors and political decision-makers in IBs. This access to the IB ecosystem in France was made possible through my involvement in the ADEME EIBs contracting processes, representing the public commissioner in the multi-stakeholders' negotiations. Through participant observation, I was able to attend all the contracting meetings and access secondary data such as service providers' application forms and evaluation grids, written documents of the negotiations during the contracting process, as well as legal documentation related to the EIB process that I incorporated into my study.

Table 2.1 Description of EIBs launched through the ADEME experiment.

Environmental service provider	Description of the intervention	Duration	Maximum repayment for the public commissioner	Impact KPIs
Envie Autonomie	Collect and distribute medical equipment to facilitate the autonomy of people with disabilities	4 years	5 487 161€	<ul style="list-style-type: none"> • Number of jobs created • Tons of material recycled • Tons of carbon dioxide avoided • Tons of raw material avoided
Label Vie	Reduce the environmental impact of day care centers	4 years	3 130 000€	<ul style="list-style-type: none"> • Number of day care centers reached • Reduction in electricity consumption • Reduction in water consumption

Toopi Organics	Collect, transform and valorize human urine as a resource for agriculture	5 years	3 826 906€	<ul style="list-style-type: none"> • KPIs are confidential, but overall objective of drinkable water consumption/reduced use of chemical pesticides
Fédération Léo Lagrange	Reduce the production of greenhouse gases by mobilizing children through educative challenges	4 years	3 200 532,00 €	<ul style="list-style-type: none"> • Number of households reached • Tons of greenhouse gas avoided • Number of eligible challenges • Tons of greenhouse gas avoided one year after the workshop cycles
Andes	Reduce food waste by valorizing unsold food	4 years	2 948 000€	<ul style="list-style-type: none"> • Tons of carbon dioxide avoided • Total volume of waste avoided • Total volume of food collected and recycled • Avoided cost of food aid
Articonnex	Collect, transform and valorize building materials	5 years	2 548 000€	<ul style="list-style-type: none"> • Tons of material collected • Tons of material reused • Circular economy practices promoted among suppliers • Diversity of material collected

Table 2.2 Description of collected data

Data source	Description	Timeframe
Interviews	Twenty-two semi-structured interviews with key stakeholders of the French SIB and EIB ecosystem: service providers (5), public administration staff (5), political decision-makers (4), financial intermediaries (3), evaluators (2), independent organizations/technical experts (2), investor (1)	April 2021–May 2022
Participant observation	Consultancy work: Over a period of 1.5 years, in charge of representing the public commissioner during the contracting process and negotiations from the launch of the procurement phases to the last EIB signature Active involvement in all stages of the contracting and implementation of EIBs: official negotiation meetings (44), informal negotiations exchanges between formal meetings (10 to 15), steering committees (14), events related to the impact bonds ecosystem in France (4)	April 2021–July 2024
Secondary data	Service providers' application forms and evaluation grids (43), written documents of the contracting process (76) Legal documentation: commitment protocols 'protocole d'engagement' (6), grant agreements 'convention de subvention' (6), shareholder agreements 'convention cadre' (6)	April 2021–July 2024

2.4. ECONOMIC VALUATION IN ENVIRONMENTAL IMPACT BONDS

The valuation literature argues that economic value is not an inherent property of objects or practices but is shaped through frameworks such as business models (Doganova & Eyquem-

Renault, 2009; Doganova & Muniesa, 2015) which facilitate the alignment of interests among different stakeholders. In the context of outcomes-based contracts (OBCs) and SIBs, these valuation mechanisms play a crucial role in translating social and environmental outcomes into investable financial terms, enabling different stakeholders—governments, investors, and service providers—to coordinate the intervention around financial and extra-financial performance.

Specifically, in IBs, outcome valuation is based—in its original conception—on the cost-savings resulting from the improvement of the social outcome (Marsh et al., 2011). In this context, SIBs offer an alternative to classical economic theory by shifting from the traditional approach of taxing negative externalities and subsidizing positive ones (Witkin, 2019). Instead, the promise to yield cashable savings for the public sector is one of the arguments put forward to prompt a wider adoption of the instrument. However, the literature about SIBs highlights a ‘stretchiness’ of the SIB model in practice (Carter, 2020; Economy et al., 2022) especially regarding the extent to which the SIB financial model relies on a cost-saving logic (Carter, 2020; Economy et al., 2022). One critique against the cost-saving assumption is the complexity and high transactions costs associated with SIBs that may offset the promise of cashable savings and cancel out the initial benefit associated with the instrument (Hall, 2017; Warner, 2020). This concern is particularly relevant since SIBs are expensive instruments to design (Lowe, 2020). Practitioners in the SIB ecosystem have also assessed the model’s evolution, revealing that a significant number of SIBs evaluated deviated from the invest-to-save logic (Ronicle et al., 2022).

On top of that, the emergence of IB subcategories such as EIBs highlights how the nature of the primary outcome shapes the IB model and influences its financial structuring. In IBs, outcome monetization can range from direct cost-savings to non-monetized benefits, and sometimes lead to an increase (rather than a decrease) in public spending (Buffa et al., 2024). EIBs often finance

preventive interventions aiming to reduce externalities beyond direct cost-savings. Unlike social services, where financial impacts can be directly linked to specific budgets, environmental outcomes are typically more diffuse and long-term, making such connections difficult (Buffa et al., 2024). As in other forms of environmental financing, the challenge of valuing environmental outcomes in EIBs is exacerbated by market failures and the lack of direct pricing mechanisms, making it difficult for governments to quantify their financial value (Witt, 2018). In that sense, valuation of environmental services requires a combination of market and non-market approaches to capture their economic value. Rooted in welfare economics, willingness-to-pay (WTP) is a non-market approach used to assess the economic value of environmental goods (Freeman et al., 2014). Outcomes-based mechanisms such as payments for ecosystem services (PES) already rely on contingent valuation methods to assess how much individuals or communities are willing to pay to access to environmental services like urban green space (Tian et al., 2020) or river ecosystem services (Khan et al., 2019).

2.5. FINDINGS

The French EIB experiment highlights the limitations of an exclusively cost-saving approach in the context of an environmental intervention. The approach had to be adapted throughout the contracting process to better account for broader non-market benefits and the specificities of environmental valuation.

Cost-savings: contractual requirements versus practical realities

From the very beginning of the contracting phase, the stakeholders involved in the design of the EIBs faced several challenges. First, because EIBs are so novel, practitioners lacked any references or benchmarks from previous EIB experiments. Therefore, they relied mainly on the textbook SIB prototypical features to build the EIB experiment in France. Second, from the public commissioner point of view, cost-savings were initially a sine-qua-none condition for contracting. The EIB stakeholders were aware that, unless they could demonstrate that the cost-

savings would exceed the commissioner's repayment in the case of success, the preselected projects would have no chance of contracting an IB:

'[For EIBs], we had framing issues because it was a bit makeshift to think that we were basing our entire financial model on cost-savings that are monetized from things that can't be monetized at all, and that have no impact on the public commissioner budget whatsoever' (Technical expert on IBs).

'[For EIBs], we had an issue with the logic of wanting to find cost-savings by any means, and without cost-savings, it would have been difficult to make a financial model because, how do you price impact if you don't associate it with costs?' (Technical expert on IBs.)

Since the EIBs were initially designed under a strict cost-saving approach aligning with the theoretical doctrine of IBs, the public commissioner's willingness-to-pay for environmental outcomes was initially low. However, while the prototypical SIB model relies on the existence of direct cost-savings for the public commissioner, the French EIB experiment reveals that in practice, the French EIBs ended up primarily monetizing avoided negative externalities rather than generating cost-savings. While both mechanisms deal with financial benefits, they rely on different logics: cost-savings is a market-based valuation approach that refers to a direct reduction in public expenses due to an intervention, while monetization of externalities is a non-market-based valuation method that indirectly quantifies and assigns a monetary value to broader social or environmental benefits. For example, a social outcome such as job placement has a direct effect in reducing public expenditure as it both decreases the need for unemployment benefits and increases tax revenues for the public commissioner. On the other hand, lowering carbon dioxide emissions reduces long-term climate-related damage, but will not have an immediate and direct impact on public spending:

'Ultimately, it is not because there will be less carbon dioxide emitted into the atmosphere that ADEME will save costs. It is not an immediate logic of cost-savings; it is in a logic of consolidation of its mission [ADEME], its mission being globally to try to improve the situation of the environment' (Investor/financial intermediary).

Alternatives to the IB model

To reach a contractual agreement, the EIB ecosystem had to adapt the requirements of the SIB prototypical model while addressing the needs of the public commissioner. In order to increase the government's WTP, they focused primarily on identifying indirect links between the expected environmental performance and theoretical cost-savings in an effort to adhere to the prototypical model. Stakeholders did so by expanding the notion of cost-savings and assigning a monetary value to environmental benefits such as reductions in carbon dioxide emissions, bio-waste, or food waste, using metrics such as the carbon tutelary value, or proxies:

‘In environmental impact bonds, ultimately, we go much further in the extrapolation between the indicator and the cost savings’ (Financial intermediary).

The French experiment also highlights the structural inadequacy of the cost-saving assumption given that the public commissioner is a national-level public agency funding environmental interventions on an annual budgetary basis. Since EIBs' financial modelling was designed on the assumption of multiannual cost-savings, the generation of cashable savings is structurally impossible for ADEME. In addition, there is a fragmentation of cost-savings included in the financial modelling between different public bodies. As an example, water management falls outside the scope of ADEME intervention and is the mandate of the local water agencies in France. Despite the generation of environmental benefits, water consumption reductions will not affect ADEME's budget:

‘From the start, our approach has been to say: it's the local authorities that have the cost-savings, not ADEME. We [ADEME] work for the general interest, and do not have any immediate avoided costs’ (Public commissioner).

Although the public commissioner's WTP was initially low due to the cost-saving condition, in practice, monetizing negative externalities effectively increased the WTP by broadening the definition of economic value and incorporating broader benefits. Beyond extending the notion of cost-savings to the monetization of avoided negative externalities, social indicators (such as job placement) were included in reasonable proportions within the EIB's financial model. However, this approach had its limitations, as ADEME's legally binding mission is to fund

primarily environmental interventions. Therefore, the inclusion of social KPIs was capped at 20% of the overall EIB financial modelling.

Impact on outcomes evaluation

Building business models relying on environmental outcomes offers the advantage of bypassing the psychological barrier associated with quantifying *social* outcomes, resulting in less resistance to the idea of introducing monetization in an evaluation. However, in the context of the EIB experiment, the particularities linked to the financial design of the mechanism complicate the environmental evaluation. First, there is a tangibility issue related to the difficulty in identifying a specific target population affected by an environmental intervention when dealing with non-tangible outcomes such as reductions in carbon dioxide. In addition, as none of the proposed methodologies to assess the performance used a counterfactual logic, it creates an issue of outcome attribution, as it becomes challenging to isolate and to measure the effect of the IB intervention on the outcome generated. Finally, the temporality issue witnessed during the design of the EIB business models, as well as the absence of previous EIB experiments and the lack of data on specific environmental outcomes posed challenges in estimating certain environmental benefits, which ended up not being included in the financial modeling:

‘[For EIBs], some environmental benefits have not been taken into account because we don't know how to track them, or we know how to track them but we can't estimate them at the moment’ (Evaluator).

Assessing the change due to an environmental intervention in the average timeline of an EIB (generally three to five years) can be challenging. This reflects a conflicting temporality issue between the usual timeline of an IB and the time needed to assess an environmental change. A way to build sustainable business models in the case of EIBs, despite this timing problem, was to extend the accounting of cost-savings and/or avoided negative externalities up to the actual duration of the EIB, assuming that the intervention will keep delivering outcomes after the end

of the contract. However, because those expected outcomes are supposed to happen after the legal duration of the IB, there is no mechanism planned to keep track of those outcomes, and therefore no assurance that those will be achieved. See Table 2.3 for a comparison of SIBs and EIBs.

Table 2.3 SIBs versus EIBs: A comparison of key dimensions.

Dimension	SIB model	EIBs
Financial logic	Based on direct, cashable cost-savings for the public commissioner (such as reduced welfare costs due to job placement)	Based on monetization of avoided negative externalities (such as carbon dioxide reduction) and using non-market valuation methods. Limited/no direct cashable savings for the public commissioner
	Clear alignment between intervention outcomes and the public commissioner's budget	Savings often benefit other public entities or materialize in the long term
Outcomes types	Tangible, human-centered outcomes with identified beneficiaries.	Non-tangible, system-level outcomes with diffuse impact
	Primarily relies on social outcomes	Primarily environmental outcomes, but incorporates social outcomes (capped) to strengthen business models
Evaluation method	Relies on a counterfactual logic to measure and attribute impact	Relies on proxies and extrapolation, often without counterfactuals
	Target population and intervention effects are clearly identifiable and measurable	Environmental impacts are difficult to isolate and some benefits are excluded due to a lack of data or estimation methods
	Outcomes are expected and measured within the contract period (usually three to five years)	Temporal misalignment between the EIB timeline and environmental change leads to the extension of outcome accounting beyond the contract period

2.6. DISCUSSION: BROADENING OUTCOME VALUATION BY BLENDING MARKET AND NON-MARKET APPROACHES IN EIBS

The French EIB experiment reinforces the idea that, while environmental projects are often designed around a single intended benefit, they inherently generate multiple co-benefits (Everard & McInnes, 2013; Gordon et al., 2018). Financing an environmental intervention extends beyond ecological outcomes, because it also delivers social impacts. In addition, it

highlights the limitations of a purely cost-efficiency approach, which might be insufficient to capture the broader value of instruments such as EIBs. Even if an EIB does not generate direct cost-savings, it may still produce an economic value currently overlooked and that could be measured using other valuation techniques such as WTP. The ADEME experiment highlights the necessity to blend market approaches such as cost-benefits analysis with non-market approaches to estimate the value of environmental goods and services in EIBs, consistent with the literature on environmental valuation (Freeman et al., 2014). Adding a non-market approach such as WTP would be relevant to estimate how much society values broader environmental benefits and include it in IBs' business models. Additionally, it could strengthen the voice of the projects' beneficiaries in the design of an IB, and attract a broader pool of investors by framing IBs in financial terms. Finally, this shift from cost-savings to monetizing avoided externalities increased the public commissioner's WTP by broadening how social and environmental benefits were valued.

In theory, the financial stakes tied to EIBs were also expected to drive more rigorous environmental impact evaluation. However, despite their focus on outcomes rather than outputs, EIBs continue to face some of the common challenges associated with environmental impact assessment including in the design process, outcome definition, metric selection, data collection and management. These challenges seem to be consistent with findings from the literature on outcomes-based contracting which highlights persistent difficulties in defining and measuring impact (De Pieri et al., 2022). Notably, the mismatch between EIBs' short-term financial structures and the long-term nature of environmental change creates the need for trade-offs and heightens both environmental impact risk (Scognamiglio et al., 2019) and measurement risk (Thompson, 2022). To address these time discrepancies, potential solutions include extending EIBs' repayment timelines, allowing more time for measurable outcomes to materialize (Brand et al., 2021). For example, the DC Water EIB was structured with a 30-years repayment period,

aligning financial returns with the long-term nature of storm water management social and environmental benefits (Appel et al., 2017). Another solution could be to integrate EIBs in a broader blended finance scheme, where the EIB serves as one component of a long-term environmental intervention.

The findings also support the relevance of new institutional mechanisms, such as outcomes funds, as a way to overcome the fragmentation across public bodies and allow greater flexibility for public commissioners regarding their structural limitations. More broadly, they point to the need to reduce the reliance on over-centralized national actors and enable decentralized local actors to design and implement EIBs. Beyond that, they echo the argument that IBs could be reimagined outside of a public-private partnership model to serve as reforming tools for private markets (Warner, 2020). This suggests a shift in logic where private actors could be both the target and the payor of such contracts, using outcomes-based tools to correct market failures they contribute to.

2.7. CONCLUSIONS

The question of the adaptation of the SIB model to environmental issues is less intuitive than it may appear, and further questions the practical reality of the IB model in terms of cashable savings for the public commissioner. In the case of EIBs in France, the building of business models is mostly based on the monetization of negative externalities rather than public savings, broadening the frontiers of business model design and environmental outcomes valuation in EIBs. These findings offer important theoretical and practical implications for understanding how the IB model applies to environmental outcomes.

Theoretical implications:

- EIBs expand the boundaries of IBs by shifting the valuation logic from direct cost-savings to the monetization of externalities.

- EIBs highlight the need to blend market and non-market valuation approaches in response to the specific challenges of measuring environmental impact.

Practical implications:

Applying the IB model to environmental issues requires adapting it to the nature of environmental impact: diffuse, long-term, and often coupled with social benefits. Potential solutions include extending their duration or integrating them into broader blended finance schemes.

Incorporating the WTP logic into EIB business models could help value broader environmental benefits, strengthen beneficiary inclusion, attract more investors, and raise public commissioners' WTP.

EIBs could be reframed as instruments of market reform, where private actors act as targets and payors to address market failures beyond the public–private partnership model.

Further research could investigate how this stretchiness from the prototype applies to the other dimensions highlighted in the IB model, such as the extent to which environmental providers are involved in the contract delivery, or protected from financial risk, especially during the post-contractual negotiations and implementation phase of the EIBs.

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CHAPTER 3. EXPLORING THE MIRRORING RELATIONSHIP BETWEEN ORGANIZATIONAL IDENTITY AND HYBRID PRACTICES: THE CASE OF IMPACT BONDS INVESTING

Authors: Maya Tira¹³, Céline Louche¹⁴

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¹³ Lead author. Entrepreneurship, Strategy and Innovation Department, Audencia Business School, Nantes, France/GRANEM, Angers University, Angers, France. mtira@audencia.com

¹⁴ Waikato Management School, University of Waikato, New Zealand

3.1. INTRODUCTION

Organizational identity construction is a dynamic and continuous process (Gioia et al., 2013) that is inherently fragile. Identity tends to be particularly destabilized and more susceptible to change during strategic transformation attempts (Dutton & Dukerich, 1991; Gioia & Chittipeddi, 1991). Notably, the introduction of new practices can challenge identity coherence, especially when those practices are perceived as incompatible with existing organizational identity (Nag et al., 2007). The interplay between organizations and practices becomes especially challenging in contexts of hybridity (Battilana & Dorado, 2010; Battilana & Lee, 2014; Smith & Besharov, 2019). While the integration of new *hybrid practices* can present opportunities for organizations, it can also make organizations struggle to reconcile new practices with an existing identity. Drawing on the recursive interrelationship between organizational identity and practice (Nag et al. 2007; Gioia et al. 2013), we aim at answering the following question: *How does the adoption of a new hybrid practice shape organizational identity, and how does organizational identity, in turn, condition the adoption of the new practice?*

In this article, we study impact bond (IB) investing as a hybrid practice. We adopt a qualitative approach, drawing on an inductive and processual research design combining 29 interviews with 31 organizations that have engaged in IB investing, as well as secondary data collection and field observations for triangulation. We aim to explore how engaging with a hybrid practice interacts with and shapes their organizational identity. Our findings reveal that hybrid practice adoption triggers a recursive process involving both practice engagement and identity work. Organizations adopt a practice selectively: they reframe and adjust it in light of who they are or aspire to become. Simultaneously, these engagements generate identity work that either reinforces or reorients the organization's identity trajectory. We make three key contributions. First, we show that identity construction is not linear, but emerges through an iterative

negotiation between practice and identity. This mirroring identity-practice relationship elucidates how identity is negotiated and reshaped through practice at the organizational level. Second, we theorize the concept of the identity-practice compass and identify three practice-identity mechanisms through which organizations continually assess and realign their identity in response to practice integration. Third, we contribute to hybrid organizing research by demonstrating how provisional identity testing through hybrid practices enables organizations to navigate identity change without committing prematurely to structural transformation.

3.2. LITERATURE REVIEW

Hybrid practices as micro-level responses to institutional pluralism

Organizations increasingly operate in environments characterized by institutional pluralism, where multiple and often conflicting logics co-exist and infuse organizational practices (Thornton et al., 2012). Within institutional theory, practices are the patterned, material and symbolic activities through which multiple institutional logics can be enacted (Thornton et al., 2012, Jay, 2013). *Hybrid* practices arise from this integration of multiple institutional logics (Gautier et al., 2023) and expand the concept of hybridity beyond organizational structures (Battilana et al., 2017). They emerge as a response to institutional voids where ‘pure’ practices fail to deliver an intended outcome (Smets et al., 2012). These practices are crucial spaces where hybridity is enacted and materialized through the actions and interpretations of organizational members. Examples of hybrid practices include impact investing that combines philanthropic and finance logics (Casasnovas & Ferraro, 2022; Hehenberger et al., 2019, Gautier et al., 2023) or green investing that blends environmental and financial logics (Yan et al., 2021).

The interplay between logics within hybrid practices can give rise to different realities: hybridity may remain symbolic, when it is largely formal and fails to translate into substantive collaboration; become contested, when attempts to combine logics produce fragile arrangements and tensions between logics; or develop into a strong form of hybrid practices,

when logics are seen as compatible and deeply integrated into organizational practices (Gulbrandsen, 2015). Beyond the debate around logic (in)compatibility, Yan et al. (2021) demonstrate the importance of compatibility between the means mobilized and the ends pursued by the different logics within the hybrid practice: for example, the case of green investing shows the subordination of financial logics as means to achieve environmental ends.

To make sense of multiple logics at the practice level, the literature has emphasized the role of organizational identity, which acts as a filter through which organizations interpret and respond to micro-level institutional complexity (Greenwood et al., 2010; Greenwood et al., 2017). Recent research emphasizes that the enactment of hybrid practices such as impact investing depends not only on the coexistence of multiple logics but also on how organizations make sense of and prioritize these logics through identity claims. Jones et al. (2025) show that within the philanthropic sector, the adoption of impact investing depends less on organizations' categorical identity (charitable or financial orientation) than on attribute identities such as entrepreneurial or traditional orientations. Entrepreneurial identities foster openness to hybridization, while traditional identities reinforce attachment to established practices. This highlights organizational identity as a key micro-level mechanism mediating institutional pluralism and shaping the emergence of hybrid practices.

The interplay between organizational identity and practice

Organizational identity was initially conceptualized as the set of attributes that organization members consider as central, distinctive and enduring in shaping their collective response to the question: *who are we as an organization?* (Albert & Whetten, 1985; Gioia & Thomas 1996; Pratt & Foreman, 2000). This foundational view emphasized identity as stable and positioning continuity in the face of organizational change. However, the notion of identity as enduring has since been challenged by scholars who argue for a more dynamic and processual approach of organizational identity (Gioia et al., 2000; Gioia et al., 2013).

By conceptualizing organizational identity as a dynamic and negotiated construct, scholars have established a link between organizational identity and organizational practices (Nag et al., 2007). First, organizational identity shapes practices because it is deeply embedded in, and enacted through the everyday routines and activities of organization members (Kroezen & Heugens; 2012). Practices' meanings are informed by the organizational contexts in which they occur (Cook & Brown, 1999) and the shared understandings between organizational members (Hatch & Schultz, 2002; Ravasi & Schultz, 2006). These organizational contexts and understandings are framed within the concept of 'identity reservoir' (Kroezen & Heugens, 2012), an accumulated set of proto-identity attributes, both material (such as equipment, technologies, products, or resources) and symbolic (names, narratives, values, or rituals) that constitute the substantive core of an organization. Organization members select those attributes, and enact them through identity claims.

Identity claims are essential to understand organizational identity. They are the statements that articulate who the organization is or aspires to be. They are shaped by the balance between isomorphism (DiMaggio & Powell, 1983) and distinctiveness (Clegg et al., 2007) in identity formation, highlighting the inherently relational nature of identity (Pratt, 2016). Identity is negotiated through interactions between organizations and external stakeholders to ultimately form a consensual identity. Identity claims are also influenced by individual, structural, and historical factors, including founders' identities (Wry & York, 2017), members past experiences and identification (Walsh & Bartunek, 2011), collective narratives (Wertsch, 2012), inherited identities from parent organizations and legacy ties to existing fields (Patvardhan et al., 2012).

Practices can also actively influence organizational identity. For example, it can lead to identity inertia (Nag et al., 2007; Tripsas, 2009). Even when organizations announce or acknowledge pursuing a new identity, change may not materialize unless routines and practices are critically

revised. In their study of a firm attempting to shift strategically from an engineering-oriented to a market-oriented R&D company, Nag et al. (2007) show that despite announcing an identity shift, implementing structural changes, and disseminating new knowledge, the identity transformation ultimately failed to materialize. At the core of this failure was the strong association organizational members made between the firm's identity and its established practices, which led them to perceive incompatibility between the organization and the new practices introduced. This illustrates how organizational identity can be "*embedded in the social practices of everyday work life.*" (Nag et al., 2007, p. 824)

Recursive dynamics between organizational identity and hybrid practices

While most of the organization literature conceptualizes hybridity through an organizational level of analysis, recent studies highlight the role of micro-level practices in addressing institutional complexity (Shams, 2021; Smets et al., 2015). Hybrid practices relocate hybridity from formal structures to the everyday actions and interpretations of organizational members. They can be arenas of contestation where actors may disagree on which logic should be prevalent, or how conflicting demands should be balanced. Organizational identity, therefore, shapes how organizational members navigate and respond to this practice-level hybridity (Greenwood et al., 2017). In navigating institutional complexity, the notion of 'organizational identity work' (Kreiner et al., 2015) captures how organizational members actively construct, repair, or revise their sense of self to maintain a coherent organizational identity (Sveningsson & Alvesson, 2003; Spyridonidis et al., 2015; Bévort & Suddaby, 2016). Cornelissen et al. (2021) demonstrate that organizational identity formation is an emergent process shaped by identity work, where members actively construct their organizational identity through the interplay of 'sayings' (the narratives and discursive framings that define who the organization is) and 'doings' (the practices and routines that give substance to these claims). Because such sayings and doings often embody competing institutional logics, they can appear contradictory.

To address these tensions, members engage in rekeying, a process through which the meaning of practices and narratives is continuously reinterpreted so that what once seemed inconsistent is reframed as coherent and mutually reinforcing.

