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“Music is everybody’s business. It’s only the publishers who think people own it.”

John Lennon

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Introduction

THEORETICAL BACKGROUND AND RESEARCH FOCUS

The rapid digitalization over the past decades has generated many opportunities for entrepreneurs and innovators. Digitalization refers to the broad implementation of digital technologies (Setia et al., 2013), which include for example the internet, online messaging, internet of things, or artificial intelligence (Dąbrowska et al., 2022; Plekhanov et al., 2023). To illustrate, the beginning of the 21st century is marked by the development of the internet, and the introduction of newcomers such as Google, Amazon and Netflix, which benefited from this new technology to develop innovative offers. More recently, digital platforms have emerged as significant contributors in the economy, with examples such as Airbnb, Uber and Blablacar. Overall, these new technologies have greatly facilitated interactions between economic actors and enabled new business models to emerge.

However, these rapid technological shifts have also facilitated illegal practices (Bhattacharjee et al., 2003). Take, for instance, the case of digital piracy which emerged in parallel with the democratization of the Internet, or the recent case of stream fraud in the music industry. The informal economy literature investigates these organizations which we refer to as "*informal firms*", defined in this manuscript as firms that carry out illicit works, thus breaking away from formal institutions (Castells & Portes, 1989; De Castro et al., 2014), but which are considered legitimate by substantial groups of consumers (Webb et al., 2009). Investigating the informal economy requires a careful definition of the term as it may encompass various degrees and forms of illegality, from tax evasion to purposefully breaking environmental regulations (Salvi et al., 2022; Schneider & Enste, 2013).

Besides, scholars and managers have rarely considered informal firms as a threat (Darbi et al., 2018; Webb et al., 2013). Indeed, because of their illegal nature, informal firms tend to be smaller and lack organizational structure, access to resources, and legitimacy (Darbi et al.,

2018; Feige, 1990; Hart, 2006; Webb et al., 2009, 2013). Nonetheless, the case of digital piracy suggests that even informal firms can disrupt well-established industries. This highlights a theoretical gap in the informal economy literature, which fails to explain how informal firms can generate disruptive innovations.

Introduced by Christensen and Bower (1996), the concept of disruptive innovation refers to the process by which new entrants develop innovations that, despite initially under-performing incumbents' offers, overtake them because of experience, novelty, and performance improvement (Christensen et al., 2018; Cozzolino et al., 2018). This is possible thanks to the introduction of novel business models, which are systems of interconnected transactions and activities centered on a focal firm, and designed to serve a given product market (Amit & Zott, 2020; Snihur & Zott, 2020; Teece, 2010). Firms like Google or Netflix are typical examples of disruptors that managed to leverage technological changes to develop innovative business models that severely impacted incumbents' performance. Rapid digitalization has sparked interest among scholars in the phenomenon of disruptive innovation, as well as the strategies deployed by incumbent firms to adapt.

However, the lack of research on disruption initiated by informal firms has left managers ill-equipped to face this kind of threat, and the applicability of the adaptation strategies developed by scholars has not been established against illegal practices. For instance, scholars argue that ambidexterity, which consists of innovating while capitalizing on existing resources and knowledge, enables firms to both compete with disruptors while profiting from the established high-end consumer base (Bower, Christensen, 1996; Christensen et al., 2018; Tushman & O'Reilly, 1996). However, incumbent firms can hardly develop competitive innovations against firms that do not play by the same rules. Other studies suggest that incumbent firms should establish alliances with their disruptors (Cozzolino & Rothaermel, 2018; Macher & Richman, 2004). Yet, incumbents risk serious legal backlashes if they

collaborate with firms that break regulations. These observations suggest that these strategies may not be applicable against disruption initiated by informal firms, calling for further investigation of the possible responses to implement against such threat.

Furthermore, the lack of research on informal firms also hinders our comprehension of digital platform governance. Digital platforms refer to a particular type of business model that facilitates interactions between two or more groups of actors, often referred to as providers and users, through a standardized digital interface (Chen et al., 2022; Tarzijan & Snihur, 2024). As their user base grows, digital platforms give rise to ecosystems, which describe interdependent actors' alignment around a digital platform to generate a common value proposition (Adner, 2017; Lingens et al., 2021; Thomas & Autio, 2020). The motives to partake in a platform ecosystem are diverse, resulting in complex multilateral relationships that must be coordinated for a common value proposition to emerge (Jacobides et al., 2018; Kapoor, 2018). Hence, managing digital platforms is challenging due to the necessity of maintaining a competitive value proposition that is created by numerous participants with diverging interests (Adner, 2017; Thomas & Autio, 2020).

Scholar have extensively researched the different governance mechanisms that can be used to manage digital platforms (see Chen et al., 2022 for a summary), such as framing the ecosystem's value proposition (Carrasco-Farré et al., 2022; Snihur et al., 2021), building a common vision through resource sharing (Dattée et al., 2018; Stonig et al., 2022), and preventing misbehaviors with ratings, reviews, and output controls (Chen et al., 2022). However, the emergence of stream fraud in the music industry indicates that, as they grow, digital platforms can also generate negative externalities (Jacobides et al., 2024; Karhu et al., 2024), with the development illegal organizations' being one of them. Yet, despite extensive research on digital platform governance, we still know little about the circumstances and characteristics behind this phenomenon. Because of the prevalence of digital platforms, it is

crucial to gain a better understanding of the conditions that facilitate the emergence of illegal practices, and help managers face this kind of challenge.

Thereby, the informal firms remain understudied in various research streams, despite representing on average 17.2% of developed economies' GDP (Schneider & Enste, 2013; Williams, 2016). We still know very little about how informal firms influence, interact with, or even shape formal ones, and we strongly believe that investigating the sector can enrich many theories and research streams. After all, the development of digital piracy has greatly influenced the way we consume music, with some arguing that it greatly accelerated the democratization of streaming services. As of today, illegal practices keep on impacting the music industry, notably with the development of stream fraud which biases streaming platforms algorithms and disrupts their royalty redistribution processes. However, the mechanisms behind these phenomena are not yet rigorously theorized, highlighting various gaps in the literature on the informal economy, disruptive innovation, and digital platform governance. In this manuscript, we thus pose the following overarching research question: *How do illegal practices emerge and disrupt established industries in contexts of rapid digitalization?*

RESEARCH STRATEGY

Case selection

To bring an answer to our overarching research question, we theoretically sampled the music industry for our research due to various factors. First, more than two decades ago, the music industry was heavily disrupted by the development of digital piracy. This phenomenon led to important monetary losses and job cuts, forcing incumbents to adjust their strategies. According to the IFPI, the revenues of the industry went from $24B in 2001 to $14.2B in 2014, while consumption habits shifted from a traditional ownership paradigm to an access-based model. Yet, after years of downturn, the industry managed to curb digital piracy and generate growth, mostly thanks to the emergence of streaming platforms. As such, the music industry is the ideal context to understand how informal firms generate disruption on well-established

industries through the case of digital piracy (Webb et al., 2009), but also how incumbents strategize and adapt to the disruptive power of informal firms, a context that remains unexplored in the literature (Birkinshaw, 2022; Cozzolino & Rothaermel, 2018; Eggers & Park, 2018).

In addition, the music industry reorganized itself around streaming platforms, which managed to inject revenues after years of downturn due to digital piracy. Nowadays, users can listen to any artist they want thanks to streaming services such as Spotify or Deezer, who act as digital platforms as they facilitate interaction between providers (artists) and users (their fans) (Chen et al., 2022; Tarzijan & Snihur, 2024). Despite enabling economic recovery, streaming platforms have also generated negative externalities, impacting artists in particular, such as difficulties in capturing revenues and overwhelming competitive pressures, which resulted in the emergence of stream fraud. Therefore, this setting is the ideal case to gain insights on the emergence of illegal behaviors in digital platforms' ecosystems, which holds promising contributions to the literature on platform governance.

Finally, we also selected the music industry for practical reasons. Indeed, the historical aspect of digital piracy implies the presence of widely and publicly available data over the years, which facilitates data collection and longitudinal methods. Thanks to major labels' annual reports and numerous institutional reports, we can easily track the evolution of incumbents' strategies over the years in parallel with environmental shifts with greater precision and reliability. Besides, as the music industry is still being impacted by the presence of illegal practices, this setting also enables us to provide timely, novel and relevant insights, while reducing memory bias when conducting interviews.

Data collection

The data collected for this thesis comprise both primary and secondary sources of data. Primary data consist of 38 semi-structured interviews carried out with employees from various firms and institutions in the music industry, amounting to a total of 25 hours and 6 minutes of

transcripts. These interviews were crucial to understand the strategies used by actors to face digital piracy in the past, but also the current state of the music industry, the tensions that persist and how these influence the adoption of stream farms. In parallel, secondary data was collected with annual reports, institutional studies and web pages, which enabled us to triangulate the insights extracted, mitigate memory biases in interviews, and include a temporal dimension in our work.

Data analysis

Various methods of analysis were used for the empirical studies in this manuscript. We analyzed interviews following the Gioia method, which is particularly well suited for exploratory works, and enables greater flexibility and proximity with respondents' opinions. This method generated precise insights on the tensions that remain in the music industry. We also used a qualitative content analysis (White & Marsh, 2006) to analyze annual reports and stream farm's web pages. For instance, this method has been particularly useful in our longitudinal analysis of Universal Music Group's annual reports, and enabled us to visualize the evolution of the strategy the group has implemented over the years against digital pirate websites. Table 1 summarizes the data collected and the analysis techniques employed.

Epistemology

In this thesis, we adopt an interpretivist approach to research, drawing insights from the analysis of semi-structured interviews and archival documents (Packard, 2017). This approach is well suited to understanding how managers perceive and react to external shocks, as it emphasizes the understanding and interpretation of respondents' answers within a given context (Bluhm et al., 2011). However, we do not rely solely on interview interpretations to generate knowledge. To better contextualize interviewees' responses, we triangulate our findings with secondary quantitative data, such as institutional studies on the proportions of digital piracy, allowing a more fine-grained understanding of the phenomena under study.

Table 1. Data collection

Data type	Data source	Number	Detail
Primary	Semi-structured interviews	38	Institutions: 19 Platforms: 3 Labels: 6 Managers: 2 Artists: 1 Experts: 4 Booking agencies: 1 Marketing agencies: 2
Secondary	Annual reports	21	Universal Music Group
	Institutional studies	22	IFPI: 16 OECD: 3 EUIPO: 2 CNM: 1
	Stream farm web pages	21	Famups: 1 Get Viral: 2 Growthoids: 5 Sides Media: 6 Spotify storm: 5 Use Viral: 1 View Expert: 1

Lastly, we employ an inductive approach to research, using the data collected to explain phenomena that existing theories and models fail to properly describe (Gioia et al., 2013). Notably, we observed various anomalies in the data that existing theories do not fully explain, such as the emergence of disruption by informal firms and digital parasites. To address these anomalies, we developed "plausible" explanations based on insights extracted from the collected data (Bamberger, 2019; Sætre & Van De Ven, 2021). For instance, in Study 3, we aim to provide explanations for the emergence of digital parasites in platform ecosystems. Through our data collection, we identified the presence of stream fraud and recognized that existing models on platform governance did not adequately explain this phenomenon. Consequently, we explored the factors contributing to the development of stream fraud to create a general theoretical model that describes the emergence of digital parasites.

STUDIES

This dissertation consists of three distinct studies that, when taken together aim at providing an answer to the overarching research question and contribute to discussions on the consequences and management of digitalization. Despite having unique and independent research questions and focuses, each study tackles different aspects of the phenomenon of informal firms, which many theories and literature have overlooked so far. Bearing this observation in mind, we studied how informal firms generate disruption, how incumbents respond, and how digital platforms can generate opportunities for their development. With this thesis, we hope to contribute significantly to various streams of literature and encourage future research on the informal economy and the negative externalities related to rapid innovation. The following sections provide an overview of these three studies with their theoretical anchor, methodologies, and contributions. All these elements are summarized in Table 2.

Study 1: Towards a Theory of Informal Disruption

The rapid technological developments that characterizes the beginning of the 21st century has sparked great interests among scholars in the concept of disruptive innovation (Ansari et al., 2016; Burgelman & Grove, 2007; Garud et al., 2022; Snihur et al., 2018). Disruptive innovation refers to the process by which new ventures propose innovative offerings that can harm incumbent firms' revenues. Despite being initially less competitive than incumbents, new ventures' manage to propose competitive offerings by leveraging technological change in order to innovate existing business models (Christensen et al., 2018; Cozzolino et al., 2018). Business model innovation refers to an activity system that is novel to the market space in which a firm operates (Snihur and Zott, 2020), and is as such critical in the emergence of disruption.

While the received literature on disruptive innovations is rich, it has rarely considered informal firms as drivers of disruption, hindering our understanding about the process by which such firms generate disruptive innovations. The case of digital piracy indicates that, despite

Table 2. Studies Overview

	Study 1	**Study 2**	**Study 3**
Title	Towards a Theory of Informal Disruption	Incumbents' Reaction to Disruption Emerging with the Informal Economy	Digital Parasites: Symptoms of Poor Governance in Platform Ecosystems?
Focus	Disruptive innovations emerging with informal firms	Incumbent firms' responses to disruptive innovations by informal firms	Illegal practices' emergence in platform ecosystems; platform design
Research question	How does disruptive innovation unfold when it is initiated by informal firms?	How do incumbents respond to disruption initiated by informal firms?	How do parasites emerge in digital platforms?
Literature base	Disruptive innovation; informal economy	Disruptive innovation; informal economy; incumbents' adaptation to discontinuities	Platform ecosystem governance
Methodology	Theoretical/Conceptual	Longitudinal qualitative case study	Qualitative case study
Data collected	None	Annual reports; interviews	Interviews, institutional reports; web pages
Observation period	None	2000 - 2021	2020-2024
Data analysis	None	Qualitative content analysis	Gioia (2013); qualitative content analysis
Theoretical contributions	Disruptive innovation theory; Informal economy; Business model innovation	Adaptation to discontinuities; Disruptive innovation theory; Informal economy	Digital platforms; Business model; Ecosystem governance
Status	Published in R&D Management Journal	Presented at DRUID23 and SMS2023	Presented at DRUID24

being largely considered disadvantaged against formal ones (Darbi et al., 2018; Webb et al., 2013), informal firms can de facto generate disruptive innovations as well. We argue that due to rapid technological advancements resulting in institutional voids (Bhattacharjee et al., 2003), opportunities emerge for entrepreneurs to develop illegal activities and generate revenues with reduced legal risks (Darbi et al., 2018; London et al., 2014; Webb et al., 2014). Furthermore, the unique characteristics of informal firms regarding entrepreneurial motivations, access to resources and legitimacy may have important implications for the whole process of disruption. To investigate this phenomenon, we ask the following research question: *How does disruptive innovation unfold when it is initiated by informal firms?*

To answer this question, we bridge two streams of research, namely disruptive innovation and the informal economy. We introduce the concept of informal disruption, defined as the process during which entrepreneurs from the informal economy develop new value propositions that eventually threaten incumbents' dominance. This process is made possible by leveraging technological changes (e.g., digitization) and most importantly avoidance of regulation (taxes, security norms, or intellectual property laws), to launch novel business models (e.g., file-sharing platforms). We also theorize about the drivers of disruption as well as the competitive dynamics that may emerge between formal firms and informal disruptors (which are informal firms that generate disruption on incumbents) and develop five related propositions. Most importantly, we theorize about the major role of institutions as drivers of disruption, as well as their limiting and supporting influence on incumbents' adaptation strategies. We also suggest that informal disruptors must formalize their activity by shaping formal institutions to fit their activity to both gain formal protection, maintain their competitive edge, and sustain growth.

This paper significantly contributes to strategic management research, particularly to the literature on disruptive innovation (Christensen et al., 2018; Cozzolino et al., 2018). In this study, we bring theoretical evidence that the existing models developed by scholars may not

fully capture disruption when it is initiated by informal firms. Specifically, we underscore important institutional factors at play, which profoundly influence how the process unfolds in this context, from the inception to the proliferation of disruptive business model innovations. This is important, as rapid technological changes may lead to regulatory uncertainty (Bhattacharjee et al., 2003) that informal firms can leverage to enhance, scale and protect their innovations. In this context, the competitive strategies that formal incumbents can deploy to adapt (Cozzolino & Rothaermel, 2018; Eggers & Park, 2018; Weber et al., 2019) must therefore be reevaluated to compensate the critical lack of institutional support.

Furthermore, the insights generated by this work call for further research on the disruptive power of informal firms, especially regarding the boundary conditions of informal disruption, related to both the institutional context and the industry-specific factors. Indeed, informal firms have been often considered disadvantaged against their formal counterparts (Darbi et al., 2018; Webb et al., 2014). Yet, this study suggests otherwise, and shows what factors enable informal firms to circumvent their limitations. Lastly, we hope to encourage with this paper more research at the crossroad between the formal and the informal economies, as the interplay between these two areas can generate valuable contributions for various research streams.

Study 2: Incumbents' Reaction to Disruption Emerging with the Informal Economy

How do small new ventures manage to disrupt established leaders? One phenomenon explaining the success of these new disruptive ventures lies in incumbents' inertia (Gilbert, 2005; König et al., 2013, 2021), a topic that scholars have looked into in order to explain the mechanisms complicating their effective adaptation. Indeed, researchers have found that major challenges emerge for incumbents when it comes to implementing radical changes necessary for surviving disruption (Christensen, 2006; Eggers & Park, 2018; Gilbert, 2005; Kumaraswamy et al., 2018). For instance, factors such as resource and routine rigidity (Gilbert, 2005), or internal conflicts (Macher & Richman, 2004) hinder the implementation of the

necessary adjustments. Besides, because disruptive innovations are initially targeted at the low end of the market (Christensen et al., 2018), incumbents lack commercial incentives to directly compete against disruptors at early stages (Cozzolino et al., 2018; Eggers & Park, 2018), which delays their responses.

Nonetheless, incumbents can implement various strategies that help overcome inertia. For instance, ambidexterity consists of innovating via a new independent unit while capitalizing on existing resources and knowledge in existing units. This approach enables incumbents to compete with disruptors while profiting from the established high-end consumer base (Bower, Christensen, 1996; Christensen et al., 2018; Tushman & O'Reilly, 1996). Incumbents can also establish alliances with their disruptors through acquisition, which enables them to quickly obtain the necessary knowledge and resources without facing internal tensions and rigidity (Cozzolino et al., 2018). Finally, migration consists in applying existing resources and knowledge to a whole new market segment or industry, enabling incumbents to capitalize on their expertise and technology in order to conquer and harness new customer bases (Birkinshaw, 2022; Ho & Chen, 2018).

Despite extensive research, the applicability of these strategies has not been tested against disruption initiated by informal firms, and calls have been made by scholars to test incumbents' adaptation strategies in unexplored contexts (Cozzolino & Rothaermel, 2018). Given that informal firms are illegal, we must take into consideration some complex institutional factors that may assert strong influence on the competitive dynamics between incumbents and disruptive informal firms (which we refer to as *informal disruptors*). For instance, the difficulties in protecting intellectual property and enforcing regulations due to rapid technological shifts (Bhattacharjee et al., 2003) creates an unbalanced competition that favors informal disruptors. Yet, the received literature does not clearly theorize the strategies incumbents can implement to overcome such challenges, leaving managers ill-equipped to face

such a threat. Therefore, we ask in the second paper: *How do incumbent firms respond to disruption initiated by informal firms?*

We conducted a longitudinal case study of a major music label (Universal Music Group) that had to navigate the disruption generated by digital piracy. The data collected comprise the focal firms' annual reports from 2000 to 2021, which corresponds to the period of the development and dissipation of digital piracy in the music industry. For each annual report, we ran a qualitative content analysis (White & Marsh, 2006) focusing on the strategies implemented against digital piracy. In addition, we triangulated data with reports from various institutional organizations (OECD, EUIPO or the International Federation of the Phonographic Industry) to better contextualize the strategy of the focal firm within its environment. With this work, we reveal that certain strategies recommended in the literature (Birkinshaw, 2022; Cozzolino & Rothaermel, 2018; Macher & Richman, 2004), like ambidexterity, may be ineffective against informal disruptors due to legal constraints. We also suggest that incumbents should instead adopt a mix of market and non-market strategies that simultaneously reduce informal disruptors' appeal and increase legal alternatives' competitiveness.

Overall, this study enriches our understanding of strategic management, especially regarding incumbents' reaction to disruption (Cozzolino et al., 2018; Eggers & Park, 2018; Kammerlander et al., 2018)**,** in the context of competition against informal firms (Darbi et al., 2018; Iriyama et al., 2016; Miric & Jeppesen, 2020). This study highlights the importance of considering the disruptive potential of informal firms as an integrative part of the competitive landscape, despite usually being considered harmless (Darbi et al., 2018; Ketchen et al., 2014; Webb et al., 2014). Another important contribution of this study relates to the influence of the informal economy on the adoption of innovations introduced by newcomers. Indeed, we defend that when initiated by informal firms, disruption prepares a fertile soil for new formal venture creation, as it pushes incumbents to support the introduction of new ventures in their industry

and accelerate their development and adoption. This highlights the transformative impact of informal disruptors and the strategic realignment needed for incumbents and new ventures to thrive, answering calls to better understand the impacts of the informal economy on entrepreneurship and society (Salvi et al., 2022).

Study 3: Digital Parasites: Symptoms of Poor Governance in Platform Ecosystems?

Digital platforms refer to a particular type of business model describing a standardized digital interface that facilitates interactions between two or more groups of actors and parties (Chen et al., 2022; Tarzijan & Snihur, 2024). As platforms grow and attract users, we observe the formation of platform ecosystems, defined as the alignment of heterogeneous and interdependent participants around a digital platform (Jacobides et al., 2018), interacting to generate a focal value proposition cannot be generated individually (Adner, 2017; Lingens et al., 2021; Thomas & Autio, 2020). Scholars have identified different motives to partake in a platform ecosystem, such as accelerated technology dissemination (Murthy & Madhok, 2021; Palmié et al., 2020), easier access to key resources (Pushpananthan & Elmquist, 2022), and increased legitimacy (Taeuscher & Rothe, 2021; Thomas & Ritala, 2022). As such, by facilitating interactions and transactions within their ecosystems, platforms can generate important benefits for numerous and diverse participant firms and support economic development (Graham et al., 2017).

Stakeholder theory suggests that considering a wide array of stakeholders, in addition to shareholders, enable greatly improve firms performances (Freeman et al., 2020; Mahajan et al., 2023; Mitchell et al., 1997). In the context of digital platforms, this implies that platform owners must deploy strict governance mechanisms in order to generate a common value proposition collectively with numerous and heterogeneous participants. In this regard, various mechanisms have been identified by scholars to help platform owners manage their ecosystem (see Chen et al., 2022 for a review). For instance, crafting a clear and inclusive value proposition (Carrasco-

Farré et al., 2022; Ricart et al., 2020; Snihur et al., 2021), building a shared understanding of its purpose through information sharing (Chen et al., 2022; Dattée et al., 2018; Stonig et al., 2022), and ensuring adequate remuneration (John & Ross, 2022) are pivotal in aligning participant's effort. Indeed, without proper governance, digital platforms may end up generating negative externalities, including pollution, resource depletion, interest misalignment, and user dissatisfaction (Daymond et al., 2023; Jacobides et al., 2024; John & Ross, 2022; Wareham et al., 2014).

However, research calls are still being made by scholars to investigate ecosystem failures (Jacobides et al., 2024), as well as the connection between digital platforms' features and their ecosystem life cycle (Autio & Thomas, 2014; Chen et al., 2022; Scaringella & Radziwon, 2018). The recent case of stream fraud in music suggests that, when negative externalities persist and governance mechanisms are lacking, platform complementors may collaborate with illegitimate organizations (which we refer to as *digital parasites*) to artificially boost their productivity and compensate the difficulties faced. We define digital parasites as strategic actors that engage in illicit behaviors to extract value from a platform's ecosystem, capture it, and redistribute some of it to other actors. Yet, the received literature fails to explain how such organizations emerge, operate, and grow within digital platform ecosystems, calling for more research to completely understand the mechanisms behind that phenomenon. We therefore ask the following research question: *How do digital parasites emerge in digital platform ecosystems?*

Accordingly, we conducted a case study of streaming platforms in music, focusing on their design, the negative externalities in their ecosystems, and the development of stream fraud (orchestrated by stream farms). We conducted 38 semi-structured interviews with employees from various organizations in music, complemented by the analysis of stream farms' web pages, which are the organizations carrying out stream fraud. We introduce the concept of digital

parasites and elucidate the conditions of their emergence. First, we show how poor platform governance, as it generates negative externalities, pushes complementors to collaborate with digital parasites. Second, we explain how the business model adopted by digital platforms may pave the way for parasite emergence, especially when their value redistribution logic to complementors is based on their market share, as this exacerbates disparities and encourage cheating. Finally, we bring empirical evidence that the persistence of negative externalities within a platform ecosystem generates opportunities for illegitimate actors. Through our analysis of stream farms' value proposition, we show that digital parasites develop their offers by almost perfectly mirroring the tensions present in the platform's ecosystem.

Studying stream fraud has allowed us to contribute to the research on digital platform governance. Recently, scholars have begun to place greater emphasis on platform and ecosystem failures, recognizing that these areas, though understudied, can offer valuable insights (Jacobides et al., 2024; Scaringella & Radziwon, 2018). By elucidating the mechanisms behind the emergence of digital parasites, our study transcends the mere identification of negative externalities (Karhu et al., 2024; Mahajan et al., 2023), providing insights into the reactions of ecosystem participants to persistent tensions. In such contexts, participants may not simply migrate to another ecosystem, but may instead seek alternatives, whether legitimate or not, to mitigate the challenges they face.

Moreover, our findings contributes to the literature on business model by addressing calls for a deeper understanding of the relationship between platforms' business models (Autio & Thomas, 2014; Snihur & Markman, 2023), governance mechanisms (Chen et al., 2022), and the performance of their ecosystem (Dąbrowska et al., 2022; Karhu et al., 2024). We demonstrate that the business models adopted by platform owners and the value proposition they offer (Carrasco-Farré et al., 2022; Ricart et al., 2020; Snihur & Bocken, 2022) can be important agents for the emergence of parasites. This suggests that business models should be

regarded not merely as mechanisms for optimizing costs and revenues to enhance profitability, but also as powerful tools for governing platform ecosystems.

Finally, this study encourages managers to foresee the potentially negative externalities of their innovations. While innovating by essence aims at benefiting society, recent works have underscored the importance to equally consider their potentially negative consequences on society (Zankl & Grimes, 2024). Indeed, while past studies suggest that digital platform benefit actors situated in the long-tail (Brynjolfsson et al., 2011; Zentner et al., 2013), more recent work suggests that featuring on platforms makes small complementors fight a hopeless battle for consumers' attention against big and resourceful competitors (Meyer et al., 2024). With the case of music streaming platforms, we go beyond by showing how market-based value redistribution logics exacerbate disparities, reduce value capture, and instigate some complementors to collaborate with illegitimate organizations.

DISSERTATION OUTLINE

This dissertation is composed of three key studies that, when taken together, aim at answering the overarching research question: *How do illegal practices emerge and disrupt established industries in contexts of rapid digitalization?* In the first place, we develop each study independently. Then, we summarize the findings and contributions of the three studies, detailing how they contribute to research on disruptive innovation, the informal economy and digital platform governance. Finally, we conclude this thesis by explaining how the insights generated enable us to answer the overarching research question, as well as the related theoretical and practical contributions.

Paper 1. Towards a Theory of Informal Disruption

ABSTRACT

What are the implications of disruption originating in firms using illegal practices, which we refer to as informal firms? Since its development by Clayton Christensen, there has been increasing interest in disruptive innovation theory among innovation and management scholars. Yet, the disruptive power of informal firms remains understudied. We theorize informal disruption, which we define as the process through which entrepreneurs engage in business model innovation based on new technology and avoidance of regulation. Institutional voids and institutional incongruence facilitate scaling of such new business models. We offer a process model of informal disruption emphasizing business model formalization as a key strategy for informal disruptors and non- market strategies such as collective lobbying and consumer education as incumbent strategies when competing with informal disruptors. Our process model highlights the role of formal and informal institutions during informal disruption, which can both facilitate informal disruptors' scaling and limit incumbents' adaptation strategies. We discuss the implications of studying informal disruption for disruptive innovation, business model, and informal economy research.

Keywords: Disruptive innovation process, informal economy, incumbent firms, business model innovation, institutions

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INTRODUCTION

Academic interest in the phenomenon of disruptive innovation, fueled by rapid technological changes, has been increasing over the last three decades (Christensen et al., 2018). Disruptive innovation refers to the process by which new ventures propose innovative offerings that can harm incumbent firms' revenues, taking advantage of technological change and business model innovation (BMI). Initially, new ventures propose products or services that underperform incumbents, but over time they increase their market share due to performance improvement and novelty (Christensen et al., 2018). Novelty can be embodied in BMI, or an activity system that is novel to the market space in which a firm operates (Snihur and Zott, 2020). Studies have provided empirical evidence on how disruptive innovators emerge and gain market share (Burgelman and Grove, 2007; Ansari et al., 2016; Snihur et al., 2018; Garud et al., 2022) and examined possible incumbent responses to such threats. Despite facing difficulties in adaptation (Gilbert, 2005; Eggers and Park, 2018), incumbents can opt for strategies such as acquisitions of disruptors, ambidexterity, or alliances (Gilbert, 2005; Cozzolino and Rothaermel, 2018; Kammerlander et al., 2018).

However, these studies typically focus on legal players and do not recognize the disruptive potential of firms in the informal economy. Such firms are characterized by activities that are illegal (e.g., avoidance of taxes or other intellectual property laws), yet considered legitimate by many consumers (North, 1990; Webb et al., 2009). Legitimacy refers to the assumption that an entity's actions are desirable or appropriate within some socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995). Piracy platforms are one example of businesses originating in the informal economy (Darbi et al., 2018). Napster, The Pirate Bay, Megaupload, and Limewire were all platforms used by millions of consumers despite their illegality. They significantly impacted incumbents' profits in the music industry. Consequently, in this paper we use the term *informal firms* to refer to businesses whose core activity requires

breaking established regulations, but this activity is considered legitimate by large groups of consumers. It is important to differentiate between the activities of informal firms and activities like drug dealing or prostitution, which are also illegal but considered illegitimate by most people, and are thus part of the *renegade economy* [1](Webb et al., 2009), which is outside the scope of this paper.

Though inherently challenging to study, various papers have advanced our understanding of the informal economy and estimated its average size to be 17.2% of developed nations' GDP (Schneider and Enste, 2013; Williams, 2016). Larger informal economies are generally associated with under- development, greater corruption as well as lower human development index and economic growth (Williams, 2016; OECD, 2019). One explanation lies in informal entrepreneurship being primarily necessity- driven due to lack of formal institutional support, which reduces entrepreneurial productivity (Fredström et al., 2021) and economic contribution. Yet, the informal economy is also viewed as a source of innovation in developed economies (Choi and Perez, 2007; Gao and McDonald, 2022) and informal entrepreneurs as potential agents for institutional change (Garud et al., 2007; Battilana et al., 2009; Cavotta and Phillips, 2022; Salvi et al., 2022).

Despite studies examining the impact and possible strategic responses to the development of digital piracy (Iriyama et al., 2016; McCann and Bahl, 2017; Eisend, 2019; Miric and Jeppesen, 2020), to our knowledge, the informal economy has not been rigorously theorized in the context of disruptive innovation. This is crucial as rapid technological changes alongside regulatory voids have generated increased uncertainty and difficulties for managers to adapt (Williams, 2016). While the informal economy and its links with formal businesses remain

[1] What is considered formal, informal, and renegade depends on the regulations in place, the power of regulative authorities and local cultures and norms. Thus, it is important to specify the institutional context in which we study informal disruptors. In our case, we study informal competition in the context of Western countries such as the United States and the European Union.

understudied, especially in developed countries (Ketchen et al., 2014; McCann and Bahl, 2017), it represents a rich terrain for innovation scholars. Neglecting its richness in terms of theoretical implications for the disruptive innovation literature could hinder our understanding of the phenomenon (Ketchen et al., 2014; Iriyama et al., 2016; McCann and Bahl, 2017; Darbi et al., 2018). Several elements remain unexplored, especially regarding the emergence of disruptive innovations originating with informal firms, the role of institutions (formal and informal) in this context, and the implications for the models and adaptation strategies that have been proposed by disruptive innovation scholars. Therefore, we pose the following research question: How does disruptive innovation unfold when it is initiated by informal firms?

In response, we blend disruptive innovation theory with insights derived from the informal economy literature to offer a process model of informal disruption. Informal firms differ from formal firms in terms of structure, resources, motivation, and legitimacy (Feige, 1990; Hart, 2006; Webb et al., 2009, 2013; Darbi et al., 2018), which impacts the dynamics when disruption emerges from the informal economy. We define the concept of *informal disruption* as the process during which entrepreneurs from the informal economy develop new value propositions. This is made possible by leveraging technological changes (e.g., digitization) and most importantly avoidance of regulation (taxes, security norms, or intellectual property laws), to launch novel business models (e.g., file- sharing platforms) that eventually threaten incumbents' dominance. We theorize about the drivers for disruptors' scaling, namely institutional voids and incongruence, the important role played by institutions, the distinct strategic pathways for business model formalization in later stages, and incumbent responses. We adopt a phenomenon- based theorizing approach (Fisher et al., 2021) anchored in the case of digital piracy and pirate platforms (such as Megaupload, Napster or The Pirate Bay), which disrupted many incumbents in the music and film industries.

We augment knowledge about disruptive innovation with insights from the informal

economy. First, we shed light on the role of institutions (formal and informal), understudied in disruptive innovation literature (Christensen et al., 2018; Cozzolino et al., 2018; Schmidt and van der Sijde, 2022), as both formal custodians and inadvertent shapers during informal disruption. Second, we delineate the strategic pathways of informal disruptors that can end up proactively formalizing their business model and become institutional entrepreneurs to maintain their competitive advantage over incumbents. These are useful insights for disruption and business model scholars that have often undervalued the impact of diverse institutional environments on disruption and business model innovation. Finally, our paper answers calls for additional research on the informal economy (Ketchen et al., 2014; Iriyama et al., 2016; Darbi et al., 2018; Nason and Bothello, 2022), especially regarding the interactions between formal and informal firms in developed economies. By doing so, we highlight the similarities and differences between classic (formal) and informal disruption and suggest directions for future research to build a foundation for a theory of informal disruption.

DISRUPTIVE INNOVATION AND THE INFORMAL ECONOMY

Disruptive innovations are those that initially underperform incumbents' offerings, but propose novel features valued by a new consumer base and enabled by new technologies and BMI. These innovations "are typically cheaper, simpler, smaller, and, frequently, more convenient to use" (Christensen, 1997, p. xv). New technologies often create new possibilities to generate revenues for firms, embodied in new business models (Christensen, 2006). Business models are defined as systems of interconnected, potentially boundary- spanning transactions and activities centered on a focal firm and designed to serve a given product market (Amit and Zott, 2001, 2020; Teece, 2010). Innovation in business models introduces activities and structures that are new to the world, the product market, or the focal firm (Snihur et al., 2021). Business models can lead to important competitive advantages (Zott and Amit, 2008; Leppänen et al., 2021) and impact their market (Cozzolino et al., 2018; Snihur et al., 2018; Peprah et al.,

2021). Entrepreneurs can use new technologies to develop powerful business models, such as online marketplaces or platforms (McDonald and Eisenhardt, 2020) that can potentially disrupt incumbents. In line with the Schumpeterian theory of creative destruction, disruptive innovations are often promoted by new actors that can destroy old ones (Schumpeter, 1942).

Disruptive innovation theory suggests that these innovations spread by increasing their performance over time thanks to testing, experience and, in the case of platforms, network effects (Helfat and Raubitschek, 2018; Rietveld and Schilling, 2021; Garud et al., 2022). Another reason why disruptive innovations are successful is incumbents' inertia and their difficulties in reacting in a timely manner. There are various reasons why incumbent firms can initially neglect disruptive innovations (Gilbert, 2005; Christensen, 2006; for a summary, see Eggers and Park, 2018; Kumaraswamy et al., 2018). First, in addition to the underlying uncertainty associated with novelty adoption and spread, disruptive innovations typically target the less profitable consumers, which are not financially attractive for incumbent firms (Eggers and Park, 2018). Second, improving existing offers represents a more attractive strategy as it enables incumbents to keep the most profitable customers and leverage existing capabilities (Gilbert, 2005). Finally, following a fundamentally new path for an incumbent with a long history can also generate organizational conflicts, impeding effective adaptation (Sirmon et al., 2011; Benner and Tripsas, 2012; Eggers and Kaplan, 2013; Eggers and Park, 2018). These factors slow down incumbents' responses and generate challenges in implementing necessary changes.

Despite such challenges, scholars have also investigated possible adaptation strategies for incumbents to react to disruptive threats (Bower and Christensen, 1996; Christensen, 2006; Cozzolino et al., 2018; Cozzolino and Rothaermel, 2018; Eggers and Park, 2018; Wenzel et al., 2020). Empirical studies suggest that the main possible market responses for incumbent firms are ambidexterity, alliances and/or acquisition of disruptors, and coopetition. Ambidexterity

consists in developing a novel business model around new technologies to attract and capture new users while maintaining routines to retain a customer base that still values existing offerings (Bower and Christensen, 1996; Tushman and O'Reilly, 1996; Christensen et al., 2018). Alliances and/or acquisition are useful when an incumbent wants to acquire new technology or knowledge and assimilate them more efficiently (Kapoor and Klueter, 2015; Cozzolino and Rothaermel, 2018; Cozzolino et al., 2018; Eggers and Park, 2018). Finally, coopetition enables various incumbents to join forces to develop innovations and accelerate their adoption by consumers (Cozzolino and Rothaermel, 2018; Thelen, 2018).

Yet, the received literature on disruptive innovation does not account for disruptive firms originating in the informal economy. Investigating the informal economy requires a careful definition of the term as it may encompass various degrees and forms of illegality, from tax evasion to purposefully breaking safety or environmental regulations (Schneider and Enste, 2013; Salvi et al., 2022). In this paper, we refer to the informal economy as the aggregation of firms that carry out illicit works, thus breaking away from formal institutions (Castells and Portes, 1989; De Castro et al., 2014), but which are considered legitimate by substantial groups of consumers (Webb et al., 2009). Institutions, as the "humanly devised constraints that shape human interaction" (North, 1990), are central to the understanding of informal firms, and can be categorized into either *formal* or *informal* institutions. *Formal institutions* refer to laws and regulations that are communicated via widely and officially accepted channels, as well as the apparatus enforcing them (Helmke and Levitsky, 2004; Webb et al., 2009; Nason and Bothello, 2022), defining *legally* acceptable behaviors. On the other hand, *informal institutions* refer to norms, values, and beliefs that define *socially* acceptable behaviors (Helmke and Levitsky, 2004; Webb et al., 2009; Minbaeva et al., 2022) and are unwritten and communicated via unofficial channels. Therefore, informal firms develop core activities that break away from formal institutions (thus illegal), but which are aligned with informal institutions (thus

legitimate).

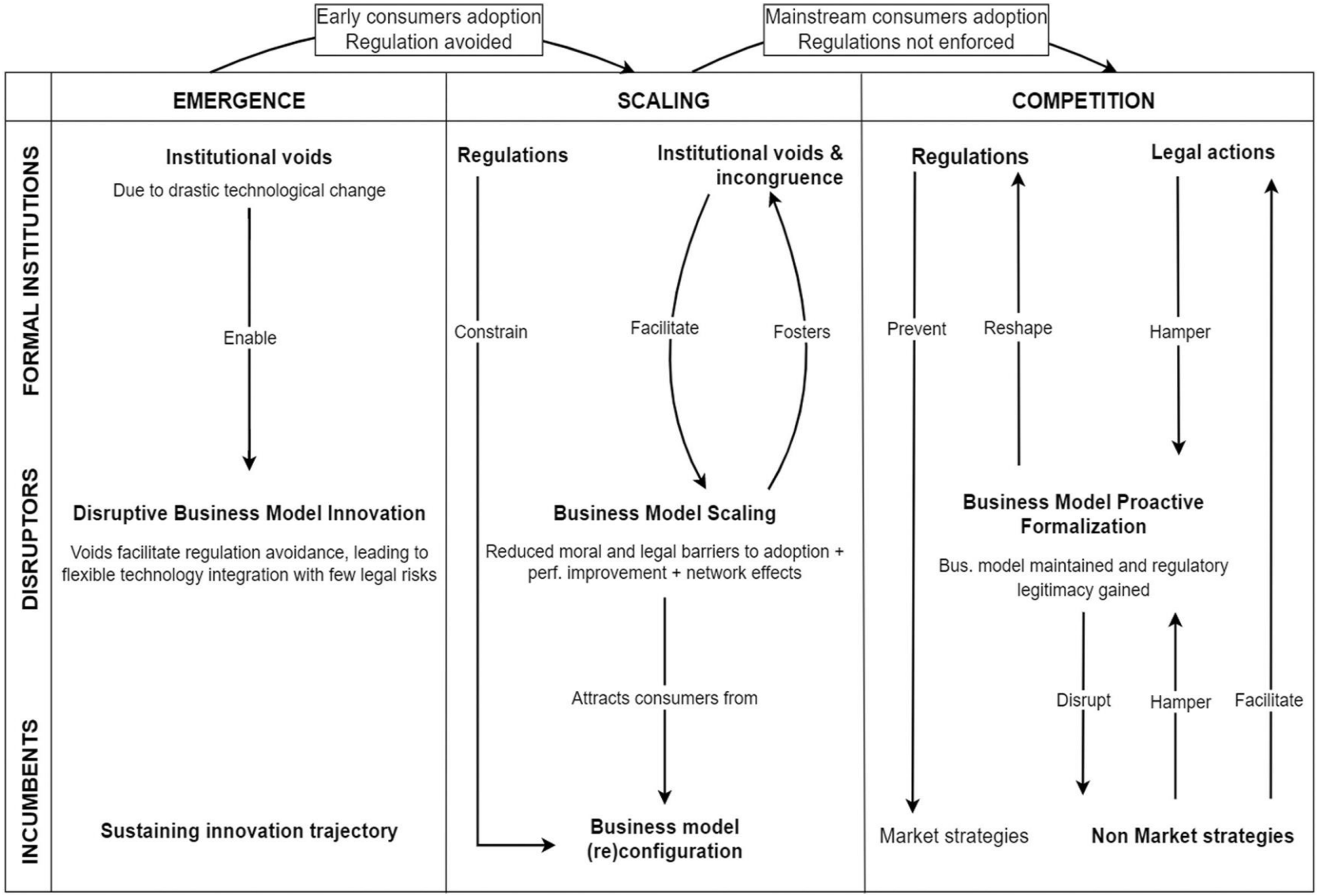
In general, informal firms are considered disadvantaged compared to formal firms as they are often smaller, and renounce the legal advantages provided by formal institutions (Webb et al., 2013; Darbi et al., 2018). Therefore, it could be assumed that informal firms rarely generate disruptive innovations. Yet surprisingly, over the past three decades, some disruptive innovators have originated in the informal economy. Consider digital piracy, which significantly impacted incumbents' performance, especially in the music industry (IFPI, 2020). The global development of such activity suggests that firms originating in the informal economy can disrupt well- established industries. This observation motivates our phenomenon-based theorizing (Fisher et al., 2021) to assess and extend the applicability of disruptive innovation theory to the informal economy.

PROCESS MODEL OF INFORMAL DISRUPTION

We develop the process model of informal disruption that helps highlight the similarities and differences between informal and classic (formal) disruptive innovation. Following the widespread recognition that disruptive innovation is a process (Christensen et al., 2018), we transpose these assumptions to informal disruption, resulting in three phases: (1) *emergence* of informal disruption; (2) *scaling* of informal disruption; and (3) *competition* with incumbents. Figure 1 depicts these phases including schematic interactions between disruptors (middle row), formal institutions (top row), and incumbents (bottom row), as indicated by various arrows that we theorize below.

To foreshadow our arguments, during the *emergence* phase (first column of Figure 1), entrepreneurs in the informal economy generate BMI based on new technologies and the avoidance of regulations that is facilitated by the presence of institutional voids. Institutional voids are defined as the absence of formal regulations, or the failure to enforce them, which can leave some space for informal actors to generate activity and revenues (Darbi et al., 2018;

Figure 1. Informal Disruption Dynamics



London et al., 2014; Webb et al., 2014), that can disrupt incumbents' sustaining innovation trajectory. Early on, however, incumbents neglect disruptors because it takes time for disruptors to scale a new business model (and many might not succeed).

During the *scaling* phase (second column of Figure 1), informal disruptors draw more consumers away from incumbents as they continue to benefit from institutional voids and incongruence, which reduce legal and moral barriers to adoption. Institutional incongruence arises when the norms, values and beliefs of informal institutions contradict the laws and regulations of formal institutions (Webb et al., 2009). Business model scaling of informal disruptors attracts the attention of incumbents, who might start experimenting with alternatives but are limited in doing so due to legal constraints and inertia.

The final phase is *competition* (the right-hand column in Figure 1), which is triggered when mainstream consumers adopt the informal disruptors' offering without regulatory backlash. Formal institutions limit the strategies that both sides can implement. Incumbents can adopt non-market strategies while disruptors can engage in more collaborative activities with formal institutions to transition from the informal to the formal economy through proactive formalization. If formalization succeeds, disruptors can gain an advantage over incumbents. We proceed by developing our arguments along the three phases and detail how the process of informal disruption unfolds.

PHASE 1: EMERGENCE

The first phase is depicted in the left-hand column of Figure 1. Initially labeled "disruptive technologies," Christensen later changed the term to "disruptive innovations" to incorporate the notion of BMI. He explained: "The technology did not make incumbent response difficult. The disruptive innovation in business models made it vexing, and I have subsequently sought to use the term disruptive innovation" (Christensen, 2006, p. 49). Thus, the way entrepreneurs embody a new technology in their business models can make them disruptive (Christensen et al., 2018). We examine the emergence of disruptive innovations in the context of the informal economy, with a particular focus on the enabling

role of new technologies and institutional voids on regulation avoidance and BMI.

Drivers of Business Model Innovation in the Informal Economy

New Technologies

New technologies are important drivers of innovation in the context of informal disruption for two reasons. Indeed, they offer novel and competitive ways to run a business with few investments. Thus, informal firms can use new, low- cost technologies to overcome their resource limitations (Webb et al., 2013) and develop innovative business models. For instance, the internet has facilitated the global transmission of information with little investment, making this technology accessible to informal firms. More recently, the widespread use of smartphones and diffusion of artificial intelligence have had similar effects.

Digital piracy platforms illustrate how informal firms capitalize on novel technologies to develop their business models (Darbi et al., 2018; Miric and Jeppesen, 2020). Although music piracy existed before the internet, it operated at a much smaller scale and did not impact the industry significantly. However, thanks to rapid digitalization, online file- sharing platforms quickly emerged as a way for entrepreneurs to sell content illegally to a greater share of the population with very little investment (no physical selling points, few employees, and no administrative work). File- sharing technologies enabled consumers to exchange large quantities of protected content very easily and rapidly. Entrepreneurs seized the opportunity to develop disruptive business models based on advertising and consumer participation, offering free or cheaper content, while increasing flexibility and keeping sound quality at a competitive level. The internet helped piracy to reach global scale and enabled core competitive solutions for illegal music consumption.

Institutional Voids and Regulation Avoidance

In parallel, technological changes can also lead to institutional voids (Bhattacharjee et al., 2003), defined as the absence of formal regulations, or the failure to enforce them. These

strongly influence how firms innovate and develop new business models. Some studies suggest that such voids must be tackled by firms to develop a business as voids hamper the steady development of the business model (see for instance Peprah et al. (2021) on how Jumia built on Amazon's business model in the African context of institutional voids). Other scholars suggest that institutional voids generate opportunities for informal firms to innovate by avoiding constraining regulations while running few legal risks (Bhattacharjee et al., 2003; London et al., 2014; Webb et al., 2014; Larsen and Witte, 2023). Indeed, in addition to greater reactiveness (Grosh and Somolekae, 1996; Blackman, 2000; Portes and Haller, 2010; Gao and McDonald, 2022) and financial savings through tax avoidance (Gottfredson, 2006; Williams, 2014), avoiding constraining regulations provides entrepreneurs with greater latitude for technological utilization and BMI. Unlike large incumbents, informal firms' small size (Darbi et al., 2018) enables them to avoid law enforcement at early stages, leading to a non- negligible competitive advantage. We thus argue that institutional voids, initiated by rapid technological changes, facilitate regulation avoidance which permits competitive technology integration at its full potential. As a result, this strengthens BMI and enables informal firms to compete against resourceful incumbents.

For example, the internet helped pirate platforms to by- pass copyright regulations. While consumers exchanged content, formal institutions could not cope with the high amount of content shared due to the slow pace of regulatory adjustment. Consequently, pirate platforms offered free- of- charge content as the risk of penalty for copyright infringement was very low. They obtained content either through theft, legal purchasing, or from consumers who had legally purchased a file to upload online and provided access to others. By involving consumers in content acquisition and distribution, and not paying royalties to copyright owners, pirate platforms reduced costs drastically. With the great speed of information transfer, such platforms could exchange enormous amounts of content without regulatory oversight. In other

words, digital pirate platforms took advantage of the institutional voids and new possibilities of the internet to innovate the business model by avoiding constraining regulations. We therefore propose:

> **Proposition 1** Institutional voids enable informal disruption through BMI based on new technology and avoidance of regulation.

In sum, formal institutions and new technologies are pivotal in informal disruption. Similarly to cases studied in the disruptive innovation literature, new technologies open up new possibilities, legal or otherwise, for BMI. Furthermore, new technologies are typically associated with institutional voids (Bhattacharjee et al., 2003), which enable informal firms to compete against resourceful incumbents by avoiding constraining regulation with reduced risks, facilitating disruptive BMI. This suggests that formal institutions exert an influence over the emergence of informal disruption (as illustrated by the "enable" arrow in Figure 1), because of the difficulties to effectively enforce regulations. Conversely, when informal firms fail to avoid regulation enforcement, or when formal institutions quickly react, disruption does not emerge as law enforcement prevents early consumer adoption. In parallel, incumbents pursue their sustaining innovation trajectory, paying insufficient attention to the threat from informal disruptors and capitalizing on their existing knowledge and resources. Disruptive innovation theory attributes such inertia to organizational conflicts and a lack of financial incentives (Gilbert, 2005; Eggers and Park, 2018; Kumaraswamy et al., 2018). This is even more pronounced against informal firms which are often perceived at a disadvantage due to the absence of legal protection and lack of resources and knowledge (Webb et al., 2009, 2013). If early adopters materialize, informal disruptors start scaling, increasing their attractiveness to mainstream consumers, and gaining market share from incumbents.

PHASE 2: SCALING

The scaling phase is depicted in the center of Figure 1. Disruptive innovation theory posits that consumer adoption of disruptors' offers is a slow process. Initially, disruptors underperform incumbents, as lower prices alone do not drive immediate offer switch (Christensen et al., 2018). Instead, consumers wait for substantial performance improvements. This suggests that disruptors' adoption is strongly driven by ongoing performance improvement derived from disruptors' growing expertise on emerging technologies and consumer expectations. Network effects, which are characteristics of platform business models (Helfat and Raubitschek, 2018; Garud et al., 2022), significantly drive disruptors' scaling as well. They arise when the number and quality of users and/or complementors on the platform amplifies the value perceived by consumers (Helfat and Raubitschek, 2018; Rietveld and Schilling, 2021). Notably, platforms like TikTok illustrate how increased user base augments the value for users and advertisers alike. In the following section, we theorize how informal firms improve their offerings and benefit from network effects to scale.

Performance Improvement and Network Effect

Informal disruptors boost performance through technology and network effects, as evident in the music industry. Technology cost reductions, enhanced computing capabilities, and rapid internet penetration enabled global music sharing. Data from the US Census Bureau (2020) show a rise from 18% of US households with internet access in 1997 to 50.4% in 2001. Pirate platforms benefited from this rapid technological expansion as more users on the platforms could share more content, ultimately fostering network effects and trust. Technology democratization and improvement empowered pirate platforms to offer extensive catalogs, flexible pricing, and high-quality content that outperformed legal alternatives. These elements underscore the significance of both performance improvement and network effects in informal disruption's expansion.

Regarding informal disruptors, however, consumers adopting their offer despite their

illegality underscore the necessity to consider institutional factors to understand the scaling process, which include institutional voids and institutional incongruence. These factors highlight the disparities between consumers and formal institutions about relevant definitions of socially acceptable behavior (Webb et al., 2009; Fredström et al., 2021).

Institutional Voids and Institutional Incongruence

Institutional voids arise when technological changes happen faster than formal institutions can adapt (Bhattacharjee et al., 2003), resulting in authorities being unable to properly enforce regulations. Consequently, informal disruptors keep running their activity with reduced risks of being caught for illegal behaviors. This also applies to consumers and drives the adoption of illegal services. In his meta- analysis, Eisend (2019) shows that when individuals perceive fewer risks of engaging in an illegal behavior, they are more likely to adopt it. When formal institutions cannot sanction consumers for law infringements, consumers will be more likely to engage in illegal activities. Thus, consumers' adoption of offers from informal disruptors is partially driven by institutional voids because disruptors can keep improving their offer while consumers face few legal barriers to adoption.

To illustrate, the spread of the internet and the growth of piracy transformed consumer entertainment consumption habits. Theories developed around piracy have resulted in fragmented insights due to important variances observed across countries and cultures. However, Eisend (2019) shows that consumer perceived risks related to piracy are negatively correlated with the practice of piracy, while the individual's experience and perceived control during the act of piracy are positively correlated. The decreasing cost of computers and their increasing performance facilitated content-sharing while hindering the enforcement of copyright law. The increase in pirating practices is therefore not only explained by economic factors but also by legislative and technological ones. Vivendi, the parent company of Universal Music Group (UMG), recognized the threat posed by institutional

voids to copyright protection and acknowledged the necessity of adapting regulations. The company suffered significant losses due to digital piracy and was very active in fighting it, as explained in its 2008 Annual Report:

> "Over the past few years, the reduction in the cost of computer and electronic equipment and associated technologies has facilitated the unauthorized reproduction of musical and video works. […]. The continued difficulties in passing and applying suitable laws and in enforcing court rulings, particularly in certain regions of the world where the group is present and where piracy is endemic, represent a threat to Vivendi's businesses, which depend heavily on the intellectual property rights owned by the group or for which it holds licenses."

These rapid transformations also result in the emergence of institutional incongruence (Webb et al., 2009; Fredström et al., 2021) between formal and informal institutions, with consumers either being unaware of informal disruptors' illegality or knowingly infringing regulations with which they disagree. Such consumer behaviors showcase a misalignment between personal values and norms (informal institutions) and established regulations and laws (formal institutions). Thus, institutional incongruence can be observed between consumers' expectations and what regulations define as legally reprehensible, which facilitates the scaling of informal disruptors by reducing moral barriers to adoption. Finally, piracy platform users may influence other individuals into adopting piracy by framing it as morally acceptable. Put simply, as the consumer base of informal disruptors expands, institutional incongruence grows, thereby reducing moral barriers for non- users and propelling the scaling of informal disruptors' business models.

The period of technological change at the beginning of the 21st century illustrates this, as it was accompanied by a relatively strong acceptance of piracy in the population. The IFPI 2004 survey from different European countries pointed out that only 66% of respondents acknowledged the illegality of sharing files online without the permission of copyright owners (IFPI, 2005). Additionally, the same survey showed that 46% of respondents neither supported litigation as an option to fight online piracy, nor had an opinion about it. These observations

were accompanied by growing piracy practices and heavy losses on the part of incumbents. However, a study of the EUIPO in 2021 suggests that individuals who do not access illegal content online have a better understanding of intellectual property law than those who do. These observations were accompanied by reduced piracy practices, as well as a generally more negative perception of the act of digital piracy and growing revenue in the industry.

In sum, beyond performance improvement and network effects, additional institutional factors attract consumers to informal disruptors. Institutional voids facilitate consumer adoption by reducing legal barriers during the scaling phase. In parallel, the development of institutional incongruence provides moral justification for illegal behavior and thus reduces moral barriers to adoption. We therefore propose:

> **Proposition 2** Institutional voids and institutional incongruence facilitate informal disruptors' business model scaling by reducing legal and moral barriers to consumer adoption of illegal offers.