We identify three gaps in the literature: first, hybrid practices are typically conceptualized as emerging within hybrid organizations (Gulbrandsen et al., 2015). Our empirical ground allows to consider hybrid practices outside of organizational forms, showing that hybrid practices can be developed within organizations that pursue hybrid goals without being formally and structurally hybrids, and to answer to the call for more research conceptualizing hybridity as a matter of degree rather than as a distinct organizational type (Battilana et al., 2017). An organizational identity lens may offer additional insight into why hybridization occurs unevenly across organizations facing similar institutional complexity.

Second, although prior research has explored how organizational identity shapes practices and how practices can in turn influence identity, these dynamics have largely been examined separately. Less attention has been given to their recursive, processual interplay. This study takes a processual view and analyzes the recursive relationship between identity and hybrid practices. Finally, while the literature demonstrates that practices can contribute to identity inertia (Nag et al., 2007; Tripsas, 2009), we argue that the integration of hybrid practices can also drive identity transformation, as such practices lead to a reflection on identity and can infuse organizations with new meanings, norms, and routines that gradually reshape how they define and enact their identity.

3.2. METHOD

Context: Impact bonds investing as a hybrid practice

Impact bonds investing is a hybrid practice blending market and social logics (Berndt & Wirth, 2018). It integrates philanthropic goals into mainstream financial decision-making (Höchstädter and Scheck, 2015) within a single financing arrangement, making hybridity an inherent feature

of the practice itself and positioning impact bond investing as a middle ground between conventional profit-oriented investments and non-return-seeking forms of funding such as grants or philanthropy. From the market logic, impact bond investing draws on the idea that competition and efficiency can be integrated into public service delivery by leveraging private-sector methodologies and investment strategies. It embeds calculative mechanisms such as performance measurement, risk transfer, and the conditionality of financial returns on verified outcomes (Maier & Meyer, 2017; Berndt & Wirth, 2018). From the social logic, impact bond investing emphasizes the creation of social and environmental value, collective accountability, and cross-sector collaboration among stakeholders (Carè et al., 2020). In impact bonds investing, private investors provide upfront capital to fund a social or environmental intervention implemented by a service provider (typically a social enterprise or an NGO). For investors, the return on investment is contingent upon the achievement of predefined social and/or environmental outcomes, which are assessed through outcomes metrics established prior to the implementation. If the intervention successfully meets or exceeds the predefined targets, the public commissioner (usually a ministry or a government agency) repays the investors with interest. If the outcomes are not achieved, the commissioner does not repay the investors, transferring the financial risk from the public sector to private investors (Maier & Meyer, 2017). Another specificity of IB investing is that the practice attracts a highly diverse range of investors (Carè et al., 2020) including traditional and non-traditional market participants. This pool of investors defies the usual conceptualization of hybrid organizations: while some investors display established organizational hybrid forms, others are structurally non-hybrid organizations that pursue hybrid goals through their investment practices.

Data collection

We relied on multiple sources of data (see Table 1), including primary data (interviews), secondary data (archival documents, annual reports and impact bonds evaluations) as well as field observations, which allowed for data triangulation (Creswell, 2007).

Interviews: Between February 2024 and July 2025, the first author conducted a total of 29 interviews with 31 individuals (some interviews involved two respondents and some respondents were interviewed more than once) working in organizations that had engaged in impact bonds investing (see Appendix 1). The interviews happened in two rounds: a first round of 9 exploratory interviews (January – February 2024) was followed by a second round of 20 semi-structured interviews (June 2024 to July 2025). The informants worked in philanthropic organizations (corporate foundations, family foundations, charities and non-profit), impact funds, corporations, and financial institutions (banks and insurance companies). This broad sample reflects the diversity of organizations in impact bonds. Interviews were conducted virtually, except for one which was in person and lasted between 25 and 60 minutes. When permission was granted, interviews were recorded and transcribed; in cases where recording was not permitted (9 interviews), detailed notes were manually documented.

To identify our respondents, we relied on two main sources: the Indigo database (GOLAB, 2025), which lists all impact bonds investments worldwide since 2010, and the first author's involvement in the impact bond practitioner and research community. Based on the Indigo Database, we initially pre-selected 60 organizations to approach: to ensure that our sample was representative of the diversity of the impact bond market, we applied purposive sampling using criteria such as organizational type, frequency of investment, geographic distribution, and date of market entry. Respondents were then contacted through a targeted outreach strategy that combined personal connections within the practitioner community with outreach via LinkedIn and email found on organizations' websites. Our efforts focused on identifying either organizational leaders (CEOs and funders) or operational staff members directly involved in

the impact bond activities within their organizations. We also benefited significantly from the willingness of certain respondents to provide access and facilitate introductions by connecting us with co-investors involved in specific impact bonds.

Interviewees were asked about their organization's initial exposure to and understanding of the practice, as well as the reasons that motivated their engagement. We also explored their practical experiences of investing in IBs and how the organization made sense of that involvement in the practice. For organizations that had abandoned the practice, questions focused on the factors underlying this decision, while for those that remained active, we examined how their motivations and approaches evolved across subsequent investments.

Secondary data: for each organization in our interview sample, we collected information on their mission statement, their investment thesis and strategy through their organizational websites, annual reports, and impact reports. To trace their trajectory in impact bond investing, we complemented these sources with press releases, news articles and social media posts, enabling us to reconstruct the chronology of their engagement in the practice. During the interviews, some respondents also shared additional materials such as case studies, reports, and internal presentations documenting their involvement in impact bonds investing. More generally, we also collected reports from organizations such as Brookings, Social Finance and the Outcomes Finance Alliance which are regarded as reference organizations in impact bond investing, and have an extensive involvement in documenting market trends, sharing lessons learned, and shaping practical standards. These sources also provided a global overview of the types of organizations that act as investors in impact bonds, including their organizational nature, their level of impact orientation, underlying motivations and role within the practice.

To gain a deeper understanding of the financial and social outcomes delivered by their impact bond investments, we also collected 35 evaluation reports and investor reports of specific impact bonds interventions. These reports, produced by third-party evaluators, provide

investors with insights into the results of impact bonds, both in terms of the effectiveness of the financed interventions and the achievement of predefined social or environmental outcome targets. Beyond assessing performance, they also document implementation processes, challenges encountered and lessons learned from the intervention

Field observations: Throughout the data collection process, the first author was also engaged as a practitioner in structuring a portfolio of six impact bonds in France. This involvement in the practice provided privileged access to the field and a practice-based understanding of how impact bonds are launched, including the sequencing of activities, the negotiations required, and the range of stakeholders involved. It also allowed the first author to observe the ways investors participate in impact bonds investing. As part of this role, the first author attended 24 steering committee meetings, where investors sat alongside public commissioners, service providers, evaluators and intermediaries to review the progress and dual performance of their investments.

This engagement in practice also provided broader access to the European impact bond ecosystem and facilitated participation in various field events and industry conferences between 2021 and 2025. For example, the first author attended four editions of the Social Outcomes Conference organized by Oxford University, which brings together the community of impact bond practitioners and researchers, as well as three editions of the Impact Investing Days, held in Barcelona in 2023, San Francisco in 2024, and Nantes in 2025. These events enabled to trace the evolution and challenges of impact bond investing, while also providing opportunities for informal conversations with investors, who shared their perspectives on the development of the practice.

Table 3.1. *Description of data collected*

Source	Amount	Detail	Timeline
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Interviews	29 interviews	<ul style="list-style-type: none"> • Impact-first organizations (9) • Hybrid organizations (16) • Finance-first organizations (4) 	February 2024 – July 2025
Secondary data	71 documents	<ul style="list-style-type: none"> • Impact bonds evaluations (35) • Annual and impact reports (10) • Internal documents: case studies, internal reports (6) • Industry reports on impact bonds investing (5) • Press releases and articles (15) 	2021 - 2025
Field observations	170 hours	<ul style="list-style-type: none"> • Impact Bonds steering committees • Social Outcomes Conference 2022, 2023, 2024 • Outcomes-Based Contracting Workshop 2023, 2024 and 2025 • Roundtable: Mapping the evolution and challenges of social outcomes contracts in Europe • Impact Investing Days 2023, 2024 and 2025 	2021 - 2025

Data analysis:

This study adopts an inductive approach (Creswell, 2007) aiming to uncover the interrelation process between organizational identity and practice through iterative cycles of data interpretation. The following section describes all the methodological steps that we followed.

Narrative strategy: We started by conducting a first round of 9 exploratory interviews. Drawing on these initial interviews, as well as the secondary data collected on each investor, we began a phase of open coding to develop narrative accounts (Langley, 1999) tracing the trajectory of their organizational involvement in the practice. To structure the narratives, we used temporal bracketing (Langley, 1999), which enabled us to divide the interaction with the practice into four phases: a pre-engagement phase, when organizations were first introduced to the practice; an engagement phase, reflecting their direct experiences with it; a reflection phase, typically triggered by events such as the evaluation of past investments, reinvestment opportunities, or strategic changes within the organization; and a post-reflection phase, beginning with the outcomes of this reflection, namely the decision to continue engaging with or disengage from the practice. During this narrative phase, it also became evident that the decision to engage in the practice was informed not only by how organizations made sense of

their investment performance but also by their broader reflection on the organizational value of impact bonds investing. In other words, the choice of staying engaged within the practice did not rely simply on whether their previous investment(s) in impact bonds were delivering social and financial outcomes, but also involved making sense of the benefits and constraints of staying engaged in impact bonds investing for their organization. Among the organizational dimensions, the question of organizational identity was recurrent, as respondents reported that the engagement with impact bonds investing generated a reflection over *who they were* as an organization. This first methodological step allowed to schematically draw the process of involvement with the practice and to create an interview guide that was focused on how organizations made sense of their organizational identity through the engagement in the practice derived through our exploratory interviews (Rowley, 2012).

Classification: As the second round of interviews began, we observed that investors in hybrid products such as impact bonds are not homogeneous; they vary not only in their organizational nature but also in the relative priority they assign to impact and profit. While the field of impact bonds is primarily composed of philanthropic investors (as reflected in our sample), it also includes a wider range of actors such as banks, insurance companies, development institutions, and impact funds. To account for this diversity, and drawing on frameworks developed by impact investing industry actors (such as Impact Europe or the Impact Management Project), we systematically positioned the organizations in our sample along a spectrum ranging from impact-first to finance-first investors.

Coding: We coded our data derived from the interviews twice, conducting the two rounds separately. In the first round, we focused on engagement with the practice; in the second, on organizational identity. For each round, we began by identifying ‘informant-centric terms’ (Gioia et al., 2013, p. 18) that captured how respondents described their engagement and how they made sense of their organizational identity. This process resulted in two distinct data

structures, one centered on engagement with the practice and the other on organizational identity. The coding involved a collaborative and iterative process between the two authors, with exchanges occurring every two to three weeks. This phase was characterized by a continuous back-and-forth between the empirical data and the theoretical literature, allowing emerging patterns to be validated and refined. For example, we relied on concepts of the organizational identity literature to guide the second-order themes (Murphy et al., 2017), such as ‘organizational identity work’, ‘identity reservoir’ and ‘identity claims’. Data coding and analysis was structured using the Gioia methodology (Gioia et al., 2013). Figure 3.1 and Figure 3.2 present the two data structures. They show how, when an organization engages with a hybrid practice, it goes through an iterative process of interpretation, enactment, rationalization and adjustment as it seeks to integrate the practice within its organizational identity. These stages of practice integration interact with the organization’s identity work phases, which unfold through labelling, anchoring, confronting, and transforming hybrid organizational identity.

Visual mapping: A key insight that emerged from this double coding was the mirroring between the aggregate dimensions of engagement in the practice and organizational identity sensemaking. As organizations moved through phases of engagement, they simultaneously engaged in identity reflection by revisiting who they were. The visual mapping strategy (Miles & Huberman, 1994) was instrumental at this stage, as it enabled us to identify dynamic interrelations (see figure 3.3) and recursive loops within the identity-practice process. This step also highlighted the critical role of the degree to which the practice was integrated into organizational structures and identity, which ultimately led to the conceptualization of the identity–practice compass.

Figure 3.1 Data structure: engagement with hybrid practice

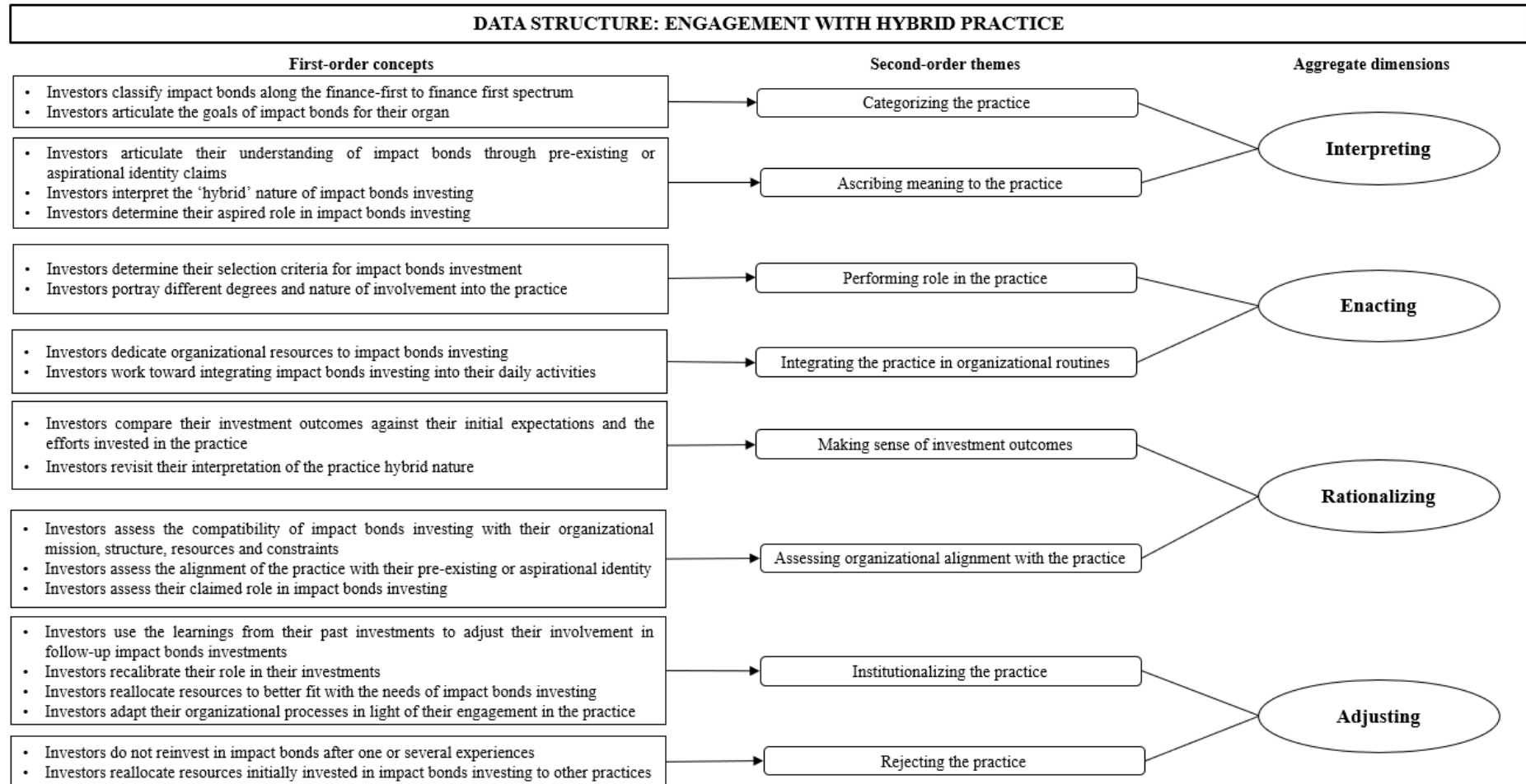


Figure 3.2 Data structure: organizational identity work

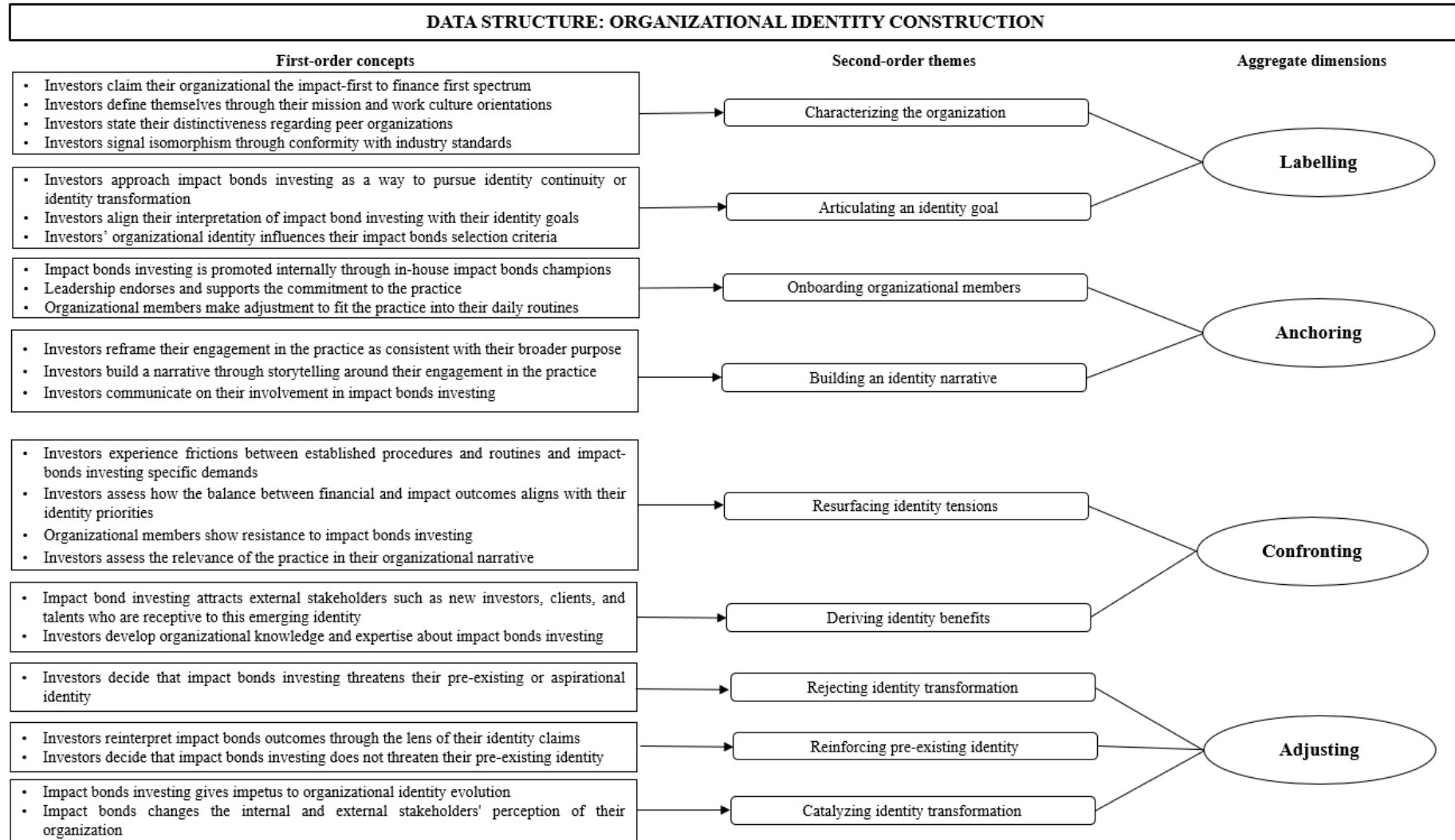
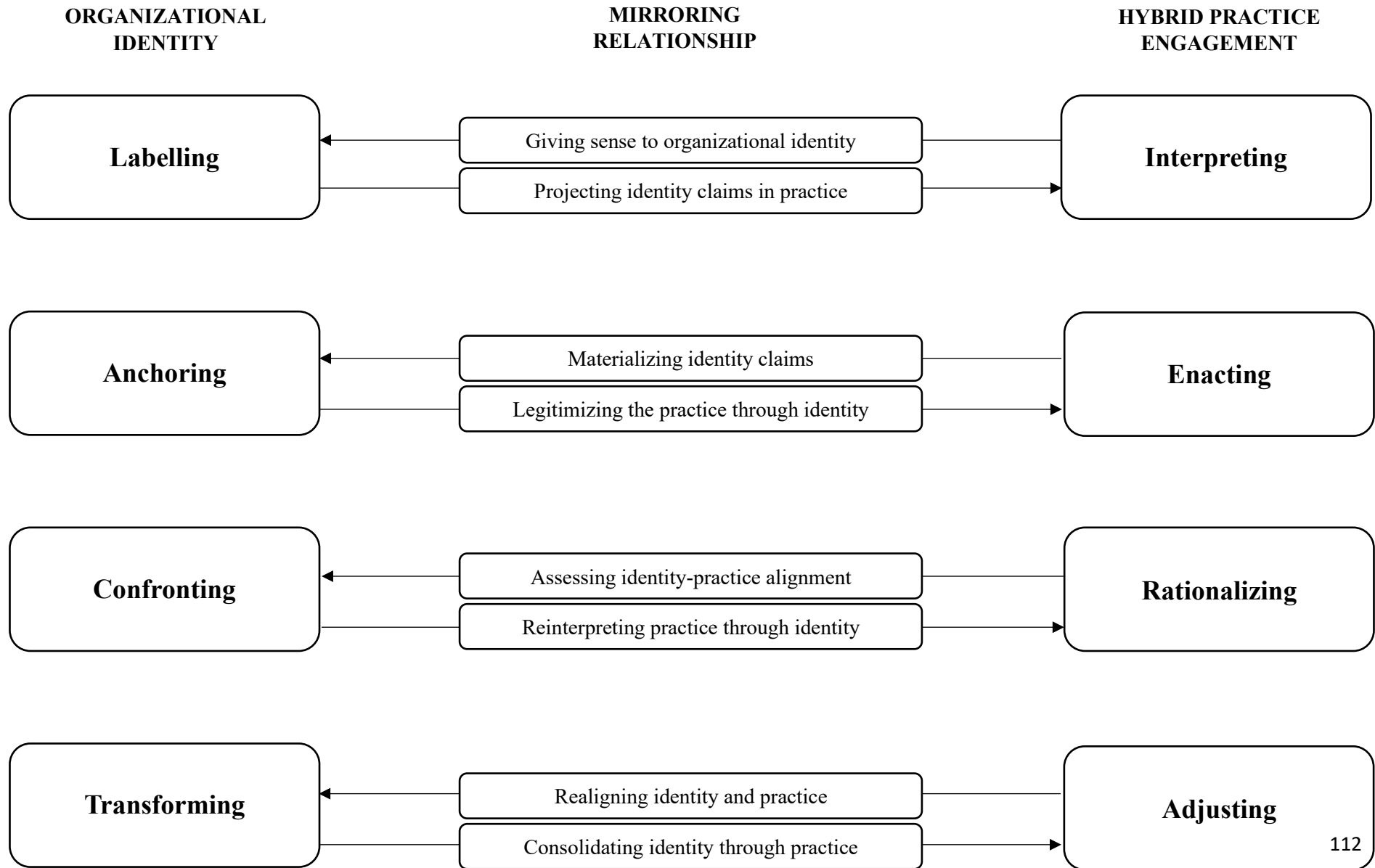


Figure 3.3 Mirroring relationship between organizational identity and hybrid practice engagement



3.4. FINDINGS

The findings section is structured as follows: in each phase of the process, we identify the practice engagement and identity work mechanisms, and show how they interact through mirroring.

Phase 1: Framing the practice through projected identity claims

Before engaging into impact bonds investing, organizations first went through a preliminary work of practice interpretation aimed at evaluating coherence between impact bonds investing and their organizational identity. This process entailed articulating who they were as organizations (labelling) before making sense of the hybrid practice (*interpreting*).

Labelling: Three distinctive identity orientations emerged in the characterization of impact bond investors. The first category includes organizations that claim an ‘impact-first’ identity. These are primarily philanthropic actors such as individual and community foundations, charities and non-profit organizations. Their core values center on the primacy of the social or environmental mission and these organizations rely predominantly on instruments such as grants and donations. The second category consists of hybrid investors, who continue to prioritize impact creation but also incorporate elements of the business logic into how they pursue their goals. This category includes impact investing funds, or family and corporate foundations that rely on debt and equity instruments while accepting below-market returns. Finally, finance-first organizations are institutional investors whose core values are grounded in market logics such as profitability and efficiency. While they may integrate sustainability objectives into their investment strategies, they continue to prioritize financial performance above impact creation.

These categories emerged from how organizations articulated their identity claims. First, organizational identity was associated with founders’ identities: respondents emphasized the personal and professional background of their founder, such as their country of origin, personal

trajectory, and previous professional experiences, and how these had shaped the organization's members perception of who they were. Investors also articulated their initial identity in ways that blurred the boundary between 'who they are' and 'what they do'. A recurring pattern in our data was the recasting of investment strategies into identity statements. Typically, respondents described their organization as 'being impact-first' (IF3, IF8, H6) rather than pursuing an impact-first strategy. Similarly, the organizational mission, formulated through a mission statement, systematically defined identity through action. Finally, investors formulated identity claims around distinctive identity markers. For example, hybrid organizations emphasized their entrepreneurial culture and flexibility, finance-first organizations emphasized their institutional approach to impact; impact-first organizations highlighted a culture rooted in deep expertise in specific social and environmental challenges, a local and ground level engagement and an understanding of the non-profit sector.

When labelling their organizations, investors navigated between identity distinctiveness and isomorphism. Across categories, all investors consistently emphasized being innovative as a core characteristic of their organizations despite their categorical identity claims. On the opposite, distinctiveness was expressed not only in relation to what they were doing differently compared to investors of other identity orientations, but also relative to their own categorical identity claims as foundations or institutional investors. In doing so, investors expressed a willingness to move beyond their categorical identities to adopt differentiating identity claims. For example, a hybrid institutional investor stated that 'we are one of the few institutional investors that does not approach impact investing primarily through the lens of financial performance', while a respondent from a hybrid foundation formulated her organization's distinctiveness:

'The other foundations, they don't have this financial DNA that we have. We're always thinking it has to be socially profitable but it also has to be financially profitable because

it has to live and go on. The other foundations, they think that impact investment is impact first, it's giving out money. It's a very 'philanthropist' point of view' (H13)

Interpreting: Given the novelty of impact bonds investing, investors engaged with the practice for the first time by relying on assumptions and expectations rather than certainties. This is particularly evident at the stage of the first investment, where limited benchmarks and practical knowledge of impact bonds meant that investors had to construct their own meaning around the practice. Organizational identity claims shaped this interpretive work in two ways: as a filter for practice selection and as a lens for understanding practice hybridity.