Incumbent Inertia and Formal Institutional Pressure

Because incumbents suffer from inertia (Gilbert, 2005), their reaction to disruption may be slow and ineffective. Inertia stems from various barriers, such as difficulties in acquiring novel technologies (Adner and Kapoor, 2010) and internal factors such as business model reconfiguration, organizational structures, and identity (Benner and Tripsas, 2012; Eggers and Kaplan, 2013). Otherwise, disruptors emerging from the informal economy do not observe formal institutional rules and so are not constrained by regulations. This means they can assimilate new technologies and configure their business models around them more flexibly in order to extract greater economic benefits than formal firms, which must obey regulations. Indeed, scholars have argued that business models can greatly increase the value and potential of a given technology (Chesbrough, 2010). Therefore, even though they have more resources for experimentation, formal firms cannot compete with informal firms by reconfiguring their

business model around a technology because of regulatory constraints. Put simply, when disruption emerges from the informal economy, incumbents face greater difficulty in developing competitive alternatives than when disruption emerges from the formal economy.

The evolution of the music industry around Apple's iTunes illustrates the difficulties involved in developing competitive alternatives. From a business model perspective, only a few changes had occurred in the music industry for several years, while revenues shrank steadily until 2015 (IFPI, 2020). In fact, UMG saw the internet as an opportunity to sell music in online marketplaces, but instead of developing a radically new approach, UMG replicated its old business model using this new technology. Artists created songs that were acquired by UMG, uploaded to online platforms, and then sold to end users, generating royalties that had to be distributed to the artists to remain legal. This royalty obligation constrained incumbent adaptation and experimentation precisely because the disruptive pirate platforms gained their competitive advantage by ignoring it. Until the global adoption of streaming business models (which enabled a new means of revenue generation for the whole music industry), the incremental changes made by the industry incumbents were insufficient to fend off the disruptive power of illegal platforms, constrained as they were by legal limitations.

Thus, in addition to performance improvement and network effects, institutional voids and incongruence drive consumers' adoption of informal disruption, as illustrated by the "facilitate" arrow in the scaling phase of Figure 1. Because of the slow pace of formal institutional adaptation, authorities fail to enforce regulation effectively, which reduces legal barriers to illegal behaviors. In parallel, because of the competitiveness of their offers, informal disruptors foster institutional incongruence (illustrated by the upward "foster" arrow in Figure 1), that reduces moral barriers to adoption. However, if formal institutions manage to update regulations and restore legal barriers, informal disruptors are likely to get banned before reaching mainstream consumers' adoption. Similarly, exit also happens when disruptors fail to

generate demand because of weak offerings that do not foster incongruence nor justify legal risks. Finally, incumbents are also handicapped in the (re)configuration of their business models around novel technology due to inertia combined with legal limitations exerted by formal institutions (as illustrated by the downward "constrain" arrow in Figure 1). They may experiment with novel technologies, but these are likely to remain uncompetitive against informal disruptors.

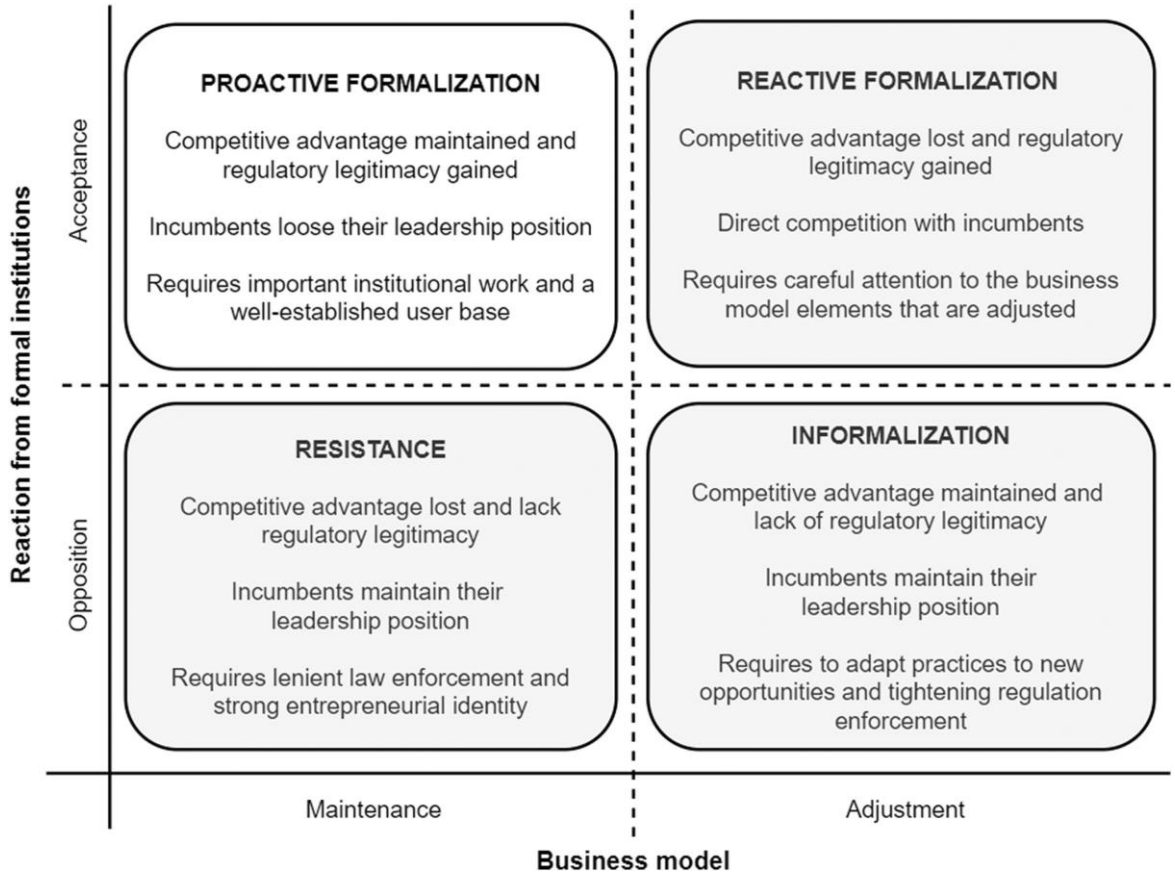
These dynamics mean that it is more challenging for incumbents to adapt their business models against informal compared to formal disruptors. Their difficulties persist in the competition phase, which starts when mainstream consumers adopt informal firm offerings on a massive scale, as those better align with their evolving needs. Next, we investigate the strategic pathways available to informal firms, as well as incumbents' possible responses, both of which are influenced by formal institutions during the competition phase.

PHASE 3: COMPETITION

During the last phase, depicted in the right-hand column of Figure 1, informal disruptors vie to overcome incumbents that are facing a direct threat of losing customers and thus are more likely to act. Informal firms can use non- legal strategies of complexity, lead time, or customer lock- in, but must give up on legal recourses, such as copyright, patent, and trademark protection, due to their illicit nature (Webb et al., 2009; Darbi et al., 2018). Consequently, informal disruptors must consider alternatives to sustain their activity in a hostile environment.

Research on informal firms suggests that to sustain their activity, informal firms can remain within the informal economy or transition to the formal economy through adjusting the business model and increasing acceptance of formal institutions (Salvi et al., 2022). Figure 2 illustrates the four possible strategic pathways for informal disruptors, namely (i) resistance, (ii) informalization, (iii) reactive formalization, and (iv) proactive formalization. Below, we discuss

Figure 2. Strategic Pathways of Informal Disruptors



these pathways and their distinct impacts and outcomes.

Remaining within the informal economy

Resistance characterizes the situation when informal disruptors maintain their business model unchanged without engaging in collaboration with formal institutions. This strategy is likely adopted when law enforcement is lenient or due to cognitive factors, where involvement in the informal economy defines the firms' identity (Webb et al., 2009; Salvi et al., 2022). However, as noted by De Castro et al. (2014), informal firms' growth tends to attract the attention of formal institutions, escalating the likelihood of law enforcement. As such, despite facilitating experiments and the establishment of a solid user base (Larsen and Witte, 2023), this approach constrains growth and increases risks of ban as it nourishes opposition from formal institutions (Carrasco- Farré et al., 2022), while incumbents keep their leadership position. This has been illustrated in the music industry with the ban on the Pirate Bay, as it

openly refused to collaborate with formal institutions.

Informalization describes how informal disruptors expand their activity deeper within the informal economy, which is likely when regulations remain poorly enforced or when new opportunities for illicit activities emerge. Additionally, institutional incongruence and persistent contestation against formal norms by consumers also encourage informal disruptors to keep developing their illicit practices. To do so and maintain their competitive advantage against evolving regulations, they tailor their operation to profit from those emerging opportunities and evade eventual regulation enforcement pushed by incumbents seeking to uphold their position. Megaupload's case illustrates how informal firms may expand illegal operations. Initially a file-s haring platform that heavily impacted the music and movie industries, it diversified into various services with video- streaming, payment solutions, and pornographic sites. However, tightening copyright regulations provoked legal actions led by numerous countries, resulting in its permanent closure.

Overall, remaining informal is motivated by cognitive factors such as entrepreneurial identity (Webb et al., 2009, 2014; Salvi et al., 2022) and the high costs and complexities involved in transitioning to the formal economy that would hinder profitability (De Castro et al., 2014). However, remaining informal limits opportunities for further growth as it intensifies tensions with formal institutions and increases the risks of regulatory enforcement or ban on operations. Hence, we argue that informal disruptors are likely to pursue formalization to overtake incumbents.

Business model formalization

Informal firms are more likely to formalize as they get wealthier (De Castro et al., 2014), when barriers to formalization such as time, cost, and complexity decrease (De Mel et al., 2013), and when formal institutions provide adequate security and law enforcement (Webb et al., 2014; Sutter et al., 2017; Floridi et al., 2020). Therefore, formalization must represent a real

benefit that counterbalances the efforts required to transition, which can be done reactively or proactively (Salvi et al., 2022).

Reactive formalization involves informal firms adjusting their business model to formal institutions to gain acceptance and legitimacy. However, adjustment may not represent an interesting alternative since informal firms derive their competitive advantage by avoiding constraining regulations (digital pirate platforms were able to offer free services specifically because they circumvented copyright laws). Thus, informal disruptors must carefully consider which elements of their business model they adjust not to lose their competitive advantage. Yet, recent studies show that refusal to adapt may escalate opposition from formal institutions (Carrasco- Farré et al., 2022). Therefore, informal disruptors find themselves in a complex situation where they must balance business model competitiveness (but increasing opposition by formal institutions) with business model adjustment (but risking losing their core competitive advantage). This has been illustrated by Uber in South Korea, where it was forced to operate exclusively with licensed taxi drivers, which heavily limited competitiveness, until terminating its activity in November 2015.

Finally, *proactive formalization* refers to informal firms actively shaping formal institutions to fit their activities without having to modify their core business model. This approach encompasses various strategies such as lobbying, advocating against unfair regulation, and public discussions aimed at garnering acceptance and preserving legitimacy among mainstream consumers (Gurses and Ozcan, 2015; Kingiri and Fu, 2020; Salvi et al., 2022). Collaborating with formal institutions, for instance through data sharing, helps uncover common interests and significantly reduces tensions on both sides (Carrasco- Farré et al., 2022). Thus, in the competition phase, informal disruptors start to act as institutional entrepreneurs [2]when they intend to shape their institutional environments to their advantage

[2] The term "institutional entrepreneurs" refers to "actors who have an interest in particular institutional

(Garud et al., 2007; Cavotta and Phillips, 2022). Proactive formalization enables informal disruptors to maintain their competitive advantage related to their initial BMI and capitalize on their well- established user base while gaining acceptance from formal institutions and access to legal protection mechanisms.

This has been illustrated with Uber in the US as it managed to push its business model lobbying and public voicing until gaining formal institutions' acceptance.

The four pathways of resistance, informalization, reactive formalization, and proactive formalization illustrate different options for informal disruptors to engage with formal institutions as competition intensifies in the last phase. While remaining informal and reactive formalization pose important limitations, proactive formalization stands out as the most efficient solution. Collaboration with formal institutions reduces opposition, enabling informal disruptors to balance competitiveness and formal institutional acceptance. This underscores the significance of proactive institutional works in navigating regulatory challenges, providing a roadmap for informal disruptors to balance competitiveness with formal institutional support. Hence, we propose:

Proposition 3 After mainstream consumer adoption, informal disruptors are more likely to proactively formalize their business model to benefit from formal institutional support.

The limiting pressure of formal institutions on incumbents' responses

The literature on adaptation to disruptive changes suggests various incumbent responses, including ambidexterity, alliances and/or acquisition of disruptors, and coopetition (Bower and Christensen, 1996; Christensen, 2006; Cozzolino et al., 2018; Cozzolino and Rothaermel, 2018; Eggers and Park, 2018; Wenzel et al., 2020). Cozzolino et al. (2018) illustrate these strategies in their study of GEDI, a major Italian news publishing house that tried to adapt to the

arrangements and who leverage resources to create new institutions or to transform existing ones" (Battilana et al., 2009; Garud et al., 2007; Maguire, 2004). Therefore, informal disruptors may be considered as a subset of institutional entrepreneurs if they follow the proactive formalization pathway.

introduction of the internet. Early on, GEDI experimented in order to capture value from the new technology, but frictions rose between internal routines and the changes that were required. Thus, to reduce frictions, gain knowledge quickly, and develop a successful business model, the firm decided either to partner with or acquire disruptors. Within the news industry, in response to the growth of Facebook, Google, and YouTube, newspapers have formed "consortia to develop technology platforms to pool proprietary classified ad spaces and video ads" (Cozzolino and Rothaermel, 2018, p. 3068). By using these different strategies—experimentation, acquisition of disruptors, and coopetition—GEDI managed to successfully adapt to the disruption in its industry better than other companies.

However, how applicable are these strategies against informal disruptors? Formal institutions pressure incumbents to strictly follow regulations (illustrated by the "prevent" arrow in the competition phase of Figure 1) in exchange for legal protection and possible court actions in cases of dispute with other formal competitors (Webb et al., 2013; Darbi et al., 2018). Thus, while incumbents can still acquire novel technologies, they are more limited than informal disruptors in how they can integrate them into their business models due to constraining regulations. This results in a weighty handicap that hinders efficient adaptation to disruption (e.g., Tripsas and Gavetti, 2000; Lucas and Goh, 2009; Eggers and Kaplan, 2013; Helfat and Raubitschek, 2018). In addition, if an incumbent wants to acquire a disruptor it considers too dangerous or if it wants to develop an alliance to benefit from its knowledge, the disruptor must operate legally, which is not the case in an informal context. In other words, because they define the rules of the game (Webb et al., 2009), formal institutions limit the possible strategic moves of incumbents to what regulations define as "legal" (Weber et al., 2019). This results in an unbalanced competitive landscape, preventing effective adaptation by incumbents based on market strategies such as coopetition, alliances, or ambidexterity.

The case of recorded music illustrates the influence of formal institutional pressure on

incumbents. The emergence of illegal platforms posed a significant challenge to various incumbents in the music industry. Consumers' evolving needs, which could not be met within legal boundaries, presented a dilemma: distributors and labels could not integrate or imitate illegal platforms due to legal constraints and risks of losing legitimacy. Despite their attempts to innovate, incumbents failed to develop value propositions or effective partnerships or acquisitions due to such difficulties. We therefore propose:

Proposition 4 When disruption originates with informal firms, formal institutions prevent effective implementation of market strategies by incumbents.

Without proper market strategies, how can formal incumbents compete against disruptors emerging from the informal economy? Informal economy literature suggests that informal competition pushes incumbents to invest in radical rather than incremental innovation (McCann and Bahl, 2017; Miric and Jeppesen, 2020), especially in contexts of weak intellectual property rights protection (Miocevic et al., 2022). Yet, these studies account neither for the eventual disruptive forces of informal firms, nor for the institutional factors influencing the competitive landscape. Therefore, in the next section, we theorize on incumbents' possible strategic responses, including lobbying and consumer education.

Incumbents' non-market strategies

Formal institutions are double- edged swords for incumbent firms. They can reduce incumbents' scope to adapt (as explained in the previous section), but they also provide valuable resources to use against informal disruptors (Gao et al., 2017; Paik et al., 2019; Peprah et al., 2021). We follow the definition of informal activities as "economic actions that bypass the costs of and are excluded from the protection of laws and administrative rules" (Portes and Haller, 2010, p. 134). Thus, formal institutions, such as law enforcement authorities, are likely to collaborate with incumbents rather than informal disruptors. As we have argued that institutional voids and incongruence facilitate informal disruptors' scaling, incumbents should

adopt collective lobbying and political actions to reduce voids and consumer education to reduce incongruence.

Collective lobbying

Incumbents can use their political power to lobby for a better regulatory environment that will better protect their interests (Lawton et al., 2013; Thelen, 2018; Paik et al., 2019). Because institutional voids drive disruptors' scaling, incumbents should aim at restoring legal barriers and facilitating regulation enforcement to impose greater legal risks on users, thus reducing informal disruptors' adoption. These reactions gain strength as the phenomenon becomes an international issue (Kennedy, 2007), and intra and inter-industry collaborations in political efforts emerge as an aggressive strategy against informal actors. As the threat of informal disruptors increases and spreads, collective lobbying offers one strategic opportunity to restore legal barriers and challenge disruptors' business models.

In the music industry, several actors collaborated under the IFPI to gain stronger political power. Some successes of this coalition were the extension of European copyright from 50 to 70 years in 2014, or the facilitation of copyright law enforcement via the US Pro- IP Act in 2008 (which has been pushed jointly by the film industry). This is illustrated in Vivendi's (2009) report:

> "This law strengthens anti-counterfeiting measures and gives greater visibility to intellectual property issues through the appointment of an Intellectual Property Enforcement Coordinator who reports to the President of the United States, and whose task will be to propose a plan to combat counterfeiting and piracy to the United States Congress."

This collaboration extended to the film industry via collective litigations against illegal platforms (and eventually their users) to force them to stop illegal activities. As a result, Megaupload was shut down in 2012, followed by many others. This had noticeable effects, for instance in the Netherlands, where illegal music consumption dropped by 4% the same year (IFPI, 2014). By engaging collectively in political activities, incumbents accelerate regulation

updates and increase the probability of disruptors' ban before they get to formalize their business model. We therefore propose:

Proposition 5a Incumbents' engagement in collective lobbying facilitates formal institutions' legal actions, which accelerates informal disruptors' ban.

Consumer education

In addition to filling institutional voids, incumbents should also target incongruence for greater efficiency against informal disruptors (Fredström et al., 2021). This approach involves two strategies: highlighting the adverse effects and moral implications of illegal practices (Weber et al., 2019) and promoting legal market alternatives. These non- market strategies aim to shape public opinion on political issues and influence consumer perceptions of disruptors (Bach and Blake, 2016). Research underscores the significance of framing and perceptions in consumer adoption of disruptors (Gurses and Ozcan, 2015; Snihur et al., 2018; Thelen, 2018), justifying the effectiveness of reducing institutional incongruence in curbing the proliferation of informal disruptors.

UMG's anti- piracy strategy relied on consumer education through two approaches. Firstly, UMG promoted legal alternatives. For instance, the firm supported the partnership between the French government and the Société National de l'Edition Phonographique (SNEP), a French music industry syndicate, to launch a prepaid card providing access to a vast catalog of legally downloadable music titles. Secondly, the company aimed to deter consumers from illegal practices like file- sharing and stream ripping by supporting regulatory initiatives like HADOPI in France and the UK's Digital Economy Act. These complementary initiatives diminished the appeal of illegal services while increasing the popularity of legal platforms (EUIPO, 2021), showcasing how such consumer education lessens institutional incongruence and thus slows down the adoption of informal disruptors' offers. As previously argued in this paper, a solid user base is pivotal for business model formalization, proving that removing institutional

incongruence to slow down consumer adoption hampers informal disruptors' formalization efforts. We therefore propose:

Proposition 5b Incumbents' engagement in consumer education hampers informal disruptors' business model formalization.

In sum, upon reaching mainstream consumer adoption, informal disruptors are likely to formalize while incumbents try to sustain their leadership. Informal disruptors proactively formalize employing tactics like lobbying and public advocacy to secure authorities' recognition and induce formal institutional change. Proactive formalization provides informal disruptors with significant advantages related to the business model and legal safeguards, while challenging incumbents. However, in the case where incumbents have strong lobbying power and implement consumer education, formalization becomes more difficult. Indeed, by restoring legal and moral barriers to adoption, incumbents increase the probability of informal disruptors' ban while reducing consumer adoption, which is pivotal for informal disruptors to gain formal institutions' acceptance. Hence, incumbents implementing such strategies are likely to uphold their leading position and prevent informal disruptors' formalization.

DISCUSSION

We contribute to the literature on disruptive innovation by augmenting it with insights about the informal economy. With this conceptual work, we introduce the concept of informal disruption and begin to unpack the connections between disruptors, incumbents, and institutions during informal disruption, detailed in Figure 1 and our propositions. By analyzing how informal firms generate disruptive innovations, we highlight the differences from the classic cases of disruption studied in formal economy contexts (see Table 3). This is crucial because the informal economy represents on average 17.2% of the developed economies' GDP (Schneider and Enste, 2013; Williams, 2016) and up to 65% of less developed economies (Medina et al., 2017), and is typically associated with lower entrepreneurship productivity

Table 3. Similarities and Differences Between Formal and Informal Disruption

			Differences	
Phases	**Actors**	**Similarities**	**Formal disruption**	**Informal disruption**
Emergence	Institutions			• Institutional voids (P1)
	Disruptors	• New technology • Business model innovation		• Regulation avoidance (P1)
	Incumbents	• Sustaining trajectory		
Scaling	Institutions			• Institutional voids (P2) • Institutional incongruence (P2) • Limiting pressure on incumbents
	Disruptors	• Performance improvement • Network effects		• Leverage institutional voids and incongruence for business model scaling (P2)
	Incumbents	• Experiments • Inertia		• Legally constrained experiments
Competition	Institutions			• Limiting pressure on incumbents (P4) • Legal actions against disruptors (P5)
	Disruptors	• Secrecy • Lock-in • Lobby	• Patent and trademark leverage	• Proactive formalization (P3)
	Incumbents		• Ambidexterity • Acquisition and alliances • Coopetition	• Collective lobbying (P5a) • Consumer education (P5b)

P1, P2, P3, etc. refer to propositions developed in the text.

(Fredström et al., 2021) and human and economic development (Williams, 2016; OECD, 2019). Scholars have urged to investigate this sector and its influence over innovation practices (Choi and Perez, 2007; Gao and McDonald, 2022) to improve our understanding of different contexts (Salvi et al., 2022). Therefore, theorizing informal disruption has important theoretical and practical implications that could shape future research on the informal economy and disruptive innovation while helping entrepreneurs, managers, and regulators navigate related challenges

Institutional Forces at Play in Informal Disruption

As shown in Table 1, the key difference between formal and informal disruption relates to institutional forces. Specifically, we theorize about the impact of institutional voids and incongruence as drivers of informal disruption (propositions 1 and 2) and formal institutions as a double- edged sword for incumbents (propositions 4 and 5a and 5b). Studies have investigated institutional influence on firms' strategies and R&D practices (Meyer et al., 2011; Narula and Verbeke, 2015; Papanastassiou et al., 2020) and BMI (Choi and Perez, 2007; Peprah et al., 2021), but not in contexts of disruptive innovation. This obstructs our knowledge on how institutions influence the emergence, scaling, and competition between disruptors and incumbents. We propose that formal institutions influence the emergence of informal disruption when such institutions do not adapt effectively to the introduction of new technologies, generating opportunities for entrepreneurs in the informal economy (Webb et al., 2009). We go beyond Webb and colleagues by explaining how institutional voids and incongruence facilitate business model scaling, making informal disruptors consequential for formal incumbents, particularly in the digital age of rapid network effects.

In addition, our process theorizing highlights the temporally distinct and paradoxical influence of formal institutions as both early amplifiers of informal disruption as well as later promotors of formalization. This suggests that formal institutions are not only custodians of the formal economy but also (inadvertent) shapers of disruption processes. Indeed, formal

institutions both reduce the possible adaptation strategies of incumbents (proposition 4) and contribute to legal and educational actions against informal disruptors, often resulting in regulation updates. In sum, our paper argues for a nuanced understanding of institutional influence when studying informal disruption, both in terms of impact over time and distinct implications for disruptors and incumbents.

Considering the important influence of institutions during informal disruption represents a relevant avenue for future research. For instance, what institutional characteristics foster successful informal disruption, and which foster successful incumbents' adaptation? What are the variations across countries? How can institutional voids be managed and adjusted, given the increasing number of new technologies with disruptive potential, such as blockchain or generative artificial intelligence? Answering such questions would refine the boundary conditions of informal disruption, provide guidance for policymakers, and help managers better anticipate risks and adapt successfully.

Strategic Pathways of Informal Disruptors

Studying informal disruption provides valuable insights on how informal firms disrupt incumbents and the pathways they follow. Initially, regulation avoidance is a key strategy for informal firms to compensate for their lack of knowledge and resources (Webb et al., 2009, 2013) and develop competitive offers (proposition 1). This can result in a competitive advantage over incumbents that follow regulations. Informal firms sustain this advantage thanks to the presence of institutional voids and incongruence (proposition 2) that enable traction with consumers despite legal breaches. These findings enrich our understanding of disruptive innovation theory by providing additional explanations for disruptors' success, despite initially being at a disadvantage against resourceful and experienced incumbents.

Note that informal disruptors need other strategies than those developed in the disruptive innovation literature (Christensen et al., 2018) due to their illegal nature that prevents legal

protection for their innovations. Building on the informal economy literature (Webb et al., 2014; Darbi et al., 2018; Salvi et al., 2022), we suggest that remaining within the informal economy limits the possibilities to overcome incumbents. Contrastingly, proactive formalization yields valuable benefits for informal disruptors, including regulatory legitimacy (see Figure 2). These insights expand the strategic toolbox of disruptors to the realm of the informal economy, which is an understudied context for the disruptive innovation theory (Table 1).

These insights are also useful to business model scholars who have rarely considered the connections between business models and their institutional environment (see Foss & Saebi, 2017 for a review). Our insight is that BMI can result from regulation avoidance (proposition 1) and necessitates formalization, where regulatory legitimacy is acquired much later (after scaling) than typically assumed in the business model literature (Snihur et al., 2022). Uncovering these temporal dynamics is interesting as they suggest that some, but not all, informal disruptors can become institutional entrepreneurs (as per Figure 2). We thus nuance work on institutional entrepreneurship (see Battilana et al., 2009 for a review) by suggesting that new business models are not sufficient, but a decision to formalize BMI is what can result in entrepreneurs engaging in institutional work to change formal institutions.

Rich possibilities abound for theoretical refinement and empirical evaluations in this area. For instance, what is the best time to formalize the business model? How does the institutional environment, such as authorities' power, incumbents' political influence and other cultural elements, impact the propensity of successful formalization? What are the best ways to formalize proactively? How do the strategic pathways (Figure 2) differ between developed and developing economies? Answering such questions could help managers and policymakers navigate informal disruption.

Formal/Informal Competitive Dynamics

Finally, our paper answers calls for additional research on the informal economy,

especially its interactions with formal businesses (Ketchen et al., 2014; Iriyama et al., 2016; Darbi et al., 2018; Nason and Bothello, 2022). Scholars have underscored the salient research opportunities that lie at "the boundaries and interchanges between the formal and the informal economy" (Ketchen et al., 2014, p. 100). Table 1 shows that differences emerge when applying disruption theory to the informal economy, mostly because of formal institutions' influence (proposition 4). Our paper begins to unveil how informal firms impact formal firms (Figure 1), improving our knowledge of formal-informal competitive dynamics. The informal economy literature typically links institutional voids and informal firms to developing economies (Bothello et al., 2019). Such firms have been depicted as competitively disadvantaged (Webb et al., 2013; Darbi et al., 2018) and often associated with sluggish market growth (Williams, 2016; Fredström et al., 2021). However, we calibrate this view as informal firms can actually gain competitive advantage through BMI and significantly influence technology adoption, consumer behavior, and formal institutions.

Future empirical research can examine the applicability and effectiveness of the strategies by both incumbents and disruptors. How can managers overcome inertia and legal issues to counter informal disruption? What are the most fruitful efforts in consumer education? Can formal/informal collaboration lead to enhanced performance? For example, multiple case studies could focus on incumbent firms adopting different strategies against informal disruptors and compare their effectiveness. Such research is important as technological advances like artificial intelligence render many regulations, such as intellectual property, hard to enforce.