Identity first acted as a filter for practice selection: identity claims guided whether impact bonds investing was seen as consistent with an existing identity or as an opportunity to extend it in practice. Hybrid investors pre-existing organizational identity served to legitimate the adoption of the practice as appropriate and consistent with their mission. For example, this coherence was made explicit by how hybrid investors framed engagement in impact bonds investing as a natural extension of their hybrid mission, with mission alignment acting as an identity filter for engagement in the practice.

'We are set up to invest for impact with profit and the profit element for us is not important, but it's important that we follow a business logic and that there is a commercial drive or business plan behind the entrepreneurs we invest in. Our mission statement is 'create enduring value and leave lasting footprint' So, if somebody comes up to our top brass and asks for help in doing something like impact bonds investing there is a fair chance that we will participate' (H11)

Impact-first and finance-first investors saw impact bond investing as an opportunity to engage in ways that differed from their usual organizational orientation. They chose to invest because the practice allowed them to step beyond their usual identity claims. Respondents from these organizations consistently highlighted what the practice introduced that diverged from their established routines. For impact-first organizations, the emphasis on impact outcomes rather than outputs and more results-oriented orientation recurred among our respondents as a central motive for investing. For some, it also represented their first experience acting as an investor

rather than making grants and donations. For example, in a report announcing its involvement in impact bonds investing, an impact-first investor positioned itself as moving ‘from a grant funder to an impact investor’. Another respondent from an impact-first organization told how their first encounter with impact bonds investing made them realize how ‘we should transform ourselves from a donor to a patient investor’ (IF5). By contrast, organizations rooted in a market logic described impact bond investing as their ‘entry point’, or ‘pilot’ into the impact space, emphasizing how the practice enabled them to experiment with approaches outside their traditional market logic.

Identity also acted as a filter for hybridity interpretation: organizational identity claims shaped how actors made sense of the hybrid nature of impact bond investing. These interpretations diverged in the ways investors framed the hierarchy and the interplay between market and social logics. Due to the specificities of impact bonds investments (which are project investments where financial returns are below-market return and contractually capped), none of the investors in our sample categorized impact bonds as a finance-first practice. From the perspective of impact-first investors, the financial aspect of impact bonds was subordinated to the impact they might generate. In this view, the market logic inherent to impact bonds was primarily seen as an enabler of the social logic, providing a mechanism to enhance impact and more effectively fulfill the core mission. Hybrid investors framed impact bond investing as a way of building a ‘business case’ (H13) for impact. They interpreted the practice as evidence that social and financial objectives were not mutually exclusive, but could be combined in practice. In this sense, they understood impact bonds as integrating the market logic into the social logic rather than privileging one over the other. For example, they did not frame the market logic of impact bond investing in terms of investor returns, but rather as a way to demonstrate the financial sustainability of financed interventions, which in turn was seen as a pathway to scaling their impact. Finance-first investors interpreted the practice as a new

investment product that would lead to a new market. In that sense, they interpreted the social logic as complementing the financial logic.

Drawing on these interpretations of impact bonds investing, investors articulated identity claims in relation to the practice by emphasizing the distinctive roles they could enact through it. In this translation of identity into practice, impact-first organizations highlighted their knowledge of the social and environmental service providers and positioned themselves as impact-stewards. Hybrid investors interpreted impact bonds as a developmental practice to strengthen the investment readiness of the impact ecosystem, foster and catalyze systemic change, enacting the role of capacity-builders. Finance-first investors, by contrast, framed impact bond investing as an emergent market in need of scaling and institutionalization, positioning themselves as field-builders (see Table 3.3)

Table 3.2 *Identity claims projected into practice interpretation*

Identity claim	Description	Interpretation of hybridity
<i>Impact-first</i>	Prioritizing social and environmental outcomes over financial performance, focusing on impact and beneficiaries	Market logic <i>subordinated to</i> social logic
<i>Hybrid</i>	Prioritizing social and environmental outcomes. Adopting a financial/business approach to impact	Social logic <i>integrating</i> market logic
<i>Finance-first</i>	Prioritizing financial performance while still considering social and environmental outcomes, highlighting a market- oriented approach to investment	Social logic <i>complementing</i> market logic

Table 3.3 *Identity claims projected into role in the practice*

Identity category	Identity claim in the practice	Projection in the practice
<i>All categories</i>	<i>Innovator</i>	Impact bonds investing is framed as an experimental, innovative financial practice

<i>Finance-first</i>	<i>Field-builder</i>	IB investing is framed as a new market in need of institutionalization
<i>Hybrid</i>	<i>Capacity-builder</i>	IB investing is framed as a way to professionalize and strengthen the capacities of the impact ecosystem
<i>Impact-first</i>	<i>Impact-steward</i>	IB investing is framed as an opportunity to leverage field expertise, deep knowledge of the social issue, and service providers to ensure impactful interventions

Mirroring relationship: On the one hand, identity shaped how investors engaged with impact bond investing: it filtered the decision to adopt the practice, oriented their interpretation of its hybrid nature, and defined the distinctive roles they claimed through it. On the other hand, the practice of impact bond investing simultaneously reflected back on identity by opening a window of opportunity for its re-articulation. Investors reaffirmed certain aspects of their existing self-understanding while also envisioning adjustments or extensions of who they might become by engaging in the practice.

Phase 2: Materializing identity claims into practice engagement

After projecting identity claims within the practice, investors began to materialize these claims by aligning their actions with their interpretation of the practice. This stage involved translating them into concrete action (*enacting*), while also integrating the new practice into organizational routines and building coherence between practice and organizational identity (*anchoring*).

Enacting: Investors' engagement with impact bonds investing reflected the identity claims they had articulated prior to adopting the practice and oriented them toward particular roles in the field. The distinction between impact-first, hybrid and finance-first investors emerged through the criteria guiding their impact bonds investments and illustrates how identity orientations shaped practice enactment.

Impact-first investors enacted their identity orientation into practice by primarily prioritizing social considerations in their investment selection. Their criteria centered around the specific

social or environmental challenge that was targeted by the intervention, as well as the quality and ethics of the service provider. For example, one respondent shared an anecdote about refusing to invest in an impact bond due to concerns about workplace harassment within the service provider organization. This selection approach was reinforced by their knowledge of the non-profit and social economy sector. As an illustrative example, four impact-first investors reported investing in impact bonds only when the service provider had already been vetted through past collaborations. Impact-first investors also prioritized balanced investor roundtables and governance structures, sometimes even explicitly rejecting the idea of a dominant investor. As a result, impact-first investors tended to favor direct, deal-by-deal investments in impact bonds.

Hybrid investors mainly focused on selecting impact bonds investments that had the potential to drive systemic change. They approached impact bonds as way to demonstrate the financial viability of impact. They chose their investments based on criteria such as the sustainability of the business model, its financial and operational viability, and the potential to scale the impact achieved beyond the intervention. These investors engaged in both direct investments and indirect investments through funds specifically created for impact bond investments.

For finance-first investors, identity orientations rooted in market logics translated into impact bonds evaluation criteria that remained similar to mainstream investing practices. Despite the fact that they adapted their criteria compared to other forms of investment (for example, return expectations were systematically lower in impact bonds investing compared to other investment practices), their selection criteria still centered on deal size, potential internal rate of return, and strategies to mitigate credit, performance or counterparty risks. They prioritized market diversification and tended to be largely sector and geography-agnostic. Finance-first investors predominantly acted as lead investors in the deals they entered, and tended to pursue both direct

and indirect investments across multiple impact bonds, reflecting a portfolio-based approach aimed at diversification and risk management.

The self-claimed identities enacted in the practice also influenced the investors' role in impact bonds investing. Impact-first organizations drew on their deep knowledge of social and environmental issues and their close relationships with service providers to act as impact stewards. Their involvement focused primarily on ensuring the quality and integrity of impact delivery. Due to their impact-first orientation, their very presence in an impact bond influenced deal structuring, by contributing to maintaining returns at relatively lower levels.

Finance-first investors who claimed a field-builder identity translated this orientation into practice by enacting in accordance with the explicit aim of fostering impact bonds investing institutionalization and transformation into an investable market. They promoted impact bonds investing to other external investors in order to mobilize additional private capital for the practice. They collaborated with other impact bonds investors to create joint financial vehicles in the form of special purpose vehicles or dedicating impact bonds investing funds.

Capacity builders actively contributed to the development of knowledge and the design of impact bonds. This included, for example, publishing guidelines and best practices for impact bonds investing, sharing data and learnings from their impact bonds investments or funding research and knowledge-creation initiatives to support wider adoption of impact bonds. They also viewed their involvement in the practice as extending beyond capital provision to include tailored support through structuring input and support or services providers in achieving impact bonds investment readiness.

Identity orientations also shaped how investors internally embedded and aligned the practice within organizational structure and day-to-day activities. In their initial engagement with the practice, finance-first organizations adopted structural containment strategies. Impact bonds

were managed within a distinct business unit with organizational boundaries and remained distinct from mainstream investment activities. For impact-first organizations, there was no structural containment as impact bonds investing was not located as a separate function within an organization. Instead, it was informally embedded to the workload of a few organizational members. Employees trained in grant-making had to add an entirely new skill set and incorporate new activities into their routines, such as participating in investment committees and serving on boards of directors. For hybrid investors that had already incorporated hybrid practices in their activities, practice integration was more transversal and resonated with established hybrid routines.

Anchoring: Despite efforts to contain impact bond investing within specific organizational units, identity tensions appeared in finance-first organizations. Practice engagement could not be enacted in isolation from the rest of the organization, as it still needed to follow existing and procedures (such as compliance and legal processes) that were predominantly rooted in market logic.

‘We had to knock on quite a few doors. I often joke that the CEO was actually convinced pretty quickly. But we had to explain everything to the risk management team because they said, ‘I know how to assess the risk of someone not repaying based on cash flow, but I have no idea how to assess the risk of not being repaid based on impact generation.’ The legal department needed convincing too. And we nearly got blocked by IT, simply because, from their perspective, the project didn’t fit into any of their existing boxes’ (FF4)

To overcome these sources of resistance, finance-first organizations engaged in practice diffusion, a translation mechanism to reconcile the hybrid demands of impact bond investing with an internal organizational identity rooted in market logic. They relied on strong internal communication efforts to increase organizational knowledge and share the learnings from the practice across their organization, encouraging members to see how impact bonds investing could fit into market-led procedures. Internal practice champions played a key role in bridging

gaps between the new practice and existing routines. This translation work helped prevent resistance and pushback among members, while motivating them to go beyond established procedures to meet the demands of the new practice.

‘Since it’s something innovative that generates impact and resonates with people, we really benefited from a lot of goodwill from people who were willing to say, ‘This isn’t part of my remit at all, but I’ll look into it to try to find you some solutions’. Or, ‘This isn’t something that can be automated at all, but I’ll try to do it manually.’ (FF4)

In cases where this translation effort was supported by identity work through narrative, it progressively led to situations where practice diffusion led to infusing into the main organizational identity. Impact bond investing moved from a bounded experiment to a practice that infused organizational routines, reshaping both procedures and organization members’ self-understandings. One respondent from a finance-first organization described a clear example of identity work through narrative construction that allowed the reshaping of entire organizational identity despite an originally strong market-oriented orientation. Impact bonds investing was incorporated into a new narrative for the organization, positioning impact investing as central to its identity and meaningful to multiple audiences: customers were told that their premiums could ‘do more’ at no additional cost, the recruitment process emphasized the appeal of working for an institutional investor with a social purpose, and the organization approached its own investors by presenting itself as an early mover in institutional impact investing. The organization managed to craft a coherent story that framed impact investing and investment in impact bonds as a new marker of organizational distinctiveness.

For hybrid organizations, practice anchoring was more straightforward because impact bonds already resonated with the organization’s collective sense of self. This alignment was reinforced by leadership’s role in aligning organizational identity with the new practice. By signaling consistency between organizational identity claims both internally and externally, leaders

helped position the practice as a natural extension of the organization's mission and values. In this way, the practice was framed as a reflection of the organization's core purpose and identity.

'The brand has been quite strongly linked with social responsibility, social impact and social entrepreneurship. It's because the tone from the top is so clear. If you look at our founder, our owner, he is extremely vocal in support of these things. He has a lot of followers on social media and he talks about social issues a lot and we walk the talk' (H11)

Mirroring relationship: Organizational identity guided how investors enacted impact bond investing, shaping their investment criteria, field roles and internal integration of the practice. In turn, embedding the practice reflected back on identity, testing its coherence with existing routines and narratives and triggering organizational identity work to ensure alignment with pre-existing or aspirational identity.

Phase 3: Reflecting on practice-identity alignment

Rationalizing: at this stage, organizations had acquired tangible knowledge of impact bond investing through their participation in one or several deals. Reflection converged into three evaluative dimensions: the financial and impact outcomes of the investments, the organizational benefits and constraints that emerged from engagement in the practice, and the fit between the role performed in the practice and organizational identity. The three categories of investors interpreted these dimensions differently:

Impact-first investors centered their reflection on whether impact bonds delivered better impact outcomes than traditional grantmaking. They assessed the practice by examining whether the market logic supported or risked undermining their social mission and. This reflection was also balanced against the significant effort made by organizational members who had to take on impact bond activities themselves due to the practice's informal embedding within the organization. A respondent from an impact-first organization described 'coming out of it very

exhausted' (IF3) Hybrid investors focused less on the individual outcomes of financed interventions and instead assessed impact bonds in relation to other hybrid practices already established within their organizations. They made sense of impact bond investing by situating it within their broader hybrid activities and assessing its added value. One respondent noted 'In impact bonds, impact management becomes a lot more important because the compensation is linked to impact. The evaluation was much more robust than what you can see in other impact investments' (H9). On the opposite, one respondent reflected:

'Being results-based is important, aligning incentives is important. But actually, impact bonds are not necessarily the only mechanism to do that, and now that it's over and I see what happened, I don't think they are necessarily the most suitable mechanism' (H6)

Finance-first investors generally engaged in several deals at the same time and tended to reflect on their engagement with impact bonds investing on a portfolio level, meaning that 'even if some projects lose money, some projects will do really well and make surplus' (FF2). However, despite anticipating below-market returns, some investors found the financial outcomes even less favorable than expected. High transaction costs, the length and complexity of the process, the impossibility to assess the level of risk of the interventions or the IRR that was not in adequacy with their own investors' expectations recurred as motives for disengagement. For example, a respondent from a finance-first investor admitted that after four different impact bonds investments, the organization decided to disengage from the practice because 'it is really hard to make money out of impact bonds investing' (FF3).

Confronting: in light of the rationalization of the practice, organizations questioned their identity trajectory through their lived experience of impact bonds investing. Among impact-first investors, reflection on impact bonds revealed identity tensions for some organizations. These tensions arose from the perceived unbalance between social and market logics in the outcomes of their investment. Some of the features of impact bonds investing such as the quantification of impact through KPIs or the overreduction of impact to measurable

proxies were interpreted as distorting impact generation and experienced as identity threatening elements that could not be reconciled with their organizational self-understanding nor were not in accordance with their projection of impact stewards in the practice. One respondent, for instance, mentioned the perceived danger of compromising their charitable status, while another stated that ‘As a foundation, from a regulatory standpoint we have to demonstrate this intentionality around impact’ (IF3). Another respondent questioned the capacity of a KPI-driven approach to adequately capture the real, qualitative effects of social interventions. A third respondent took the example of one impact bonds investment to explain how the heavy reliance on numerical thresholds to trigger payments created perverse incentives for service providers: instead of focusing on the most vulnerable beneficiaries the programs were designed to support, they prioritized those closer to meeting the targets to maximize payment likelihood. That led to impact bonds that were successful in terms of financial performance, but that were compromising the depth and quality of the intended impact. In those cases, impact bonds triggered identity boundary work that reaffirmed the primacy of their categorical identity claims and the primacy of the social logic and the limits of hybridity for these actors.

‘We were repaid with interest, even generously in some cases. But was it really worth all the effort it required? I’m not sure. And actually, even when we did get repaid, there was a bit of a bitter taste, because some of the social outcomes were just dismissed. And we weren’t in it for the financial return’ (IF3)

By contrast, other impact-first organizations read the financial logic less as a threat to their categorical identity claim. They reinterpreted elements from market-logic as means of reinforcing a results-based mindset and enhancing social outcomes. In this framing, market logic was not destabilizing their impact-first identity and was effectively reframed as enabling mission delivery in practice.

For hybrid investors, impact bonds resonated with their organizational understanding of hybridity and were unanimously perceived by respondents as coherent with their pre-existing

identity narrative and consistent with their desire for identity continuity. However, the way they projected their role within the practice was often questioned: for example, respondents from hybrid investors admitted to ambiguity about how to enact their role as capacity-builders on the ground. One recalled: ‘At the beginning, we hesitated about whether we should act as structurers’ (H10) Another echoed this uncertainty after their involvement in impact bonds, asking: ‘Are we investors? Are we structurers?’ (H2) These reflections points to a broader questioning of whether those hybrid investors should position themselves within the impact bond ecosystem in relation to the capacity-building role they were projecting in it.

From an identity perspective, engaging in impact bond investing reshaped how external stakeholders perceived finance-first investors. Their positioning within the impact bond ecosystem as field builders further reinforced this change of perception: by being seen as actively contributing to the development of the practice, they acquired legitimacy within a hybrid practice and were recognized as knowledgeable actors, which granted them a privileged position within the impact bonds field.

Mirroring relationship: Identity served as a lens for evaluating the coherence and organizational value of impact bond investing, while the lived experience of the practice generated organizational identity work in the form of reaffirming core understandings, questioning role adequacy within the practice, or projecting possible extensions of organizational identity through involvement in the practice.

Phase 4: Reconfiguring identity through practice

The reflection phase led to a fourth step in which organizations adjusted their engagement in the practice (*adjusting*) and, in some cases, adapted their organizational identity (*transforming*).

Adjusting engagement with practice: The outcome of the reflection process led to four different strategic responses to the practice:

Practice rejection: Practice rejection occurs when the practice is judged inadequate with the pre-existing categorical identity. In our study, two distinct forms of rejection emerged: On one side, several impact-first investors who withdrew from impact bond investing perceived the dominance of market logic as excessive and threatening to the primacy of their social mission as an impact-first organization. In both cases, rejection reflected a perceived imbalance between logics that investors found incompatible with their pre-existing organizational identity.

Practice redirection: hybrid investors that were already familiar with other hybrid investment practices chose to redirect their efforts toward alternative practices they perceived as better suited to achieving social goal through the integration of a business logic. They transferred the learnings acquired through impact bonds such as the reliance on a results-based logic and the focus on outcomes instead of outputs to other hybrid practices that they considered more efficient for the accomplishment of their dual mission.

Symbolic practice institutionalization: Some finance-first investors reengaged in impact bond investing without substantive changes in their organizational structures or routines. The practice was predominantly embedded into market-led structures and procedures. This symbolic adaptation allowed them to maintain legitimacy and signal alignment with impact bonds investing, without altering their core market orientation. Although their core identity remained market-driven, their participation in the practice led them to be perceived by external stakeholders as socially-oriented. Engagement in the practice also allowed to change internal perceptions of organization members' without necessarily having to change their internal structural identity. The organizational structure remained rooted in market logics, but the anchoring of the new identity played out in practice and the narrative developed within the organization changed how employees were perceiving their organization. Members from finance-first organizations described impact bonds investing as a practice that 'changed the

conversation' (FF2) and 'shifted mentalities' (FF4) toward more impact integration within the organization without fundamentally altering the structures of the organizations.

Substantive practice institutionalization: Hybrid investors that decided to institutionalize impact bonds investing integrated it in their set of hybrid practices. For both impact-first and finance-first investors that decided to substantially institutionalize impact bond investing, the practice progressively infused the organization and reshaped its organizational structures. Among impact-first investors, this took the form of a diffusion of result-based and outcome-oriented culture, along with a stronger focus on evaluation across activities and the creation of investment teams dedicated to market-based approaches. Among finance-first investors, it involved the integration of impact considerations into other investment practices and the creation of dedicated impact functions within the organization. In both cases, impact bond investing triggered what was perceived by organizational members as a positive contagion: engagement in a hybrid practice allowed to spread hybrid logics throughout the organization.

Transforming organizational identity narrative: Beyond differences in engagement, the various strategic responses to impact bond investing also shaped how organizations made sense of their organizational alignment with the hybrid nature of the practice. These responses carried distinct implications for organizational identity:

Reinforcement of identity continuity: For hybrid investors that chose to stay engaged in the practice, impact bonds investing was interpreted as consistent with their pre-existing hybrid identity. Engagement in the practice acted as an identity-affirming mechanism, reinforcing alignment between internal self-understanding and external expectations. Reinvestment was also described as necessary to preserve legitimacy, as withdrawing would have created a gap between their claims to hybridity and their actions. In these cases, organizations sustained a coherent hybrid identity narrative and institutionalized the practice.

‘I would say there's no additional benefit from impact bonds for us, but it would look very stupid if we were not clued up on impact bonds given the rest of our focus’ (H11)

Reinforcement of identity transformation: For some impact-first and finance-first organizations, engagement in impact bonds investing facilitated a successful incorporation of a new hybrid identity narrative. Initially, investing in impact bonds allowed these organizations to experiment with an alternative identity, one distinct from their dominant orientation. Over time, the experience produced a positive contagion effect, and the aspirational identity became progressively integrated into their sense of who they were, transforming a provisional identity into a more stable hybrid identity. In such cases, impact bond investing acted as a catalyst for identity hybridization, resulting in the substantive embedding of hybrid logics into organizational structures and routines.

Symbolic identity transformation: In some finance-first organizations, engagement in impact bonds primarily reinforced identity transformation at a symbolic and external level. Hybridity remained bounded to the specific demands of the practice: it reshaped how the organization was perceived by external stakeholders rather than substantively altering its internal practices or decision-making structures.

Resistance to identity transformation: for some impact-first and finance-first organizations, engagement with impact bonds led to the recognition of a misalignment between their foundational identity and the practice itself, echoing the idea of identity inertia (Nag et al., 2007). The comparison between their projected hybrid identity and their lived experience revealed fundamental incompatibilities and a willingness to come back to a pre-existing identity claim. In these cases, pre-existing identity constrained change, resulting in the rejection of the practice and a reaffirmation of the organization's non-hybrid identity. As one respondent noted:

‘Impact Bonds made us realize that, in general, impact investing was not necessarily for us as a foundation, because we did not have the adequate risk appetite for what it entails. We just completely stopped impact investing after that’ (IF3)

The outcome of identity reflection shaped how organizations reconfigured their resources. In cases of rejection, financial and human resources dedicated to IBs were withdrawn and reallocated to activities that better aligned with the organization’s enduring identity. On the opposite, organizations pursuing institutionalization, whether symbolic or substantive committed additional resources, including increased financial allocations and the recruitment of new staff. Some organizations adopted adaptive strategies to reconcile identity–practice tensions without full disengagement. They maintained their presence in the practice but moved from investing in individual impact bonds deals to indirect involvement (investing through impact bond funds managed by intermediaries) or by shifting from investor to other roles in the practice.

Mirroring process: The decision to stay engaged or to withdraw echoed a deep questioning of the compatibility between the new identity claims enabled by the practice, the enactment and the confrontation with organizational identity claims. While certain organizations manage to draft a coherent identity narrative that allowed the practice to be integrated, other perceived the practice as incompatible, and returned to their previous identity claims.

Table 3.4 Outcomes of the reflection process

Decision on practice	Identity reflection	Definition	Implication on hybrid identity
<i>Rejection</i>	<i>Resistance to identity transformation</i>	Practice viewed as incompatible with foundational non-hybrid organizational identity leading to disengagement	<i>No identity hybridization</i>
<i>Institutionalization (symbolic)</i>	<i>Symbolic identity transformation</i>	Practice integrated into the identity narrative but without structural change. Practice is molded into non-hybrid structure. Transformation remains largely symbolic	<i>Symbolic identity hybridization</i>

<i>Institutionalization (substantive)</i>	<i>Reinforcement of identity continuity</i>	Practice strongly aligned with organization foundational hybrid identity and organizational structure	<i>Reinforced hybrid identity</i>
	<i>Reinforcement of identity transformation</i>	Practice strongly embedded into new hybrid identity narrative and organizational structure	<i>Substantive identity hybridization</i>

Recursive Loops in the Identity–Practice Process

Our findings also suggest that the identity–practice process is not linear. We conceptualize *recursive loops* as moments when the identity–practice process returns to an earlier stage, interrupting or redirecting the trajectory of practice integration. First, there is a constant back and forth between practice engagement and identity work in each of the main phases of the identity-practice process. On top of that, we identified three main loops that recursive loops that capture distinct dynamics of engagement, adjustment, and identity (re)claiming.

Loop 1: pre-enactment rejection: The first loop occurs before the practice is even enacted, when a mismatch is perceived between the organization’s claimed identity and the practice: the practice is interpreted as inconsistent with the organizational identity and rejected early in the process. This dynamic was observed by the research team during their involvement in the contracting of environmental impact bonds in France. During the fundraising phase, several investors refused to participate in impact bonds investing as a practice. This was confirmed by one of our interviewees, who mentioned investors refusing to engage in impact bond investments, citing investors whose understanding of impact creation did not align with that implied in the impact bond model. This early-stage rejection highlights the importance of intended identity work when introducing hybrid practices, particularly in organizations whose pre-existing identity is rooted in a single institutional logic. Without deliberate efforts to

reconcile the meaning of the new practice with the organization's sense of self, the hybrid practice is likely to be dismissed before it can be enacted or experimented with.