The notion of informal disruption implies informal firms defying established formal institutions. In developing economies, formal institutions are generally considered "weak" and breaking regulations is more commonplace (Schneider, 2002; Webb et al., 2014; Williams, 2016), thus our theorizing might be more relevant for developed economies. However, exploring whether and how formal institutions might be defied in developing economies could

refine the boundary conditions of informal disruption theorizing. We suggest that other factors may also influence the applicability of the theory. For instance, industry- specific attributes such as heavy reliance on safety regulations, like in aerospace, health or nuclear energy, might reduce informal disruption likelihood. Consumers' emphasis on safety concerns may prevent institutional incongruence and thus impede adoption, which is pivotal for informal disruption. Finally, the technology introduced must substantially disrupt established regulations and generate institutional voids, allowing entrepreneurs to circumvent regulations, innovate business models and trigger consumer adoption. This has been illustrated with the internet or crypto currencies, but not with electric cars, which lacked disruptive impact to generate institutional voids. Investigating industry and technology-specific attributes could help refine boundary conditions and thus represents a fruitful direction for future research.

CONCLUSION

Our main objective has been to elucidate the dynamics of informal disruption. With rapid societal and technological shifts, institutional voids are increasingly likely, enabling informal firms to generate disruption. Such firms leverage institutional voids to disrupt incumbents through BMI based on technological change and regulation avoidance. In this context, incumbent firms' managers are left without proper legal protection and strategies to counteract such competition. We set the stage for empirical research to investigate how disruptive innovations originate with informal firms, how they formalize, and how incumbents may respond, both in developing and developed economies.

The illegal nature of informal disruptors has implications for disruptive innovation theory. First, we theorize additional drivers of the emergence and scaling of informal disruption, such as avoidance of regulation, institutional voids, and incongruence. Second, informal disruptors can formalize to maintain competitiveness while gaining regulatory legitimacy and legal protection. Finally, given that incumbents have difficulty adapting, they can support legal

newcomers, creating a fertile environment for new ventures. Indeed, industries with informal disruption have also seen many legal alternatives thrive, with examples such as the success of Swedish Spotify and French Deezer after digital piracy, or Kakao T in South Korea after Uber's attempted entry there. All these elements justify the importance of further investigating informal disruption as an under- researched but powerful force.

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Paper 2. Incumbents' Reaction to Disruption Emerging from the Informal Economy

ABSTRACT

This study explores how incumbent firms respond to disruptive innovations initiated by firms within the informal economy, an overlooked area in extant research. Labeled as "informal disruptors," such entities engage in illegal activities but hold legitimacy among a substantial consumer base. By examining Universal Music Group's (UMG) strategic responses during the digital piracy crisis. Contrary to strategies established in the literature, this work emphasizes the necessity for incumbents to engage in non-market strategies and support newcomers to combat disruptions stemming from the informal economy. It reveals the intricate interplay between formal and informal economies, highlighting how the illegal nature of disruptors forces incumbents to adapt their strategies against such threats. In essence, this study sheds light on the unique strategic demands imposed by disruptions from illegal players. In addition, by shaping incumbents' strategies in favor of newcomers' introduction, this work suggests that disruption emerging from the informal economy prepares a fertile soil for new ventures.

Keywords: Disruptive innovation, Incumbents adaptation, Informal Economy, Institutions, Market and Nonmarket strategies

INTRODUCTION

The rapid and profound technological changes over the past decades have sparked growing interest among scholars in how firms adapt to disruptive innovation (Christensen et al., 2018; Cozzolino & Rothaermel, 2018; Schmidt & van der Sijde, 2022; Snihur et al., 2018). Disruptive innovation refers to the process by which new ventures introduce innovative offerings that can harm incumbent firms' revenue by capitalizing on technological improvements and business model innovation (Christensen et al., 2018). The literature suggests that incumbent firms may encounter difficulties stemming from inertia issues related to resource commitment, strong lack of incentives, and routine rigidity (Eggers & Park, 2018; Gilbert, 2005; König et al., 2021; Lucas & Goh, 2009). To overcome such barriers, various strategies have been theorized by academics, including ambidexterity (Gilbert, 2005; Macher & Richman, 2004), alliances, acquisitions (Cozzolino et al., 2018), and migration (Birkinshaw, 2022).

However, these insights have largely emerged from studies involving firms facing disruption initiated by disruptors adhering to regulations. In contrast, building upon the informal economy literature, we examine incumbents' adaptation strategies to disruptive innovations initiated by informal firms. We define informal firms as firms engaging in illegal activities, yet considered legitimate by a substantial portion of consumers (Darbi et al., 2018; Webb et al., 2009, 2013), with examples such as digital piracy. Although some studies explore the competition between formal and informal firms (Iriyama et al., 2016; McCann & Bahl, 2017; Miocevic et al., 2022; Neuhauser & Snihur, 2024), to our best knowledge, no study has investigated incumbents' responses to disruption initiated by such firms. In the remainder of this paper, the term "*informal disruptor"* will be used to refer to firms that generate disruption by undertaking illegal activities that are considered legitimate to a substantial group of consumers.

This phenomenon is not only understudied but also crucial and timely due to the rapidly evolving technological landscape, like artificial intelligence and cryptocurrencies, combined with

the difficulties of formal institutions in adapting regulations promptly. We argue that the illicit nature and the specificities of informal disruptors, such as motivations and resource accessibility (Lee & Hung, 2014; Salvi et al., 2022; Webb et al., 2014) influence the competitive dynamics vis-à-vis legal counterparts. Because informal disruptors operate outside established regulatory frameworks, incumbents compete against players who do not play by the same rule, prompting us to question the strategic responses implemented in such context. We therefore ask: *How do incumbent firms react and adapt to disruption initiated by informal disruptors?*

To address this question, we conducted a case study (Eisenhardt, 1989, 2007; Gibbert et al., 2008) of Universal Music Group (UMG), a major record label in the music industry, which asserted dominance amidst and after the digital piracy crisis. Our data encompass 21 annual reports from UMG (2000 – 2021) and institutional studies conducted by organizations such as the International Federation of the Phonographic Industry (IFPI), the OECD, or the European Union Intellectual Property Office. We complemented this dataset with 38 semi-structured interviews involving key stakeholders in the music industry including artists, managers, experts, and employees from labels, institutions, and platforms.

Our findings retrace the trajectory of UMG's strategy, from initial experiments, litigations, and technical protection of intellectual property, to non-market strategies and support of newcomers later on. Because of inertia and regulative constraints, UMG's initial experiments prove inadequate in outpacing digital pirate services. These challenges, combined with the introduction of legal alternatives prompted a strategic shift towards lobbying, consumer education, cooperation with institutions, and newcomers support that helped the firms and its industry surmount the disruption initiated by digital piracy.

This paper contributes significantly to our understanding of incumbents' adaptation to disruptive innovations (Cozzolino et al., 2018; Eggers & Park, 2018; Kammerlander et al., 2018). We show that against disruption emerging from the informal economy, and because of legal

constraints, incumbents must use different strategies than those previously explored in the literature. Furthermore, we answer calls for further comprehension of the competitive dynamics between formal and informal economies (Darbi et al., 2018; Iriyama et al., 2016; McCann & Bahl, 2017; Salvi et al., 2022). We contend that disruptors' illegal nature compels incumbents to accelerate newcomers' adoption by boosting their visibility and legitimacy. In parallel, by advocating for regulatory updates, incumbents also facilitate actions against informal disruptors, reducing competition against newcomers. In this regard, our work indicates that disruption emerging with informal firms creates a conducive context for new ventures, contributing to both research on the informal economy and entrepreneurship.

LITERATURE REVIEW

Disruptive innovation and incumbents' adaptation

Disruptive innovation has nourished numerous discussions among strategic management scholars for almost three decades now. Introduced by Christensen and Bower (1996), disruptive innovation refers to the process by which new entrants develop innovations that, despite initially under-performing incumbents' offers, overtake them thanks to experience, novelty, and performance improvement (Christensen et al., 2018; Cozzolino et al., 2018).

How do small firms manage to develop innovations that harm established leaders despite having limited resources? One reason is that disruptors leverage the introduction of new technologies to develop innovative business models (Christensen, 2006). Business models refer to systems of interconnected, potentially boundary-spanning transactions and activities centered on a focal firm and designed to serve a given product market (Amit & Zott, 2020; Snihur & Markman, 2023; Teece, 2010). When done right, innovative business models can attract new consumer segments into an industry due to lower prices and more convenient offers. Over time, thanks to network effects and accumulated experience, disruptors manage to attract mainstream consumers, ultimately affecting incumbents' user base (Garud et al., 2022; Helfat & Raubitschek, 2018;

Rietveld & Schilling, 2021). Network effects are a characteristic of platform business models, arising when the value perceived depends on the quality and number of complementors and/or users present on the platform (Helfat & Raubitschek, 2018; Rietveld & Schilling, 2021). For instance, Airbnb's value proposition demonstrates the two-sided platform characteristic, wherein the increased presence of hosts on the platform enhances the appeal for guests, and vice-versa.

Another phenomenon explaining disruptors' success lies in incumbents' inertia. Indeed, scholars have investigated how incumbents react to environmental discontinuities, and specifically the challenges faced in implementing drastic changes required for surviving disruption (Christensen, 2006; Eggers & Park, 2018; Gilbert, 2005; Kammerlander et al., 2018; Kumaraswamy et al., 2018). For instance, various studies have shown that resource dependency and routine rigidity hinder swift adaptation to discontinuities (Gilbert, 2005; König et al., 2021). Indeed, the deployment of novel technologies challenges the viability of previous technologies that incumbents have relied upon to build their whole business models. Therefore, integrating novel technologies requires for incumbents a profound reorganization of their operations to remain competitive against disruptors that can quickly pivot their activity.

Finally, the lack of commercial incentives also delays incumbents' responses (Eggers & Park, 2018), because disruptive innovations are initially targeted towards the low-end of the market (Christensen et al., 2018), which is not profitable for incumbents in the first place. This explains why incumbents do not invest time and money early on into novel offers that seem hazardous, less financially attractive, and that risk cannibalizing core competencies.

That being said, disruptive innovations usually fail to overtake incumbents as Birkinshaw (2022) has observed that only 3.4% of today's companies making the Fortune 500 did not exist back in 1995, suggesting that effective disruption is rare. However, if successful, this phenomenon can have a disastrous impact on incumbents, which makes adaptation strategies worth being investigated further. Scholars have identified three main strategies that incumbents can implement

to survive disruption in their industry: i) ambidexterity, ii) alliances and/or acquisition of disruptors, and iii) migration. Table 4 summarizes the main strategies with illustrative cases.

Ambidexterity consists in innovating while capitalizing on existing resources and knowledge. Such approach enables incumbents to both compete with disruptors while profiting from the established high-end consumer base (Bower, Christensen, 1996; Christensen et al., 2018; Tushman & O'Reilly, 1996). However, incumbent firms should implement innovation activities within an independent unit separated from the parent firm to improve flexibility, while reducing resource allocation conflicts and routine rigidities (Gilbert, 2005). IBM implemented this strategy to respond to changes in consumer demand related to the introduction of the Personal Computer (PC). A new entity specifically dedicated to the PC was created while top-managers were forbidden to give instructions in order not to interfere with innovation activities within the entity (Macher & Richman, 2004). One year after the project launch, IBM's PC was available on the market with highly promising results.

The second strategy consists of making alliances with or acquiring disruptors before they scale up. By doing so, established firms obtain the knowledge and resources that will enable them to fully capitalize on a novel technology while reducing risks of routine and resource rigidity. GEDI, an Italian newspaper leader managed to overcome disruption brought by internet partly because it acquired its own disruptors (Cozzolino et al., 2018). Initially, the firm engaged in standalone experiments, but quickly faced strong internal tensions and managerial constraints that prevented effective innovation. Acquiring disruptors and developing alliances enables to rapidly incorporate knowledge and resources required to develop competitive innovations while reducing internal tensions.

Finally, migration consists of applying existing resources and knowledge to a whole new market segment or industry. As such, incumbents can continue to capitalize on their expertise and technology, while conquering and harnessing new customers. For instance, against disruption

Table 4. Illustrative cases of incumbent adaptation to disruptive changes and comparison between formal and informal contexts

	Authors	Industry/Case	Disruptive technology or Business Model	Methodology	Firm(s)	Inertia issues	Strategic responses
Formal context	Gilbert (2005)	Press Newspaper	Internet and online news paper	Multiple case study	Anonymous	Resource dependence Lack of incentives Contraction of authority Reduced experimentation Focus on existing resources	New venture creation for experimenting independently of parent company
	Cozzolino (2018)	Press Newspaper	Internet and online news paper	Single case study	GEDI	Still profit from old BM Failed innovations Internal tensions between novelty and conservative	Experimentations Alliances & acquisition Ambidexterity
	Ho & Chen (2018); Brikinshaw (2022)	Photography	Digital photography	Single case study	Fujifilm	Resource dependence Current consumers' high profitability	Internal innovation Migration
	Macher (2004)	Telecommunication	Cellphone development	Single case study	Motorola	Resource dependence Cannibalization Lack of incentives Old strategic vision	Ambidexterity Ambidexterity Independent unit in charge of innovation development Independent unit in charge of innovation development
		IT	Personal Computer	Single case study	IBM	Lack of incentives Resource allocation reluctance Current consumers' high profitability Inability to develop low-cost products	Ambidexterity Ambidexterity Independent unit in charge of innovation development Independent unit in charge of innovation development
	Lucas (2009)	Photography	Digital photography	Single case study	Kodak	Current consumers' high profitability Lack of incentives Middle manager rejection Routine rigidity Firm's image mismatch with new technology	Independent unit in charge of innovation development Independent unit in charge of innovation development Independent unit in charge of innovation development Independent unit in charge of innovation development Independent unit in charge of innovation development
Informal context		Music	Digital Piracy	Single case study	UMG	Legal limitations Old strategic vision	Experiments, innovation, litigation and technical protection (Phase 1) Non market strategies and new comers support (Phase 2) Discursive and performance legitimizing strategies (phase 3)

brought by digital photography, Fujifilm decided to leverage their core knowledge to a whole new market. Through R&D efforts, clever strategic reorientation and intense technology reconfiguration, the firms managed to conquer non-photography industries, such as medical imaging, and generate opportunities for growth (Birkinshaw, 2022; Ho & Chen, 2018).

However, the effectiveness of these strategies has solely been assessed with disruptions emerging from firms respecting regulations (i.e., formal firms). We posit that when a business ventures beyond regulatory frameworks and generates disruption, incumbents' strategic responses are affected. Hence, it becomes crucial for scholars to explore how incumbents' respond to disruption initiated by informal, which can deepen our understanding of disruptive innovation and help managers navigate nowadays uncertain technological landscape.

Informal firms and the informal economy

The informal economy represents the aggregation of firms that are not aligned with formal institutions, but that are considered legitimate by informal institutions. Formal institutions refer to laws and regulations that are communicated via widely and officially accepted channels, as well as the apparatus enforcing them (Helmke & Levitsky, 2004; Nason & Bothello, 2022; Webb et al., 2009), and thus define *legally* acceptable behaviors. On the other hand, informal institutions refer to norms, values, and beliefs that define *socially* acceptable behaviors (Helmke & Levitsky, 2004; Minbaeva et al., 2022; Webb et al., 2009) and are unwritten and communicated via unofficial channels. Based on this theoretical approach, we define informal disruptors businesses whose core activity requires breaking established regulations, but which is considered legitimate by large groups of consumers. Therefore, the concept of legitimacy is central to the understanding of the informal economy, and refers to the generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995).

Because of their illicit nature and unique characteristics, we suggest that when informal firms

generate disruption, different dynamics are likely to occur compared to their formal counterparts. First, they do not play by the same rules as legal players (Webb et al., 2014) which influences the possible strategic responses of incumbents. In addition, scholars have identified differing motives to engage in informal ventures compared with formal ones, such as greater flexibility and reactivity after opportunity recognition (Blackman, 2000; Grosh & Somolekae, 1996; Portes & Haller, 2010), tax avoidance (Gottfredson, 2006; Williams, 2014) and the rejection of formal institutions (Webb et al., 2013). Finally, firms operating in the informal economy are often considered at disadvantage, as their illegal nature deprive them from legal protection mechanisms and limit accessibility to key resources and knowledge (Webb et al., 2013). Surprisingly, over the past decades, some disruptive innovations have actually originated from the informal economy. Consider for instance digital piracy or the proliferation of ride-sharing activities despite their illegality in many countries, which both have significantly impacted incumbents' performance. These observations suggest that non only informal firms can generate disruption, but the strategies that incumbents implement may be different than against formal firms generating disruption.

Scholars have recently given more attention to the responses given by incumbents to growing competition from the informal economy, and several calls have been made to refine our understanding in this area (Darbi et al., 2018; Ketchen et al., 2014; Salvi et al., 2022). Research suggests for instance that informal competition has a direct and positive effect on the probability of a firm to launch a new product (McCann & Bahl, 2017; Miric & Jeppesen, 2020), which is partially strengthened in context of weak property right protection (Miocevic et al., 2022). However, these studies do not consider the potential disruptive power of firms in the informal economy. In addition, the strategic evolution of incumbents overtime against informal disruptors has not yet been considered by scholars. Therefore, we came to the following research question: *How do incumbent firms respond to disruption initiated by informal disruptors?*

METHODOLOGY

To examine how incumbent firms respond to disruptive innovations emerging from the informal economy, we theoretically sampled the music industry as our longitudinal case study. Thanks to their strong embeddedness within the real-world context, case studies provide deep understanding on how subjects under investigation react to changes happening in their environment and enable to test or generate theories (Eisenhardt, 1989; Gilbert et al., 2008). The music industry offers a pertinent context to investigate adaptive strategies to informal disruptors due to its historical exposure to disruptive changes from digital piracy.

Case Selection and Description

Digital piracy has inflicted severe harm on incumbents and artists in general. Recorded music revenues have been shrinking from 2000 until 2015 followed by a subsequent resurgence stemming from the democratization of streaming platforms such as Spotify, Deezer or Soundcloud. During the past two decades, incumbents such as Universal Music Group (UMG) or Sony Music Entertainment, and other institutions have proactively fought digital piracy in various ways, whether it be thanks to the support of new alternatives or lobbying efforts. This creates the perfect setting for our research question as it provides well documented information on the whole phenomenon.

In this study, we focus on the leading incumbent, UMG, that had to adapt to the rapid development of digital pirate websites, which represent informal disruptors in this paper. UMG has been very active in the fight against digital piracy and has initiated various strategies to overcome the disruptiveness of digital piracy. For instance, UMG has initiated joint ventures such as Press Play, has participated in many public consultations with the European Union Commission and has greatly supported the development of streaming platforms. As a result, the firm managed to maintain its leadership within a music industry that is growing like never before.

Our study is bound in time as we have gathered data ranging from 2000 until 2021, which corresponds to the rise and fall of digital piracy, followed by the introduction and democratization

of music streaming platforms. This chronological window enables to capture UMG's responses to the different environmental shocks related to digitization and piracy, and helps establish a temporal evolution of its strategies.

Data collection and analysis

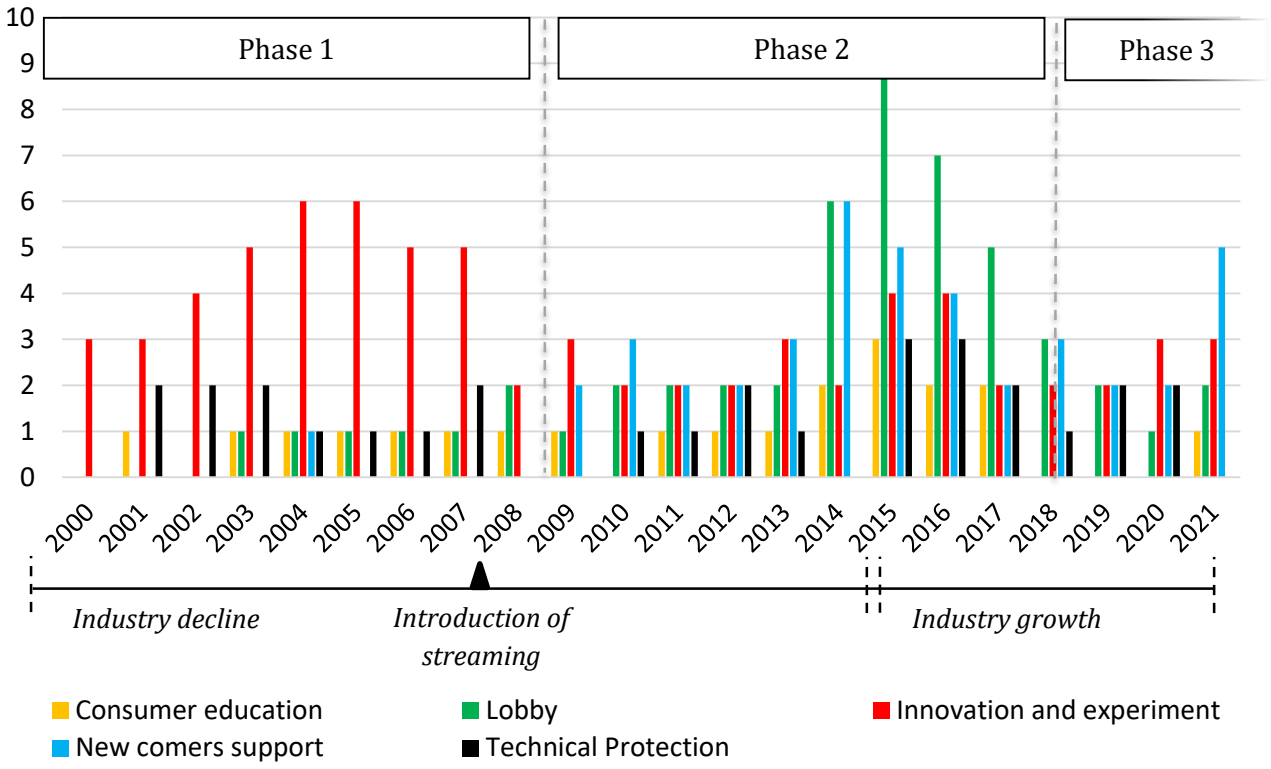
Our data comprise both secondary and primary data. Secondary data consist in 22 annual reports from UMG (2000-2021), which helped track the firm's strategy during the disruption process, along with 23 studies reports from institutions such as the International Federation of the Phonographic Industry (IFPI), the European Union Intellectual Property Office (EUIPO) and the OECD. We triangulated these with 38 semi-structured interviews with artists, experts and employees from labels, institutions, streaming platforms and production agencies. These interviews were conducted between 2020 and 2024 using different methods like video calls, face to face meetings or phone calls, and lasted between 30 minutes and 1 hour 45 minutes, for a total of 25 hours and - minutes transcribed. Table 5 summarizes the data collected and how they were used in the analysis.

We started the analysis process by synthesizing the firm's strategy from annual reports, and coded the relevant quotes related to digitalization and piracy. We then counted the codes related to similar strategies, enabling us to measure their relative significance. For instance, the quote taken from the firms' 2003 annual report "*UMG has established eLabs, a business strategy and technology division, which supervises UMG's digitization and online distribution of content and negotiates agreements for selling that content through third parties*" was coded as "*innovation and experiment*". The result of the coding process served as a basis to establish a chronology of UMG's strategy throughout the years. Employing Langley's (1999) temporal bracketing method (Cloutier & Langley, 2020; Gehman et al., 2018), we divided the chronology of the firm's strategy into 3 phases denoted by strategic shifts and environmental events as illustrated in Figure 3.

Table 5. Data Sources and Usage

Data source	Type of data	Use in the Analysis
Archival data	• 21 UMG's annual reports from 2000 – 2021 • 15 reports from the IFPI • 7 reports from various institutions on counterfeiting and digital piracy - 3 by the EUIPO - 2 by the HADOPI - 2 by the OECD • 1 book (Boulevard du Stream, Sofian Fanen)	• UMG's strategy around digital piracy and digitalization • Consumers' habits regarding digital piracy and online music to better contextualize UMG's strategy • Institutional actions against digital piracy • Addition insights on industry actors' reaction during digital piracy digitalization
Semi-structured interviews	• From 10/2020 – 03/2024 for a total of 25 hours transcribed - 19 with institutions employees - 6 with label employees - 1 with artists - 2 with managers - 3 with streaming platforms - 1 with booking agency - 4 with an industry expert - 2 marketing agencies	• Triangulation • Deeper understanding of the emotion around digital piracy and streaming platforms • Deeper understanding of the stakes and strategies in the industry throughout the past 25 years

Figure 3. UMG Communicated Strategy Evolution Over Time (2000-2021)



For instance, during phase 1 UMG emphasized on innovation and experiment while it focused instead on lobby and newcomers support during phase 2, indicating a strategic shift between the two phases that corresponds with the introduction of streaming platforms in the industry.

We conducted interviews in parallel to enrich the depth of analysis, triangulate the insights generated with archival data, increase construct validity (Gilbert et al., 2008) and because interviews are particularly suited for research questions focused on processes (Rowley, 2012). After opening the discussion around the position and responsibilities of the respondent, the interview was structured into three sections. First, we asked interviewees to recap the emergence, growth, and disruptive impact of piracy on the industry. Then, we explored the strategy that respondents' firms and/or institutions implemented as a response. We also asked questions about the motives behind these strategies, as well as the short-, medium-, and long-term results. Finally, we opened the discussion and encouraged respondents to develop further on the current and future state of the industry as well as their current strategy and relationship with other stakeholders.

To increase validity, several steps were taken. We used non-directive questioning to improve response accuracy and depth, but kept the discussion focused on piracy and the strategies used by incumbents and/or institutions. Moreover, we interviewed multiple informants from varied organizations, and hierarchical positions, contributing to the richness of the data collected. Finally, we ensured anonymity for interviewees, which encouraged them to speak with sincerity and openness.

We coded the answers based on the strategies described by respondents in order to obtain our first order concepts. To illustrate, the following quote from a UMG employee was coded as "*diversification*" as it highlights the aim to generate alternative revenue streams: "*Following the piracy issues, well the industry looked into other means of monetizing music and remunerate authors and artists"*. In a similar fashion, we have coded for the motivations that pushed the adoption of such strategies in order to have a better understanding of the factors triggering strategic shifts. These two steps enabled us to group strategies and motivations respectively. For instance, the "*diversification*" and "*digitalization*" efforts have been regrouped into and labeled as "*innovation and experiment*". Similarly, "*lobby*", "*consumer education*", "*litigation*" and" investigation" have been regrouped into the general idea of "*non-market strategies*". Table 6 provides illustrative quotes and their codes.

FINDINGS

UMG's response to digital piracy unfolded throughout three distinct phases. During the initial phase (2000-09), the focus was on countering the threat of piracy through experiments, innovation, litigations and technical protection measures like Digital Rights Management (DRM) technologies. However, because of various reasons such as legal constraints, value destruction and lack of institutional support, these strategies failed to give rise to a viable solution and put an end to illegal downloading, which in turn prompted the firm to shift its strategy. Hence the evolution in the approach during the second phase (2009-18), which simultaneously addressed both the threat

Table 6. Illustrative Quotes from Secondary and Primary Data Sources

Strategies	Data sources	Illustrative quotes
Innovation/experiments	Ex-UMG employee	*When we ended up at the beginning of the 21st century with this hassle which is piracy, the decreases in sales and all that, we had to step back and think of growth alternatives and diversification.*
	UMG annual report (2004)	*UMG also invests resources through a variety of independent initiatives and strategic alliances in the technology and electronic commerce areas to allow the music business to be conducted over the Internet and over cellular, cable and satellite networks.*
Litigations	UMG annual report (2006)	*The industry and UMG are increasing their anti-piracy activities with a multipronged approach focusing on legal action […]*
Technical protection	Music journalist	*Companies in the music industry joined forces with IT firms in order to try to implement a system of control of copying on walkmans. […}*
Non market strategies	UMG annual report (2012)	*UMG works with governments and ISPs to introduce measures to educate users about the wide availability of legitimate downloading services and which implement a system of warnings about the use of illegal services.*
	UMG annual report (2016)	*Lobbying activities by Universal Music Group are mostly conducted through industry associations such as the IFPI at an international level and national affiliates like the RIAA in the United States, the BPI in the United Kingdom and SNEP in France.*
Newcomers support	Streaming platform employee	*Labels have pretended not to see the problem for years until they said "hey guys, it's been 4 years that we are losing money: we need to react!" and they started to put the money. We (Deezer) have common shareholders in labels, like Spotify.*
Performance strategies	UMG annual report (2020)	*UMPG launched UMPG Window, its next-generation copyright portal, in 2020, giving its artists and customers instant access to clear, comprehensive, real-time information about their income and data.*
Discursive strategies	Label manager	*It is funny because I spend a lot of time discussing with managers, to educate on digital, the nuts and bolts of the thing*

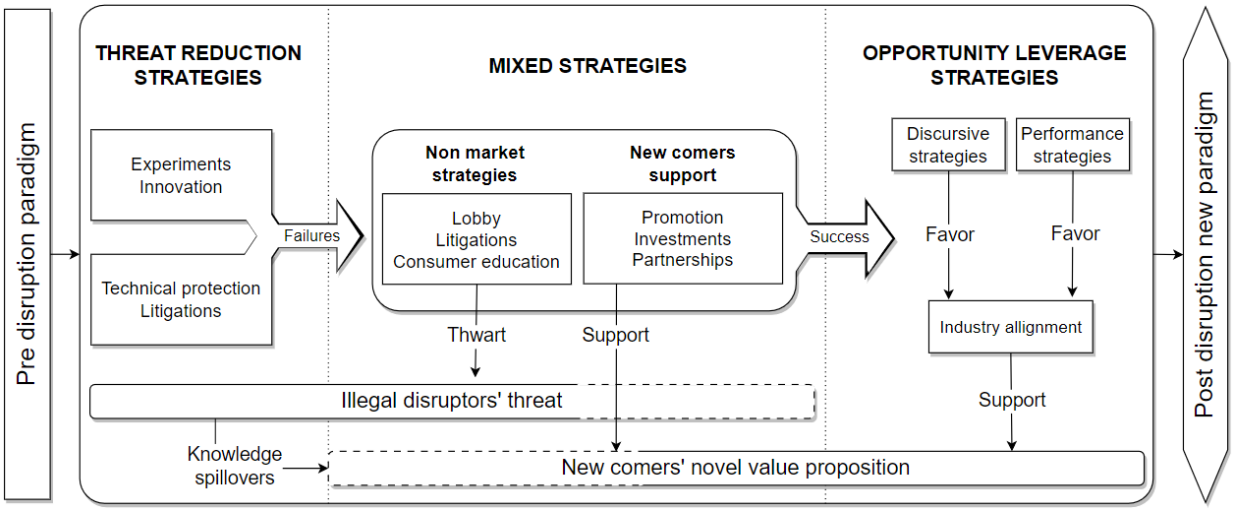
of piracy and the opportunity of alternatives introduced by newcomers. Non-market strategies, consisting in lobby, litigations and consumer education, helped reduce the threat of informal disruptors while promotion, investments and partnerships supported the development of newcomers with viable alternatives. Upon the resurgence of the industry, the strategy shifted again in the last phase (2018–2021), with a pronounced focus on industry alignment around newcomers' value proposition. To do so, UMG employs performance and discursive legitimizing strategies, which enhances profits derived from these newcomers and encourages other complementors to align with the emerging new paradigm. Figure 4 illustrates the identified phases and the strategies adopted by UMG throughout the adaptation process, as well as the triggers and outcomes of these strategies.

Phase 1 (2000 – 2009): Threat reduction: Experiments, innovation, litigation and protection

The democratization of computers and the internet highly accelerated the development of digital piracy which quickly spread worldwide. Institutions and incumbents like UMG failed to anticipate the potential risks, resulting in difficulties in protecting right owners and enforcing copyright laws. A journalist specialized in the music industry explains that "*There was a deflagration that was about to happen, and no one was expecting that at all!*". He continues describing the mentality of incumbents at the end of the 20th century explaining that *"The music industry was not sensitive, interested nor questioned about what was happening*" as it lacked awareness of the unfolding digital revolution. An artist adds up: "*There were no rules nor laws about it, so we let things go. Only then did some artists start to complain*".

Therefore, despite important litigation efforts undertaken by UMG and some initial legal victories against pirate platforms like Naspter, enforcing copyright regulations became an uphill battle for institutions, given the sheer volume of infringements and the rapid pace of technological change. An employee from the EUIPO compares the situation to "*whacking the mole*" because *"the people who want to access this type of content just migrate to another site".* This sense of

Figure 4. Incumbents' Strategic Adaptation to Disruption Emerging from the Informal Economy



urgency is evidenced in Vivendi's annual report in 2000 (p.ii): "*Technological developments that may affect the distribution of our products or create new risks to our ability to protect our intellectual property rights".* UMG was thus compelled to react quickly as the firm could not rely on legal mechanisms to safeguard its operations against the disruptive impact of digital piracy. Without robust institutional support, the firm responded with important investments in digital technologies and developed an independent unit called e-Lab, tasked with monitoring the technological landscape and *"engaged in various projects intended to open new distribution channels and improve existing ones*" (Vivendi annual report 2005, p.13). Through e-labs, the firm capitalized on online solutions, in partnership with other actors such as Apple with the iTunes store, to offer consumers the possibility to obtain music online. However, this was done "*under a historical prism which is purchasing music to become owner and be able to reuse"*, as explained by an ex-employee at UMG. Another respondent denounces the lack of vision from labels "*There are some people who had the vision like 'we will put everything that exists instantly at someone's disposal', and labels which tried to secure the fact to sell products to people."*

Nevertheless, this proactive approach did allow greater experiments and diversification with alternative sources of revenue. To illustrate, UMG utilized its existing music assets to launch the sales of ringtones and expanded artist endorsement with brands to counterbalance to shrinking CD

sales. An ex-employee at UMG describes the urgency and riskiness of the situation: "*we absolutely needed to react, but no one had a guideline: nothing!* […] *The idea was then not to sell albums and recorded music, but to create partnerships with other firms to integrate music in their development strategy*". But, the lack of institutional and technical safeguards, coupled with uncertainties related to digital technologies at that time hampered UMG's effort to integrate online solutions in its traditional operations. Pascal Nègre, CEO of Universal Music France (1998 to 2016), explains that *"Technologies at that time did not allow to protect ourselves from copying, therefore we would not upload music on our websites and would advise our artists not to do so due to lack of reliable technical and juridical solutions*" (Fanen, 2017, p. 58).

In response to this predicament, UMG and the industry sought solutions, often through technological means, to prevent consumers from copying and uploading CD content online. The use of DRM technologies was one such approach, as stated in the firm's 2007 annual report (p.42), "*Standard DRM solutions have already been developed within the Open Mobile Alliance (OMA) […]*". However, this approach backfired as DRM curtailed the value of CDs by restricting consumers from making copies of their legally purchased music to enjoy it on their devices as they pleased, which was not the case with pirated music. Even worse, DRM lacked interoperability between different supports, resulting in CDs being incompatible with various devices. For example, EMI, one of UMG's primary competitors, introduced a DRM technology called "*copy control*" both in the US and Europe at the same time without pre-testing its functionality. This move proved disastrous as French local managers quickly discovered that CDs with the copy control technology were incompatible with approximately 45% of French cars' radios, rendering almost half of EMI's customers enable to enjoy the music they had legally purchased. This scandal further eroded CD's competitiveness against pirate platforms and was described as a nail on an agonizing support's coffin (Fanen, 2017), and prompted major labels to rethink their strategy.

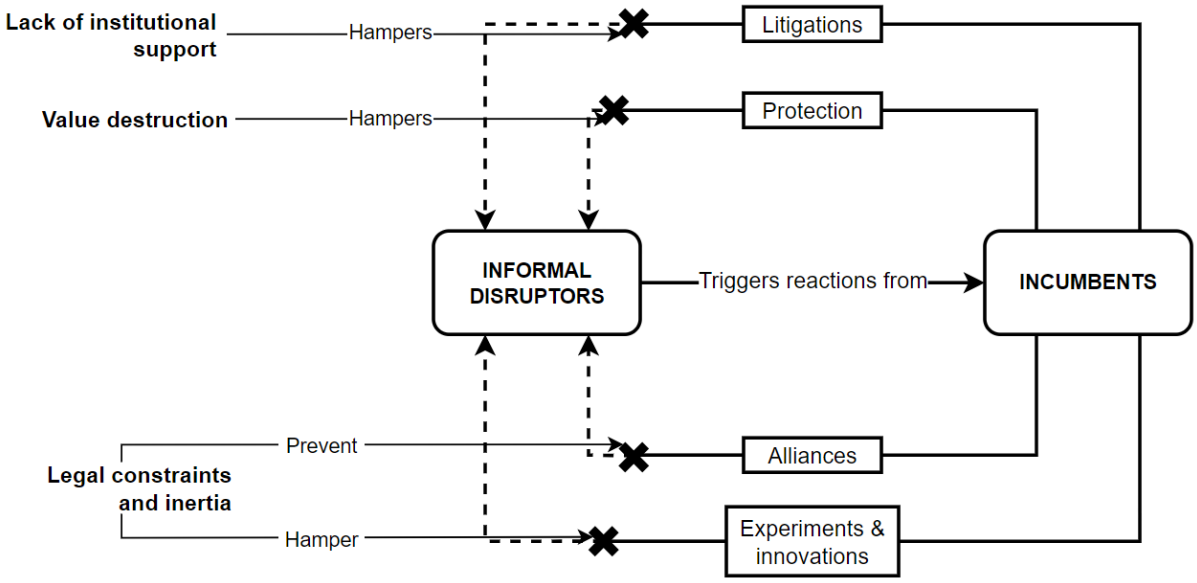
The dynamics observed in the initial phase unveil the challenges that incumbents face in

assessing the threat posed by disruptors' upfront and react accordingly. In addition, the lack of institutional support due to difficulties in adapting regulations hampers litigations against informal disruptors. Under such circumstances, incumbents' respond with experiments and innovations coupled with strong technical IP protection, but hardly achieve overthrowing disruptors. Indeed, despite the usage of recommended strategies in the literature (such as the creation of UMG's e-Lab illustrating ambidexterity strategy in our case), these endeavors only yield limited effectiveness in mitigating the impact of disruption and compensating the resultant losses. Their inefficacy stems from legal constraints and strong inertia, both hampering the seamless implementation of required changes within incumbents' operations. Finally, over-protecting the firm's assets via technological solutions such as DRM may lead to value destruction, as these constrain consumers' experience and thus reduce the firm's competitiveness against other illegal offers (see figure 5).

Phase 2 (2009 – 2018): Mixed strategies: Non market strategies and new comers support

Facing difficulties in developing competitive offerings, and because of the lack of institutional protection, UMG strategically repositioned its approach to support the introduction in their industry of newcomers with novel value propositions. This support manifested in vigorous lobbying and extensive consumer education campaigns, as evidenced in Vivendi's annual reports (2012, p.24): "*UMG works with governments and ISPs to introduce measures to educate users about the wide availability of legitimate downloading services and which implement a system of warnings about the use of illegal services*". In fact, the transparency register reveals that between 2014 and 2018, UMG has participated in 33 meetings with the European Commission to address copyright issues and regulation enforcement (see figure 6). UMG also collaborated with the IFPI, which was present in 68 meetings since 2014 on related topics, to bolster its political influence as illustrated in the 2015 annual report of the firm (p.66): "*Industry level action is coordinated by global and national industry associations (such as the IFPI and its national group affiliates) with*

Figure 5. Limiting pressures over incumbents' initial responses

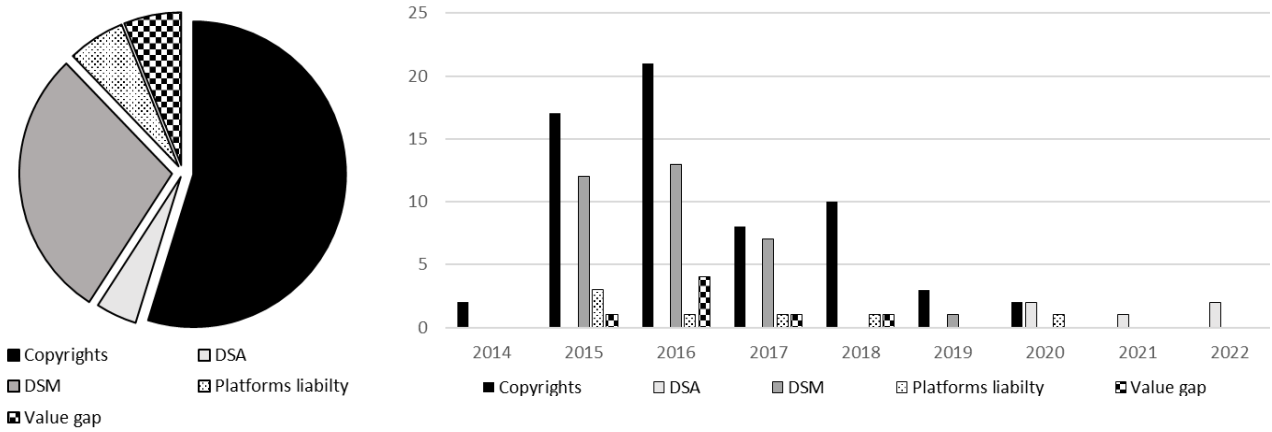


whom UMG works very closely". The strong collaborative ties between labels and institutions reduced pirate competition thanks to the closure of illicit websites such as The Pirate Bay or MegaUpload, the extension of the copyrights' protection duration, and the facilitation of regulations' enforcement, which ultimately facilitated the development of newcomers.

In parallel, extensive consumer education campaigns have been meticulously executed, with a particular focus on students and children, aimed at curbing piracy by elucidating its adverse effects on society, the economy, and artistic creativity. However, these legal and educational interventions, illustrated by the HADOPI in France, have fallen short in completely eradicating illegal practices on their own. As criticized by a music industry expert, HADOPI's approach seemingly resembles "*beating a dead horse*" because "*they did not take into account what was happening in society*". He continues by highlighting the critical chasm that existed between rapidly evolving technologies and the rigid regulatory frameworks: "*We gave the technological possibility for consumers to download, why would we take it away afterwards?*".

In light of this paradox, UMG and institutions have recognized the imperative to support solutions capable of generating sustainable profits. Actually, various studies run by the EUIPO provide evidence that reducing illegal behaviors necessitates competitive and legitimate

Figure 6. UMG, Vivendi and IFPI's meeting subjects with the EU Commission



Note: DSM stands for Digital Single Market and DSA stands for Digital Services Act. Only recurring subjects from 2014 (year when meetings held between commission members and organizations were made publically available) until today have been included. Vivendi has been the parent company of UMG until 2020.

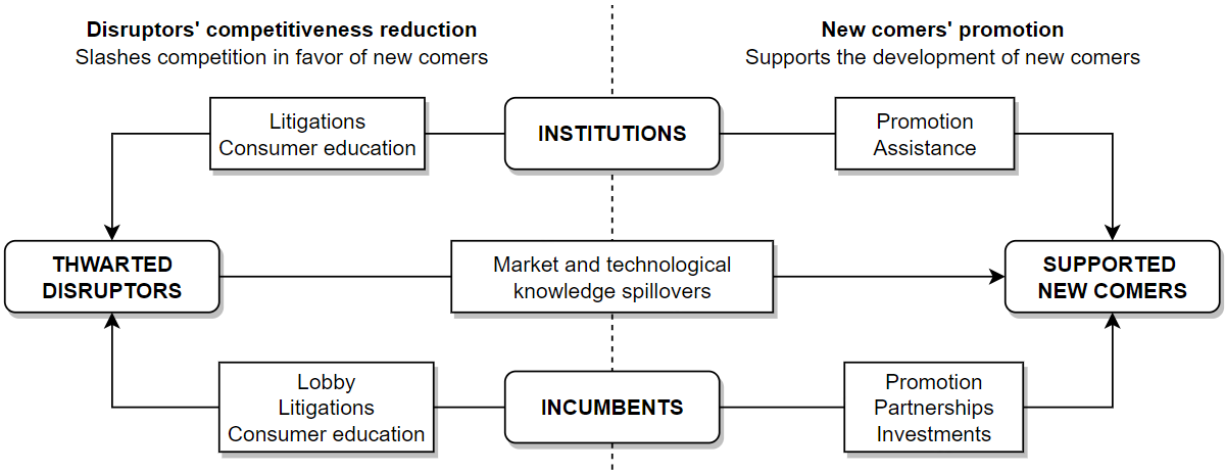
alternatives: *"[…] we find that there are big differences between the EU member states in the way people use pirated content. And what we find is that, also when you have a good legal offer, that reduces piracy*". Such observations motivated various initiatives in favor of the development of legal solutions. For instance, the SACEM (Société des Auteurs, Compositeurs et de l'Edition Musicale) in France, has taken an active role in nurturing entrepreneurs and facilitating the development of legal, viable business models. The emphasis here lies in cultivating collaborative agreements rather than resorting to punitive measures for non-compliant platforms. As explained by an employee of this organization: "*What is important is developing business models… then we know the money will come eventually. Therefore, we would rather find deals than force closure because they (platforms) do not have agreements*". Another important initiative has been the creation of legal websites referencing platforms to improve their notoriety. To illustrate, the HADOPI has developed a website featuring "*approximately 436 referenced platforms that appear as respecting copyrights",* thus empowering consumers to make informed choices in favor of legal solutions.

Finally, and because of the difficulties in developing solutions and enforce regulations, UMG rapidly forged partnerships with newcomers by signing deals that propelled their launch. An ex-employee reveals that "*At UMG, we would privilege dialogue and compromise to find deals, even*

though it meant renegotiating on a yearly basis to increase them. We needed to initiate those deals". UMG's annual reports also underscore this concerted effort, stating, "*UMG plays a leading role in the evolution and expansion of the digital music market and continues to encourage and support innovation through partnerships with the leading players in the market, including Spotify, iTunes, Deezer, Google and Vevo*" (UMG annual report 2014, p.26). Notably, after years of strong inertia, the firm opened its catalog to various new platforms, actively promoted their solutions, and made significant financial investments to facilitate and influence their development. According to an employee in a leading streaming platform, labels had turned a blind eye to the problem for years until they finally realized: *"'It's been 4 years that we are losing money: we need to react!' and they started to put the money. We, just like Spotify, have common shareholders in labels".* Therefore, UMG, with its competitors and institutions, has pushed newcomers towards a viable, legal and competitive business model: *"It is the music industry, spearheaded by labels, big editors and powerful collective rights management companies, SACEM is one of them, who managed to bring platforms to a premium model"* explains a SACEM employee.

UMG's strategic shift serves as valuable insights on how incumbents navigate disruptive challenges posed by the informal economy. Rather than forming partnerships with disruptors themselves, as suggested by past studies (Cozzolino et al., 2018; Eggers & Park, 2018), against informal disruptors incumbents are more inclined to partner with newcomers offering legal alternatives. Indeed, the failure of past experiments and the emergence of legal alternatives compel incumbents to foster the growth of newcomers with legal alternatives and expedite their introduction to counter informal disruptors. These observations suggest that disruption stemming from the informal economy creates an environment conducive to the emergence of newcomers, notably thanks to the strategies embraced by incumbents and institutions to support their development (see figure 7). Past research has hinted at this direction, acknowledging digital piracy as a valuable source of market and technological knowledge for entrepreneurs (Choi & Perez,

Figure 7. Incumbents Mixed Strategies Towards Disruptors and Newcomers



2007; Darbi, 2018). On the one hand, collaborating with institutions through lobbying, litigations, and consumers' education mitigates informal competition. On the other hand, this collaboration reinforces newcomers' legitimacy thanks to partnerships, investment, assistance and promotion. In doing so, incumbents foster the development and enhance the competitiveness of newcomers, thereby accelerating consumers' transition from illegal to legal solutions.

Phase 3 (2018 – 2021): Opportunity leveraging: Legitimization and Industry alignment

Today, the supported rise of streaming platforms has reached a global scale, capturing 66% of UMG's recorded music revenue in 2020 (UMG annual report 2021). However, their novel proposition drastically shifted the long-standing ownership model centered around CDs and downloads to an access-based model driven by streaming services, whose legitimacy has still not yet been fully established. Even though it helped reinject revenue in the industry, the streaming business model is still today subject to heavy criticism due to unbalanced value re-distribution among artists with some labelling streaming as "*tolerated theft*". This highlights the challenges in achieving consensus around a brand-new paradigm as illustrated by a label manager: "*It is very complicated because everyone tries to compare streaming to selling albums. […] But it makes no sense actually. You see, these are totally different things!"*.

Therefore, to accelerate acceptance from complementors', which we define as actors (in our

case, artists) that provide products or services that are necessary for a value proposition to materialize (Thomas & Ritala, 2022), UMG and other labels engaged in *discursive* and *performance legitimizing strategies*. *Discursive legitimizing strategies* aim at motivating complementors to embrace and participate in an ecosystem by building a shared understanding of the roles, purpose and value proposition (Battilana et al., 2009; Phillips et al., 2004; Snihur et al., 2018; Thomas & Ritala, 2022), This fosters the legitimacy of the value proposition within and outside of the ecosystem, as attested in UMG's 2021 annual report (p.102): "*UMG is a key promotor of innovation across the digital ecosystem through partnerships in new product categories and through proactive efforts to cause its partners to evolve and innovate."* These elements indicate that substantial efforts have been made by incumbents to educate complementors on how to utilize novel value propositions and to enhance their legitimacy via discursive legitimizing strategies. In turn, this enables labels to assist artists in achieving greater success and generate more value from streaming platforms, ultimately benefiting all stakeholders.

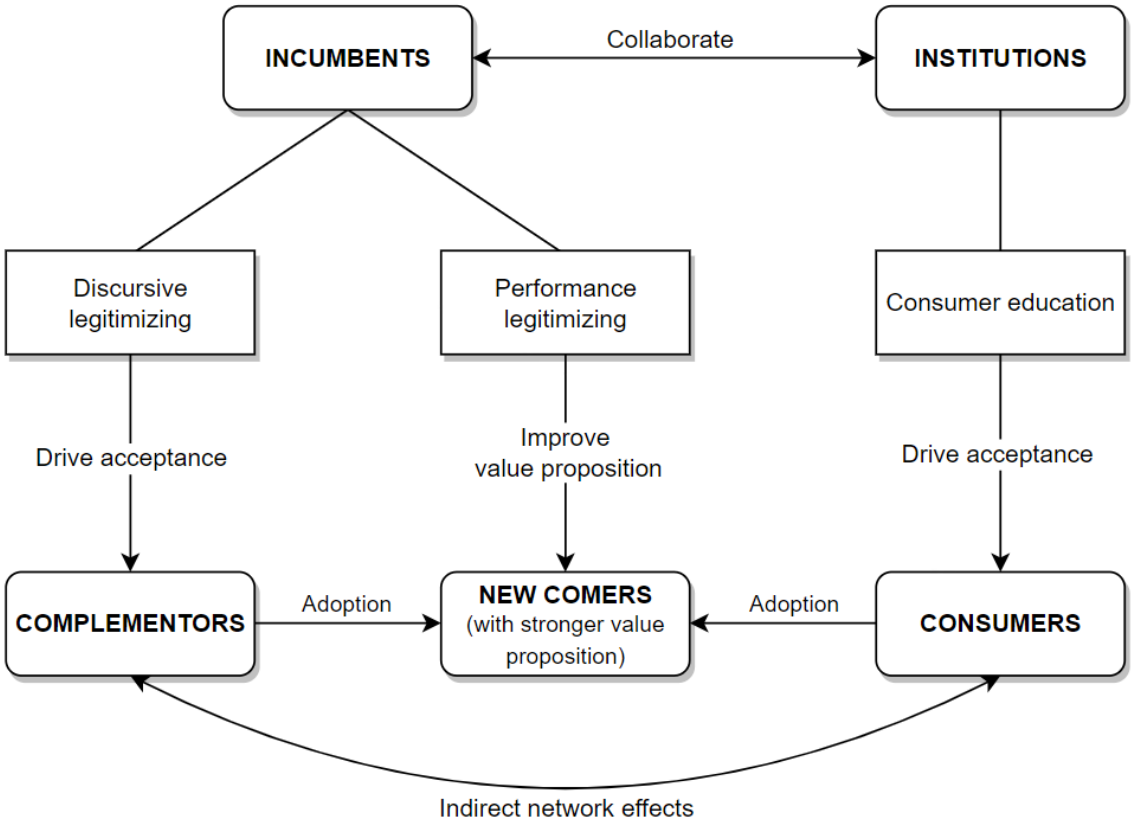
In parallel, UMG engaged in *performance legitimizing strategies*, which we refer to as actions that demonstrate and/or improve the viability of a value proposition (Aldrich & Fiol, 1994; Suchman, 1995; Thomas & Ritala, 2022). As such, incumbents can improve an ecosystem's performance thanks to strategic actions such as innovation or investments in technologies specific to the novel value proposition (Thomas & Ritala, 2022). As illustrated in UMG's annual reports in 2019 (p.25): "*UMG continues to pursue new ways to capitalize on the digital transformation of the industry, including using data that were previously unavailable in the physical business to help its artists better analyze consumers' listening habits*". The launch of Universal Music Artists in 2019, an application providing artists with real-time data about music consumption which helps them "*move their career forward*" (Universal Music Artist website) exemplifies this approach. This illustrates how incumbents' innovations can help increase newcomers' legitimacy, and thus drive acceptance and adoption.

Finally, consumer education campaigns have been maintained with the intermediary of institutions and towards youngsters "*as they are the ones who tend to use piracy more often […]"* explains an employee at the EUIPO. These consumer education campaigns aimed at legitimizing newcomers' offers by empathizing on the adverse effects of piracy while "*informing consumers about the existence of all legal offers*" explains an employee at HADOPI. UMG have maintained an influence over these campaigns with its engagement in lobbying activities and its participation in public discussions:

> *"Through our collaboration with the Recording Industry Association of America (RIAA) […], we participate in meetings and discussions with other industry leaders on a daily basis. The RIAA has teams in place that work with various stakeholders in law enforcement, data analysis, consumer education, political, and music industry ecosystems."* (UMG's annual report 2021, p.154)"

These findings indicate that incumbents, after years of experimentation and attempts to develop alternatives, push stakeholders to align with new paradigms introduced by newcomers. The convergence of discursive and performance legitimizing strategies (Thomas & Ritala, 2022), plays a pivotal role in facilitating the adoption of newcomers by complementors and consumers. Through discursive legitimizing strategies, incumbents positively frame newcomers' value proposition, fostering acceptance, adoption and better utilization by complementors, which helps them extract more value from it. Simultaneously, performance legitimizing strategies capitalize on newcomers' value proposition and optimize value capture for both complementors and consumers, which ultimately accelerates adoption from both sides. These legitimizing strategies generate indirect network effects, characteristic of platform business models, wherein the value perceived by consumers is contingent on the quality and number of complementors present on the platform (Helfat & Raubitschek, 2018; Rietveld & Schilling, 2021). As the industry aligns around newcomers, their value proposition gets more competitive (see Figure 8). This alignment enables stakeholder to generate greater value, accelerate consumers' adoption and increases resilience against disruptors, as a respondent emphasized: "*The signals are still very positive, and there is*

Figure 8. Industry Alignment Around Newcomers



no indication that it's going to take a nosedive".

DISCUSSION

In this study, we answer the research question: *How do incumbent firms respond to disruption initiated by informal disruptors?* Our observations unveil three different phases that incumbents go through during their adaptation process consisting in 1) experiment, innovation, litigations and technical protection, 2) non market strategies and new comers' support, and finally, 3) discursive and performance legitimizing strategies. We find that incumbents employ different strategies when faced with disruption emerging from illegal businesses compared to legal ones, and these strategies evolve over time. Our findings contribute to different literatures, namely incumbents' adaptation to disruption (Cozzolino et al., 2018; Eggers & Park, 2018; Kammerlander et al., 2018) and the informal economy (Darbi et al., 2018; Iriyama et al., 2016; Salvi et al., 2022; Webb et al., 2014). By shedding light on the distinct stages of incumbents' responses and the dynamics of these

strategies, our study enriches the understanding of how firms navigate disruptions emanating from the informal economy. These insights offer valuable implications for strategic management theories and practices in times of disruption that we develop in this section.