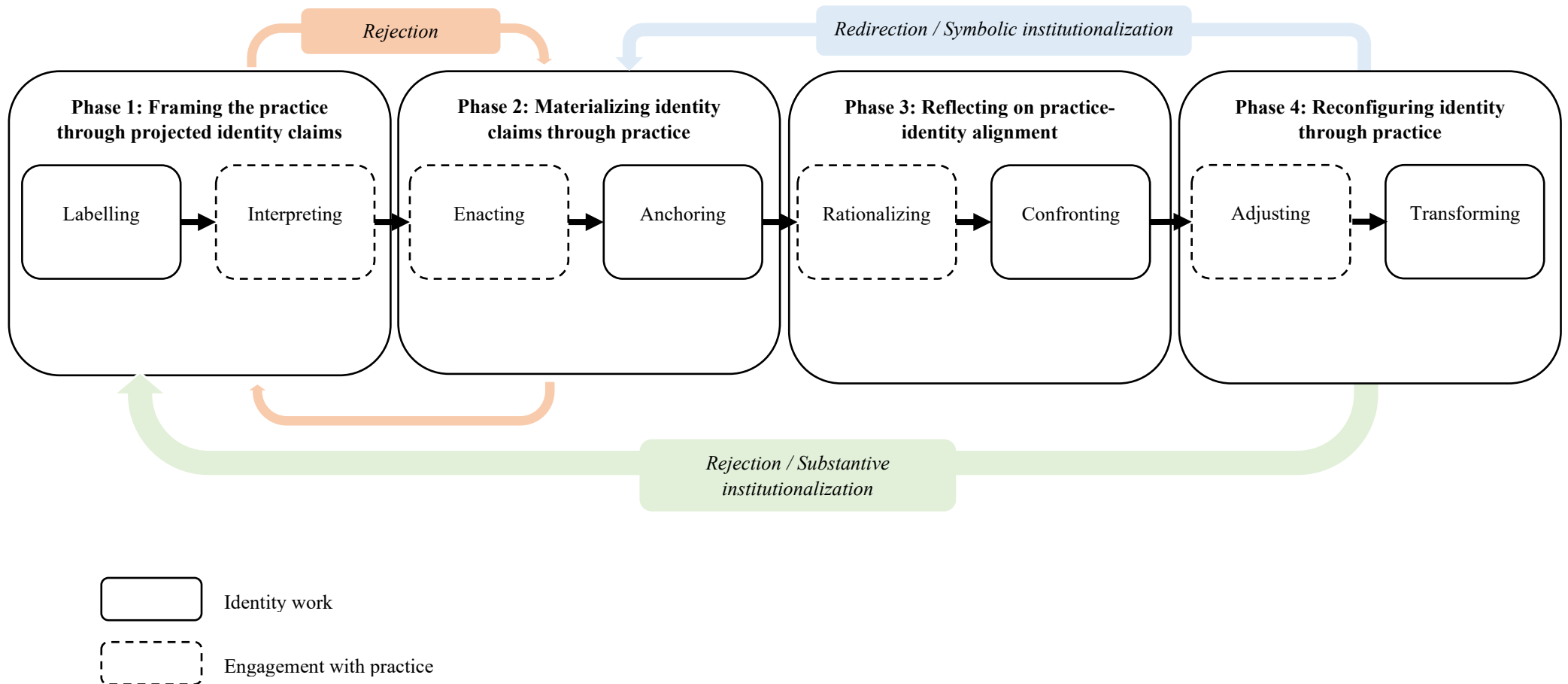
Loop 2 - no identity reclaiming: A second recursive loop emerges when engagement with the practice does not necessitate an explicit identity reclaiming. In our conceptualization, this occurs in two cases. First, in the case of *reinforcement of identity continuity*, the practice aligns strongly with the organization's pre-existing identity. Instead, adjustments can occur through the reenactment of the newly institutionalized practice, without altering the identity claims initially articulated by the organization. Adaptive strategies may include practice redirection, where another practice is favored over the one initially tested not due to identity misalignment, but as a result of strategic or contextual considerations. Such adaptations can also occur when organizations remain engaged in the practice but shift their role within it, adjusting their level or mode of participation while maintaining involvement.

Another variation of this process involves *symbolic identity transformation*. In such cases, although engagement in the practice generates a symbolic shift in how the organization's identity is perceived both internally and externally, it does not result in a fundamental redefinition of the organization's core identity claims. This occurs when the practice remains structurally contained within a specific unit, functioning as a peripheral practice rather than transforming the organization as a whole. The hybrid practice thus introduces localized experimentation and symbolic change, but its effects on organizational identity do not cascade across the broader structure or organizational identity.

Loop 3 - identity reclaiming: A third recursive loop occurs when engagement with the practice triggers identity questioning and organizational identity reclaiming. In our process, this happens in two cases. First, it occurs in the case of practice rejection, when the experience of enactment reveals a perceived incompatibility between the practice and the organization's foundational identity leading to a form of *resistance to identity transformation* through the

practice. Therefore, an identity rooted in one logic is de facto reclaimed through the abandonment of the practice. It also appears in cases where engagement in the practice leads to the *reinforcement of identity transformation*. In such cases, the organization shifts from its initial pre-engagement claims to reclaim an identity that has been infused by engagement in the practice. The reclaimed identity is different from the pre-existing identity claim, and repositions the organization within a new identity.

Figure 3.4 Identity-practice process



3.5. DISCUSSION

Building on existing research that conceptualizes organizational identity formation as a process, we advance the literature by showing that organizational identity can be shaped through active engagement in practice. A hybrid practice can contribute to that process in several ways. First, it can serve as a stabilizing element within the organization's identity reservoir, leading to the *reinforcement of identity continuity*. Second, engagement with a hybrid practice can also have a transformative influence on organizational identity. Transformation occurs when the practice does not remain confined to a single unit or function, but spreads beyond its initial boundaries and becomes embedded in the organization's broader narrative and routines. This contagion turns localized experimentation into collective identity change. Our findings also distinguish between symbolic and substantive forms of identity transformation. *Symbolic transformation* reflects an internal localized containment of the hybrid practice which alters how the organization's identity is *perceived* without substantially diffusing into its broader structures or routines. *Substantive transformation*, on the other hand, denotes a deeper shift in which the practice infuses organizational routines, structures, and narratives, generating a redefinition of organizational identity claims.

Finally, our findings also reveal a reciprocal relationship where organizational identity can shape the integration of a practice. When a strong pre-existing collective identity is present, identity continuity can hinder integration if the practice is perceived as misaligned with the established identity, leading to practice rejection induced by a *resistance to identity transformation*. Consequently, practice integration requires organizations to continuously assess and manage the alignment between their predefined or aspired identity and the practices they adopt. This echoes Jones et al. (2025), who demonstrate that identity configurations strongly influence the organization's willingness to adopt a hybrid practice. Their work shows that identity serves as a filter through which organizations interpret the desirability of hybrid

practices, determining whether hybridity is embraced or resisted. Building on this insight, our study advances understanding by examining the reverse dynamic: how engagement with a hybrid practice, once adopted, can reshape organizational identity over time.

Mechanisms of practice-identity alignment

Throughout our process, we identified several mechanisms that organizations used to align organizational identity and practice:

Practice translation refers to the mechanism through which an organization interprets a novel hybrid practice through their own categorical identity claims. By filtering practice sensemaking through their organizational identity, they define what the practice means to them and how it can be enacted within their identity frame. Through this process, actors interpret the hybridity of the practice by deciding whether it aligns with or extends their pre-existing organizational identity. In our sample, this mechanism characterized the first phase of engagement with impact bond investing, as organizations made sense of the practice in relation to who they were: hybrid investors interpreted it as a natural extension of their dual mission, while impact-first and finance-first investors saw it as a space to experiment with new identity claims.

Practice infusion refers to the mechanism through which a structurally contained practice progressively infuses the organization. In its early stages, this mechanism occurs as the practice is translated into existing organizational routines and adapted to fit internal processes, creating symbolic identity transformation. In more advanced stages, the practice reshapes organizational narratives and contributes to structural change, signaling a shift from practice adaptation to a substantive identity transformation. In our sample, finance-first investors used practice infusion in the embedding phase to gradually diffuse social logics within their structures and processes. While some organizations engaged in limited forms of infusion by translating the practice into existing routines without fundamentally altering core structures,

others displayed greater organizational permeability, allowing the hybrid practice to diffuse and reshape narratives, routines and ultimately leading to a substantive transformation of organizational identity.

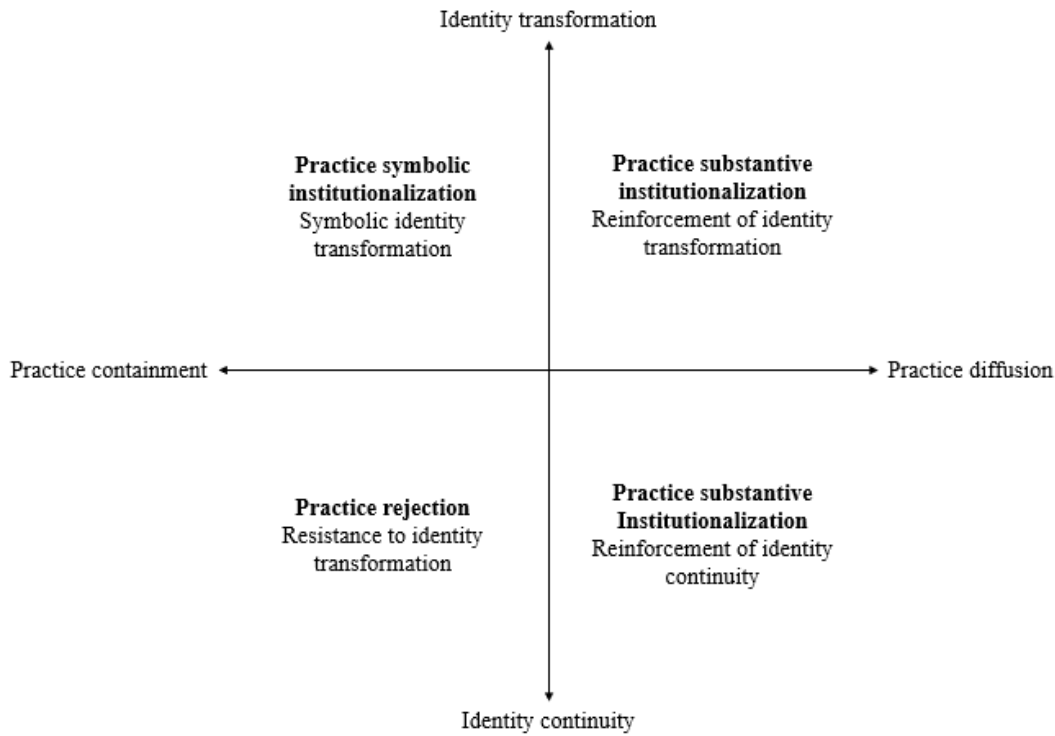
Practice accommodation refers to the mechanism through which organizations reinterpret the outcomes of a hybrid practice by emphasizing elements that do not threaten their existing identity while incorporating those that can constructively expand it. This process allows organizations to engage with hybridity without destabilizing pre-existing identity coherence. Rather than replacing prior identity claims, new elements are added into the identity reservoir, allowing the organization to extend and enrich its identity while maintaining a sense of continuity. In our sample, impact-first organizations used practice accommodation in the reflection phase to selectively emphasize aspects of the practice that reinforced their impact orientation while incorporating market-driven elements as tools to enhance effectiveness, without being constrained by their categorical identity claims. This selective incorporation expanded their identity claims to include a stronger emphasis on accountability and results, while preserving their core impact-first identity. Practice accommodation prevents hybrid practice rejection by reframing potentially conflicting elements as complementary to their existing identity.

Conceptualizing the identity-practice compass:

Building on these findings, we develop the identity–practice compass as a concept for understanding how organizations navigate the reciprocal shaping of identity and practice. The compass captures how organizational identity serves as a reference point for guiding practice integration, while engagement in practice can either reaffirm existing identity trajectories or reorient them over time. The model conceptualizes two intersecting dimensions. The horizontal axis represents the degree to which organizational identity becomes infused by the practice,

ranging from practice containment to practice contagion. The vertical axis captures the identity trajectory, ranging from identity continuity to identity transformation (see Figure 3.5).

Figure 3.5 The identity-practice compass



3.6. CONCLUSION

This study unfolds the mirroring process between engagement with a hybrid practice and organizational identity trajectories, showing how identity and practice mutually interact. Through a processual approach, we were able to identify four iterative phases where organizations continuously oscillate between identity work and practice engagement. In the case of impact bond investors, organizational identity claims and their projection onto the practice influenced how each organization interpreted and enacted the practice, while the lived experience of the practice reflected back on those claims. The outcome of this reflection process may reaffirm existing identities or change organizational identity trajectories. In that sense, engagement with hybrid practices can lead either to inertia, or triggers a first step of hybridization through identity, without necessarily needing to structurally hybridize the

organization. This conceptualization also shows how practice can act as sites of organizational identity work to experiment with provisional identities. We also uncover a mechanism of practice-identity alignment, conceptualized under the practice-identity compass, a framework for understanding how organizations navigate the reciprocal shaping of identity and practice, and highlighting that organizational identity provides a reference point for practice integration, while practices in turn can infuse organizational identity

Appendices:

Appendix 1. Description of interviewees

Type of organization	IB investments	Investment geography	Interviewees
Private foundation	1	Colombia	Lead Program Manager
Private foundation	1	Cambodia	Senior Portfolio Manager
Non-profit	1	Cameroon	CEO Associate Director, Global Health Innovation
Private foundation	1	Colombia	President and CEO
Private foundation	2	Canada	Impact Investment Manager
Public foundation	2	United States of America	Senior Director of Philanthropic Investments
Private foundation	3	United Kingdom, United States of America	Program Manager
Private foundation	3	India	Program Manager
Public foundation	7	Finland	Project Lead
Private foundation	7	The Netherlands	Managing Director / Founder
Corporate foundation	1	Austria	Social Impact Investment Lead
Impact fund	1	United States of America	Impact Management Director
Corporate foundation	1	Germany	Program Manager
Corporate foundation	5	Belgium, France	Senior Program Manager
Corporate foundation	4	India, Israel	Program Director
Impact fund	7	France	Managing Director
Cooperative bank	5	Finland	Managing Director
Impact fund	9	France	Co-founder 1 Co-founder 2
International Financial Institution	15+	France, Finland, Portugal, Belgium, The Netherlands	Head of Social Impact Investments
Social enterprise	15+	United Kingdom	Co-founder
Impact fund	15+	United Kingdom	Head of Investments
Impact fund	15+	United Kingdom	Investment Director
Social enterprise	15+	India	CEO
Bank	4	The Netherlands	Impact Bonds Team Lead
Insurance company	15+	Australia, United States of America	Portfolio Manager
Corporation	5+	Norway, Jordan	Investment Chief, Social Investments
Bank	15+	France, United States of America, Ethiopia	Head of Social Business and Microfinance Head of impact bonds structuration
Advisory firm	/	/	CEO / Managing Partner

Appendix 2. Supporting data for second order themes on practice engagement

Phase	Theme	Illustrative quote
Interpreting	Categorizing the practice	<ul style="list-style-type: none"> • ‘We didn’t see it [impact bonds investing] as a donation because there was a possible return on investment, but we clearly categorized it as impact first, we’re not doing it for the financial return. • What’s certain is that within the foundation, there’s a very strong culture of innovation. So we were very much in that ‘let’s test a new tool’ mindset. We were following the news, we saw that this was something emerging, especially in the UK, and we thought ‘well, here’s something new and innovative, let’s give it a try’. So it was really from that perspective, about trying something innovative. The goal wasn’t to make money.’ (IF9) • ‘Well, our first goal is...we are impact first, so making a profit isn’t... Well, we want to make a profit in the sense that we want to demonstrate a model and we want to demonstrate financial viability. We wanted to show that we could also reimburse our transaction costs with the income from the project. Once we’ve done that, we don’t have a huge interest in keeping those revenues’ (H6) • ‘As an institutional investor, certainly the return was something that was important... it’s certainly not a concessional approach’ (FF2)
	Ascribing meaning to the practice	<ul style="list-style-type: none"> • ‘The idea was to look for new financing mechanisms that reward outcomes. It was a way for foundations to truly become results-oriented, and also, for NGOs, the implementers, to learn and develop a stronger results-driven culture than they might have had before’ (IF3) • ‘We wanted this [first impact bond investment] to be a business case’ (H13) • ‘There was an interest in scale and the future market. We were interested to be an institutional investor at the table in the development of these particular transactions. So that was an important part of the overall goal, which is to be able to help to shape the market. So that it might be more ‘institutional appropriate’ and that other investors would follow’ (FF2)
Enacting	Performing an established role in the practice	<ul style="list-style-type: none"> • The ‘low IRR’ was clearly stated from the start, so there were no negotiations about it during our fundraising. What appealed to some investors was the strong focus on impact, particularly the inclusion of envelope for evaluation within the impact bonds. What also attracted was [the founders] deep

knowledge of the nonprofit sector and of impact bonds. They are particularly attentive to the risks of investors making decisions within NGOs (IF2)

- So the first thing is, is it in one of our kind of target impact areas? You know, do we do we think it's a project that's going to improve the lives of longer individuals. And then the second one is, do we think that contracting on outcomes rather than the usual method of inputs is going to deliver dramatically better performance in terms of both quality and productivity. So, you have to go and look at how that type of service has been contracted in the past by government and so if you can see the problems with it and if the problems are plausibly caused by the way it's contracted, that gives you some confidence that if you're being contracted a different way, you might be able to fix those problems (H3)
- As an institutional investor, our approach was more towards evidence-based programs. Some of the SIBs that we would see in early propositions were, you know, great programs, great concepts but too early stage. We took the view that some of those early-stage impact bonds were more suitable for catalytic philanthropy to be able to put pilot programs rather than necessarily at the institutional level. We were also looking at the size of the deal, did the size of the deal make sense for the amount of work that would necessarily go into it? And we were agnostic for the impact area. Not agnostic to impact, but agnostic to like, we had an interest in a broad range of impact areas' (FF2)
- 'It's a case of us actually sitting down designing some impact bonds with some social entrepreneurs. Us approaching some of the companies we work with and asking them, have you thought about making this an impact bond and how can we do that? How can we help you as a hands-on investor?' (H11)
- 'We had someone on the team, out of a team of four, who was spending almost 100% of their time on social impact bonds. So, you see, it's a long-term effort, but basically, they were trying to source as many social impact bonds as possible and bring them back to us, even if they were still very underdeveloped, and spend time providing input on them' (H2)
- 'Apart from our investments, we also try to contribute to the development of learning and design of outcomes-based finance. For example, we fund a public-private initiative to accelerate outcomes-based financing approaches in the world' (H8)
- We worked on mechanisms that would avoid excessively high returns, while still offering some protection to investors on certain points (FF4)
- I see the role of the organization as advancing knowledge on the topic of impact bonds, and to bring in other public, private, and nonprofit funders, playing a kind of market builder or catalyst role There's also this idea that we're trying to attract others. Maybe if we show that we're interested and that we're

getting involved, it might encourage others to join us in this approach that's very targeted and dedicated to impact' (FF4)

Integrating the practice internally

- 'During implementation, it was a lot of work, especially for the NGO carrying it out, but also for those of us following the project, like me. For me, dedicating two days a month to a single project is huge, because I manage a portfolio of, let's say, 15 to 20 projects, plus other topics and issues to deal with. So it was really time-consuming' (IF3)
 - 'We're all very impact focused and all of us have been involved with impact bonds. We typically have one person responsible for each of our engagements, so there'll be a number one and there will be a backup in the team on all our projects, whether it's an equity investment or a social outcome contract. And we follow them in the same way as we follow any other investment' (H11)
 - 'A bank is pretty standard. It likes standard processes, it likes standard products, because behind every product, there's a process... We went through the organization's processes. Every time you develop a new product, we have a new products committee. So it went through the new products committee. We tried to do things to really fit in with the necessary steps' (FF4)
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Making sense of investment outcomes

- 'The evaluation of the first social impact bonds using cost-benefit analysis showed that outcomes-based financing is more cost-efficient than traditional grant-making approaches' (IF2).
 - 'From the moment we rely solely on numerical KPIs, because that's what impact bonds are ultimately based on, indicators with thresholds: how many people have exited welfare, in how many months, how many people are no longer registered as unemployed, how many no longer receive unemployment benefits? So of course, we need elements that allow us to quantify results, but the real question is: what is the actual impact on the person behind those numbers? And that's something you don't capture in an Impact Bond' (IF8)
 - 'In fact, these homelessness charities were doing excellent work, but not always recognized or rewarded for it. For example, a student who was still skipping school, attending only one day out of five and who suddenly becomes motivated, gets support, starts making an effort, and begins attending three days out of five, that's actually a huge improvement, going from one to three days a week. Yet that progress wasn't recognized at all, because the outcome measure was binary: payments were only triggered once attendance reached four days a week. So that created a kind of perverse incentive, where the [implementer] team was encouraged to focus on students who were already attending three days a week to push them to the four-day threshold that triggered a payment. It meant they were incentivized to
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		<p>concentrate on those ‘almost-there’ students, instead of the ones who were truly disengaged from school, the very students these programs were supposed to help in the first place, those most vulnerable and left behind by the system.’ (IF3)</p>
	Assessing organizational alignment with practice	<ul style="list-style-type: none"> • ‘We’re continuing with Impact Bonds because, since our focus is on employment, there really aren’t that many investment opportunities that fit within our scope. They align well with our focus. Since this approach fits with the Foundation’s mission, we’ll probably keep going in that direction, and it does remain a relatively innovative tool in the sector’ (IF8) • ‘It’s about the capacity we have, with relatively small teams, and the time spent on structuring. And that’s not really part of our core role, you know? We’re investors, not impact bonds structurers. The structuring of impact bonds, at some point, we had to stop working that way. It wasn’t necessarily an easy decision, but it was preventing us from maintaining a steady pace in the rest of our social impact activities, in our other social impact investments’ (H2) • ‘IBs are a very interesting product for more risk tolerant institutions’ (H9)
Adjusting	Institutionalizing the practice	<ul style="list-style-type: none"> • Even if I still believe that our added value is greater when we stay true to our role as an impact wholesaler, since we started reflecting internally on our approach and where our real added value lies, we’ve never formally rejected a single Impact Bond, not one. (H2) • When we went to talk to the private banking teams, it was the same thing: it’s not a product they would easily offer to their wealthy clients, because it’s quite complex to understand. But I’ve already noticed some changes. Nowadays, when a client mentions impact or shows interest in these topics, everyone calls me: “We have a client who’s interested in impact — real impact’. So they ask me, ‘Can you talk to them? Can you present your product?’ And I can really see that mindsets are evolving. there’s a growing effort to make the product better distributed, better known, and better understood’ (FF4) • ‘The program itself has grown from 2014-15, from a pilot across the business to basically being, you know, 1 billion by 2021, and 2 billion by 2025, by which time it’s 5 to 8% of the portfolio, which is quite sort of a significant commitment (FF2)
	Rejecting the practice	<ul style="list-style-type: none"> • ‘What’s more efficient for us, in terms of how we use our time as a team and our resources as a foundation, is to provide grants, even if those grants are used by NGOs as working capital while they wait to secure larger contracts with international agencies or development agencies. But basically, to be able to make decisions and move forward, we ended up stopping. We actually stopped all impact investing’ (IF3)

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- Typically, we're much more interested in exploring how to do results-based financing through different kinds of mechanisms, outside of impact bonds (H6)
 - 'We made the strategic decision to stop investing in impact bonds because it is really hard to make money out of them (FF3)
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Appendix 3. Supporting data for second order themes on organizational identity

Phase	Theme	Illustrative quote
Labelling	Characterizing the organization	<ul style="list-style-type: none"> • ‘We have a very long tradition, we were founded 200 years ago and we started in the community. Our roots are inside the community and our roots started from the impact value proposition and not from the risk and return profile’ (IF5) • ‘To provide some context, we are a UK-based family foundation, and so this obviously has a strong influence on both the organizational dynamics and the type of investments we pursue. Our board’s expertise is also very entrepreneurial. They come from the private sector. [...] The niche that’s been identified is to focus on market-based approaches’ (H6) • ‘We are set up to invest for impact with profit and the profit element for us is not important, but it’s important that we follow business logic and that there is a commercial drive or business plan behind the entrepreneurs we invest in. (H11) • ‘The other foundations, they don’t have this financial DNA that we have. We’re always thinking it has to be socially profitable but it also has to be financially profitable because it has to live and go on. The other foundations, they think that impact investment is impact first, it’s giving out money. It’s a very ‘philanthropist’ point of view’ (H13) • We are a cross-functional entity within the group, whose purpose is to support impact-driven entrepreneurs, to promote all notions of impact and social inclusion and their diffusion throughout the group, and to help all the group’s business lines gain a better understanding of what impact really means (FF4)

Articulating an identity goal	<ul style="list-style-type: none">• Of course, no one wanted to invest [in a project to train marginalized women to become care assistants for disabled people] or you could, but only as a grant, and a grant isn't sustainable. So, we decided to package it as a social impact bond. We said: as a foundation, we'll take the first risk. We'll hire an NGO and give them a grant to identify 100 women and employ 30 of them in the care sector. That would cost around €300,000, but if it's successful, we want someone to pay for those results. So, we needed to transform ourselves from just a donor to becoming a patient investor' (IF5)• 'I think for us, at the beginning, and that's quite typical of foundations, it was of course interesting to be the first institution to implement something like this [impact bonds investing]. It's much less interesting to be the second or the third, not the innovator, but the follower' (H8)• Over the years, [the organization] has made a few strategic shifts, but impact investing and sustainable finance have always been a constant focus, something we've been exploring for about 12 or 13 years from different angles (H8)• 'The team has invested in social impact and social innovation for the last 15 years as a part of the group. We have very much been a driving force talking outcome approaches for very long time' (H11)	
Anchoring	Onboarding organizational members	<ul style="list-style-type: none">• 'The tone from the top is so clear. If you if you look at our founder, our owner, he is extremely vocal in support of these things. He has a lot of followers on social media and he talks about social issues a lot and we walk the talk' (H11)• 'We also communicated about it with our customers and employees. For customers, there was a clear value proposition: their insurance premiums could be doing more — creating positive impact — at no additional cost to them, simply through the way their money was invested. [...] There was also an employee value proposition. Employees put in a lot of effort to bring in premiums and do the right thing for customers, but this initiative added an extra layer of meaning to their work' (FF2)• 'We had to knock on quite a few doors. I often joke that the CEO was actually convinced pretty quickly. But we had to explain everything to the risk management team because they said, 'I know how to assess the risk of someone not repaying based on cash flow, but I have no idea how to assess the risk of not being repaid based on impact generation.' The legal department needed convincing too. And we nearly got blocked by IT, simply because, from their perspective, the project didn't fit into any of their existing boxes' (FF4)