Incumbents' adaptation to disruptive innovation

With our longitudinal case study of UMG's responses to digital piracy, we reveal that certain recommended strategies proposed in the literature, such as ambidexterity (Cozzolino et al., 2018; Gilbert, 2005; Macher & Richman, 2004), may prove challenging and ineffective when confronting disruptions arising from the informal economy. Indeed, incumbents are inclined to embark early on in experimentation to harness technological transformations, and litigations against informal disruptors. However, litigations are unsuccessful because of lack of institutional support due to their slow adaptation to technological changes. In addition, experiments may only partially mitigate the losses caused by disruptors because of inertia and legal constraints that reduce the competitiveness of incumbents' innovations. Alternatively, we suggest that incumbents benefit from supporting innovations introduced by newcomers in their industry who are less limited by inertia (Gilbert, 2005). In fact, collaboration with institutions in consumer education campaigns, lobby, litigations, and newcomers support have proven successful in curbing illegal behaviors while expediting the adoption of the legal alternatives. In essence, successful adaptation against informal disruptors is likely when incumbents adopt non-market strategies that are geared towards competition reduction (phase 1 and 2 in our case) and complemented by newcomers support (phase 2 and 3). As expressed by our respondent from the Finish Anti-Piracy Center: "[…] y*ou cannot fight piracy without alternatives!*".

These findings have important theoretical implications suggesting that when disruptors emerge from the informal economy, managers should adopt different strategies than those developed in the literature to maintain competitiveness. Our contributions also provide practical guidance for managers on how to successfully strategize amid growing disruption from the

informal economy. This is important given the accelerating pace of technological changes that are likely to make existing regulations difficult to enforce, thereby calling for strategic management practices that align with this evolving landscape. The implications of our findings extend to the realm of artificial intelligence along with the related legal and strategic challenges, especially in terms of intellectual property, as our paper may serve as guidance to navigate this disruption. While it could be argued that the uniqueness of digital piracy in our study may hinder generalizability, we view it as an intriguing opportunity for future research. Indeed, as technological advancements proliferate rapidly in contemporary times, exploring the applicability of our findings becomes even more pertinent. Furthermore, investigating how incumbents and institutions collaborate against informal competition could be a highly valuable avenue for both the literature on disruption and the informal economy. This could yield invaluable insights into the dynamics of adapting to informal disruptors and enrich our understanding of strategic management practices in understudied business environments and conditions.

The disruptive forces of the informal economy

The insights developed in this paper also answer calls for a deeper understanding on the relationships and competitive dynamics between formal and informal economies (Iriyama et al., 2016; McCann & Bahl, 2017; Salvi et al., 2022), particularly in context of developed countries (Darbi et al., 2018). We show how the illegal nature of disruptors, when emerging from the informal economy, influences the competitive strategies adopted by incumbent firms. While scholars have argued that firms in the informal economy are less resourceful, and thus less competitive than incumbents (Darbi et al., 2018; Webb et al., 2013), our case study reveals that informal firms can pose a great threat. This is important because the disruptive innovation literature has predominantly focused on the formal sector of the economy to craft adaptation strategies for incumbent firms, leaving managers ill-equipped to confront disruptive forces emerging from the informal economy. In the current landscape, where growing technologies challenge existing

regulations, this knowledge gap becomes especially critical.

While some may argue that the case of digital piracy is unique due to its occurrence at the dawn of the digital era, other examples like Uber's rise, despite its illegality in certain countries, suggest that disruption can indeed emerge from the informal economy. This underscores the relevance of conducting further research in contexts where disruption originates from informal firms. What are the key drivers behind the success and failure of incumbent responses to informal disruptors, and what best practices can be identified to enhance their strategic adaptation capabilities? How do the regulatory and institutional environments in different countries shape the emergence and growth of ventures originating from the informal economy, and how do incumbents navigate these diverse contexts? Such investigations would allow us to fine-tune our findings, pinpoint the key factors driving disruptors' growth, and unveil the most effective strategic responses for managers to deploy.

Illegal practices and legal venture creation

Finally, our findings suggest that the growth of informal disruptors prepares fertile soil for new venture creation. Researchers have called for further research on the influence of the informal economy on strategic practices (Darbi et al., 2018; Ketchen et al., 2014; Salvi et al., 2022) and how to foster entrepreneurship in contexts of strong informal competition (Cavotta & Phillips, 2022). Notably, past studies indicate that firms within the informal economy serve as great sources of market and technological knowledge, benefiting entrepreneurs operating in the formal economy (Choi, 2007). Building on these insights, we advance the argument that incumbents' responses to informal disruptors favor formal new venture creation. The interplay of inertia, legal constraints, and regulatory enforcement challenges impede incumbents from both stopping illegal behaviors and developing viable solutions, leaving them to grapple with continual market share loss. In response to this complex institutional landscape, incumbents are compelled to pivot their strategy towards proactively supporting the entry of new ventures into their industry and lobbying for more

effective regulation enforcement against informal disruptors. Thus, the emerging ventures find themselves in an advantageous position as they gain traction amid diminished competition, access to resources, increased notoriety, stronger legitimacy, and institutional support, which are all critical factors for success.

This symbiotic relationship between incumbents and new ventures underscores the transformative impact of informal disruptors and highlights the strategic realignment needed to thrive in this evolving business landscape. Yet, while our study is primarily focused on incumbent firms, it offers useful yet limited insights on the experience of newcomers and how entrepreneurs develop their licit businesses in times of disruption. We believe that this represents a valuable avenue for future research that could refine our knowledge on disruptive innovation and entrepreneurship. How do entrepreneurs harness incumbents and institutional support to propel their activities in times of disruption? How do they capitalize on knowledge spillovers from informal disruptors to develop legal and sustainable business models? By probing into the influence of periods of disruption from the informal economy on entrepreneurship, researchers can unveil critical dynamics that shape entrepreneurial endeavors. Understanding how these disruptions influence the birth and evolution of ventures offers valuable implications for research not only for disruption and the informal economy research, but also for the broader entrepreneurship literature.

CONCLUSION

As we contemplate the future of strategic management considering disruptive forces and the evolving informal economy, our research offers a prescient lens through which to anticipate upcoming challenges and opportunities. We highlight the limitations of traditional strategies proposed in the literature and explore novel approaches for incumbents to maintain competitiveness against informal disruptors. By embracing collaborations with institutions, engaging in lobby efforts, and supporting new comers, incumbents can reduce informal disruptors'

threat and foster industry alignment with legal alternatives. With these insights, entrepreneurs and managers can navigate the intricacies of competition emanating from the informal economy with greater efficacy, enabling their new ventures or organizations to thrive in an ever-changing landscape. Thus, our study serves as a call to action, urging scholars to explore these important avenues for future research in strategic management.

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Paper 3. Ecosystem Parasites: Symptom of Poor Ecosystem Governance?

ABSTRACT

Platform ecosystems represent the alignment of heterogeneous and independent actors around a digital platform, interacting to generate a focal value proposition that cannot be generated individually. While participating in a platform ecosystem can be highly beneficial, rigorous governance mechanisms must be implemented to maintain complementors' engagement toward a common value proposition. Despite extensive research on the mechanisms used to govern complementors, gaps remain in our understanding of the consequences of poor platform design and governance. This is evident from the rise of illicit behaviors (or parasites) in streaming services, where fraud has become common. Through a case study of the streaming platforms and their ecosystems, we identify the factors responsible for the emergence of fraud carried out by stream farms and provide insights generalizable to other digital platforms. Overall, we contribute to research on platform governance by introducing the concept of digital parasites and highlighting the potential consequences of poor platform ecosystem management.

Keywords: Digital platforms, Business models, Governance, Ecosystem, Illegal behaviors, Digitalization

INTRODUCTION

Due to rapid digitalization and technological progress, digital platforms have emerged over the past decades as significant forces in the economy. Digital platforms refer to a particular type of business model that facilitates interactions between two or more groups of actors, often referred to as users and complementors, through a standardized digital interface (Chen et al., 2022; Tarzijan & Snihur, 2024). Companies like Uber, Airbnb, and Amazon have transformed industries and challenged traditional business models by connecting buyers and complementors, enabling peer-to-peer transactions, and leveraging network effects to create value for their users. Digital platforms are appealing for managers as their collaborative nature helps to improve performance and overcome challenges such as access to resources (Pushpananthan & Elmquist, 2022), legitimacy (Taeuscher & Rothe, 2021; Thomas & Ritala, 2022) and technology dissemination (Murthy & Madhok, 2021; Palmié et al., 2020).

As they grow, digital platforms give rise to ecosystems, which describe interdependent actors' alignment around a digital platform to generate a common value proposition (Adner, 2017; Lingens et al., 2021; Thomas & Autio, 2020). Stakeholder theory (Freeman et al., 2020) suggests that platform owners must consider the interests of a wide array of stakeholders in order to maintain their performance, legitimacy, and competitiveness against other platforms (Carrasco-Farré et al., 2022). Indeed, because of the variety of complementors orbiting around digital platforms, it is crucial to implement rigorous governance mechanisms in order to ensure their involvement in joint value creation (Chen et al., 2022; Ricart et al., 2020), and by extension, platform performance and legitimacy (Mahajan et al., 2023; Mitchell et al., 1997). For instance, platforms can stimulate complementors' effort with incentives such as rewards, autonomy, sharing resources, and providing information. In parallel, they can shape complementors' conduct to avoid misbehaviors via control mechanisms related to platform accessibility, behavior, output, and external relationships. As such, platforms assert strong

influence and use it to govern behaviors and align objectives towards common value creation (Daymond et al., 2023; Pushpananthan & Elmquist, 2022; Visnjic et al., 2016).

Yet, despite highly contributing to economic development (Graham et al., 2017; Solomon & Van Klyton, 2020), without proper management, digital platforms may generate negative externalities for their ecosystem and society. Such negative externalities include pollution, resource depletion, interest misalignment, user dissatisfaction, and unbalanced value capture among complementors (John & Ross, 2022; Daymond et al., 2023; Jacobides et al., 2024; Wareham et al., 2014). The rapid growth of Airbnb in Barcelona illustrate such negative externalities; as it incentivized undeclared transactions, led to an important increase in rental costs, and accelerated mass-tourism to the detriment of the local residents, pushing them to leave (Carrasco-Farré et al., 2022). This example suggests that digital platform owners should also consider the eventual negative consequences related to the development of their platforms for various stakeholders, and thus implement strict governance mechanisms.

However, we still know little about the long-term consequences of negative externalities in platform ecosystems. Recent studies indicate that tensions related to value capture unbalance, hyper-competition or interest misalignment reduce complementors' effort, resulting in free-riding behaviors (Jacobides et al., 2018; Wareham et al., 2014). Yet, this topic remains relatively neglected, as illustrated by the recent calls made to investigate platforms' evolution over time (Pushpananthan & Elmquist, 2022; Thomas & Autio, 2020) and consider their failures in addition to their successes (Jacobides et al., 2024; Scaringella & Radziwon, 2018). Investigating the platforms' feature that lead to negative externalities, as well as their long-term consequences would improve our knowledge of platform ecosystem lifecycles, a domain that remains overlooked in the literature (Autio & Thomas, 2014; Daymond et al., 2023; John & Ross, 2022; Scaringella & Radziwon, 2018).

One particular phenomenon not yet theorized is the emergence of parasitic behaviors,

illustrated by stream fraud in music. As defined by the Centre National de la Musique (CNM) in France, stream fraud describes "*the artificial creation of online plays or views by human and non-human means to generate income, improving chart position and/or swaying a recommendation system"* (CNM, 2023). This case highlights important gaps in the platform governance literature, especially regarding failures, negative externalities, and the mechanisms behind the emergence of parasitic behaviors. Because digital platforms are likely to proliferate due to rapid digitalization and the development of artificial intelligence, it is urgent to build a rigorous understanding of the emergence of parasitic behaviors, as these may hinder the swift development of the platform and its users. We therefore ask the following research question: *How do digital parasites emerge in platform ecosystems?*

To bring an answer, we conducted a case study of streaming platforms in music, focusing on the development of stream fraud in their ecosystems. Stream fraud is carried-out by illegal organizations called "*stream farms*", which artificially increase artists' streams to boost their visibility on streaming platforms, and thus capture more revenues. This represents an ideal case to understand how such organizations emerge and what factors push platform users to adopt their services. We therefore conducted semi-structured interviews with various people involved in the music industry, and complemented with secondary data for triangulation, such as market studies, institutional reports, and websites.

With this study, we contribute to platform governance and business model research. First, we introduce digital parasites defined as strategic actors that engage in opportunistic behaviors to extract value from a digital platform, capture it, and eventually redistribute it to other actors. We elucidate how the lack of incentives and control mechanisms, by generating negative externalities, create ideal conditions for digital parasites' invasion and promote their utilization by complementors. We go beyond the mere identification of negative externalities by showing how platforms' complementors react to persisting tensions within their ecosystem, which

remains understudied in the literature (Jacobides et al., 2024; Scaringella & Radziwon, 2018). Second, this paper also contributes to research on business model by illustrating how the business model adopted by a given platform may pave the way for illicit practices. Indeed, our findings indicate that a value redistribution logic based on complementors' market share can exacerbate disparities and enable performance manipulation, which ultimately instigates collaboration with illegal organizations. This also indicates that digital platform business models can actually handicap actors in the long tail, which contradicts the assumption that platform business models benefit smaller actors (Brynjolfsson et al., 2011; Zentner et al., 2013). These insights answer calls for further investigation on the connection between business models and platform ecosystems (Snihur & Bocken, 2022; Thomas & Autio, 2020). Finally, our findings suggest that business models should be used to address underlying ecosystem tensions, in addition to improve profits.

DIGITAL PLATFORMS AND ECOSYSTEM GOVERNANCE

Stakeholder theory suggests that firms should not only aim at creating value for their shareholders, but for various stakeholders such as customers, suppliers, society, and the environment (Freeman, 2010). This approach to strategic management argues that considering a wide array of stakeholders, in addition to shareholders, enable firms to make better decisions, access to resources, and foster engagement by collaborators, which ultimately translates into better performances (Freeman et al., 2020; Mahajan et al., 2023; Mitchell et al., 1997). Therefore, stakeholder theory provides valuable suggestions for how digital platforms may improve their performance and operations. Indeed, as they act as interfaces between stakeholders with diverging interests, it becomes critical for digital platforms to develop value propositions and governance mechanisms for the benefit of various and diverse actors to sustain performance and legitimacy (Carrasco-Farré et al., 2022; Ricart et al., 2020).

Indeed, with the emergence of novel technologies such as the Internet, smartphones and

artificial intelligence, digital platforms have profoundly reshaped the way many firms operate. Digital platforms refer to a particular type of business model that facilitates interactions between two or more groups of actors, often referred to as users and providers, through a standardized digital interface (Chen et al., 2022; Tarzijan & Snihur, 2024). Firms such as Alibaba, Deliveroo or the Apple Store are some examples of digital platforms. One important implications of this business model relies in networks effects (Eisenmann et al., 2011; Rochet & Tirole, 2003), which describes how an increasing number of users present on the platform increases the value perceived by providers, and vice-versa. As such, network effects play a pivotal role in digital platforms' growth.

As they grow their user base, digital platforms give rise to platform ecosystems, describing the alignment of heterogeneous and interdependent complementors around a digital platform, interacting to generate a focal value proposition that cannot be generated individually (Adner, 2017; Lingens et al., 2021; Thomas & Autio, 2020). The opportunities encouraging participation in ecosystems vary from one participant to the other (Adner, 2017; Autio & Thomas, 2014; Lingens et al., 2021; Stonig et al., 2022), resulting in complex multilateral relationships that must be coordinated for a common value proposition to emerge (Autio & Thomas, 2014; Jacobides et al., 2018; Kapoor, 2018). Hence, following stakeholder theory, sustaining digital platforms' performance becomes challenging due to the need to maintain a competitive value proposition generated by complementors with diverging interests (Adner, 2017; Ricart et al., 2020; Thomas & Autio, 2020).

In parallel, platform owners must equally consider eventual negative externalities related to their platforms' growth (Jacobides et al., 2024; Zankl & Grimes, 2024). Indeed, digital platforms have emerged with the promise of facilitating transactions in sectors that previously suffered from frictions such as music (e.g. Spotify or Deezer), transportation (e.g. Uber or Lyft), or tourism (Airbnb or Booking.com). Yet, some platforms have been criticized for generating

negative externalities on the sectors they promised to contribute to. For instance, artists have criticized the difficulties in making a living with streaming platforms, while Airbnb has been held partially accountable for rents increases in Barcelona (Garcia-López et al., 2020). In response, scholars have begun to investigate the potential negative externalities related to platform development, such as market share loss, conflicts, pollution, resource depletion, interest misalignment, user dissatisfaction, and unbalanced value capture among complementors (Daymond et al., 2023; Jacobides et al., 2024; John & Ross, 2022; Wareham et al., 2014), making platform management even more challenging.

Because of complementors' heterogeneity and the threat of negative externalities, governance mechanisms are crucial to sustain the performance of digital platforms. Scholars have identified various governance mechanisms (see Chen et al., 2022 for a review) such as framing the ecosystem's value proposition (Carrasco-Farré et al., 2022; Snihur et al., 2021), building an inclusive value proposition (Dattée et al., 2018; Ricart et al., 2020; Stonig et al., 2022), and preventing misbehaviors with ratings, reviews, and output controls (Chen et al., 2022). Finally, because of the coopetitive nature of their ecosystems, digital platforms must create adequate conditions that encourage cooperation, foster resource sharing, and increase productivity (Autio & Thomas, 2014; Daymond et al., 2023; Hannah & Eisenhardt, 2018).

However, recent instances of stream fraud in the music industry, orchestrated by stream farms, raise additional questions regarding the governance of digital platforms and their ecosystems. Stream farms are illegal organizations that repeatedly stream music titles, which artificially inflate their charts raking to accrue associated revenues and enhance visibility (CNM, 2023). These organizations exemplify what we refer to as digital parasites, defined as strategic actors that engage in opportunistic behaviors to extract value from a digital platform, capture it, and eventually redistribute it to other actors. We distinguish parasitic from other forms of opportunistic behaviors because they are external organizations that require an

established ecosystem to "feed on it" and survive. Yet, despite fruitful research on platform governance (Chen et al., 2022), no theory rigorously explains this phenomenon. Indeed, the specific features of digital platforms—whether related to their business models or governance mechanisms—that contribute to the rise of digital parasites remain ambiguous.

Examining the mechanisms that explain the emergence of stream farms will improve our knowledge about digital platform governance and the lifecycle of their ecosystems (Autio & Thomas, 2014; Daymond et al., 2023; John & Ross, 2022; Scaringella & Radziwon, 2018). In addition, shedding light on this phenomenon can answer the numerous calls made by scholars to equally consider platform failures, rather than solely focusing on successes (Jacobides et al., 2024; Scaringella & Radziwon, 2018; Thomas & Autio, 2020). These elements motivated the following question: *How do digital parasites emerge in platform ecosystems?*

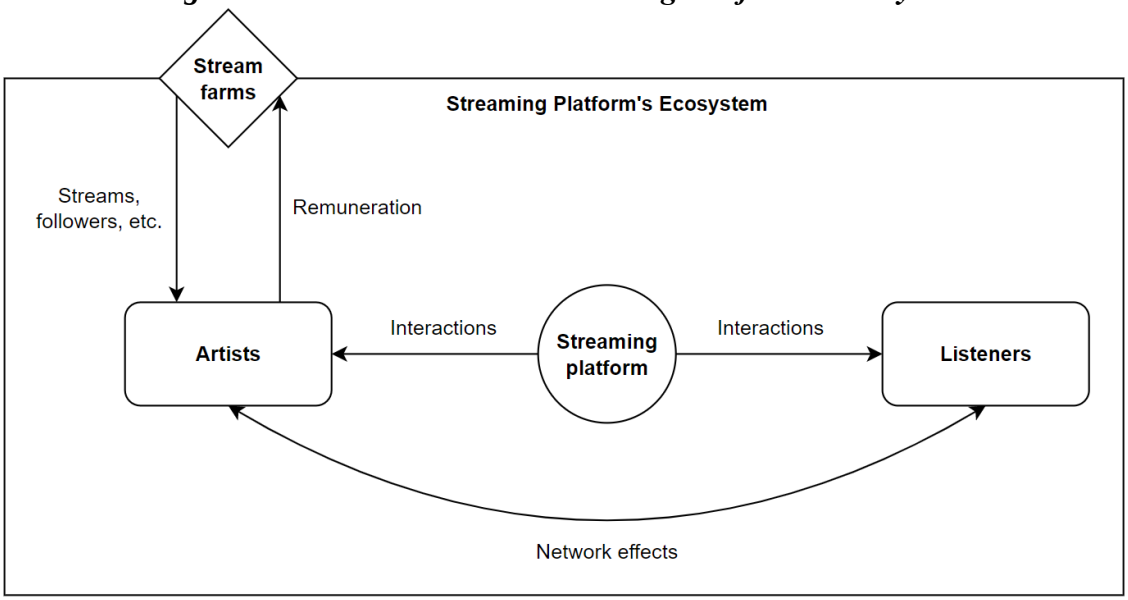
SETTING AND METHODOLOGY

Stream fraud and the streaming ecosystem

To answer our research question, we conducted a case study of the music streaming platforms and their ecosystems (labels, artists, managers, distributors, booking agencies, and institutions). We theoretically sampled streaming platforms as they are currently subject to fraudulent behaviors, notably with the appearance of stream farms. Stream farms are illegal organizations that repeatedly stream a given title to artificially boost it in the charts, collect the associated revenue and accelerate the artist's development[3] (see Figure 9). In other words, by collaborating with stream farms, artists aim at inflating their metrics which in turn generates more revenues and improves their visibility on the platform. However, this practice biases recommendation algorithms and disrupts how streaming platforms redistribute value to artists, making it an important issue for platform owners. As such, the development of stream fraud is

[3] Some sources indicated that stream farms can also be used for money laundering (CNM, 2023). However, as our paper investigates ecosystem governance, we decided to focus on the stream farms used to boost artists' career and not consider criminal activities.

Figure 9. Stream Farms in a Streaming Platform's Ecosystem



an ideal case to understand how digital parasites emerge and grow. It is estimated that almost 7% of streams coming from Deezer in 2022, and 1.1% from Spotify in 2021 have been generated artificially. The gap between the two platforms can be explained by the progress made in fraud detection between 2021 and 2022 and differences in detection methods.

Since their inception, streaming platforms have managed to reinject profits into the music industry and are considered the main factor for reducing digital piracy. However, their business model, referred to as "*market-centric*", has also led to great tensions within their ecosystem, especially regarding artists' remuneration. Indeed, the market-centric method aggregates subscription money and then calculates the amount allocated to artists according to their cumulated stream share on the platform. While this seems reasonable at first, it implies a disproportionate concentration of revenues on artists generating lots of streams. To illustrate, let's imagine users X and Y generate 20€ of turnover on the platform with their 10€ subscription plans. In a given month, user X generated 100 streams exclusively for artist X and user Y, 900 streams only for artist Y, with artist X accounting for 10% of the total number of streams on the platform, and artist Y for 90%. With the market-centric approach, platforms allocate 10% of their turnover (20€) to artist X (therefore 2€) and 90% to artist Y (therefore 18€), meaning

that 8€ out of the 10€ of user X's subscription are not allocated to the artist they listen to, but to an artist they do not listen to at all.

Besides, rapid digitalization drastically reduced the costs of producing and sharing music, leading to more content being uploaded on streaming platforms. Yet, streaming services did not implement quality or quantity control mechanisms, which led to an overload of content on their platforms. While attracting many users can be a sign of good performance (Brynjolfsson et al., 2011; Zentner et al., 2013), this led to increased maintenance costs for streaming platforms and overwhelming competition between artists.

As a response to these issues, some artists pay illicit organizations, which we refer to as stream farms, to artificially boost their streams and increase revenue and visibility (Centre National de la Musique, 2023). These elements suggest that the business model adopted by platforms combined with the lack of strict governance mechanisms promotes the development of digital parasites. Combined with the lack of research on this phenomenon, these observations motivated us to investigate streaming platforms to establish the relationship between platform governance and design, business models, and digital parasites' emergence.

Data Collection

We conducted semi-structured interviews with various individuals in the streaming ecosystem such as artists, label managers, industry experts, and employees of platforms, institutions, booking and marketing agencies, and followed the Gioia (2013) method to conduct the interviews. In total, 38 interviews were conducted, amounting to a total of 25 hours and 6 minutes of transcription. This approach is particularly well suited for explorative studies, as it enables great flexibility and adaptability to respondents' answers during and between the interviews (Gioia et al., 2013; Grodal et al., 2021).

Our initial focus was on illegal practices and digital piracy in the music industry. Yet, after a first round of interviews, we noticed that most respondents indicated that the impact of piracy

was not significant anymore but mentioned stream fraud as a new important threat in the music ecosystem. We therefore decided to update our protocol to orientate the discussion around this topic. The finalized interview protocol consisted of 10 open questions, opening the discussion by asking respondents to introduce themselves and present their roles in their companies. The rest of the interview was structured as a bottleneck, with questions ranging from the ecosystem structure to the emergence and utilization of stream fraud. Concretely, we looked at the (absence of) governance mechanisms in streaming platforms, the presence of negative externalities for artists, and how these would influence the adoption of stream farms.

Secondary data were collected, consisting of stream farms' web pages to better define stream farms' offer to artists, and institutional documents to triangulate the insights generated with the interviews. Table 7 summarizes the data collected and its utilization in the study.

Data Analysis

We followed the Gioia (2013) methodology to analyze the interviews and used NVivo, a recent qualitative analysis software. We used an open-coding approach for the first phase of the interview analysis, listing codes as they appeared in the transcript (Blair, 2015), which enabled to maintain closeness to the respondents' perspectives. Later, codes with overlapping meanings were regrouped following axial coding (Strauss & Corbin, 1998), and enabled the identification of 29 first-order concepts. During the second phase of the analysis, we regrouped first-order concepts into second-order themes, which helped us identify overarching issues existing in streaming platforms' ecosystems (lack of shared vision, value capture unbalance, loopholes, etc.). We identified in total 12 second-order themes that helped explain the issues that emerged in the music ecosystem and the phenomenon of digital parasites' invasion. The third phase of the analysis led to the identification of 3 aggregate dimensions that were level-specific (i.e., platform level, ecosystem level and extra ecosystem-level) that explain digital parasites' proliferation: i) Digital platform design, ii) ecosystem negative externalities, and iii) parasite

Table 7. Data Collection and Usage in the Analysis

Type of data	Source	Number	Use in the analysis
Semi-structured interviews	**Total**	**38**	Ecosystem characteristics Complementors roles Understanding of stream farms' operations Reasons for artists to adopt stream farms' services
	Institutions	*19*	
	Platforms	*3*	
	Labels	*6*	
	Managers	*2*	
	Artists	*1*	
	Experts	*4*	
	Booking agencies	*1*	
	Marketing agencies	*2*	
Stream farm's web pages	**Total**	**21**	Digital parasites' value proposition components
	Famups	*1*	
	Get Viral	*2*	
	Growthoids	*5*	
	Sides Media	*6*	
	Spotify storm	*5*	
	Use Viral	*1*	
	View Expert	*1*	
Institutional documents	**Total**	**17**	Triangulation
	IFPI	*16*	
	CNM	*1*	

value proposition materialization (see Figure 10). Finally, we looked at the inter-relationships between these dimensions to move from a static representation of the data in Figure 10, to a more dynamic theoretical process model of digital parasite emergence.