	Building a new identity narrative	<ul style="list-style-type: none"> • ‘What was great is that since this was something innovative and impact-driven, something that really speaks to people, we benefited from a lot of goodwill within the group. There were people who said, ‘This isn’t really part of my job, but I’ll look into it and try to find a solution’ Or, ‘It’s not something we can automate, but I’ll try to do it manually’ I think if it had been something less meaningful, we never would have managed to make it happen. But the impact aspect really drew people in’ (FF4)
Confronting	Deriving identity benefits	<ul style="list-style-type: none"> • ‘Today, internally, it’s the only way we have to finance NGOs. Otherwise, we don’t do that, you know? So we can really see the value that this impact bonds can have’ ((H2) • ‘It actually changed the conversation. Because it was part of responsible investment, It actually led to a group sustainability function being created, an ESG risk team, and now there is 20 different sort of types of headcounts across a global business that are related to a focus on environment, there's now a head of social impact, so there's and there's a range of things where a focus on impact has actually supported and catalyzed a different conversation for the business’ (FF2) • Some NGOs that probably wouldn’t have chosen us as their bank in the first place actually started working with us through social impact bonds. We also had several associations that got to know us for the first time thanks to this mechanism (FF4)
	Resurfacing identity tensions	<ul style="list-style-type: none"> • ‘What happened, I think, is that in our learning process, there were a few elements we may have misjudged, or at least, these are the lessons we took away from the experience we wanted to have in this sector. First of all, in some cases, there was confusion about our role in an impact bond: are we investors, or are we structurers? (H2) • ‘Our added value in a social impact bond is smaller than what we bring by investing in a local fund. Those funds are on the ground, with the experience to structure and negotiate SIBs individually, and with much better knowledge of the market, the legal framework, and the monitoring. We’re not really equipped to do that ourselves. Our added value is greater when we stick to our role as a wholesaler’ (H2)
Transforming	Reinforcing pre-existing identity	<ul style="list-style-type: none"> • ‘Impact Bonds made us realize that, in general, impact investing was not necessarily for us as a foundation, because we did not have the adequate risk appetite for what it entails. I think our founders’ approach to risk was too conservative for impact investing to work at the foundation anyway. We completely stopped impact investing after our experience with impact bonds’ (IF3)

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Catalyzing identity transformation

- There's no additional benefit from impact bonds, the reason being we already get those benefits from 15 years of being the lighthouse in social impact investing. But it would look very stupid if we were not clued up on impact bonds given the rest of our focus' (H11)
 - 'From a talent perspective, both attraction and retention, it mattered that people could choose to work for an insurer where doing good was a core part of the business: not only underwriting risk, but also investing responsibly. And that's actually been confirmed over time through the interest shown in graduate recruitment programs and the attention this area has continued to receive. Finally, from an investor standpoint, it also resonated strongly with responsible investors. 'In general, there's a range of things where a focus on impact bonds has actually supported and catalyzed a different conversation for the business'
 - 'So, in a way, it's transformative, I also see it as a tool [impact bonds investing] that changes mindsets' (FF4)
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CHAPTER 4. INVESTIGATING INVESTORS' WILLINGNESS TO REINVEST IN IMPACT BONDS

Authors: Maya Tira¹⁵, Benjamin Le Pendeven¹⁶

Keywords: hybrid market, investor persistence, investor motivation, syndication, reinvestment

¹⁵ Lead author

¹⁶ Audencia Business School

4.1. INTRODUCTION

A central challenge for the development of the Impact Bonds (IB) market is the difficulty of attracting private capital. While IBs have attracted a wide variety of investors since the first SIB tackling recidivism among short-term prisoners in Peterborough (UK) in 2010, most investors participate only once. In other words, investor retention – the willingness of investors to reinvest after a first participation – remains strikingly low. This lack of repeat participation undermines the ability of IBs to scale, raising questions about the conditions under which investors are willing to return.

The literature on IBs has extensively discussed the barriers to the effective development of impact bonds explaining why IBs have not been able to attract significant private capital (Del Giudice and Migliavacca, 2019). Those barriers include a high level of complexity (Andersen, 2023), a high uncertainty due to the difficulty of performing risk estimation (Giacomantonio, 2017), high transaction costs (Fitzgerald et al., 2019; Burand, 2019), low returns for investors (Economy et al., 2022) and limited post-experiment diffusion of the SIB-funded programs (Buffa et al., 2023). Studies have also examined why different types of investors enter the market, highlighting the role of hybrid motivations, organizational identity, and legitimacy (Jackson, 2013; Tan et al., 2015; Scognamiglio et al., 2023). Yet, despite a growing body of work on investor entry in the market, we know little about what drives investors to remain in the market. This gap is crucial: without repeat investors, the nascent IB market risks remaining fragmented, dependent on a narrow set of actors, and unable to achieve institutionalization. This paper addresses this gap by investigating the drivers of reinvestment in Impact Bonds. We build a novel dataset of 285 investors across 235 IB transactions worldwide between 2010 and 2013, systematically coding both deal-level and investor-level information. We propose a new classification of investors that moves beyond traditional organizational typologies to focus on organizational motivation, positioning investors along a spectrum from *impact-first* to *finance-*

first. Using a Firth-penalized logistic regression and a multinomial model, we analyze the factors associated with investors' likelihood to reinvest. Our findings show that syndication emerges as a consistent driver of reinvestment in the IB market. Moreover, the composition of syndications also matters: investors participating in hybrid-dominated syndications, where both financial and impact logics coexist, are significantly more likely to reinvest. These results suggest that sustained participation in the IB market depends not only on individual investor attributes but also on the relational environments in which investments occur.

4.2. LITERATURE REVIEW AND HYPOTHESES

Conceptualizing investor persistence in the IB market

In the entrepreneurial finance literature, fund performance persistence refers to the phenomenon where past fund performance predicts future outcomes within the same General Partner (GP) (Kaplan & Schoar, 2005; Robinson & Sensoy, 2016; Harris et al., 2023). Yet, reliable performance data are often opaque and difficult to access. In more recent research, scholars have turned to *Limited Partner (LP) persistence*, an alternative that shifts the focus from performance to show whether investors reinvest within the same GP (Abreu Neto & Saito, 2024). LP persistence relies on the following assumption: LPs that invested in a previous fund are better informed than outsiders about a GP's underlying quality. Given that information asymmetry, they can more accurately assess the GP's skill. Therefore, their decision to reinvest, or to withdraw acts as a powerful signal to external LPs (Hochberg et al., 2014).

The Impact Bond market faces similar challenges regarding data scarcity and lack of standardization: each IB is tailor-made, and the multiplicity of financial arrangements and models makes performance comparability very hard to achieve. Moreover, the assumption about information asymmetry for impact bonds holds particularly true: as a nascent market, investors' decision to reinvest or disengage from the market can be seen as a signal toward other

potential investors. However, the underlying nature of asymmetry differs: reinvestment in IBs does not occur at the level of the same intervention, but means investing in other (and sometimes completely) different IBs deals. In this context, investor persistence cannot be interpreted as a signal of service provider skill, but rather as an indicator of investor confidence in the IB model and, more broadly, as a proxy for the institutionalization of this market. Therefore, we define *IB investor persistence* as the willingness to reinvest in subsequent impact bonds deals, as a critical indicator of market development.

Drivers of investments in the IB market

As a hybrid market, IBs attract a wide range of investors, from actors originating in the philanthropic sector (foundations, charities) to traditional financial market actors (institutional investors such as banks, insurance companies...). The literature on IBs has examined investors' heterogeneous motivations to participate in this market: for institutional investors, IBs provide a visibility motivation, as well as an avenue to invest in entrepreneurial solutions that they historically have not been able to support or that fall outside the scope of their typical portfolio. Philanthropic investors see impact bonds as an opportunity to make program-related investments enabling them to potentially 'recycle' and repurpose their grants, or to enhance their reputation (Gustafsson-Wright et al., 2015). Some of them are comfortable with the idea of not recovering their investment. Previous literature focusing on the marginal participation of institutional investors in the IB market concludes that institutional investors are more likely to invest in SIB that offer contractual arrangements lowering agency problems, such as the presence of a special purpose vehicle (SPV) or a limited number of financial stakeholders involved. Interestingly, better financial conditions such as a high Internal Rate of Return (IRR) or longer maturities do not seem to play a significant role in attracting those investors, who prefer less risky forms of investing and favor debt over equity (Del Giudice et al., 2018). Recent

evidence confirms that institutional investors in the IB market are generally risk-averse and do not base their participation primarily on high-return expectations, which rules out purely financial motivations (Mazzuca et al., 2023).

To date, the very nascent body of literature that quantitatively assesses investors' participation in impact bonds (Mazzuca et al., 2023, Del Giudice et al., 2018; Gruyter et al., 2020) has classified investors according to their categorical identities, distinguishing between institutional investors and philanthropic investors. However, this categorization might overlook the diversity of organization profiles that sit in these categories. In this paper, we shift the focus from the categorical nature of investors toward the main overall investment motive of an organization, distinguishing between organizations that pursue impact-first, hybrid or finance-first investment motives.

Syndication strategies in the IB market

Generally, investors do not invest individually: in entrepreneurial finance, syndication refers to the alliance of multiple investors co-investing together in the same deal (Bygrave, 1987; Wright & Lockett, 2003; Jääskeläinen, 2012; Tian, 2012). Previous research has investigated the motives behind syndication, emphasizing the practice as a risk sharing and portfolio diversification strategy (Manigart et al., 2006) or as a way to pool complementary resources needed for the investment (Ferrary, 2010).

There are multiple reasons to believe that syndication is positively linked with reinvestment: having a strong syndication network is crucial since it increases the likelihood of being invited to follow-up investments and increases the quantity and quality of deal flow (Sorenson & Stuart, 2001; Manigart et al., 2006), ultimately leading investors to add value to their portfolio (Bygrave, 1988). Syndication also depends on group dynamics, as investors with stronger prior co-investment ties tend to build trust and coordinate more easily, which makes them more likely

to invest together again (Zhang et al., 2017). Syndications can also allow investors to invest across other geographies, by partnering with other investors where it would be a local investment (Sorenson & Stuart, 2001). In the IB context, where deals are complex and require coordination among diverse stakeholders, the value of syndication may be particularly high. Investors' may be drawn to syndicate with other investors for risk sharing (Mazzuca et al., 2023) given the uncertainty that is inherent to impact bonds. For newcomers, they might also want to syndicate for learning purposes from their peers that have already invested in impact bonds. Co-investing with experienced IB investors can also provide a model for learning the instrument's intricacies. Therefore, we make the following hypothesis:

***Hypothesis 1:** Higher levels of syndication are positively associated with investors' reinvestment in the IB market.*

Syndication networks can be homogeneous (same organization types investing together) or heterogeneous (different types of investors investing together). Heterogeneous forms of syndication can lead to power asymmetries between investors. Dominant investors may shape decisions according to their own logic, at the expense of shared objectives (Du, 2016; Wright & Lockett, 2003). In venture capital, the literature highlights these tensions in the case of traditional venture capital funds that co-invested with socially or environmentally-oriented venture capital firms (Barber et al., 2021). In impact bonds, the diversity leads to situations of heterogeneous syndication, where institutional investors such as banks and insurance companies can co-invest with philanthropic organizations. Beyond the organizational nature of investors, investors may have to syndicate with organizations that have different inherent motives, which might lead to fundamental disagreement and disengagement from the market. Because of its hybrid nature, the IB market has been designed to attract hybrid investors (Ragin & Palandjian, 2013) that seek both impact generation while looking for below-market returns. In situations of syndications including a diversity of investors, they also might be able to

mitigate tensions or disagreements between impact-first and impact-first investors and therefore increase their willingness to reinvest. Therefore, we state the following hypotheses:

Hypothesis 2: The syndication composition affects investors' decision to reinvest in impact bonds

Hypothesis 3: Hybrid-dominated syndications is positively associated with reinvestment

4.3. METHOD

Database construction

This article is based on a novel cross-country dataset of 285 impact bonds investors engaged in 235 impact bond transactions between 2010 and 2023. The dataset was manually constructed by the first author. The primary data source was the Indigo database, developed and maintained by the Government Outcomes Lab (Carter et al, 2024), which compiles information on all impact bonds launched worldwide since 2010. From the GOLAB database, we retrieved information on impact bonds, including the year of signature and launch, the contract maturity, the investment sector, the geographical location, the amount invested, and the investors disclosed for each deal. Then, we collected additional data for each investor describing their characteristics (country of origin, size, public or private status, organizational type), as well as their investment activity in the IB market (number of investments, first and last year of participation, and for each deal, the total amount of the deal, the year of signature, duration, and level of syndication). Our final sample includes 766 investment observations of impact bonds investors throughout the 2010-2023 period.

Investors classification

To make sense of the investor landscape investing in impact bonds, we also propose a categorization of investors that goes beyond their organizational nature (institutional vs philanthropic). This classification goes beyond the traditional organizational nature of investors

(GIIN, Annual Impact Investor Survey 2020, Rizzello et al., 2016, Gustafsson-Wright et al., 2020, Olson et al., 2024). Instead, it relies on policy reports and publications from impact investing industry actors that define a finance-impact continuum that goes beyond organizational nature and mainly focuses on investment profile (Bridges Venture, Impact Management Project) and investors’ motivation (Impact Europe). To classify our investors, we relied on a coding protocol using investment criteria that we define in Table 4.1. A first round of coding was established by two research assistants, that relied on all available public information to classify investors according to their organizational source of capital, the type of funding instruments used, the usual return expectations and the funding approach. The main author conducted a blind coding of all cases and subsequently compared the results with those coded by the research assistants. In cases of disagreement, differences were discussed and resolved through joint deliberation to ensure consistency in the classification.

Table 4.1 *Criteria of investors classification*

	Impact-first investors	Hybrid investors	Finance-first investors
Definition	Intention to create measurable social or environmental impact. Financial returns are secondary and often concessional.	Investors seeking to balance impact and financial objectives. Both are pursued simultaneously, with flexibility in return expectations.	Investors primarily driven by financial performance, investing in impact primarily when it aligns with market-rate returns (ESG, Socially Responsible Investment)
Main motivation	For impact	For impact with profit	For profit
Organizational source of capital	Public funding Endowment	Pooled capital from institutional investors seeking low-returns Parent company	Client or shareholder capital
Main instruments	Catalytic capital through grants	Mix of catalytic capital and investment (fixed income, equity)	Mainly investment through fixed-income, debt and equity
Return expectations	No expectation of return (concessional capital)	Below-market returns or near-market returns	Market-rate returns
Funding approach	Program-related	Program related and/or portfolio approach	Portfolio approach

<i>Example of organizations</i>	Non-profit organizations charities Individual and community foundations	Corporate foundations Institutional investors such as Development Finance Organizations Social Impact Venture capital Non-profit asset managers	Institutional investors such as commercial bank, insurance companies, For-profit asset-managers, private equity and VC funds
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Models’ specification

To investigate the main drivers of impact bonds reinvestment, we estimate a Firth bias-reduced logistic regression model. This approach is particularly suited for datasets where the binary outcome is unbalanced and some categorical combinations have few observations and can lead to separation or small-sample bias in maximum likelihood estimation (King & Zeng, 2001; Firth, 1993). The Firth correction introduces a Jeffreys prior penalty that effectively reduces small-sample bias and ensures finite, stable coefficient estimates even under quasi-complete separation. The dependent variable (REINVEST) is a binary variable indicating if the investor reinvests after a deal (1) or disengage from the market (0). The independent variables include both investor-level characteristics such as organizational type (ORGTYPE), previous experience (EXPERIENCE), and predominant motivation (MOTIV) and deal-level characteristics, including the composition (COMPO), size (DEALSIZE), duration (TOTALYEARS), and level of syndication (SYND) of each contract. Control variables for deal country and deal year are also incorporated to account for contextual and temporal heterogeneity in investment patterns. To complement the binary analysis of reinvestment, a multinomial ridge regression was estimated to explore the factors associated with investors’ levels of experience in the impact bond market. The dependent variable (REINVESTPROFILE) categorizes investors into three groups: one-time investors (only one deal), occasional investors (2–4 deals), and serial investors (5 or more deals). Independent variables include the investor’s dominant motivation (Finance-first, Hybrid-first, Impact) and the composition of the deal

(balanced, finance-dominated, hybrid-dominated, impact-dominated). A ridge penalty was applied to address potential multicollinearity and small-sample bias across categorical combinations.

Table 4.2. Description of variables

Type of variable	Name of variable	Description of variable	
Dependent variables	Reinvestment (REINVEST)	binary variable indicating whether an investor reinvested (1) or not (0)	
	Investor persistency profile (REINVESTPROFILE)	Variable indicating if the investors is a single, occasional or serial investor	
<i>Variables: Nature of Investors</i>			
Independent variables	Type of organization (ORGTTYPE)	Binary variable indicating whether the investor is public (0) or private (1)	
	Experience (EXPERIENCE)	Continuous variable indicating the number of deals previously made by the investor	
	Predominant motivation (MOTIV)	Categorical variable indicating if the investor is impact-first, hybrid or finance-first	
	<i>Variables: Nature of Deals</i>		
	Sector (SECTOR)	Categorical variable indicating public sector targeted by the deal	
	Deal Size (DEALSIZE)	Size of the deal (in M\$)	
Independent variables	Syndication (SYND)	Binary variable indicated if the deal is syndicated or not	
	Composition of the deal (COMPO)	Categorical variable indicating if the deal is finance-dominated, hybrid-dominated, impact-dominated, or balanced	
	Duration (TOTALYEARS)	Categorical variable indicating the deal duration (in years)	
	Control variables	Country (COUNTRY)	Investor country
		Year (YEAR)	Investment year

4.4. FINDINGS

Descriptive statistics

Figure 4.1 illustrates the distribution of investors by number of IB investments, showing a highly skewed distribution with a majority of investors that have participated only once in the

market. Figure 4.2 illustrates the distribution of investors according to their level of experience in the IB market between 2010 and 2023. The majority of investors (69%) have participated in only one deal. Occasional investors, defined as those participating in two to four deals, represent 19% of the sample, while only 12% serial-investors, having engaged in five or more transactions. The sample is predominantly composed of private organizations (89%), with also includes a part of public investors (11%). In terms of organizational size, small investors (less than 100 employees) constitute the largest group (38%), followed by large organizations (29%) and medium-sized organizations with more than 250 employees (27%). Regarding their dominant motivation, according to our classification, 40% of investors are classified as hybrid, 36% as impact-first; and 24% as finance-first.

Figure 4.1 Investors' experience distribution in the IB market (2010-2023)

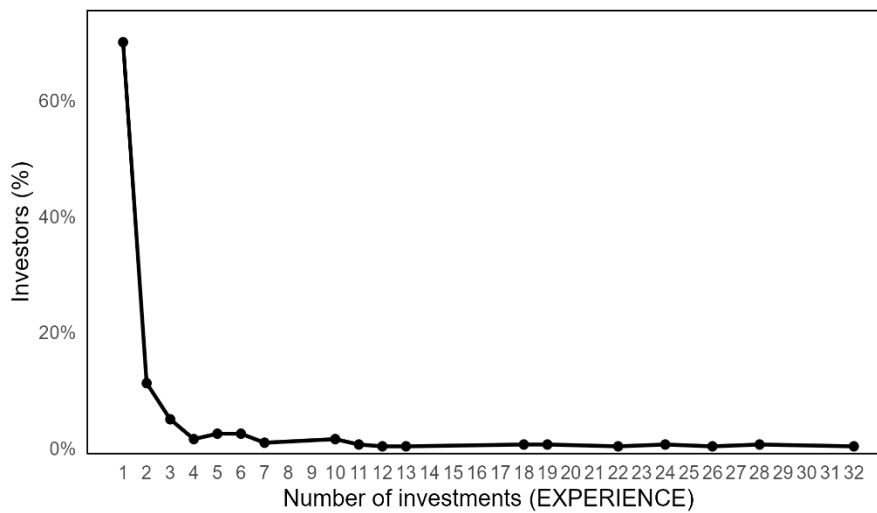


Figure 4.2 Investors' participation frequency by motivation type

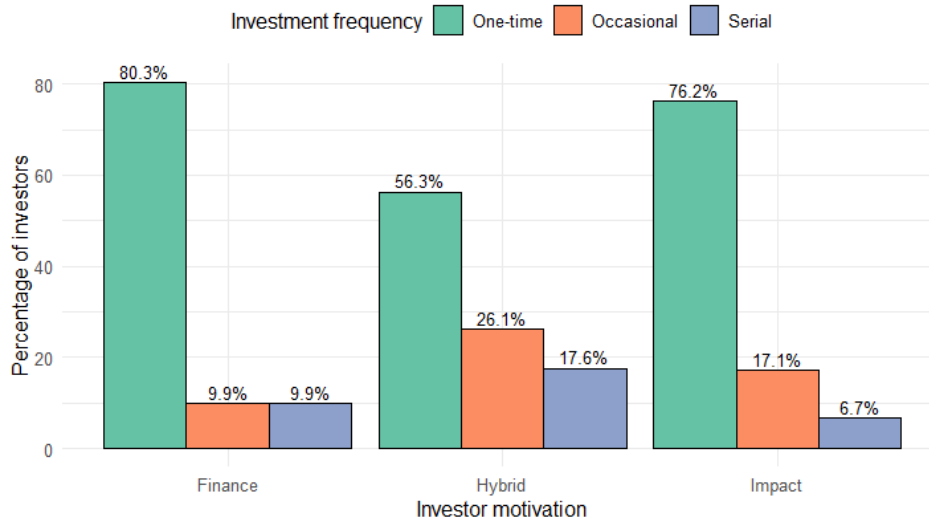


Table 4.2 Descriptive statistics at the investor-level

Variable	Modality	n	%
EXPERIENCE	1-time investor	204	69,1
EXPERIENCE	Occasional investor (2-4)	56	19,0
EXPERIENCE	Serial investor (5)	35	11,9
ORGTTYPE	Private	263	89,2
ORGTTYPE	Public	32	10,8
SIZE	Small	113	38,3
SIZE (<100)	Large	80	29,4
SIZE (100 – 249)	Medium	79	26,8
MOTIV (> 250)	Hybrid	119	40,3
MOTIV	Impact	105	35,6
MOTIV	Finance	71	24,1
REGION	Europe and Central Asia	118	40,0
REGION	North America	72	24,4
REGION	East Asia and Pacific	54	18,3
REGION	Latin America & the Caribbean	16	5,4
REGION	Middle East and North Africa	16	5,4
REGION	Sub-Saharan Africa	10	3,4

Table 4.2 reports descriptive statistics for the main deal-level variables in the sample. The average deal size is around US\$ 3.28 million, but the large standard deviation (10.7) indicates substantial variation across deals, with deal sizes ranging from US\$ 30 000 to US\$ 150 million.

The number of investors per deal averages 3.82, with again a high heterogeneity between single-investors deals to large syndications involving up to 17 investors. Deal duration averages close to 4 years, ranging from short 1-year deals to a maximum of 12 years. These figures highlight the heterogeneity of impact bonds transactions, especially in terms of financial size and investor participation.

Table 4.3 Descriptive statistics at the deal-level

Variable	Mean	Median	Min	Max	SD
SYNDICATION	3.82	2.50	1.00	17.00	3.70
DEAL SIZE	3.28	1.22	0.03	150.00	10.70
MATURITY	3.91	4.00	1.00	12.00	1.89

The most frequent policy sectors targeted by the interventions are employment and training (25,5%), child and family welfare (19,1%), and health (17,4%), followed by education (16,2%) and homelessness (11,9%). deals targeting criminal justice account for 7%, while those addressing agriculture and environment and poverty reduction remain marginal (1,7% and 0,9%, respectively).

Table 4.4 IB deals by sector

DEAL SECTOR	n	%
Employment and Training	60	25.5
Child and Family Welfare	45	19.1
Health	41	17.4
Education	38	16.2
Homelessness	28	11.9
Criminal Justice	17	7.2
Agriculture and Environment	4	1.7
Poverty Reduction	2	0.9

Table 4.5 Syndication compositions

SYNDICATION COMPOSITION	n	%
Hybrid dominated	126	53.6

Balanced	45	23.4
Finance dominated	29	12.3
Impact dominated	25	10.6

Deal and investor-level reinvestment drivers

Table 4.6 reports the results of the fifth logistic regression estimating the likelihood of reinvestment across three model specifications. Model 1 presents the baseline results considering all investments countries in the sample. Model 2 introduces year and country fixed effects, and Model 3 focuses on the subsample of UK investors as the main country of impact bonds investments. Model fit improves with the inclusion of fixed effects (Model 2), as indicated by a lower residual deviance and AIC compared to the baseline. The LR test confirms the improved fit ($\chi^2 = 75.15, p < 0.001$).

In terms of deal characteristics, syndication appears as one of the stronger predictors of reinvestment, with a positive and statistically significant effect across all model specifications. Other deal level characteristics such as the deal amount and duration show no statistically significant effect on the likelihood to reinvest. Regarding investors' characteristics, our findings reveal that impact-first investors show a significantly lower likelihood of reinvestment compared to finance-first investors. Interestingly, the organizational type also plays a significant role, as public investors are more likely to reinvest compared to other organizational forms. This effect weakens and becomes statistically insignificant in the UK-only model, suggesting that public involvement may be particularly important in non-UK markets. The amount of experience also shows a positive and statistically significant effect in Model 1 and 2, suggesting that the likelihood to reinvest in the IB market increases with the amount of deal experience.

Table 4.6 Estimation results for benchmark models and robustness checks

Variables	(1) Baseline	(2) Year & Country FE	(3) UK
EXPERIENCE	0.147*** (0.042)	0.151*** (0.043)	0.024 (0.019)
ORGTTYPE = Public	1.437** (0.548)	1.485** (0.553)	0.409 (0.367)
MOTIV: Hybrid	0.091 (0.463)	0.102 (0.482)	0.295 (0.437)
MOTIV: Impact	-1.339* (0.528)	-1.365* (0.541)	-0.518*** (0.156)
SYNDICATION	0.191*** (0.048)	0.189*** (0.049)	0.078** (0.028)
AMOUNTDEAL	0.049 (0.022)	0.037 (0.056)	0.012 (0.033)
TOTALYEARS	0.041 (0.093)	0.072 (0.096)	-0.089 (0.065)
FINANCE DOM	-0.107 (0.517)	-0.261 (0.548)	0.928* (0.427)
HYBRID DOM	0.404 (0.338)	0.335 (0.357)	0.619** (0.219)
IMPACT DOM	0.092 (0.551)	0.084 (0.564)	-0.587 (0.322)
Year FE	No	Yes	No
Country FE	No	Yes	No
Observations	637	634	347
Residual deviance	514.59	499.30	283.41
AIC	650.59	513.30	—
LR test (χ^2)	—	—	75.15***

Building on the baseline, we also estimated an extended specification including two-way interactions (see Table 4.7) to explore potential moderating effects between deal and investor characteristics. The results suggested several patterns. First, syndication continues to display a strong positive association with reinvestment. Second, the interaction between experience and dominance of the deal composition is positive and significant when the deal is dominated by hybrid investors and impact-first investors. Third, the positive effect of experience on reinvestment weakens as deal duration increases, suggesting that experienced investors may favor shorter deals. The interaction between impact-first investors and deal amount is also negative and statistically significant, suggesting that impact-first investors may be less inclined to reinvest in larger deals.

Table 4.7 Estimation results: Two-way interactions

Variables	Two-way interactions
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	Year & Country fixed effect
(Intercept)	-1.630* (0.903)
SYNDICATION	0.300** (0.129)
EXPERIENCE × HYBRID DOM	0.545** (0.219)
EXPERIENCE × IMPACT DOM	0.459*** (0.110)
EXPERIENCE × SYNDICATION	0.025** (0.010)
EXPERIENCE × TOTALYEARS	-0.050** (0.019)
MOTIVHybrid × SYNDICATION	-0.253** (0.113)
MOTIVImpact × AMOUNTDEAL	-0.229** (0.114)

LR $\chi^2 = 243.0777$ on 51 df, $p = 0$; $N = 637$.

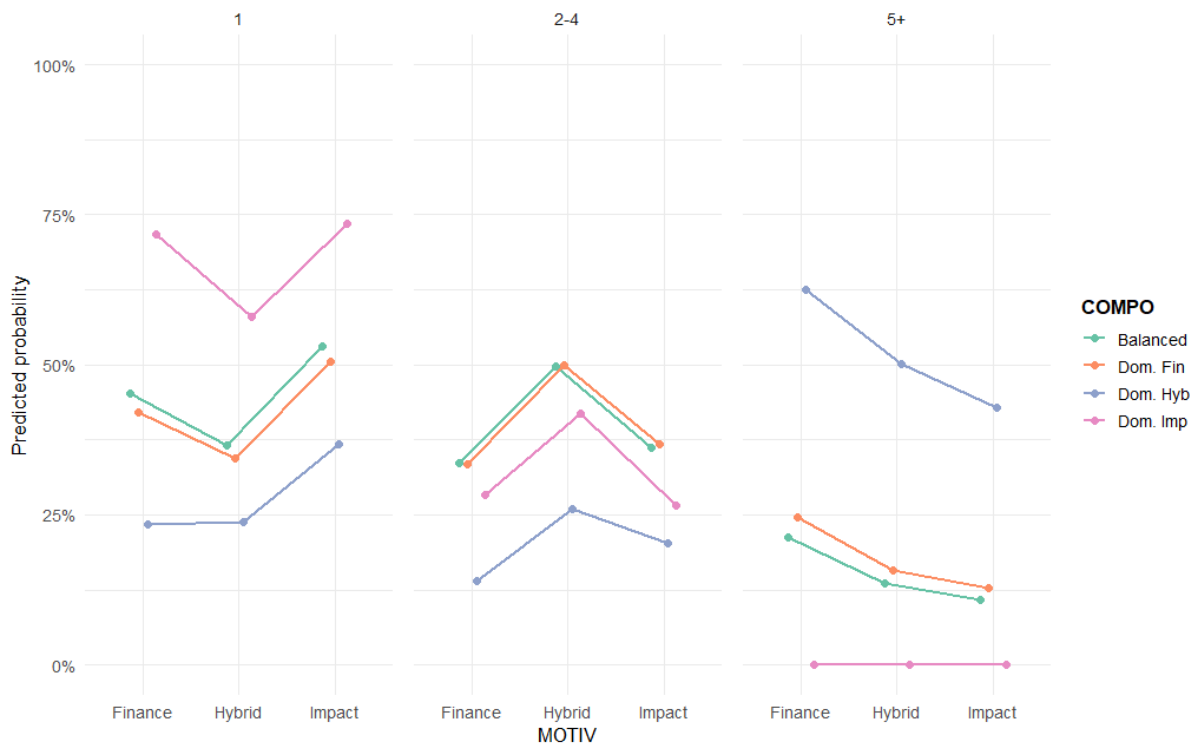
Wald $\chi^2 = 126.2888$ on 51 df, $p = 2.524262e-08$.

Predicted probabilities of reinvestment

We then move to test whether the composition of syndications that is, if the deal is dominated by a certain category of investors, within a deal affects investors’ likelihood of reinvesting in subsequent impact bonds. The rationale behind this hypothesis is that investors’ reinvestment behavior may not only depend on their own characteristics but also on the peer environment they are embedded in. Participating alongside impact-first, hybrid, or finance-first oriented partners may shape investors’ perceptions of risk, thus influencing their decision to reengage. To investigate this, we estimated a multinomial logistic regression model with ridge penalization. The model estimates the predicted probability of belonging to each experience group as a function of both investor-level characteristics (motivation) and deal-level characteristics (syndication composition). Our results show that one-time investors participating in impact-dominated syndications have the highest probability of remaining one-time investors, across all motivational orientations (Finance = 0.71; Hybrid = 0.57; Impact = 0.73). This suggests that syndications primarily composed of impact-first peers are less conducive to reinvestment. In contrast, investors in finance-first or hybrid-dominated syndications show lower probabilities of remaining one-time investors.

Among moderately active investors, those involved in hybrid-dominated syndications show the highest probabilities of belonging to this group (Hybrid = 0.26; Impact = 0.20; Finance = 0.14). Hybrid-motivated investors, in particular, display the highest probabilities of being occasional participants across syndication types (ranging from 0.26 to 0.50), suggesting that they reinvest selectively, balancing financial and social returns across a few deals. Serial-investors are most likely to participate in hybrid-dominated syndications, with predicted probabilities of 0.65 (Finance-first), 0.52 (Hybrid), and 0.45 (Impact-first).

Figure 4.3 Predicted probabilities of reinvestment according to investor motivation and syndication composition



4.5. CONCLUSION

This paper aimed to investigate the drivers of reinvestment in the Impact Bond market, focusing on how deal-level and investor-level characteristics shape investors' willingness to sustain their participation. By analyzing a unique dataset of 285 investors across 235 deals, we explore the role of deal and investors' characteristics in the likelihood to reinvest in the impact bonds market. The findings highlight syndication as a central mechanism in sustaining participation in the IB market. Across all model specifications, syndication consistently shows a positive and significant effect on reinvestment. However, not all investor configurations are equally conducive to sustained participation. Syndications dominated by impact-first investors appear to discourage reinvestment. By contrast, hybrid-dominated syndications emerge as the most fertile environments for repeated engagement, as they allow the coexistence and negotiation of both impact and financial logics. At the investor level, our analysis reveals that impact-first investors are significantly less likely to reinvest than finance-first ones. Experience also matters: investors with prior deal experience are more likely to reinvest, pointing to learning effects and increasing familiarity with complex contracting structures.

Appendices:

Appendix 4.1 All two-ways interactions tested

Variables	(1) Baseline — All two-way interactions
(Intercept)	-1.630* (0.903)
EXPERIENCE	-0.174 (0.168)
ORGTYPEDublic	-1.822 (1.701)
MOTIVHybrid	1.296 (0.899)
MOTIVImpact	0.734 (1.007)
COMPODOM FIN	-0.678 (1.266)
COMPODOM HYB	1.135 (1.028)
COMPODOM IMP	-0.925 (2.022)
SYNDICATION	0.300** (0.129)
AMOUNTDEAL	0.029 (0.126)
TOTALYEARS	-0.083 (0.206)
EXPERIENCE × ORGTYPEDublic	-0.045 (0.057)
EXPERIENCE × MOTIVHybrid	0.056 (0.086)
EXPERIENCE × MOTIVImpact	0.078 (0.093)
EXPERIENCE × COMPODOM FIN	0.545** (0.219)
EXPERIENCE × COMPODOM HYB	0.459*** (0.110)
EXPERIENCE × COMPODOM IMP	0.803 (0.596)
EXPERIENCE × SYNDICATION	0.025** (0.010)
EXPERIENCE × TOTALYEARS	-0.050** (0.019)
MOTIVHybrid × SYNDICATION	-0.253** (0.113)
MOTIVImpact × AMOUNTDEAL	-0.229** (0.114)

Appendix 4.2: Predicted probabilities for reinvestment

One time-investors (1 investment)

BALANCED SYNDICATION

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.43	0.31–0.57
Hybrid	0.35	0.26–0.45
Impact	0.52	0.40–0.63

FINANCE-DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.40	0.26–0.57
Hybrid	0.33	0.19–0.51
Impact	0.49	0.30–0.68

HYBRID DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.22	0.13–0.35
Hybrid	0.22	0.17–0.28
Impact	0.35	0.25–0.46

IMPACT-DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.71	0.49–0.86
Hybrid	0.57	0.38–0.74
Impact	0.73	0.58–0.84

Occasional investors (2-4 investments)

BALANCED SYNDICATION

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.34	0.23–0.47
Hybrid	0.50	0.41–0.60
Impact	0.37	0.27–0.48

FINANCE-DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.34	0.20–0.50
Hybrid	0.50	0.32–0.69
Impact	0.37	0.21–0.58

HYBRID DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.14	0.08–0.23
Hybrid	0.26	0.20–0.32
Impact	0.20	0.13–0.29

IMPACT DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.29	0.14–0.51
Hybrid	0.43	0.26–0.62
Impact	0.27	0.16–0.42

Serial-investors (5+ investments)

BALANCED:

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.23	0.13, 0.36
Hybrid	0.14	0.09, 0.22
Impact	0.12	0.07, 0.19

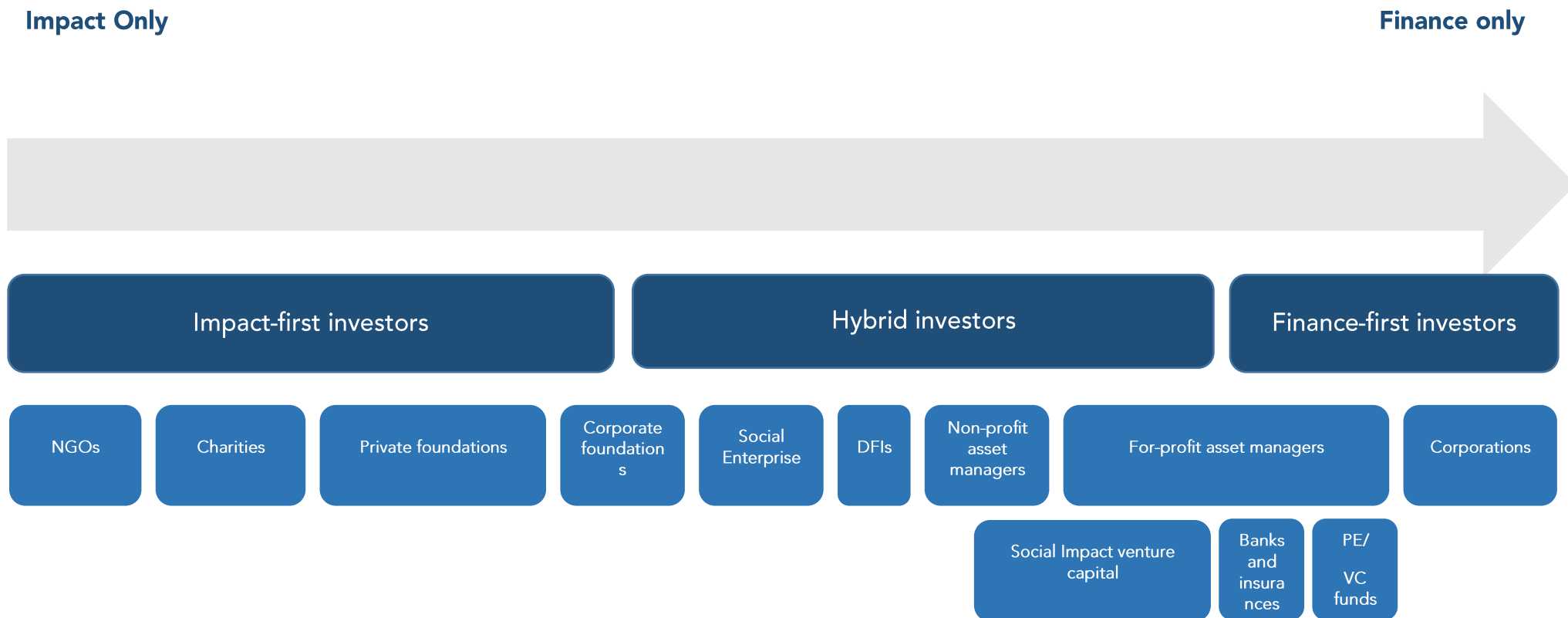
FINANCE-DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.26	0.12, 0.47
Hybrid	0.17	0.07, 0.36
Impact	0.14	0.05, 0.32

HYBRID DOMINATED

Motivation	Predicted Probability	95% Confidence Interval
Finance	0.65	0.50, 0.77
Hybrid	0.52	0.45, 0.59
Impact	0.45	0.34, 0.57

Appendix 4.3: The impact-finance continuum (Author's creation)



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CHAPTER 5. INVESTIGATING THE SIGNALING EFFECT OF PUBLIC FUNDING ON FUTURE PRIVATE FINANCING: THE CASE OF FRENCH SMES

Authors: Maya Tira, Benjamin Le Pendeven, Maxime Colin

Keywords: Certification effect, public funding schemes, Differences-in-Differences, public policy support, SMEs

5.1. INTRODUCTION

Small and Medium Enterprises (SMEs) represent a critical component of private sector activity and employment in most economies worldwide (Ou & Haynes, 2006). However, access to external finance is widely recognized as the most significant barrier to SMEs' growth and development (Beck & Demirguc-Kunt, 2006; Ardic et al., 2012). To address these concerns, governments over the world have developed a significant number of programs and funding mechanisms (in the form of grants, subsidies, soft loans or credit guarantees) specifically dedicated to SMEs, both to address supply-side market failures and encourage access to future private financing.

While the literature on signaling in venture financing is extensive, it predominantly focuses on early-stage or highly innovative ventures. Yet the French entrepreneurial ecosystem is mainly composed of SMEs: In 2018, SMEs accounted for 99% of French companies, generated 43% of the total value added and employ 6,3 million full-time equivalent workers (INSEE, 2020). This article aims to study the impact of access to public funding on SMEs' likelihood of securing future private debt and equity financing. Specifically, our research investigates the effect of accessing *multiple* public funding schemes from *multiple* certifiers. We use a unique dataset on public funding schemes granted to SMEs by two public certifiers between 2010 and 2019: the French Public Investment Bank (Bpifrance) and the French Agency for Environmental and Energy Management (ADEME). We adopt a two-steps empirical approach based on Propensity Score Matching followed by a difference-in-differences (DiD) estimation. Beyond documenting whether public programs alleviate financing frictions, we aim to contribute to detangling the effect of multiple, potentially overlapping signals, testing whether certification effects are complementary or redundant depending on the number, combination and issuer identity-orientation of public schemes. We also investigate a potential 'green

certification effect' by contrasting signals sent by a specialized environmental certifier (ADEME) with those sent by a generalist public investment bank (Bpifrance),

5.2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The use of signals in venture financing

The foundation of public funding as a certification mechanism is rooted in signaling theory (Spence, 1973). Signaling theory addresses the problem of information asymmetries by examining how one party (the sender) with a superior amount of information convey credible cues to less-informed counterparts (the receivers). It also argues that a signal is effective only when it is observable and credible, given the high costs of acquiring it. Signaling theory is predominantly used in the entrepreneurship literature to describe the strategic use of signals by startups (Connelly et al., 2011) to acquire private Venture Capital (VC) funding across their life-cycle phases, especially given the existence of an equity gap at the early stages of their development (Lockett et al. 2002; Kelly 2011). Among those signals, public funding schemes play an important certification role (Lerner, 1999; Meuleman and De Maeseneire, 2012; Bergh et al., 2014, Hottenrott et al., 2018; Bellucci et al., 2019; Santoleri et al., 2020; Chiappini et al., 2022) and act as a stamp of approval on the quality of the recipient firm (Lerner, 1999; Howell, 2017). This signaling effect is particularly critical in the case of SMEs, which are more exposed to capital market failures and face more financial constraints (Chiappini et al., 2022). SMEs struggle to access finance because information asymmetries make their creditworthiness hard to assess (De Maeseneire & Claeys, 2012). Their insufficient collateral and limited business track record (Bakhtiari et al., 2020) increase investors' perception of risk and raises the cost of external capital (Bakhtiari et al., 2020; Berger & Udell, 2006; Revest & Sapio, 2012)

The literature on the impact of public funding schemes on future private financing points toward the existence of a positive signaling and certification effect of public funding across

geographies, with empirical evidence emerging both from the United States (Lerner, 1999; Toole & Turvey; 2009; Stevenson et al., 2018; Zhao & Ziedonis, 2020) and continental Europe (Meuleman & De Maeseneire, 2012; Söderblom et al. 2015; Guerini & Quas, 2016 Hottenrott & Richstein 2020; Chiappini et al., 2022). Studies on the signaling effect of public funding have examined signals emerging across various types of public finance schemes, including research grants (Lerner, 1999; Howell, 2017; Islam et al., 2018), R&D subsidies (Kleer, 2010; Meuleman and De Maeseneire, 2012; Antonelli & Crespi; 2013; Bellucci et al., 2019), innovation subsidies (Chiappini et al., 2022) loans (Zhao and Ziedonis; 2020) and equity-based instruments such as Governmental Venture Capital (GCV) (Guerini & Quas, 2016; Li et al., 2019). Studies mostly look at the certification effect for start-ups, but some have specifically focused on SMEs (Bellucci et al., 2019; Chiappini et al., 2022). Bellucci et al. (2019) find that R&D subsidies influence SMEs debt structure by encouraging a shift toward long-term financing and help reduce the cost of debt (Bellucci et al., 2019). Looking at innovation subsidies provided by Bpifrance, Chiappini et al. (2022) find that they ease financial constraints for French SMEs and improve access to bank debt, especially for young and small firms.

However, the evidence also highlights that this certification effect is conditional: signals' impact heterogeneity is driven by factors such as the type of firms that convey the signal, the type of public funding mechanisms and the private recipient of the signal. Regarding the type of public funding mechanism, the level of selectivity of public funding awarded affects the strength of the signaling effect (Grilli & Murtinu, 2012; Takalo & Tanayama, 2010), as public grants awarded through rigorous screening and competitive selection processes provide a stronger signal to private investors than automatic or non-competitive subsidies. Public funding also acts as a positive signal when it crowds in private investment by complementing it (Diamond, 1999; Meuleman & De Maeseneire, 2012; Hottenrott & Richstein, 2020) rather than crowding it out by serving as a substitute. For example, Giraudo et al. (2019) show that government-guaranteed

loans reduce the likelihood of receiving fiscally-incentivized VC, while Fini et al. (2023) find that SBIR grants can negatively affect VC fundraising in digital sectors. The certification effect also depends on the credibility of the certifier, since the signal lies more in the reputation of these institutions than in the tangible support they provide (Higgins & Gulati, 2003, 2006). The signals also do not hold the same power according to the nature of the private recipient: certification effects are found to be particularly effective in easing access to bank loans (Meuleman & De Maeseneire, 2012; Li et al., 2019; Martí & Quas, 2018) while their impact on equity financing appears comparatively weaker (Chiapini et al., 2022; Meuleman & De Maeseneire, 2012).

Detangling the effect of multiple signals

Entrepreneurs seek multiple sources of funding at the same time (Hanssens et al., 2016; Mason, 2017), generating a variety of signals to attract private capital. However, these signals may vary in effectiveness and create ambiguity about how investors interpret them, raising the question of whether such signals are complementary or potentially conflicting. In such cases, the presence of public support may reduce the urgency or perceived opportunity for private investors to provide capital. To date, the literature that empirically looks at multiple public policy instruments remains underdeveloped, overlooking potential interactions between signals. Li et al. (2019) show that GVC investment advances green innovation by acting an initial quality signal that subsequently attracts private VC, facilitates access to government high-technology certificates, and increases the likelihood of winning public bidding projects. However, this highlights a cascading effect of signals rather than the effect of multiple simultaneous signals. One of the only studies looking at the signaling effect of multiple public funding instruments finds a positive effect of policy mixes, where combining grants with subsidized loans does not crowd out private finance but instead enhances firms' potential to

attract venture capital (Hottenrott & Richstein 2020). Therefore, we state the following hypothesis:

Hypothesis 1: the impact of the certification effect is stronger when SMEs receive multiple public fundings from multiple public bodies.

More certifications are often assumed to automatically improve a firm's subsequent access to private finance. However, evidence from United States SBIR award data shows that the effect of multiple certifications depends on who issues them and what new information they provide, distinguishing between 'certification broadening', where the follow-on certification comes from a different institution, and 'certification redundancy' where the follow-on certification comes from a different institution (Lanahan & Armanios, 2018). Certification broadening strengthens a venture's ability to attract private VC, as it signals an endorsement from multiple actors that value different criteria. On the opposite, certification redundancy can weaken access to private VC because the different signals do not bring additional information. Therefore, we state the following hypothesis:

Hypothesis 2: The certification effect of public funding is stronger when SMEs obtain multiple forms of public funding from different certifying bodies, compared to receiving multiple public funding from the same certifier.

The 'Green' certification effect:

Firm environmental performance is increasingly perceived positively by external capital provider, as they integrate environmental criteria into their financial performance objectives. For firms, better environmental performance leads to a decrease in the cost of capital, as banks include selection criteria of environmental performance and adjust lending conditions according to that performance (Ambec & Lanoie, 2008). For example, a study on China's green credit policy finds that green innovation improves firms' access to loans (Xing et al., 2021)

To signal environmental credibility and reduce information asymmetries, firms can rely on Environmental Management Systems such as ISO norms (Nishitani, 2011) and environmental certifications provided by third-party certifiers. Those certifications build investor trust and secure lower yields for firms (*greenium*) (Li et al., 2024). Although those certification programs are increasingly available, many SMEs do not seek them due to lack of awareness (Hillary, 2004), their perception as a cost and limited understanding of their potential benefits (McKeiver & Gadenne, 2005). Yet, looking at the effects of Eco-Lighthouse Foundation certification program supported by the Norwegian Ministry of the Environment, Djupdal & Westhead (2015) conclude that these environmental certifications act as a *'buffer against the liabilities of newness and smallness'* as they allow firms to build legitimacy, making their activities more visible and understandable to external stakeholders.

In France, a range of public funding schemes has been introduced to specifically support SMEs in their ecological transition (ADEME, 2023). Those are primarily allocated through ADEME, the French Agency for Environmental and Energy Management. Therefore, we propose to apply the findings on the literature on the benefits of environmental certifications on firms' perception by external stakeholders to public green certifiers: In other words, the strength of the certification may be greater when it is issued by a specialized, environmentally oriented public body rather than a generalist certifier, as it may signal both good quality and environmental orientation. We state the following hypothesis:

Hypothesis 3: The certification effect is stronger when the certifier is environmentally-oriented rather than generalist

5.3. METHOD

Empirical context

Bpifrance is the French public investment bank. It supports French companies of all sizes and at all stages of development by providing funding for innovation, investment, export and

growth. Bpifrance is unique in that it combines, within a single institution, the role of an operator granting innovation grants and subsidies to companies, and that of a public development bank providing loans and equity investments (Cour des Comptes, 2021). According to a recent Senate report on the transparency and evaluation of public support to French firms¹⁷, Bpifrance allocated €41 billion in public financial support to French firms (Senat, p. 21, 2025)

ADEME is the French Agency for Environmental and Energy Management, a state-owned industrial and commercial entity (*EPIC* in French) under the supervision of the Ministry of Environment, Energy and Research. ADEME supports and funds the ecological and energy transition in France through research, innovation, expertise, and project financing. According to a report from the French Inspectorate General of Finance (IGF), ADEME is the main public funder of the ecological and energy transition in France. Out of the €1.7 billion dedicated to ecological transition support for companies in 2022, ADEME funded €1.3 billion, mainly in the form of grants. Nearly 40% of these amounts were allocated to SMEs. (IGF, 2023). ADEME is also the main provider of public funding specifically dedicated to the Social Economy (SE) sector in France, which accounted for 6% (€62.5 million) of its 2024 budget (*Cour des Comptes*, 2025).

Our empirical context is particularly relevant for three reasons. First, the public funding products delivered by both Bpifrance and ADEME specifically target SMEs. Second, our empirical context allows us to study the effect of policy mixes, as French firms frequently combine different forms of public support. For instance, a report by the French *Cour des Comptes* (the French Supreme Audit Institution) on innovation aid shows that 58% of firms receiving innovation support from Bpifrance between 2016 and 2019 also benefited from other

¹⁷ <https://www.senat.fr/notice-rapport/2024/r24-808-1-notice.html>

forms of public innovation support. Specifically, out of the 15,613 firms that benefited from Bpifrance public innovation funding during this period, 446 also received support from ADEME (Cour des Comptes, Table 5, 2021). Finally, it enables a comparison of the signals conveyed by a generalist versus a specialized certifier. While Bpifrance acts as a generalist certifier, providing a wide range of financial instruments to firms, ADEME functions as a specialized agency focused on the ecological and energy transition.