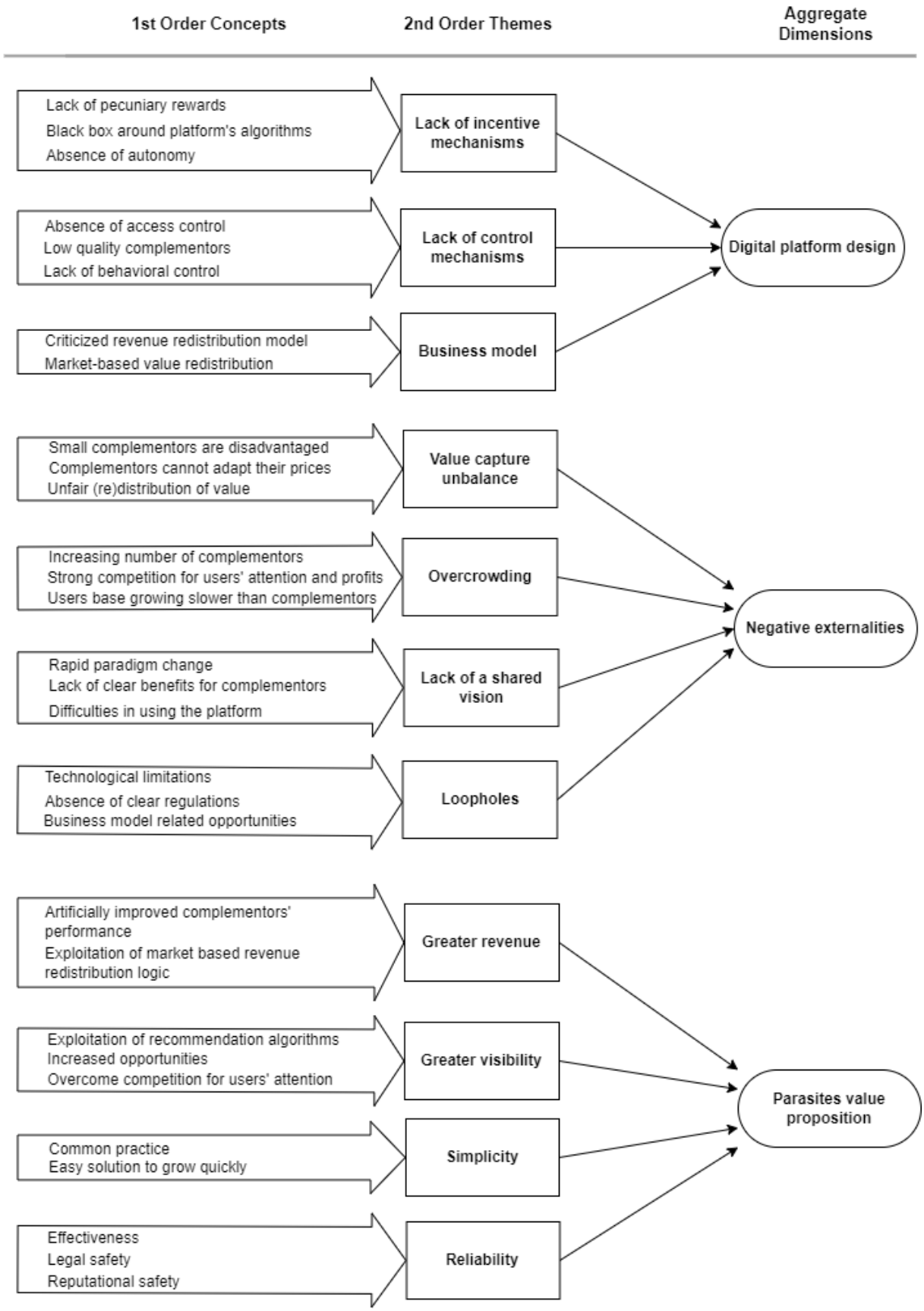
We ran in parallel a content analysis (White & Marsh, 2006) of stream farms' web pages in order to identify the components of their value proposition. We coded each argument provided by the websites based on the ecosystem failures identified to establish a parallel between stream farms' offers and the actual difficulties faced by artists.

FINDINGS

The analysis revealed that digital parasites emerge due to the combination of facilitating factors related to the platform's design, which generate negative externalities. Platform design refers to the governance mechanisms and business model implemented by a platform to create, capture and redistribute value among complementors while optimizing overall performance (Chen et al., 2022; Wareham et al., 2014). Chen et al. (2022) have identified two categories of governance mechanisms, namely incentives and control mechanisms. Incentives refer to arrangements used to stimulate greater investment or investment from complementors. For instance, sharing resources such as software development kits or programming interfaces, or financial rewards are examples of incentives. On the other hand, control mechanisms refer to design features that may shape complementors' conduct, such as a controlled access to the platform or complementors' outputs evaluation and monitoring systems. These mechanisms are pivotal in ensuring the ecosystem's durability and performance, and their absence favors the development of negative externalities.

We define negative externalities as unintended consequences of platform design that negatively impact one or several categories of complementors (Jacobides et al., 2024; John & Ross, 2022). Based on the existing literature on ecosystem governance and our analysis, we have extracted 3 related types of negative externalities, namely value capture unbalance

Figure 10. Interviews Data Structure



(Miller & Toh, 2022; Panico & Cennamo, 2022; Zhang et al., 2022), overcrowding (Boudreau, 2012; Cennamo & Santalo, 2013; Wareham et al., 2014), and the lack of a shared understanding (Dattée et al., 2018; Stonig et al., 2022; Thomas & Autio, 2020). Our analysis also revealed the emergence of loopholes, which we define as ecosystem's pitfalls that can be exploited by digital parasites and facilitate value extraction and capture. Such externalities reduce ecosystem's performance, create tensions among complementors, decrease their involvement in joint value creation, and ultimately push them to seek illicit means to overcome difficulties.

How do negative externalities promote digital parasites' invasion? On the one hand, negative externalities generate tensions that justify the utilization of illicit means to circumvent them. For instance, value capture unbalance generates tensions that reduce participants' profits, and thus justify seeking illicit means to capture greater value. Digital parasites target these negative externalities to align their value proposition with tensions emerging within the platform ecosystem. On the other hand, loopholes enable digital parasites to abuse a platform's design and generate profits, but also reduce risks of being spotted and banned. Table 8 provides definitions of the different platform design features and ecosystem negative externalities identified with the interviews, as well as their influence on digital parasites' value proposition materialization. Figure 11 provides a representation of the relationships between the digital platform's features, the negative externalities within its ecosystem, and the emergence of digital parasites.

Platforms' business model and value capture unbalance

Value capture unbalance

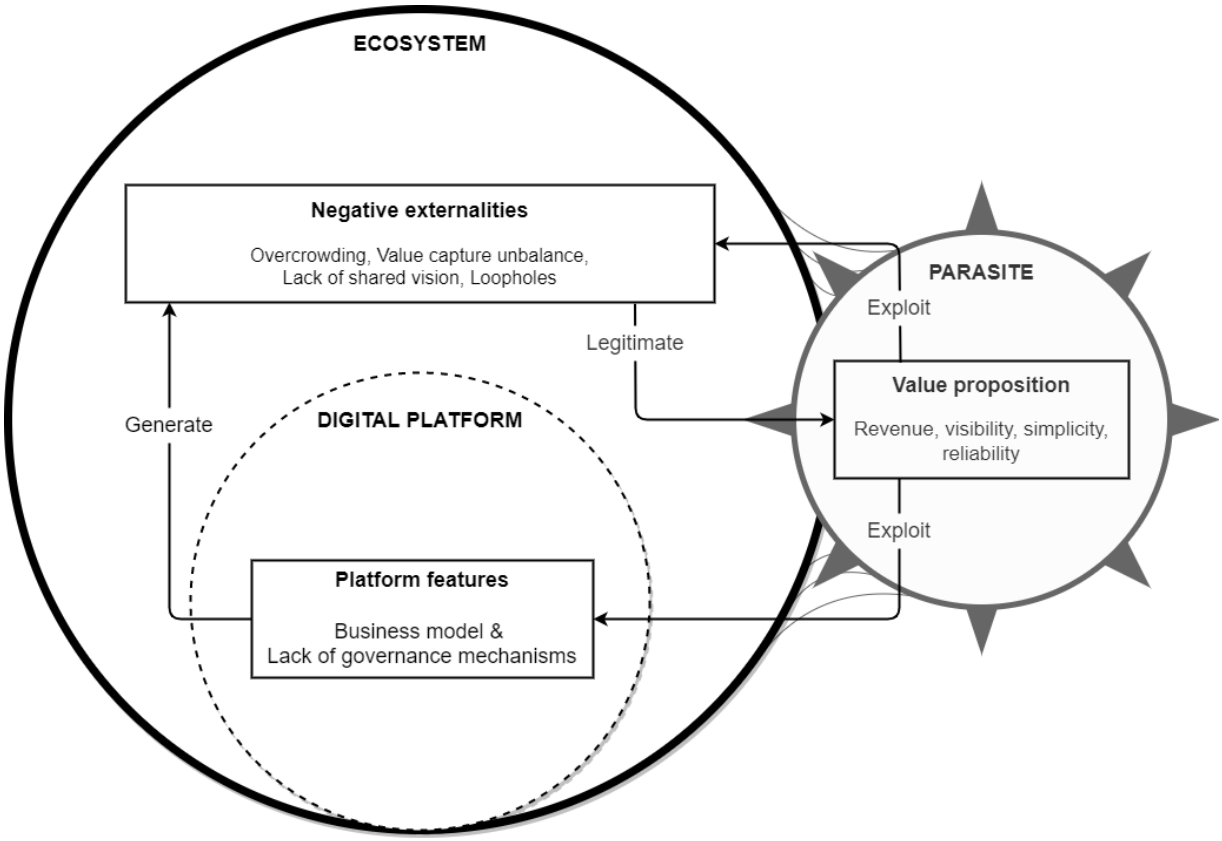
The value redistribution logic adopted by a platform plays influences all the complementors in their ecosystem (John & Ross, 2022). The case of streaming platforms illustrates how a certain value redistribution logic adopted can lead to important tensions that justify the use of illicit alternatives.

One consequence of the market-centric approach to remuneration is the somehow unfair

Table 8. Factors Facilitating Digital Parasites' Emergence

Categories	Types	Definition	Illustration in streaming ecosystem	Influence on parasites' value proposition materialization
Digital platform design	Lack of incentives	Lack of mechanisms that stimulate complementors' effort.	Lack of pecuniary rewards, autonomy, transparence and assistance.	Generate lack of a shared vision that justifies digital parasites' adoption.
	Lack of control	Lack of mechanisms that shape complementors' conduct.	Absence of access restrictions, clear rules and technological means to detect fraud.	Generate overcrowding and loopholes that are exploited by digital parasites.
	Business model	Value creation, capture and redistribution logic of a platform.	Market-centric approach that redistribute value to artists based on their stream share.	Disproportionately concentrates revenue redistribution on few complementors.
Negative externalities	Value capture unbalance	Disparities between the value captured by complementors of the same or different categories.	Streaming platforms' revenue redistribution logic that prevents smaller artists to generate decent revenues.	Generates feeling of unfairness among complementors who are then looking for solutions to compensate.
	Overcrowding	The presence of too many complementors leads to extreme levels of competition.	Too many artists on the platforms hinders their visibility.	Negatively impacts complementors' discoverability, pushing them to seek illicit means to stand out.
	Lack of a shared vision	Difficulties in using the platform and understanding its benefits.	Artists do not know how to promote their presence on platforms and fail to capture value.	Hinders complementors' development and pushes them to circumvent challenges via illicit means.
	Loopholes	Ecosystem's pitfalls that can be exploited by digital parasites to extract and capture value.	Streaming platforms' revenue redistribution logic enables fraud while technological limitations and vague legal frameworks hinder spot and ban.	Enable fraudsters to generate profits by artificially boosting their share, while reducing risks of being spotted and banned.

Figure 11. Digital Parasites Emergence



repartition of value among artists. Indeed, funds are pooled and distributed based on aggregated streams across all platform users. As succinctly articulated by an artist manager, "*In today's system, if you allocate €10 monthly to Spotify but predominantly listen to a single jazz artist, your contribution does not directly benefit that artist.*" This observation has sparked widespread contestation against the market-centric approach, considered inherently unfair, as elucidated by a CNM representative who notes that it "*disadvantages certain artists, with consumers' streams failing to translate into equitable compensation for the artists they actually support."* Furthermore, this approach exacerbates the disparity in value capture between popular and niche genres. By remunerating artists based on their share of total streams, the model inherently disadvantages smaller artists compared to their mainstream counterparts. As highlighted by a UK IPO employee, "*Our research indicates that to achieve a minimum wage in the UK solely through streaming, an artist must amass at least 1 million streams monthly and supplement their income through other means.*" This threshold excludes a significant portion of musicians,

who lament that despite the proliferation of streaming, artists "*rarely see returns*," as noted by an independent artist

To summarize, the prevailing model of streaming platforms has engendered a pervasive sense of unfairness among artists who are struggling to capture value for their contributions. Consequently, these artists are tempted to use stream farms to artificially inflate their revenues. This trend is corroborated by a 2023 study conducted by the CNM (2023), which found that most fraudulent streams detected on Spotify and Deezer originated from newly released titles in the long tail. Thus, it becomes apparent that a platform's value redistribution logic can promote the adoption of digital parasites by complementors looking for greater value capture. Put simply, value capture unbalance generates tension among complementors and pushes them to use illicit means to increase their revenues. As illustrated by a representative of independent labels when asked to explain the causes of stream farm adoption: "*Streaming platforms' model is not optimum and we need to sit back and think through it together […], especially the recommendation and remuneration system*".

Lack of incentives and shared vision

Lack of a shared vision

Furthermore, it is equally crucial for platforms to share information and resources to mitigate market uncertainty and complementors' discouragement (Chen et al., 2022; Dattée et al., 2018), but also to foster greater performance (Fan et al., 2016). The rapid shift from an ownership to an access model in music, combined with the lack of transparency around streaming platforms' algorithms led to difficulties for artists to use them at their full potential and comprehend the benefits of taking part in the ecosystem.

While conducting interviews, various respondents referred to streaming as "*tolerated theft*" because they would compare the profits made by streaming to the profits made by selling hard copies. Another artist explains: "*In terms of technology, this is really cool because we can listen and all… But their model, their interests and strategy, for me, clearly, I do not see the pleasure*

in working with them." However, most managers argue that selling hard copies and streaming are not comparable, as streaming platforms were created "*on the idea of accessing a catalog rather than ownership*", and that comparing both paradigms would maintain frustration as streaming "*has nothing to do with selling albums*". The rapid shift from an ownership to an access model resulted in tensions and incongruence between platforms and complementors' visions, making it more acceptable for artists to cheat a system they believe does not support them.

This lack of a shared vision is also due to streaming platforms' lack of transparency, especially regarding their algorithms. Various respondents have pointed to the black box surrounding platforms' algorithms and their strong influence on consumers' habits. A major label employee explains that "*algorithms decide whether or not a song is successful*" and therefore "*we (consumers) decide less and less what they want to listen to*". Even institutions such as the UK IPO underscore that "*a lot of big playlists out there are algorithm-based, but no one really knows how those work and who is pushing the content*". Therefore, artists have little knowledge and control over how their content is pushed forward, encouraging them to seek simpler alternatives.

Frustration and tensions may emerge among complementors when they do not feel supported by digital platforms or do not clearly understand the benefits of taking part in their ecosystem. The complexity argument is also pushed forward by stream farms to convince artists to use their services: "*Spotify is constantly working on its algorithm, which means that what might have worked for you a couple of months ago isn't working anymore*" (Sides Media). In other words, the lack of shared ecosystem understanding will push complementors to seek solutions facilitating their development. This is underscored by the following quote:

> "*You have the case of the artist or label feeling a bit helpless in front of streaming platforms, looking to reach thresholds thinking it would benefit them and increase*

their visibility […] This is the easy solution to bypass the required time to build up a community".

Lack of control, overcrowding, and loopholes

Overcrowding

Streaming platforms offer a significant advantage by drastically reducing exposure costs and expanding the potential audience for artists. In today's digital landscape, any artist can independently upload music and potentially connect with listeners worldwide. This ease of distribution is exemplified by an artist who remarks, "*With digital platforms, delivering music has become effortless. I've released singles without any label support*." A label manager echoes this sentiment, emphasizing that streaming eliminates barriers to music dissemination: "*There are no obstacles to sharing music. Even an artist in Poland can succeed with the right network and promotion*."

However, this accessibility has also intensified competition among artists, leading to pressure to become visible. With nearly 100,000 tracks uploaded daily on some platforms, artists struggle to gain visibility and generate significant revenue. As one streaming platform employee explains, "*While it's easier than ever to upload music, it's increasingly difficult to gain traction and earn a living from it*." Consequently, artists are compelled to cultivate broader appeal beyond their music alone, as noted by a label manager who observes, "*Today, success requires more than just talent. Artists must be engaging and market themselves effectively*."

Another repercussion of heightened competition is the dilution of earnings, as revenues are divided among an expanding pool of complementors. Despite steady subscription growth, the influx of new content surpasses the rate of revenue growth. This dilemma is acknowledged by industry insiders, with one remarking, "*We're at a saturation point where most people already have streaming subscriptions, and revenue growth has plateaued*." As a result, each participant receives a diminishing share of the overall value created by the ecosystem and must struggle for greater visibility to capture greater value.

In the context of music streaming, overcrowding yields two primary outcomes for complementors. Firstly, it amplifies the challenge of standing out, requiring complementors to diversify their skill sets beyond their core knowledge to remain competitive. Secondly, the influx of complementors necessitates a corresponding increase in overall ecosystem value to sustain profitability for all stakeholders. Failure to address such issues may push some complementors to pursue self-serving strategies at the expense of others. Put simply, overcrowding pushes complementors to adopt digital parasites' offers as a solution to gain greater visibility. As illustrated by a label project manager when asked about the motives to use stream farms: "*There are promotional stakes, and therefore an important objective to be number one in the top 200*". This is backed up by an employee at the CNM: "*Some just want to be visible, earn more money, be included in playlists and noticed by labels*".

Loopholes

Loopholes refer to ecosystem pitfalls that can be exploited by parasites to extract and capture value. Based on our interviews, we have identified 3 types of loopholes either related to technological limitations, the digital platform's business model, or the legal framework.

Technological loopholes: At the early stages, streaming platforms did not have the technological resources to efficiently track fraudulent behaviors, making it challenging to clearly identify fraud and track fraudsters. In fact, the first fraudulent behaviors were detected by accident when unknown artists would generate more streams than international superstars. Nowadays, thanks to algorithm improvement and machine learning, platforms can spot fraudulent behaviors and track down the attached accounts based on predefined criteria such as streaming durations, quantity, location, or trends[4].

However, as pointed out by a respondent in charge of fraud detection in a leading streaming

[4] For instance, rapid growth in subscribers followed by a sustained stagnation implies that stream farms were used to generate fake subscribers. Similarly, a sudden pike in streams in one precise location followed by sustained inactivity indicates that stream farms were used to generate fake streams.

platform, stream farms are constantly adapting to new detection methods: "*They keep looking for flaws and we keep improving our algorithms and stay tuned for what's happening*". Therefore, a constant improvement of technologies is required to fight digital parasites that keep adapting their practices to avoid detection. The same respondent goes on: "*If you manage to simulate a realistic behavior, yet intense enough to capture profits, you can still misappropriate revenues*". Overall, technological loopholes promote digital parasites' adoption by reducing risks of detection and penalties.

Platform's business model loopholes: As explained earlier, streaming platforms are mostly based on the market-centric approach, which consists of calculating artists 'revenues according to their streams' share over the total number of streams recorded on the platform. This implies that artificially increasing streams enables stream farms to extract important revenues while boosting algorithmic recommendations. As explained by a researcher in a major streaming platform: "*It is the market-centric business model that enables to generate more money with one account than what the account actually costs […] The market-centric system enables this kind of fraud*". This is backed up by another respondent from the same platform: "*Today, the system is market-centric. It is problematic, notably because fraud can have a huge impact. By paying 10€, you can get 50€ back if you manage to generate enough streams. So, there is an inherent problem here.*" This clearly illustrates how the business model adopted by a platform may pave the way for digital parasites' invasion, and facilitate the development of their activity. We therefore suggest that business model loopholes are exploited as opportunities by digital parasites to develop lucrative activities at the expense of the ecosystem.

Legal loopholes: The absence of a clear legal framework that defines stream farms as illegal limits legal actions against them or people using their services. Indeed, such actors do not engage in activities that are necessarily illegal per se, making legal actions more complex to implement. As highlighted by the CEO of a marketing agency specializing in streaming: "*As*

fraudulent offers and purchasing streams become more sophisticated, the boundaries between this and the legitimate work of an agency become blurrier". Indeed, many stream farms offer to boost titles' metrics with streams generated by real listeners, which thus may not be considered fake as it is not done by robots or algorithms. Therefore, despite artificially boosting a title's streams being against platforms' terms of use, it may be difficult to prove and sanction it when originating from a human being, which ultimately promotes that practice. Put simply, legal loopholes promote digital parasites' adoption by reducing risks of detection and penalties.

Digital Parasites' Value Proposition Components

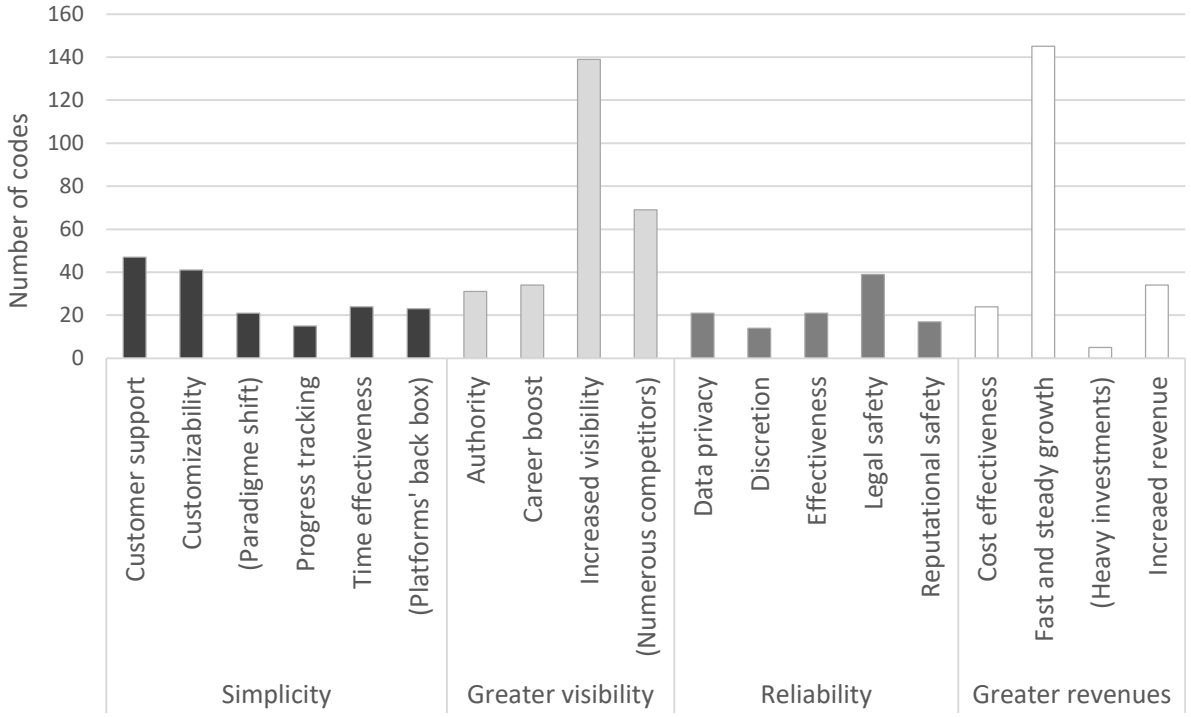
We completed our study with a content analysis of various stream farms' websites. Figure 12 illustrates the solutions offered and established in parallel with the ecosystem's negative externalities. The main arguments used by stream farms consist in providing greater visibility (light grey) on the platforms, offering greater revenues (white), and simplifying artists' career development (black). Finally, stream farms also exploit loopholes to justify the reliability of their offers (dark grey).

Greater visibility offer

The main value proposed by stream farms relates to increased visibility via paid streams, followers, or saves. This helps overcome negative externalities related to overcrowding: "*You can buy Spotify saves from us at SpotifyStorm and get the needed push to make your album or song popular and get more visibility online*" (SpotifyStorm website).

Therefore, such offers are mostly directed at emerging artists looking for rapid growth, as evidenced by the fact that 96% of the fraud detected on Spotify comes from new releases (CNM, 2023). As pointed out by a major label employee: "*There are many titles that have been launched thanks to that (stream fraud) and became major songs. They have been boosted at early stages and became enormous, without any management agency or without entering any playlist.*"

Figure 12. Stream Farms' Value Proposition Components



Note: Arguments between parenthesis refer to negative externalities in the streaming ecosystem. For instance, "numerous competitors" refers to the heavy competition that artists face on streaming platforms. Other arguments refer to solutions or benefits provided by stream farms. For instance, "cost-effectiveness" refers to the low prices offered by stream farms.

Greater revenue offer

Stream farms also offer to increase artists' revenues to overcome value capture unbalance due to the platforms' market-centric approach. By repeatedly streaming titles, stream farms offer to boost the associated revenues and help artists overcome value capture difficulties, as evidenced in the following quote: *"This system is to help the young and new musicians grow and earn royalties over time. More plays and popularity are equivalent to more earnings. Choose the right service of Spotify saves at SpotifyStorm and get a boost to your profits and revenues"* (Spotify Storm's website). This is also confirmed by respondents from major labels and institutions: "*The idea is to seek streams to benefit from the remuneration related to those streams*." (ex-Universal Music Group employee) and "*Then you've also got within the system of Spotify some kinds of robot listeners, almost kind of, streaming a lot of content to kind of boost some of the earning of particular people or tracks"* (UK IPO employee).

Simplicity offer

Finally, stream farms will frame themselves as easy and effective to adapt to the lack of a shared understanding within the streaming ecosystem. Indeed, such services emphasize a lot on the paradigm shift that happened within the music industry induced by rapid digitalization, as well as the challenges that came with it. As illustrated: "*Back in the day, it was a lot easier to have lots of plays on your songs, without having to worry about monthly listeners"* (Sides Media website). Thus, they propose user-friendly solutions: "*This easy process helps them get the plays while they sit back and create more songs to upload.*" (Get Viral website). Stream farms also emphasize transparency, offering in parallel the possibility of tracking progress made and benefiting from customer support: "*Growthoid offers intuitive dashboards and real-time tracking, enabling you to monitor your engagement campaign's progress closely"* (Growthoid website); "*You can always reach our support to check the status of your order day or night! We remain committed to helping you reach your goals faster than ever before*" (ViewsExpert website).

Reliability offer

Finally, stream farms face reluctance from most artists who are aware of the lack of legal clarity regarding the adoption of such services, who are thus afraid of getting banned from the streaming platforms, and fear for their reputation. In response, stream farms will reduce the perceived risks by providing details on their operations to justify why their activity is effective, discrete, and thus not risky for the artist's reputation: "*We use a drip method to provide the followers and other metrics to avoid flagging or penalties on the clients' accounts*" (SpotifyStorm website); "*Growthoid stands out as a secure and reliable option for purchasing social media services, including Spotify followers, guaranteeing the safety of your music career"* (Growthoid website).

The case of stream farms shows that digital parasites base their value propositions on ecosystem negative externalities and offer solutions to the complementors most affected by those. For instance, stream fraud enables artists to circumvent overcrowding tensions, which is highlighted in the following quote taken from a stream farm's website: "*Having a presence on digital music platforms alone is insufficient due to the huge number of rivals. If you're serious about differentiating yourself from the competition and succeeding as an artist, you should buy Spotify plays, followers, and more Spotify plays*" (Famups website).

In addition, digital parasites may also offer to increase complementors' revenues, responding to tensions related to value capture unbalance: "*This system is to help the young and new musicians grow and earn royalties over time. More plays and popularity are equivalent to more earnings"* (SpotifyStorm website).

Furthermore, digital parasites may frame their offer as easily accessible in contrast to the difficulties that complementors face due to their lack of understanding about the operations and benefits of the ecosystem they partake in. As illustrated: "*Hardly anyone has time to spend working out the intricacies of Spotify's algorithm, which is why they instead choose to buy their Spotify Saves*" (Sides Media website).

Finally, the lack of legal clarity, despite reducing the risk of penalties, also induces reluctance and doubts from complementors regarding collaboration with digital parasites. Therefore, the latter will exploit these legal loopholes and emphasize the reliability of the offers and the absence of risks. These observations show how platforms' design may pave the way for parasitic behaviors by generating negative externalities in their ecosystems that promote the adoption of and are exploited by these parasites.

DISCUSSION

We explore in this study the factors enabling the emergence of parasites in digital platform ecosystems from a stakeholder theory perspective. While digital platforms offer to facilitate

interactions and transactions between individuals (Chen et al., 2022; Tarzijan & Snihur, 2024), they may also inadvertently promote the development of illicit behaviors by generating negative externalities for their complementors. With the study of stream fraud on music streaming platforms, we introduce the novel concept of digital parasites, defined as actors engaging in illicit behaviors to extract value from an ecosystem, capture it, and eventually redistribute it to other actors. We elucidate the mechanisms behind their emergence as well as their methods of operations, providing important theoretical implications that we develop below.