Dataset

We build a dataset by combining administrative data provided by two major public funders in France – ADEME and Bpifrance, with the FARE database containing accounting and performance data on French companies. ADEME data was provided directly by the agency, whereas Bpifrance and FARE data were accessed through the *Centre d’Accès Sécurisé aux Données* (CASD), a comprehensive database that records data on French public institutions and private firms.

Table 5.1 Data sources

Database	Source	Description	Key variables	Coverage period
ADEME database	ADEME	Firms that have received financial support from ADEME	Type of funding intervention, amount of financial support, year of financial support	2010-2019
Bpifrance database	CASD	Firms that have received financial support from Bpifrance	Type of instrument, amount of financial support, year of financial support	2010-2019
FARE database	CASD	Firm-level accounting and performance data on French companies	Date of creation, legal form, sector, number of employees, location, turnover, value added, nominal gross output, intermediate inputs, tangible and intangible capital, investment goods, revenue, debt, equity.	2010-2019

For both ADEME and Bpifrance databases, we excluded large firms (that are less financially constrained than SMEs), as well as universities, research centers, local and regional authorities from the list of recipients in our dataset. Our analysis focuses exclusively on firms classified as SMEs, following the INSEE and European Commission definitions: fewer than 250 employees, and either an annual turnover not exceeding €50 million or a balance sheet total below €43 million. In terms of type of products provided by the public bodies, we excluded tax exemptions (such as the *Crédit d'Impôt Recherche*) and guarantees to focus exclusively on direct funding schemes. To avoid potential distortions caused by the exceptional public intervention during the COVID-19 crisis (notably the massive diffusion of the *Prêt Garanti par l'État* provided by Bpifrance to tackle the economic effect of the pandemic on SMEs in 2020), we deliberately restricted our dataset to the period between 2010 and 2019. Finally, the amount of public funding analyzed ranges between €10,000 and €1 million.

Classification of public funding schemes

For Bpifrance data, given the diversity of public funding schemes provided, we classified the funding by product type. Table 5.2 provides a classification of the 8 products that were selected for the analysis. Those products included grants, repayable advances, differed repayment loans and middle/long-term loans. Following the literature on the effect of selectivity on the strength of the signal provided by future private funding (Grilli & Murtinu, 2012; Takalo & Tanayama, 2010), we also classified the public funding schemes according to their level of selectivity. We differentiate between *selective* and *automatic* public funding schemes. Under an automatic scheme, any firm that meets the statutory criteria required by the law is entitled to receive public support, without any discretionary selection by public authorities. On the contrary, selective public support refers to products that undergo ex-ante selective screening of applicants and are awarded competitively (such as the *Concours Mondial d'Innovation* or the *Concours d'Innovation i-Lab* in our sample)

Table 5.2 Description of Bpifrance types of public funding products

Public funding product	Bpi-CASD Code	Details
Innovation support – Repayable advance) (Aides à l’innovation du réseau – Avances remboursable)	AI-AR	Bpifrance repayable advances as part of the innovation support policy (several specific products in this category)
Innovation support – Interest-free loan for innovation (Aides à l’innovation du réseau – Prêt à Taux Zéro pour l’Innovation)	AI-PTZI	Public loans provided under the innovation support policy
Innovation support – Grants (Aides à l’innovation – Avances remboursable)	AI-SUB	Bpifrance grants provided under the innovation support policy (several specific products in this category)
Worldwide Innovation Competition (Concours Mondial d’Innovation)	CMI	Prestigious national-level competition supporting breakthrough innovations, from early feasibility Phase 1 up to 200,000€) to large scale deployment (Phase 3: up to 20M€) Between 2014 and 2018.
Innovation competition i-Lab (Concours d’innovation i-Lab (<i>i-Lab</i>))	CONCOURS	National-level competition since 1999 promoting the most promising innovative projects and/or start-ups, offering up to 600,000€ subsidy ¹⁸
Deffered repayment loans (Prêts à remboursement différé échéancé)	PRET-DEV	Loans with deffered repayment schedule allowing beneficiaries to delay repayment of principal and/or interest to ease cash flow during the project’s development phase.
Medium to long term loans (Prêt moyen-long terme)	PRET-MLT	Loans aimed at supporting business growth, industrial investment, or scale-up phases, with maturities typically between 3 and 15 years.
(Projets industriels d’avenir)	PIAVE	Program under the Investissement d’Avenir initiative (PIA) supporting strategic industrial innovation projects through grants and repayable advances, often in partnership with large firms or research centers

For ADEME, due to data constraints, the funding schemes were not classified at the product level. The analysis focuses on grants, which is methodologically consistent since they constitute ADEME’s primary instrument of support (IGF, 2023). Instead, we classify ADEME support schemes according to their modes of intervention. ADEME distinguishes 3 types of interventions (Systèmes d’aide¹⁹) that can be available for SMEs (see table 5.3): support for

¹⁹ <https://www.ademe.fr/nos-missions/financement>

project implementation (*Aides à la réalisation*), support for knowledge development (*Aides à la connaissance*) and support for behavioural change (*Aides au changement de comportement*):

- ***Support for project implementation ('Aides à la réalisation')***: this type of intervention provides financial support for environmental projects, including support for decision-making through preliminary diagnostics and support investment projects in environmental areas such as circular economy, energy efficiency, air quality improvement, and waste management.
- ***Support for knowledge development ('Aides à la connaissance')***: this type of intervention includes funding dedicated to research, innovation, and observational activities aimed at knowledge creation for the development and commercialization of new or improved products and services. Eligible projects include feasibility studies, R&D studies, funding for research infrastructures and experimentation facilities, and SME innovation expenditures (such as patent applications or innovation consulting services)
- ***Support for behavioral change (Aides au changement de comportement)***: this type of intervention is dedicated to funding for awareness-raising, communication, outreach, and training initiatives aimed at fostering changes in attitudes, behaviors, purchasing and investment practices in relation to the environment.

The different types of ADEME support are granted mainly through competitive procedures in the form of calls for projects or call for expression of interest. These calls are directly tied to specific budgetary programs that define ADEME's intervention priorities. Those specific budgetary programs originate from ADEME own financial envelope, from dedicated thematic funds (such as the *Fonds Chaleur* or the *Fonds Économie Circulaire*) or from national strategic programs (such as the *Programme d'Investissements d'Avenir* or *France 2030*).

Table 5.3 Description of ADEME types of public funding interventions

Type intervention	Details	Eligible expenses
Support for project implementation (Aides à la réalisation)	Financial support for environmental projects, from preliminary diagnostics to investment in areas such as circular economy, energy efficiency, air quality, and waste management.	- Diagnostics - Investment projects in environmental areas such as circular economy, energy efficiency, air quality, waste management.
Support for knowledge development (Aides à la connaissance)	Funding for research, innovation, and observational activities to create knowledge for new or improved products and services.	- Feasibility studies - R&D studies - Funding of research infrastructures and experimentation facilities; - SMEs innovation costs (patents, consulting services).
Support for behavioral change (Aides au changement de comportement)	Financial support for initiatives fostering changes in attitudes, behaviors, and environmental practices.	- Awareness campaigns; - Communication - Outreach - Training.

Databases merging procedures

We constructed a database of French firms’ accounting information from 2010 to 2019 using the FARE datasets. Using the SIREN identifier (the French national business identification number), we matched this database with the Bpifrance and ADEME databases, each enriched with accounting information.

Sample construction

To identify the effect of receiving funding from one or multiple public bodies on SMEs’ future access to debt and equity financing, we construct six mutually exclusive samples:

Treatment groups: We define three treatment groups.

- *Bpifrance only* group includes firms that received at least one funding instrument from Bpifrance but no support from ADEME.
- *ADEME only* group consists of firms that received at least one funding intervention from ADEME but no support from Bpifrance.

- *ADEME and Bpifrance* group includes firms that received support from both ADEME and Bpifrance.

Control groups: we created three control groups with firms that meet the SMEs definition and that are active during the same time period as the treated firms

- *No funding:* this group includes firms that received no funding from either ADEME nor Bpifrance
- *Both vs ADEME control:* this group includes firms that have been financed by both certifiers, or just by ADEME
- *Both vs Bpifrance control:* this group includes firms that have been financed either by both certifiers, or just by Bpifrance

Dependent variables:

The aim of this study is to capture the certification effect of public funding on subsequent debt or equity financing. Following Chiappini et al. (2022) and Bellucci et al., (2019), we chose the following dependent variables to assess the actual changes in financing flows:

- *The debt leverage* is the ratio between firm's bank debt and total assets
- *The equity ratio* is the ratio between firm's equity and total assets

Empirical strategy

Matching procedure: To construct our control groups, we adopt a quasi-experimental design requiring a matching procedure. To mitigate potential selection bias and reduce endogeneity concerns, we match firms that received public funding with comparable firms that did not. Endogeneity arises because public institutions do not randomly allocate funding; instead, they may apply selection criteria related to firm characteristics and performance. We use Propensity Score Matching (Rosenbaum & Rubin, 1983) to account for this non-random allocation, using firm-level covariates such as firm age, annual turnover, annual profit and level of bank debt.

All covariates are measured in the year prior to the receipt of funding to mitigate potential endogeneity. The PSM model is estimated separately for each treatment group using a logistic regression: our strategy relies on a one-to-one nearest neighbor matching: each firm is matched with a control firm that has the nearest propensity-score. This strategy is particularly common and relevant regarding the large size of our sample. The probability that a firm receives the treatment, conditional on its observed characteristics, is defined as:

$$p(X_i) = P(T_i = 1|X_i)$$

To check the robustness of our matching procedure, we assess covariate balance to ensure that observable differences between treated and control firms are substantially reduced. Balance is evaluated using standardized mean differences (target: < 0.1 in absolute value) and variance ratios between control and treatment groups.

Difference-in-difference estimation: To assess the impact of public financing on firms' subsequent access to private funding, we rely on a Difference-in-Differences (DiD) regression. This approach is particularly suitable for policy evaluation when treatment is not randomly assigned. It allows us to compare the evolution of treated and untreated firms over time, controlling for time-invariant unobserved heterogeneity between the two groups. By observing outcomes before and after the treatment, the DiD estimator isolates the average causal effect of receiving public support, under the assumption of parallel trends between treated and control firms in the absence of the intervention.

The DiD model can be expressed by the following equation:

$$Y_{it} = \alpha + \beta_1 Post_{it} + \beta_2 Treat_i + \delta(Post_{it} \times Treat_i) + \gamma_i + \tau_t + \varepsilon_{it}$$

where:

Y_{it}	Outcome variable for firm i at time t (e.g., <i>financial debt leverage, Equity, Bank debt / total debt</i>)
$Treat_i$	Dummy = 1 if firm i is treated (received financing), 0 otherwise
$Post_{it}$	Dummy = 1 for years after the treatment (funding year or pseudo-year for controls), 0 before

$(Post_{it} \times Treat_i)$	Interaction term = DiD estimator
γ_i	Firm fixed effects (control for time-invariant firm characteristics)
τ_t	Year fixed effects (control for aggregate macro shocks)
ε_{it}	Error term

Dynamic DiD (event-study) model: However, the effects of public financing are unlikely to be instantaneous or constant over time. Financial support may have lagged or cumulative effects on firms' leverage, equity, or investment capacity. To account for this temporal dimension, we extend the baseline specification using a dynamic DiD model. This specification introduces event-time indicators that capture the impact of financing in the years preceding and following the treatment. This dynamic framework allows us to verify the validity of the parallel trends assumption by examining pre-treatment coefficients. It also enables to identify the timing and persistence of treatment effects and to distinguish between short-term adjustments and longer-term structural effects. By combining the DiD and dynamic DiD approaches, our analysis provides a robust and nuanced understanding of how public financial support influences firms' trajectories over time.

The Dynamic DiD event-study model is expressed as follows:

$$Y_{it} = \alpha + \sum_{k \neq -1} \delta_k D_{i,t+k} + \gamma_i + \tau_t + \varepsilon_{it}$$

5.4 FINDINGS

*Descriptive statistics**Table 5.4 Descriptives statistics for treatment and control groups*

	Both_none	Bpi_none	Ademe_none	Both_bpi	Both_ademe
Average amount	262536	249258.8	116139.9	267477.9	204977.3
Maximum amount	985025.1	999577.6	988325.5	997372	988325.5
Minimum amount	5000	2000	10000	2000	5000
Average number of fundings	4.693098	3.090581	2.314548	3.826829	3.383562
Maximum number of fundings	22	43	18	43	22
Minimum number of fundings	1	1	1	1	1
Average reference year	2014	2014	2014	2014	2015
Maximum reference year	2019	2019	2019	2019	2019
Minimum reference year	2011	2011	2011	2011	2011
Average age	15.22848	14.00624	16.54164	15.38793	15.80627
Average number of employees	43.59894	26.54884	44.18465	31.88238	31.28274
Average turnover	17984.05	7569.473	17828.35	6781.139	6640.013
Maximum turnover	8105942	4437614	3693953	69465.02	51168.59
Minimum turnover	0	0	0	0	0
Number of ADEME firms	(411)	0	684	0	639
Number of Bpifrance firms	(1574)	34979	0	2109	0
Number of firms receiving both fundings	1985	0	0	2049	796
Number of non-funded firms	1709	28762	687	0	0
Total number of firms	3694	63741	1371	4158	1435

Table 5.4 presents descriptive statistics for the different treatment and control groups used in our analysis. Firms that received funding from both Bpifrance and ADEME (Both_none, n = 3,694) obtained on average 4.7 public fundings, for an average total amount of €262,536. These firms are on average 15 years old, employ around 44 workers, and report an average turnover of €17.9 million. Firms funded exclusively by Bpifrance (Bpi_none, n = 63,741) received fewer interventions on average (3.1) and slightly smaller amounts (€249,259). They are younger (14 years old on average), smaller (27 employees), and exhibit lower turnover (€7.6 million), which is consistent with Bpifrance's broader focus on financing growth-stage SMEs. Firms supported only by ADEME (Ademe_none, n = 1,371) received an average of 2.3 fundings for a smaller average amount (€116,140). These firms are slightly older (16.5 years) and have a workforce size of 44 employees, with an average turnover of €17.8 million. Both_bpi (n = 4,158) and Both_ademe (n = 1,435) groups display comparable characteristics. Both_bpi firms received on average 3.8 fundings for €267,478, while Both_ademe firms obtained 3.4 fundings for €204,977. Both groups show similar firm age (around 15–16 years), workforce (31 employees), and turnover levels (around €6–7 million).

Results

We first started by validating the existence of a certification effect of public funding schemes by verifying that our results were not driven by a resource effect. The resource effect refers to the possibility that the observed outcomes arise from the additional financial resources provided by the public funding rather than from its signaling or certification role. To assess this, we included the amount of the public funding scheme in our regression models. If this variable were significant, it would suggest that the main driver operates through a liquidity channel, in which public funding primarily eases firms' financial constraints. Across all of our specifications, the amount of the subsidy was not significant, which supports the interpretation that our results reflect a certification effect rather than a liquidity effect.

Effect of multiple certifiers compared to no certifier

We started by testing the effect of receiving fundings from both Bpifrance and ADEME against control firms that didn't receive either funding. Compared to receiving no public funding, our results show a negative and statistically significant correlation between access to multiple public funding and firms' access to equity financing one year after receiving the public funding. This first finding aligns with Chiappini et al. (2022) who show that innovation subsidies by Bpifrance do not improve access to equity financing, partly due to a substitution effect between debt and equity.

Table 5.5: Dynamic treatment effects (Both funding vs. no funding control group)

Time to treatment (ref. -1)	Equity ratio
-9	0.0537** (0.0210)
-8	0.0461** (0.0182)
-7	0.0427** (0.0165)
-6	0.0370** (0.0147)
-5	0.0282* (0.0129)
-4	0.0220· (0.0114)
-3	0.0160· (0.0097)
-2	0.0098 (0.0062)
0	-0.0117* (0.0050)
1	-0.0170* (0.0079)
2	-0.0205· (0.0110)
3	-0.0185 (0.0129)
4	-0.0219 (0.0180)
5	-0.0306 (0.0222)
6	-0.0326 (0.0307)
7	0.1416 (0.1564)
8	-0.0046 (0.0499)
Observations	34,743
Number of firms	2,608
Year FE	Yes
Firm FE	Yes
Adj. R²	0.136
RMSE	0.894

Across individual programs, we also find negative and statistically significant coefficients for both Bpifrance and ADEME products taken separately (see Table 5.6). Specifically, ADEME products such as public subsidies for project implementation ('Aide à la réalisation') as well as

Bpifrance differed loans (AI_PTZI) and medium-long term loans (Prêt MLT) are each associated with a reduction in the equity ratio one year after support is received.

Building on these insights, we tested several combinations of Bpifrance, and ADEME products. Interestingly, we find that when two different Bpifrance and ADEME instruments are combined, the effect turns positive and statistically significant. For example, Bpifrance deferred loan and a support for implementation funding from ADEME as well as Bpifrance long term loan and ADEME support for implementation funding from ADEME an increased and statistically significant access to equity funding (see Table 5.5). We also observed statistically significant on access to equity funding for firms that benefit from for multiple products from Bpifrance. Those findings seem to suggest that some combinations of two different products coming both from the same certifier as well as different certifiers might be interpreted as complementary signals from equity investors.

We also tested the combination of three products coming from three different certifiers. In this configuration, the effect turns negative and statistically significant. This finding suggests that when firms benefit by multiple public fundings, their signaling effects may become redundant, pointing to an effect of saturation. Beyond a certain threshold, the accumulation of certifications might also no longer strengthen firms perceived credibility, but instead dilutes the informational value of each individual signal, echoing the concept of certification redundancy (Lanahan & Armanios, 2018).

Table 5.5 Dynamic treatment effects (Both certifiers vs no funding control group)

Variable	Product combination	Equity ratio
AI_PTZI	Bpifrance	-0.0362** (0.0138)
Aide à la Réalisation	ADEME	-0.0439* (0.0171)
Prêt MLT	Bpifrance	-0.0495** (0.0179)
AI_PTZI × Aide à la Réalisation	Bpifrance x ADEME	0.0425* (0.0174)
AI_PTZI × Prêt MLT	Bpifrance x Bpifrance	0.0336· (0.0196)
Aide à la Réalisation × Prêt MLT	ADEME x Bpifrance	0.0283* (0.0134)
AI_PTZI × Aide à la Realisation × Prêt_MLT	Bpifrance x ADEME x Bpifrance	-0.0598** (0.0215)
Observations		34,743

Number of firms	2,608
Year FE	Yes
Firm FE	Yes
Adj. R²	0.136
RMSE	0.894

Effect of multiple certifiers compared to one certifier:

Regarding the effect of having multiple public funding from both ADEME and Bpifrance, we find distinct post-treatment trajectories compared to firms certified only by ADEME. In the short term (up to two years after the treatment), multi-certified firms ease their financial constraints by experiencing an increase in their debt ratio, suggesting improved access to debt financing immediately after the funding. From approximately five years after treatment, these firms show a delayed increase in their access to equity financing. They also experience an increase in employment levels immediately after the funding (see Appendix 4.6). Although multi-certified firms start from lower employment and turnover levels before treatment, their subsequent trajectory suggests that accessing multiple fundings from multiple certifiers acts as a credible signal to facilitate access to debt and equity. This first finding also suggests a potential cascading effect of public certification, where early signals from one institution amplify firms perceived credibility and trigger additional signals from other funding bodies and private investors.

When comparing firms certified by both ADEME and Bpifrance to those certified only by Bpifrance, we find that multi-certified firms already displayed higher leverage levels several years before treatment (see Appendix 4.8). This suggest that multi-certified firms had already had greater access to debt funding prior to obtaining the ADEME certification. Around the certification year, leverage remains stable, suggesting that the environmental certification does not generate an increase in debt access beyond that associated with Bpifrance support,

indicating that the environmental certification neither improves nor deteriorates firms' access to debt financing beyond that already associated with Bpifrance support.

Table 5.6: Dynamic treatment effects (Both certifiers vs. ADEME only control group)

Time to treatment (ref. -1)	Equity ratio	Debt leverage	Employment	Turnover
-9	0.0290 (0.0312)	0.0293 (0.0200)	-0.1141** (0.0439)	-0.2103*** (0.0572)
-8	0.0122 (0.0208)	0.0228 (0.0242)	-0.1232** (0.0380)	-0.2058*** (0.0492)
-7	0.0044 (0.0211)	0.0285 (0.0236)	-0.0851** (0.0264)	-0.1423*** (0.0339)
-6	0.0011 (0.0198)	0.0282 (0.0240)	-0.1028*** (0.0257)	-0.1320*** (0.0292)
-5	-0.0044 (0.0185)	0.0291 (0.0219)	-0.0884*** (0.0191)	-0.1171*** (0.0264)
-4	-0.0088 (0.0135)	0.0248 (0.0205)	-0.0808*** (0.0181)	-0.0857*** (0.0193)
-3	-0.0080 (0.0099)	0.0118 (0.0065)	-0.0547*** (0.0153)	-0.0590*** (0.0167)
-2	-0.0021 (0.0057)	0.0148 (0.0098)	-0.0290* (0.0121)	-0.0327** (0.0108)
0	-0.0049 (0.0036)	0.0155*** (0.0026)	0.0286** (0.0105)	0.0113 (0.0077)
1	-0.0013 (0.0056)	0.0135** (0.0047)	0.0519** (0.0165)	0.0284* (0.0133)
2	0.0078 (0.0101)	0.0181** (0.0070)	0.0704** (0.0231)	0.0329 (0.0178)
3	0.0223 (0.0147)	0.0219 (0.0171)	0.0945*** (0.0269)	0.0355 (0.0215)
4	0.0284 (0.0204)	0.0002 (0.0194)	0.1002*** (0.0275)	0.0179 (0.0218)
5	0.0456* (0.0228)	-0.0126 (0.0276)	0.0923** (0.0334)	0.0281 (0.0253)
6	0.0542* (0.0272)	0.0075 (0.0125)	0.0985** (0.0378)	0.0507 (0.0323)
7	0.0630* (0.0316)	0.0059 (0.0141)	0.1290** (0.0440)	0.0550 (0.0430)
8	0.0928* (0.0438)	0.0017 (0.0174)	0.1161* (0.0566)	0.0958 (0.0654)
Observations	14,715	14,715	14,280	13,853
Number of firms	1,048	1,048	1,044	1,046
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adj. R²	0.447	0.130	0.930	0.909
RMSE	0.716	0.898	0.255	0.289

Note: Standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. “.” denotes significance at 10%.

5.5. DISCUSSION

This study contributes to the growing literature on the certification role of multiple public schemes from multiple certifiers. Our first results open promising directions for further research. The following section proposes a roadmap for the continued development of this paper, highlighting five key research directions that can deepen and validate its main contributions.

Testing for a separating equilibrium: To further validate the certification mechanism, we plan on explicitly testing whether public funding generates a separating equilibrium between high- and low-quality firms (Spence, 1973).

Exploring firm-level outcomes: while our analysis identifies short-term employment effects, this need to be investigated more in depth. More innovation-related proxies will also be included such as patent applications, R&D intensity to assess how certification affects firms' innovative performance.

Comparing the nature of the public funding product: Extending the analysis to distinguish grants versus loans, and selective versus broad programs, could shed light on how program design shapes the strength and credibility of certification effects. Moreover, examining all combinations of funding schemes per certifier would help identify which mixes of instruments convey the strongest signals.

Understanding certification redundancy and complementarity: building on the observed effect of saturation, we plan on systematically testing policy-mix configurations across certifiers. This would clarify when multiple certifications generate complementary signals and when they result in redundancy.

Heterogeneity of certification effects: Future research could refine the analysis by firm characteristics, testing for conditional effects by size, sector, or technological intensity, particularly in industries with high information asymmetries. Exploring a potential ‘green certification effect’ could also be valuable, by isolating ADEME-only and Bpifrance-only control groups.

Methodological refinements: future analyses could integrate additional matching procedures (such as kernel or Mahalanobis distance matching) to ensure robustness, and extend the temporal window to assess long-term persistence of certification effects.

The following table summarizes the tests already performed and outlines the additional analyses planned for paper development.

5.7 Table Roadmap for future research

Areas of research	Performed tests	Additional tests planned
<i>Confirmation of a certification effect</i>	Amount of the subsidy not significant in the Diff-in-diff regression	Testing for a separating equilibrium
<i>Effect on the firm</i>	Positive and significant effect on employment and turnover	Testing on R&D proxies
<i>Effect of multiple certifications vs no certification</i>	Negative and significant effect on equity financing (consistent with the literature)	Testing for debt leverage
<i>Effect on the nature of the public funding scheme (grant vs loan, level of selectivity)</i>	Tests on combination of funding schemes: suggest that ADEME Support for project implementation funding and Bpifrance loans schemes convey a stronger signal than other types of funding	Testing all different combinations of public schemes per certifier Refinement of the public scheme categories
<i>Certification redundancy vs broadening</i>	Tests on interactions between different public products: suggests that certain combinations of two different products from the	Testing all the policy mixes combinations between different certifiers Refinement of the public scheme categories

<i>Conditionality of signal according to recipient</i>	<p>same/different certifiers act as complementary signals Suggest that the combination of three products (2 by the same certifier and one by a different certifier) may be interpreted as redundant Test on effect by size (not statistically significant)</p>	<p>Refining the size brackets Testing by sector, high-tech / low tech companies (with a high level of information asymmetry) Creating another control group of Bpifrance only and ADEME only firms</p>
<i>'Green' certification effect</i>		<p>Investigating the potential 'cascading effect' of signals, leading to access to bank debt, followed by a delayed access to equity</p>
<i>Chronology of public funding</i>	<p>Tests on the effect of multiple fundings from both certifiers against firms that received only one funding from Bpifrance</p>	<p>Adding additional matching procedures (Kernel matching or Mahalanobis distance matching) for matching validation</p>
<i>Other refinements</i>		

5.6. CONCLUSION

This paper contributes to a broader effort to understand how public funding operates beyond its financial function, by examining its certification effect on SMEs' access to private finance and the role of multiple certifiers in the French context. Our article provides evidence of a certification effect rather than a liquidity effect, as the amount of public support received does not explain changes in financing outcomes. Importantly, the comparison between two certifiers (Bpifrance and ADEME) and one certifier (ADEME only) provides strong evidence of a certification effect: multi-certified firms experience a clear and sustained increase in employment and improved access to both debt and equity financing in the years following the treatment. These results confirm that multiple public endorsements act as a credible and powerful signal to private investors. When comparing firms benefiting from both Bpifrance and ADEME funding against the one that had no access to funding, we find that firms multi certified experience a short-term decrease in equity financing, consistent with a substitution effect

between debt and equity. However, certain combinations of instruments, especially when originating from different certifiers, generate positive and significant effects on equity access, suggesting the presence of complementary signaling mechanisms. Conversely, when firms accumulate too many sources of public support, signals appear to become redundant or diluted, pointing to a saturation effect. Overall, the existence of a certification effect and a stronger certification effect when funding comes from multiple certifiers receive partial empirical validation, while the presence of a ‘green certification effect’ remains to be explored.

Appendices

Appendix 5.1 Balance statistics before and after matching (Bpifrance funding vs no funding control group)

Variable	Mean Treated (All)	Mean Control (All)	Std. Diff (All)	Mean Treated (Matched)	Mean Control (Matched)	Std. Diff (Matched)
Distance	0.0183	0.0118	0.355	0.0165	0.0165	0.000
Turnover	5013.58	843.12	0.500	4858.07	8009.06	-0.378
Profit	203.65	56.48	0.060	200.37	465.18	-0.108
Debt	1248.10	495.27	0.069	1246.00	1883.09	-0.059
Age	13.08	7.34	0.591	12.20	12.18	0.002

	<i>Control</i>	<i>Treated</i>
All	3,172,908	38,230
Matched	36,703	36,703
Unmatched	3,136,205	1,527
Discarded	0	0

Appendix 5.2 Balance statistics before and after matching (ADEME funding vs no funding control group)

Variable	Mean Treated (All)	Mean Control (All)	Std. Diff (All)	Mean Treated (Matched)	Mean Control (Matched)	Std. Diff (Matched)
Distance	0.0024	0.0003	0.056	0.0006	0.0006	0.000
Turnover	6052.98	843.12	0.518	5969.62	19147.76	-1.311
Profit	247.42	56.48	0.076	242.71	4048.14	-1.516
Debt	11710.98	495.27	0.263	12155.03	64935.08	-1.239
Age	15.61	7.34	0.756	14.56	14.49	0.007

	<i>Control</i>	<i>Treated</i>
All	3,172,908	931
Matched	889	889
Unmatched	3,136,205	1,527

Appendix 5.3 Balance statistics before and after matching (Both funding vs no funding control group)

Variable	Mean Treated (All)	Mean Control (All)	Std. Diff (All)	Mean Treated (Matched)	Mean Control (Matched)	Std. Diff (Matched)
Distance	0.0012	0.0007	0.517	0.0011	0.0011	0.000
Turnover	6291.14	843.12	0.692	6167.58	25587.45	-2.467
Profit	190.15	56.48	0.165	183.42	1366.25	-1.457
Debt	1462.22	495.27	0.302	1428.69	1654.96	-0.071
Age	13.87	7.34	0.681	13.24	13.14	0.010

	<i>Control</i>	<i>Treated</i>
All	3,172,908	2,180
Matched	2,113	2,113
Unmatched	3,170,795	67

Appendix 5.4 Balance statistics before and after matching (Both funding vs Bpifrance control group)

Variable	Mean Treated (All)	Mean Control (All)	Std. Diff (All)	Mean Treated (Matched)	Mean Control (Matched)	Std. Diff (Matched)
Distance	0.7233	0.6479	1.173	0.7219	0.6987	0.361
Turnover	6291.14	6052.98	0.030	7068.50	4412.06	0.338
Profit	190.15	247.42	-0.071	204.98	103.10	0.126
Debt	1462.22	11710.98	-3.200	1725.52	1413.47	0.097
Age	13.87	15.61	-0.182	14.77	14.74	0.003

	<i>Control</i>	<i>Treated</i>
All	931	2,180
Matched	845	845
Unmatched	86	1,335

Appendix 5.5 Balance statistics before and after matching (Both funding vs ADEME control group)

Variable	Mean Treated (All)	Mean Control (All)	Std. Diff (All)	Mean Treated (Matched)	Mean Control (Matched)	Std. Diff (Matched)
Distance	0.0549	0.0539	0.144	0.0549	0.0549	0.000
Turnover	6291.14	5013.58	0.162	6291.14	6030.98	0.033
Profit	190.15	203.65	-0.017	190.15	230.44	-0.050
Debt	1462.22	1248.10	0.067	1462.22	1565.16	-0.032
Age	13.87	13.08	0.082	13.87	14.76	-0.094

	<i>Control</i>	<i>Treated</i>
All	38,230	2,180
Matched	2,180	2,180
Unmatched	36,050	0

Appendix 5.6 Dynamic treatment effects on firm annual turnover (Bpifrance funding vs no funding control group)

Time to treatment (ref. -1)	Turnover
-9	-0.0151*** (0.0027)
-8	-0.0179*** (0.0024)
-7	-0.0157*** (0.0020)
-6	-0.0147*** (0.0018)
-5	-0.0124*** (0.0014)
-4	-0.0099*** (0.0011)
-3	-0.0067*** (0.0008)
-2	-0.0030*** (0.0004)
0	0.0018*** (0.0004)
1	0.0047*** (0.0008)
2	0.0057*** (0.0011)
3	0.0066*** (0.0015)
4	0.0070*** (0.0019)
5	0.0072** (0.0023)
6	0.0058* (0.0028)
7	0.0056· (0.0033)
8	0.0056 (0.0040)
Observations	574,398
Number of firms	55,243
Year FE	Yes
Firm FE	Yes
Adj. R²	0.967
RMSE	0.173

Note: Standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. “·” denotes significance at 10%.

Appendix 5.7 Dynamic treatment effects on firm employment (ADEME funding vs no funding control group)

Time to treatment (ref. -1)	Employment
-9	-0.0312* (0.0142)
-8	-0.0260* (0.0128)
-7	-0.0240* (0.0115)
-6	-0.0197* (0.0099)
-5	-0.0176* (0.0083)
-4	-0.0146* (0.0065)
-3	-0.0128** (0.0044)
-2	-0.0062* (0.0025)
0	0.0039· (0.0021)
1	0.0078· (0.0041)
2	0.0109· (0.0060)
3	0.0143· (0.0081)
4	0.0201* (0.0101)
5	0.0248* (0.0123)
6	0.0279· (0.0145)
7	0.0280 (0.0171)
8	0.0276 (0.0188)
Observations	11,883
Number of firms	1,304
Year FE	Yes
Firm FE	Yes
Adj. R²	0.985
RMSE	0.114

Note: Standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. “·” denotes significance at 10%.

Appendix 4.X Dynamic treatment effects on firm employment (Both funding vs no funding control group)

Time to treatment (ref. -1)	Employment
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-9	-0.0109 (0.0066)
-8	-0.0116* (0.0058)
-7	-0.0091· (0.0050)
-6	-0.0097* (0.0041)
-5	-0.0089** (0.0032)
-4	-0.0071** (0.0024)
-3	-0.0048** (0.0017)
-2	-0.0026** (0.0010)
0	0.0044*** (0.0011)
1	0.0074*** (0.0020)
2	0.0082** (0.0028)
3	0.0095** (0.0035)
4	0.0102* (0.0041)
5	0.0103* (0.0048)
6	0.0099· (0.0054)
7	0.0114· (0.0062)
8	0.0134· (0.0072)
Observations	33,485
Number of firms	2,520
Year FE	Yes
Firm FE	Yes
Adj. R²	0.988
RMSE	0.107

Appendix 5.8 Dynamic treatment effects (Both certifiers vs ADEME only control group)

Time to treatment (ref. -1)	Debt leverage
-9	0.0502** (0.0195)
-8	0.0479** (0.0174)
-7	0.0455** (0.0156)
-6	0.0390** (0.0141)
-5	0.0379** (0.0129)
-4	0.0305** (0.0115)
-3	0.0241* (0.0099)

-2	0.0218* (0.0108)
0	0.0202*** (0.0033)
1	0.0165** (0.0064)
2	0.0144 (0.0091)
3	0.0114 (0.0144)
4	0.0021 (0.0131)
5	-0.0144 (0.0197)
6	-0.0214 (0.0235)
7	0.1728 (0.2024)
8	0.0006 (0.0260)
Observations	40,717
Number of firms	2,709
Year FE	Yes
Firm FE	Yes
Adj. R²	0.074
RMSE	0.929

Note: Standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. “.” denotes significance at 10%.

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CHAPTER 6: GENERAL CONCLUSION

As I am writing these concluding words, France is experiencing a period of political turbulence which may well lead the country to enter a second consecutive year without an approved public budget. The annual budget law eventually adopted in 2025 already introduced significant spending cuts, including a projected 14% reduction in expenditures related to environmental policies (Senat, 2025). As such, the budget allocated to ecology has decreased from €24 billion in 2024 to €21 billion in 2025. At the same time, a recent report by the Institute for Climate Economics (I4CE, 2025) indicates that, by 2030, climate-related investments will need to increase by €87 billion compared with 2024 levels, €52 billion of which should come from public sector. Yet the trend is moving in the opposite direction, with total public and private climate investments having fallen by 5% in 2024. In this context, the topic of this dissertation takes on a renewed and pressing significance.

6.1. SUMMARY

Building from a multidisciplinary approach, this doctoral dissertation aimed to study the contributions of public-private finance beyond capital allocation at different levels of analysis, throughout different phases and by looking at different level of interactions between public and private finance. Chapter 1 recontextualizes the emergence of impact bonds through the lenses of public management and sustainable finance. It draws on insights from research on Impact Bonds and Outcomes-Based-Contracting that has developed over the past 15 years since the launch of the first Social Impact Bond in the UK, examines the current state and recent trends of the impact bond market, and focuses on its most recent developments through the example of the ADEME EIB experimentation. The chapter also introduces the second empirical setting of this thesis which focuses on public funding schemes developed by governments to support SMEs. These schemes were initially designed to operate at the earliest stages of the SME

finance escalator (Sénat, 2018) and are mainly conceived as ‘stamps of approval’ of a venture, signaling its quality and facilitating its access to subsequent private funding.

Chapter 2, 3 and 4 empirically focus on impact bonds, a public-private direct financing mechanism relying on a pay-for-performance logic to fund social or environmental experimentations that hold the potential to evolve into public policies. Chapter 5 studies a more indirect form of public-private interaction by investigating the certification effect of public funding schemes for SMEs and their potential to attract subsequent public funding.

Chapter 2 explores the role of Impact Bonds as valuation devices for environmental outcomes. Drawing on the French Environmental Impact Bonds (EIB) experiment led by ADEME, it challenges the core assumption that payments by results should be grounded exclusively in public budgetary savings. The chapter shows that such a “cost-saving” logic is ill-suited to environmental issues and argues for the inclusion of non-market valuation approaches, such as the monetization of avoided negative externalities, to capture the full scope of environmental value created. Chapter 3 turns to the organizational dimension of investing in Impact Bonds. It examines how engaging in this hybrid practice creates identity tensions for investors. Mobilizing insights from institutional complexity and micro-organizational literature, the chapter introduces an iterative process of organizational identity work and practice engagement to explain how investors reflect upon and reshape their organizational identities through their participation in hybrid practices. Chapter 4 adopts a quantitative approach to analyze reinvestment dynamics within the Impact Bond market, based on a dataset of 285 investors and 235 contracts (2010–2023). Results highlight syndication as a key driver of re-engagement, with hybrid investors dominated consortiums fostering the most sustained participation. This suggests that the stability of the Impact Bond market depends on its ability to balance divergent investment logics through collaborative structures. Chapter 5 examines the certification effect of public funding for SMEs using novel datasets from ADEME and Bpifrance. Employing

matching and difference-in-differences methods, it shows that combinations of public funding schemes influence subsequent access to debt and equity, depending on the type of instruments and the profile of public funders and opens avenues for research toward the investigation of a green public certification effect conveyed by environmentally-oriented certifiers.

6.2 THEORITICAL CONTRIBUTIONS

Contributions to the literature on outcomes based-contracting and Impact bonds

Chapter 2 advances the theoretical understanding of Impact Bonds by questioning the transferability of their original model to new institutional and policy contexts. It demonstrates that the introduction of environmental objectives exposes the limits of the cost-saving rationale that underpins the IB model, and reveals the need for broader frameworks of value construction. By integrating Willingness-to-Pay (WTP) approaches, the chapter reconceptualizes Impact Bonds as valuation devices—mechanisms through which social and environmental outcomes are made commensurable and investable within public policy.

Chapter 3 offers one of the first empirical attempt to quantitatively study the impact bonds market. It advances the understanding of market dynamics and investor behavior by exploring the determinants of investors' willingness to reinvest. It brings insights from entrepreneurial and sustainable finance to a domain largely framed by public management and introduces a new way to frame impact bonds as but also identity alignment, trust, and learning among investors.

Contributions to the literature on organizational identity

Chapter 2 advances the literature on organizational identity and institutional complexity by examining how engagement in hybrid practices triggers identity work within stakeholders that take the role of investors. By focusing on investors participating in Impact Bond deals, this study brings the analysis of organizational identity into the field of finance, a context where hybridity has been primarily theorized in terms of motives rather than identity work. First, it

conceptualizes identity work as a practice-driven process, showing how hybrid practices serve as sites where organizational identity is tested and potentially transformed. This practice-based approach extends identity scholarship beyond discursive accounts, emphasizing the performative dimension of organizational identity work. Second, it identifies four distinct configurations of identity response to practice, and three mechanisms of practice identity alignment. This typology contributes to ongoing debates on stability and changes in organizational identity (Gioia et al., 2013), demonstrating that hybridization is not a linear or inevitable outcome of hybrid engagement. Finally, by studying financial actors, the paper extends the boundary of identity theory to a traditionally understudied domain. It shows that even organizations anchored in financial logics experience tensions and identity reconfigurations when engaging in socially oriented practices, suggesting that identity work is a key mechanism through which hybridization penetrates market-based fields.

Contribution to the literature in entrepreneurial finance in the public policy domain

Chapter 5 offers promising avenues to advance the literature by analyzing multiple, overlapping signals, showing that the credibility of public certification depends on the interaction and complementarity between different certifiers and instruments rather than their number alone. Moreover, by contrasting a generalist (Bpifrance) and a specialized environmental certifier (ADEME), the paper introduces the concept of a ‘green public certification effect’, highlighting how the domain orientation and environmental distinction of the public certifier could condition private investors’ responses to public signals.

6.3 POLICY AND MANAGERIAL CONTRIBUTIONS

Beyond its theoretical contributions, this dissertation also offers practically grounded insights for policymakers, investors, and practitioners engaged in the design and implementation of OBCs and IBs. Through the analysis of the impact environmental bonds structuring process, chapter 2 provides a roadmap for the design of impact bonds, highlighting strategies to overcome common implementation barriers suggesting ways to broaden current design practices through the integration of Willingness-to-Pay (WTP) approaches. This perspective encourages practitioners to move beyond cost-saving logics and consider the broader social and environmental value generated by interventions. It also opens new avenues for reimagining Impact Bonds beyond the traditional public–private realm. Interestingly, this new insight comes at a time when some private actors are starting to explore the idea of developing impact bonds with corporate private commissioners.

Chapter 3 invites investors to reflect on the importance of including a reflection over organizational identity when introducing a hybrid practice. The chapter show how tensions can materialize when organizational members are not prepared to change and must navigate conflicting expectations.

Chapter 4 offers a first attempt to understand the reinvestment drivers in impact bonds. As a market structure that encompasses a wide diversity of investor profiles, it highlights the central role of collaboration and syndication in sustaining market growth and knowledge transfer. The chapter also shows how hybrid investors act as intermediaries between impact-first and finance-first organizations, facilitating coordination, reducing informational frictions, and contributing to the institutionalization of shared standards and expectations within the market. By emphasizing these relational dynamics, the chapter provides practical insights for building more cohesive and resilient investment consortia in outcomes-based finance. It also gives insights on how to design impact bonds that are more suited for interested counterparties.

Chapter 5 aims to contribute to detangling the multiplicity of signals conveyed by public finance schemes. Public support mechanisms are often criticized for being complex, overlapping, or redundant, making them difficult for firms to navigate and for policymakers to evaluate. By comparing two major French public funders, this study provides insights into how different certifiers interact and how their combined interventions are perceived by private financiers. It could therefore significantly contribute to improving the coherence and readability of public funding architectures, helping policymakers design complementary rather than substitutive instruments, and ultimately strengthening the signaling power of public finance in mobilizing private capital for SMEs.

6.4 LIMITATIONS

This section outlines the main limitations of the dissertation discussed chapter by chapter.

Chapter 2 draws on the single case of the first EIB experiment in France. This in-depth, context-specific focus allowed to gain unprecedented access to the field. I was able to engage with the entire EIB ecosystem in France, including public commissioners, investors, intermediaries, service providers and third-party evaluators. This level of empirical depth provided a practical and detailed understanding of how EIBs were designed and structured in the French context. However, I acknowledge that relying on a single national case limits the generalizability of my findings. To address this, I conducted three additional interviews with five individuals that were involved in EIB ecosystem in the United States. Although they are not included in my study, these comparative insights enabled me to distinguish what is context-specific from what may be generalizable or transferable across contexts. These cross-national comparisons also led to the writing of a dedicated book chapter comparing the French and USA approaches to EIBs, further contributing to the broader understanding of EIBs in multiple contexts.

Another limitation of this chapter lies in my direct and practical involvement in the field. Participant observation may have induced over-identification bias, since prolonged immersion in the research setting can blur the boundary between observer and participant, potentially compromising analytical distance and affecting the researcher objectivity. A second potential bias is role conflict, arising from my dual position as both researcher and representant of the public commissioner in the EIB experiment. This tension became apparent early in the data collection process, as one respondent declined to participate and expressed discomfort with my practitioner involvement. 'Wearing two hats' may also have influenced how respondents interacted with me, potentially shaping their narratives to align with perceived expectations of what the researcher wants to hear, or downplaying critical or sensitive reflections. To mitigate these biases, several safeguards were put in place. First, all of the interviews were conducted jointly with another researcher who had no practical involvement in the ADEME EIB experiment, which helped ensure a sense of neutrality during data collection. During those interviews, my dual role was systematically made explicit to all participants. By clearly stating both my research and practitioner positions, I aimed to foster transparency and reduce social desirability bias. Finally, I maintained a reflexive stance throughout the research process by engaging in ongoing critical self-reflection and regularly discussing methodological and ethical dilemmas with my co-supervisors.

Chapter 3 mobilizes an organizational identity lens to theorize the recursive interplay between hybrid practice adoption and identity construction. While much of the literature on organizational identity and hybridity adopts a longitudinal, single-case design to trace identity formation over time within a single organization, our study follows an inductive, qualitative approach based on multiple organizations. Rather than focusing on a single case, we aimed to identify recurring patterns of interaction between identity and practice across multiple organizations. This approach is methodologically aligned with the work of Kroezen and

Heugens (2012), who similarly developed a process of organizational identity formation through a multi-organizational retrospective lens.

However, the empirical focus of this study is limited to the investor perspective, which may overlook the interpretations and experiences of other key stakeholders involved. This stakeholder asymmetry constrains our ability to fully capture the multi-actor complexity that characterizes impact bonds investing. Additionally, the study is based on retrospective interviews, which are inherently subject to recall bias, selective memory and post-rationalization. Respondents may reconstruct past events through the lens of current perspectives, which can affect the reliability of their narratives. To mitigate this risk, we employed data triangulation by integrating interviews with secondary data in order to cross-validate the findings. There is also a risk of self-selection bias: organizations that agreed to participate may have held particularly reflective or polarized views on impact bonds investing. As a result, those with more nuanced or neutral perspectives may have opted out, potentially skewing our findings toward more extreme positions.

Chapter 4 represents one of the first studies that attempts to quantitatively analyze the dynamics of the impact bonds market. We are fully aware of the methodological limitations of our study. As stated in the paper, impact bonds remain an emerging market structure, largely based on tailor-made deals whose features vary across national contexts. For instance, Australian impact bonds are now considered market-based instruments: they tend to be large-scale deals with IRRs that are capped much higher (up to 30%²⁰) than in continental Europe, as well as a financial design that includes multiple risk profiles and systematic guarantees for investors, allowing a stronger participation and more systematic reinvestment of investors. This market development has been facilitated by the strong commitment of the government and by specific characteristics

²⁰ <https://emmatomkinson.com/2017/07/18/aussie-sibs/>

of the Australian non-profit sector, where service providers are more accustomed to rate card-based approaches and tend to operate as relatively large organizations. In contrast, the French approach to impact bonds has focused on smaller, service-based projects that were not necessarily accustomed to results-based approaches. The French market is also characterized by a high level of concentration, with a single banking institution involved almost everywhere and in every deal. This monopoly may create reluctance among other investors to co-invest alongside this dominant player, leaving limited room for new entrants. Moreover, French impact bonds have primarily operated under a low-risk-low-reward model with IRRs usually under 5%, even as deal sizes and public commissioners' expectations continue to grow. Despite the high level of activity within the French impact bond ecosystem, it may also remain largely self-referential, leading to limited knowledge spillovers and a form of cognitive lock-in.

Despite our attempt to adopt a global view of the impact bonds market, our analysis was clearly constrained by data scarcity and the limited size of our sample, both in terms of deal characteristics and investor participation. We acknowledge the non-exhaustiveness of the investor sample, as it relies on a database of disclosed investors only. It is therefore possible that we missed information that could skew the observed investment patterns, notably cases where investments were made through specific funds or SPVs dedicated to impact bonds leading to an underestimation of their participation in the market.

Chapter 5 has several limitations. First, although the Propensity Score Matching and Difference-in-Differences design mitigates endogeneity concerns, it does not entirely eliminate the possibility of unobserved heterogeneity such as the firm managerial quality or firm networks that may simultaneously influence both access to public funding and subsequent private financing. Second, the dataset only includes direct public funding schemes and excludes guarantees or tax incentives, potentially understating the full spectrum of policy mixes available to SMEs. A further limitation concerns the matching stage, which proved particularly

challenging given the diversity of firms and funding schemes. Achieving satisfactory balance between treated and control firms required multiple iterations due to missing information and inconsistencies in the original administrative databases, which may have affected sample composition and reduced matching precision. Moreover, ADEME funding schemes are not coded at the product level, which prevents distinguishing between different types of interventions and limits the comparability of results with the more detailed Bpifrance data.

6.5 AVENUES FOR FUTURE RESEARCH

Throughout this PhD journey, several research questions have emerged that go beyond the scope of this dissertation. First, regarding research on Impact Bonds and Outcomes-Based Contracting, this dissertation primarily focused on one stakeholder of the IB equation: investors. Future research should further explore the interactions between all stakeholders and how these shape identity construction. In particular, it would be valuable to study how service providers engage in organizational identity work through their participation in IBs, and how these instruments may have transformational effects on their organizational structures, missions, and professional logics.

Second, the concept of the hybrid market introduced in this dissertation is still relatively new and understudied. Further theoretical development is needed to better understand how hybrid markets form and evolve over time; how legitimacy is distributed within them; and under what conditions they can sustain a balance between financial and social value creation. Finally, this dissertation calls for continued research on the performativity of public–private finance mechanisms. Beyond their capital allocation function, these instruments actively shape how actors define, measure, and embody social and environmental value. Understanding these processes in greater depth will be key to assessing the broader institutional and policy implications of public–private finance for sustainable development.

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Titre : La finance publique-privée entre création de valeur, identité organisationnelle et structuration des marchés

Mots clés : Finance publique-privée, Contrats à impact, identité organisationnelle, pratique hybride, marché hybride, effet de certification, aides publiques

Résumé : Les instruments de financement public-privé ne se contentent pas d'allouer des ressources. Ils opèrent également comme des dispositifs de valorisation, de réflexivité, de création de marché et de signal. Ce faisant, ils construisent la valeur, façonnent les identités organisationnelles et influencent les décisions d'investissement ainsi que les trajectoires de marché. À travers une approche multi-niveau, cette thèse montre que les instruments de finance publique-privée fonctionnent non seulement comme des mécanismes d'allocation de capitaux, mais aussi comme des dispositifs de production de sens et de transformation institutionnelle. Au niveau des pratiques, elle examine comment la valeur environnementale est construite dans les contrats à impact environnemental à travers la conception des modèles économiques et les pratiques de valorisation. Au niveau organisationnel, elle analyse comment la pratique d'investissement

dans les contrats à impact déclenche un travail identitaire par la pratique, amenant les organisations à renforcer ou à redéfinir leur identité. Au niveau du marché, elle explore les facteurs de réinvestissement dans les contrats à impact. Enfin, au niveau des politiques publiques, elle étudie l'effet de signal et de certification des subventions publiques octroyées aux PME sur l'accès à des capitaux privés. Ces travaux soulignent ainsi comment la finance publique-privée contribue à reconfigurer les organisations, les marchés et les politiques publiques.

Title: Beyond allocation. Shaping value, organizational identity and markets through public-private finance

Keywords: Public-private finance, Impact Bonds, Organizational identity, Hybrid practice, Hybrid market, public funding scheme, certification effect

Abstract: Public-private financial instruments do more than allocate resources. They operate as valuation, reflexive, market creating and signaling devices. In doing so, they construct value, shape organizational identities, and influence investment decisions and market trajectories. This dissertation investigates these dynamics across multiple levels: it demonstrates how public-private finance instruments function not only as a mechanism of capital allocation but also as a device of meaning-making and institutional transformation. At the practice level, it examines how environmental value is constructed in environmental impact bonds through business model design and valuation practices. At the organizational level, it analyzes how engagement in impact bonds investing triggers a process of identity work through

practice, leading organizations either to reinforce or reshape their organizational identity. At the market level, it explores reinvestment dynamics in the impact bond market, uncovering structural patterns at the deal and investor levels that sustain or limit participation. Finally, at the policy level, it investigates the signaling effect of public funding for SMEs, showing how state support acts as a certification device that shapes firms' access to future private funding. Together, the studies demonstrate how public-private finance mechanisms create meaning and drive institutional transformation.