Implications for Digital Platform Governance

Recent publications have underscored the importance of improving our knowledge of platform ecosystem failures and the consequences of poor governance (Chen et al., 2022; Jacobides et al., 2024; Scaringella & Radziwon, 2018). By investigating the emergence of stream fraud in music-streaming, we contribute by theorizing how poor governance promotes the utilization of digital parasites by generating negative externalities among complementors, pushing them to seek solutions to overcome related tensions. For instance, difficulties in capturing value (John & Ross, 2022), being visible for users (Boudreau, 2012; Wareham et al., 2014), or using the platform (Chen et al., 2022) can hinder complementors' activity. When unmanaged by the platform, such tensions legitimize the adoption of solutions to circumvent difficulties, despite their potential negative influence on the overall ecosystem.

We move forward the rich knowledge of platform governance and design by elucidating how certain platforms' characteristics, namely their business models and (the lack of) governance mechanisms, pave the way for the emergence of digital parasites. We show that digital parasites develop their value proposition by mirroring the tensions and issues that participants face to generate traction. As such, solely tightening control mechanisms without addressing negative externalities may weaken complementors inputs, escalate tensions, and legitimize collaboration with digital parasites. With these insights, we move forwards existing

research on ecosystem negative externalities by explaining how participants react to persisting tensions, and engage in resistance against platforms (Jacobides et al., 2024; Mahajan et al., 2023). Therefore, it is crucial for platform owners to address negative externalities, before complementors turn to illicit solutions that compensate the impact of these externalities.

Implications for Business models

The insights developed in this paper also contribute to the business model literature by elucidating the role that business models can play in the governing of platform ecosystems (Autio & Thomas, 2014; Snihur & Markman, 2023). We show that the market-centric approach adopted by streaming platforms to redistribute revenues to their complementors generates tensions and enables stream farms to capture "fake" profits by artificially boosting streams. This suggests that platform owners should pay careful attention to the business models they adopt and value proposition they offer (Carrasco-Farré et al., 2022; Ricart et al., 2020; Snihur & Bocken, 2022) as they can be important agents for the emergence of digital parasites.

Therefore, the emergence of digital parasites should be regarded as a symptom or manifestation of tensions within the platform ecosystem, that are partially due to business model design issues that must be addressed by platform owners. As such, in the context of digital platforms, business models should not only be approached as a way to increase value creation or platform performance, but also as a powerful tool to prevent digital parasites' emergence. However, adjusting business models may prove challenging, as platform owners must navigate diverging interests within their ecosystems, with in our case major and independent labels, artists, and the platforms themselves. The recent communications by streaming platforms' about changing their approach related to artists' remuneration illustrate the potential of business models in preventing digital parasites. Many artists, managers, and institutions are pushing for a shift from a market-centric approach to a user-centric one, because value would be redistributed more "fairly" based on users' consumption behaviors, but also because it would

prevent profits misappropriation. As explained by a respondent in a streaming platform:

"*With user-centric, every user pays some money, our platform takes its 30% commission, and thus we redistribute less than what the user pays. So if you want to fraud streams, you can take your fake accounts, but if you pay 10€, you can take back a maximum of 7€. So there is no benefit, and you cannot concentrate revenues the same way market-centric allowed to.*"

Limitations and future research

However, our study is not without limitations. First, we do not explore how platform owners and complementors respond to digital parasites' invasion, and what strategies they can implement to mitigate their impact. The heterogeneity among complementors implies the presence of different interests in platforms' ecosystem, which may pose challenges in smoothly implementing responses against digital parasites. With rapid digitalization, platforms are likely to proliferate, making it crucial for scholars to investigate the responses that platform owners can implement, while navigating diverging interests in their ecosystems. We believe that qualitative case studies are highly appropriate to provide valuable insights in this regard. What are the most effective strategies to adapt to parasite invasion? How can they be implemented and by which actors? Which interests should platform owners take into account when responding to parasite invasion? These questions may hold promising contributions to the digital platform governance literature.

Furthermore, our study does not measure the actual impact of digital parasites on platforms and ecosystems they invade, whether it be related to complementors productivity, user satisfaction, or value creation and capture. Yet, we argue that these parasites may decrease user satisfaction for various reasons. First, stream farms distort streaming platforms' algorithmic recommendations, as they enable non-popular artists to be recommended despite not being popular, nor matching users' preferences. Second, as fraud grows, the accuracy of the data extracted from the streaming platform is severely impacted, reducing the reputation and

reliability of the platform, especially for complementors relying on such data to measure their performance.

This also raises questions on the actual "benefits" gained by adopting digital parasites' offers. Most of the respondents agree that stream farms may not have the positive influence they promise, because they skew algorithmic recommendations and promote complementors to irrelevant audiences. Therefore, there are also strong potential contributions in quantitatively measuring the negative (and eventually positive) impacts of digital parasites on platforms and their ecosystems. Do parasites worsen ecosystem negative externalities, or do they actually help mitigate those? Can digital parasites improve platform performance and maintain complementors level of engagement? Can parasites and platforms collaborate to develop symbiotic (in opposition to parasitic) relationships? Answering those questions would provide valuable insights to contribute to platform governance, and help practitioners improve their platforms' performances.

CONCLUSION

This paper investigates the emergence of digital parasites in digital platforms with a case study of streaming platforms in the music industry. From a stakeholder theory perspective, we elucidate the conditions that facilitate the emergence of digital parasites and promote their adoption by complementors in platforms' ecosystems. The insights developed in this paper contribute to the literature on digital platform governance and offer various directions for scholars to investigate this important yet overlooked phenomenon.

While digital platforms have emerged with the promise of facilitating interactions, transactions and collaboration between economic actors, our study brings a more nuanced view. First, while past studies suggest that digital platform benefit actors situated in the long-tail (Brynjolfsson et al., 2011; Zentner et al., 2013), more recent work suggests that featuring on platforms makes small complementors fight a hopeless battle for consumers' attention against

big and resourceful competitors (Meyer et al., 2024). With the case of music streaming platforms, we go beyond by showing how market-based value redistribution logics exacerbate disparities and instigate small complementors to collaborate with illegal organizations.

Second, our work corroborates studies suggesting that platform growth may generate negative externalities (Karhu et al., 2024), which contrast with the accepted wisdom that platforms benefit from attracting more complementors (Chu & Wu, 2023; Wareham et al., 2014). Indeed, the interviews we conducted revealed that the music streaming ecosystem is affected by an overabundance of artists, resulting in overwhelming rivalry that encourages cheating. In addition, as streaming platforms struggle to attract new users, an increasing number of artists will decrease the amount of value that each artist can capture, and thus escalate tensions. Therefore, we argue that platform owners should be cautious when attracting new complementors as their business models must be able to ensure fair remuneration to a growing number of complementors to prevent cheating.

Finally, this study encourages managers to foresee the potential negative externalities of their innovations. While innovating by essence aims at benefiting society, recent works have underscored the importance to equally consider their potential negative externalities on society (Zankl & Grimes, 2024). Pollution, data privacy, working conditions, and more recently highlighted with this paper, the emergence of illegal practices, are some factors that managers and entrepreneurs must consider while designing their innovations.

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Discussion and Contributions

DIGITALIZATION AND ITS IMPACTS

Digitalization refers to the broad implementation of digital technologies (Setia et al., 2013), which include for instance the internet, online messaging, internet of things, or artificial intelligence (Dąbrowska et al., 2022; Plekhanov et al., 2023). These technologies have had, and are still having profound impacts on our society at various levels. The concept of digital transformation has been used to describe this phenomenon and how digital technologies have replaced non-digital ones (Vial, 2019), along with the consequences it had on innovation, management, interactions and value creation.

The positive impacts

Digitalization has reshaped many aspects of our society at many levels. For instance, it drastically facilitated interactions and information sharing between individuals at scales never attained before in human history. The role of firms has thus also evolved with the rapid evolution of digital technologies (Menz et al., 2021), which enabled many innovations to be introduced such as online messaging, streaming, file sharing, and easy remote transactions. Therefore, not only these innovations have enhanced our personal welfare, but they have also drastically changed the way firms operate, innovate and perform.

One notable contribution of digitalization is the introduction of new business models by firms that leverage digital technologies to develop competitive offers (Snihur & Markman, 2023; Volberda et al., 2021). These new business models enabled small players to compete against, and even disrupt established leaders, despite their limited resources. Christensen & Bower (1996) introduced the concept of disruptive innovation as the process by which new entrants develop innovations that, despite initially under-performing incumbents' offers, overtake them because of experience, novelty, and performance improvement (Christensen et al., 2018; Cozzolino et al., 2018). A great example of disruption is the introduction of Netflix's

online streaming service, which resulted in the bankruptcy of Blockbuster, the biggest movie rental service in the United States.

More recently, digital platforms have emerged as a significant force in the economy, with companies like Uber, Airbnb, and Amazon transforming industries and challenging traditional business models. Digital platforms are business models that facilitate interactions between two or more groups of actors, often referred to as users and complementors, through a standardized digital interface (Rietveld & Schilling, 2021; Rochet & Tirole, 2003; Tarzijan & Snihur, 2024). It is, therefore, no surprise that digital platforms have sparked interest among strategic management scholars. Researchers have found that digital platforms are appealing for managers as their collaborative nature helps improve performance and overcome challenges such as access to resources (Pushpananthan & Elmquist, 2022), legitimacy (Taeuscher & Rothe, 2021; Thomas & Ritala, 2022) and technology dissemination (Murthy & Madhok, 2021; Palmié et al., 2020). As digital platforms have proliferated, their impacts have become more evident, particularly in facilitating entrepreneurship and contributing to economic growth, especially in developing economies (Graham et al., 2017; Solomon & Van Klyton, 2020).

Overall, digitalization and digital transformation have substantially contributed to improving various aspects of our society, from the way we do business to the way we communicate. For instance, digital technologies facilitated resource access and recombination to generate novel business models (Snihur & Markman, 2023; Vial, 2019), which brought about disruption in various industries (Christensen et al., 2018), such as in entertainment, messaging, or tourism. In addition, rapid digitalization led to the emergence of digital platforms such as Amazon, which eased entrepreneurs and independent workers' growth by generating network effects (Helfat & Raubitschek, 2018; Karhu et al., 2024; Rietveld & Schilling, 2021), and removing barriers related to legitimacy (Taeuscher & Rothe, 2021; Thomas & Ritala, 2022) and access to resources (Pushpananthan & Elmquist, 2022). However, the rapid pace of digital

transformation also necessitates questioning the potential unintended consequences related to digitalization, which we refer to as negative externalities (Jacobides et al., 2024; Karhu et al., 2024).

The negative impact of digitalization

Despite numerous beneficial effects, digital technologies have also generated adverse consequences. Indeed, the widespread democratization of the Internet has introduced several issues, one notable example being regulatory challenges. As the Internet facilitated information and content sharing at unprecedented scales, it severely weakened copyright regulations and intellectual property protections. Another significant challenge due to the democratization of the Internet relates to data privacy online, which keeps posing difficulties to governmental authorities to this date. The implementation of the General Data Protection Regulation (GDPR) in the European Union illustrates ongoing efforts to achieve consistent and efficient enforcement solutions across different jurisdictions.

Likewise, the spread of digital platform business models has engendered various negative externalities, which can have important implications for a platform's performance and their ecosystems. Such externalities can take multiple forms, such as market share loss, conflicts, pollution, resource depletion, interest misalignment, user dissatisfaction, and unbalanced value capture among participants (Daymond et al., 2023; Jacobides et al., 2024; John & Ross, 2022; Wareham et al., 2014). For instance, the case of streaming platforms in music illustrates how the emergence of digital platforms can affect the capacity of complementors to capture value, as artists in the long tail struggle to generate profits when competing against popular ones. Similarly, the proliferation of Airbnb hosts in Barcelona has led to an increase in rents, the migration of the local population, and tensions with local authorities (Carrasco-Farré et al., 2022; Garcia-López et al., 2020).

Finally, the negative consequences of digitalization are also observable at the

environmental level. Indeed, the increasing number of internet connections and smartphones engenders an ever-growing consumption of data, resulting in digital technologies accounting for 4% of global carbon emissions in 2021, which is predicted to reach 7% in 2025 (The Shift Project, 2021). This phenomenon is due to the substantial amount of energy required for data centers and network infrastructures to operate. In parallel, the production of digital devices requires the extraction of vast amounts of materials, often under socially deprived and environmentally damaging conditions, which raises important ethical concerns regarding the widespread use of digital technologies.

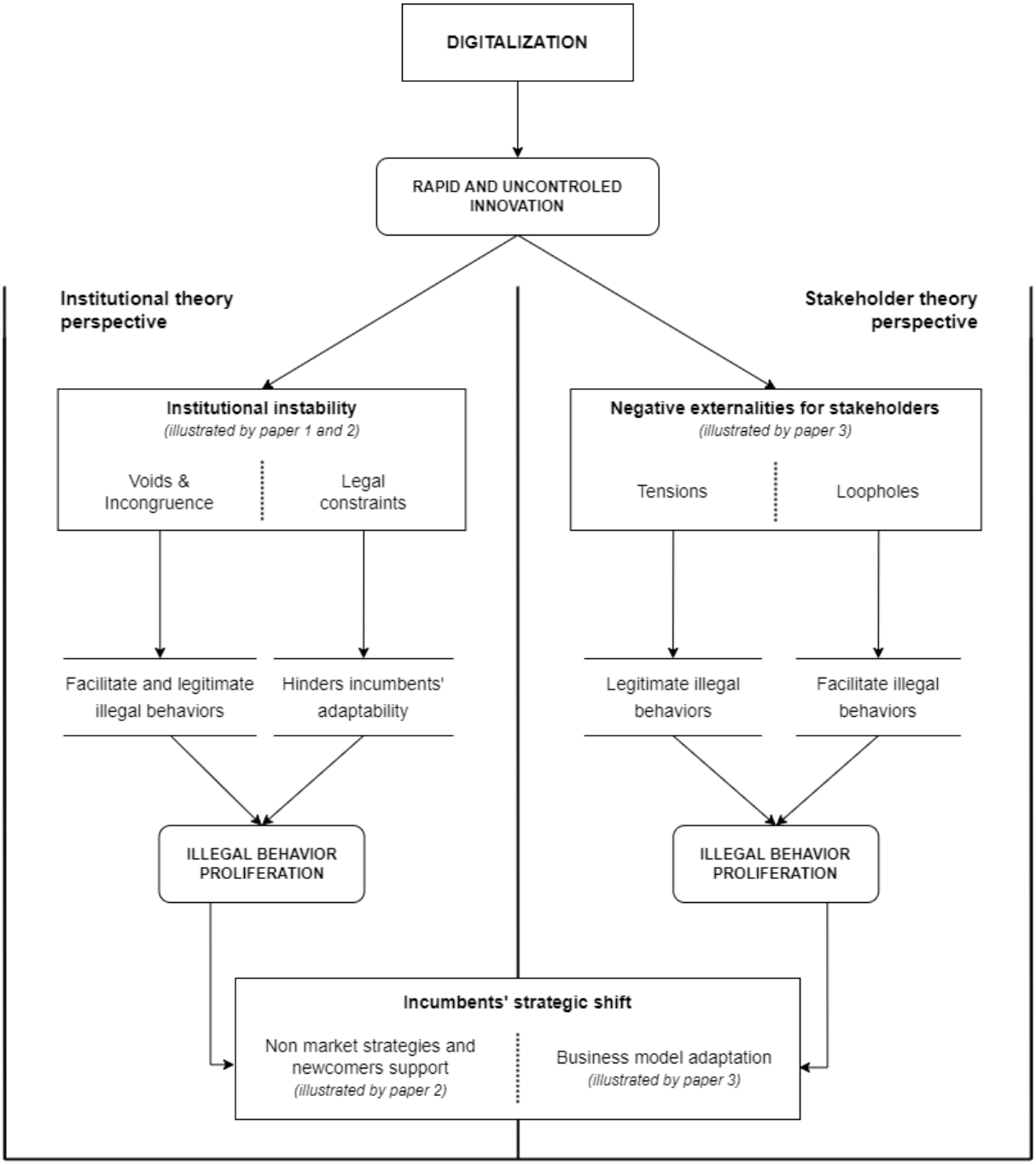
In this thesis, we investigate how rapid digitalization results in the proliferation of illegal behaviors. More precisely, we answer the following research question: *How do illegal practices emerge and disrupt established industries in contexts of rapid digitalization?* By doing so, we contribute to various questions that remain unanswered in strategic management research, specifically regarding digitalization, its consequences, and what strategies can be deployed to prevent and mitigate their impacts. We answer the research question by detailing the different factors favoring the emergence of illegal practice in context digitalization, which we illustrate in Figure 13, and develop the related contributions in the following paragraphs.

DIGITALIZATION AND THE EMERGENCE OF ILLEGAL PRACTICES

Institutional Theory Perspective

First, we adopt an institutional theory perspective by highlighting the diverse institutional factors related to digitalization that must be considered to fully understand the emergence of illegal behaviors and scaling of illegal practices (left-hand column in figure 13). Indeed, rapid technological changes facilitate illegal practices because they bring about institutional instability. On the one hand, this translates into institutional voids that drastically reduce the risks involved in breaking regulations because formal authorities fail to adapt as quickly as technologies change (as illustrated by study 1), reducing the legal risks faced by informal firms

Figure 13. The Emergence of Illegal Practices in Context of Digitalization



and consumers carrying out illegal activities. On the other hand, these illegal offers are much more convenient and competitive than incumbents' because they circumvent constraining regulations. This results in institutional incongruence, where consumers adopt informal firms' offers despite being illegal, because they are either unaware of their illegal nature, or knowingly infringe regulations out of disagreement. Hence, the combination of institutional voids and

incongruence are important elements in the emergence of illegal practices as they facilitate their development and legitimate their adoption by consumers.

In parallel, this institutional instability also impedes established players' adaptability to the disruption generated by such illegal practices. This happens because of legal constraints that prevent incumbents to deploy effective adaptation strategies such as ambidexterity, or establish alliances with their disruptors, without facing legal risks or legitimacy backlash (as illustrated by study 2). In addition, the persistence of institutional voids prevents incumbents from engaging in legal actions against informal firms. Therefore, the responses brought by incumbents and formal institutions are slower, leaving more time for informal firms to build up their user base and increase their legitimacy.

Stakeholder Theory Perspective

Second, we explain how illegal practices emerge from a stakeholder theory perspective. These practices result from persisting negative externalities that affect stakeholders when new business models are introduced (right-hand column in Figure 13). Indeed, the rapid democratization of digital platform business models has generated negative externalities for various stakeholders (in our case, platform complementors), which legitimized collaboration with illegal organizations. Concretely, we bring evidence in our third study that the value redistribution logic of digital platforms, and their (lack of) governance mechanisms, may generate value capture unbalance, overwhelming competition, and a lack of shared vision among complementors. This translates into great tensions that heavily impede complementors' performance, and legitimize in fine collaboration with illegal organizations that offer solutions to reduce the difficulties persisting within the platform's ecosystem.

Moreover, when poorly governed, digital platforms generate opportunities (which we refer to as loopholes) that drastically reduce the risks faced when engaging in such collaborations. For instance, the business model, specifically the value redistribution logic used by streaming

platforms, enables fraud because it calculates revenue redistribution based on complementors' market share. Therefore, it encourages complementors to artificially boost their metrics and performance (plays, saves or followers) to capture more profits from other complementors. In parallel, the lack of sophisticated technological means and clear legal framework will make it more complicated for platform owners to spot and enact ban on undesired behaviors. These insights suggest that business models should be regarded not merely as mechanisms for optimizing costs and revenues structure, but also as tools to prevent (and by opposition enable) the emergence of illegal practices. It is thus important for managers to carefully consider the way they design their platforms, because without proper attention given to their business model and governance mechanisms, they may unintentionally pave the way for illegal practices.

To summarize, the emergence of illegal practices in context of rapid digitalization can be the consequence of institutional instability, and/or the presence of negative externalities, related to the introduction of novel business models, that affect stakeholders. Therefore, the emergence of illegal practices is not solely an institutional issue that can only be addressed with institutional work. Throughout the studies comprised in this thesis, we adopt different perspectives to explain the emergence and proliferation of illegal practices in context of rapid digitalization, which enable us to better capture how and why illegal practices emerge, but also the reasons pushing established actors to collaborate with them. First, as rapid digitalization results in institutional instability, informal firms can more easily develop illegal offers that will be more difficult to stop through legal actions and incumbents' responses. In addition, digitalization facilitates the introduction of novel business models that can unintentionally generate substantial tensions related to resource access and knowledge for their complementors, and enable illegal practices. With the persistence of such tensions, actors are more likely to engage in collaboration with illegal organizations that offer to compensate for these tensions.

CONTRIBUTIONS

Theoretical contributions

Investigating the emergence of illegal practices in contexts of rapid digitalization enabled us to contribute to various domains in strategic management research. Not only, does it help to better understand some of the important consequences of digitalization, but it also provides interesting contributions to disruptive innovation theory, business model research and the literature on the informal economy, all of which we develop in the sections below.

First, we contribute to research on disruptive innovation (Christensen et al., 2018; Cozzolino et al., 2018). In the first paper of this thesis, we theorize on the mechanisms that enable informal firms to disrupt established and powerful leaders, despite important limitations related to resource access, knowledge and legitimacy (Webb et al., 2014). Specifically, as rapid technological changes lead to institutional instability (Bhattacharjee et al., 2003), informal firms can leverage institutional voids and incongruence to introduce and scale illicit business model innovations. In addition, we also complement existing models on incumbents' reaction to disruption (Cozzolino & Rothaermel, 2018; Eggers & Park, 2018; Kammerlander et al., 2018). Indeed, when disruption is initiated by informal firms, incumbents suffer from more inertia than when initiated by formal ones (Gilbert, 2005; König et al., 2021), because of strong legal constraints exerted by formal institutions that prevent the deployment of the strategies such as ambidexterity or strategic alliances with disruptors. Instead, with our second study, we bring evidence that incumbents can successfully adapt to disruptions initiated by informal firms by implementing a mix of market and non-market strategies. This mix enables incumbents to reduce institutional instability and facilitate legal actions against informal firms on the one hand, and accelerate the adoption of legal alternatives introduced by newcomers on the other hand.

Second, our findings also contribute to research on business model. In our first study, we theorize on the process of business model innovation when undertaken by informal firms. We

show how such firms leverage institutional voids and incongruence to develop and scale competitive business models, and manage to compete against established leaders despite their lack of resources and legitimacy. Furthermore, we also answer calls for future research on the eventual negative consequences of business model innovation on society (Snihur & Bocken, 2022; Zankl & Grimes, 2024). Indeed, through our investigation of stream fraud in our third study, we illustrate how digital platforms' features may facilitate the emergence of illegal practices in their ecosystem. Specifically, the case of stream fraud in music suggests that the value redistribution method adopted by platform may encourage complementors to cheat and collaborate with illegal organizations. Therefore, these observations imply that business models can play a major role in both facilitating and preventing illegal behaviors within platform ecosystems, advancing our knowledge on the governance potential business models (Chen et al., 2022; Snihur & Markman, 2023). This is corroborated by the recent changes that streaming platforms have undergone regarding their value redistribution methods to artists, as a response to growing fraud in the music ecosystem.

Third, we contribute to the literature on digital platforms governance (Chen et al., 2022; Jacobides et al., 2024; Zhang et al., 2022) by establishing a link between digital platform design and the emergence of illegal practices. While digital platforms offer significant advantages by facilitating interactions and transactions between individuals (Rietveld & Schilling, 2021; Rochet & Tirole, 2003; Tarzijan & Snihur, 2024), we show in our third study that they may also generate important negative externalities and tensions for their users. For instance, we suggest that, while high levels of competition can translate healthy platform performances (Chu & Wu, 2023), poor governance can greatly intensify it among complementors to a point where it becomes "unhealthy" rivalry (Karhu et al., 2024), and generates great tensions related to value creation and capture. When not properly addressed by platform owners, such tensions may promote the utilization of illegal solutions by complementors as a solution to overcome the

difficulties they face. These elements also answer calls for a better understanding on the consequences that digitalization holds for competition dynamics in platforms ecosystems (Dąbrowska et al., 2022; Vial, 2019). These are important contributions as continued digitalization will lead to the emergence of more digital platforms, which may pave the way for criminal activities in case of improper design and governance. It is therefore crucial to keep investigating the mechanisms behind the development of parasitic behaviors and how to prevent them in order to refine the models developed in the literature on platform governance.

Finally, taking all studies together, this thesis contributes to research on the informal economy. We bring some evidence that informal firms can actually disrupt established industries and induce change, despite being largely considered disadvantaged against formal firms (Darbi et al., 2018; Webb et al., 2014). This is important because, with rapid technological changes, informal firms are likely to thrive, and the competitive dynamics between formal and informal firms remains understudied (Iriyama et al., 2016; Ketchen et al., 2014). Indeed, the informal economy has often been studied from an entrepreneurship perspective, neglecting the rich implications it may hold for strategic management research (Salvi et al., 2022). We hope to fill this gap by providing insights on the competitive dynamics between formal and informal firms, and how these dynamics evolve over time.

Managerial implications

Taken together, the three studies of this thesis hold important managerial implications, especially regarding the complexity of the emergence of illegal practices and how to strategize as a response to this phenomenon. First, it is crucial for managers to recognize the potential threat posed by informal firms. Indeed, the contemporary and rapid technological advancements are likely to result in regulatory ambiguities that will facilitate the development of illegal practices by hindering legal actions against them. While such firms are rarely seen as a threat, they can in fact strongly challenge incumbents' leadership, as illustrated by digital piracy in the

music industry. We therefore encourage managers to consider illegal practices when crafting their strategy.

Second, we show in studies 1 and 2 that the strategies developed in the literature may not be applicable against disruptors from the informal economy. We propose alternative strategies, consisting in collaborating with regulatory bodies, and engaging in lobbying efforts to update obsolete regulations and foster an industry environment that mitigates the threats posed by informal disruptors. In parallel, it is also crucial to support the introduction of legal newcomers to accelerate consumers' transition from illegal to legal alternatives. This can be done via consumers and stakeholders' education, partnerships with newcomers, and innovations aimed at complementing newcomers' value propositions. This multi-pronged strategy enables countering illegal practices more easily, but also accelerating the adoption of legal alternatives by consumers.

Finally, as digital platforms become major players in developed and developing economies, our study points out towards a potential negative consequence related to their democratization, which is the emergence of illegal practices. Although platforms can facilitate interactions and transactions, they also lead to disparities among participants, particularly small complementors. Indeed, our third study indicates that platform owners should design business models that ensure fair value distribution among complementors to prevent unethical behaviors and cheating. Furthermore, we suggest that the abundance of players on platforms, as observed in the music streaming industry, can result in overwhelming competition, a lack of shared vision, and unbalanced value capture, ultimately fostering tensions within the platform's ecosystem and legitimizing fraudulent behaviors. This is important because, as illustrated with stream farms, digital parasites can disrupt value redistribution and alter recommendation algorithms, thereby impeding users' experience. Hence, it is crucial to balance platform growth with the equitable remuneration of all participants, thereby maintaining a healthy ecosystem and preventing the

rise of illegal practices.

Overall, our thesis encourages managers, entrepreneurs and policymakers to carefully consider the potentially negative consequences of digitalization. While the primary aim of innovations is the benefit society, we show in our studies that it is crucial to anticipate the potential adverse effects that can emerge when introducing novel technologies or business models. Managers should adopt a multifaceted strategy that includes proactive collaboration with regulatory bodies, equitable platform governance, and ethical innovation practices. These approaches will enable firms to navigate the complexities of modern disruption, foster sustainable growth, and contribute to a more responsible and equitable digital economy.

Limitations and Avenues for Future Research

All of the studies carried out investigate a particular context, exploring the consequences of digitalization in the music industry. It is therefore legitimate to question the generalizability of our findings to other industries. Indeed, music, as a creative industry, has specific features such as product life cycle (music titles in that case), fragmentation, or consumption habits that can influence some of our findings. For instance, music has been the first industry to be hit by digital piracy because music files contained less amount of information, and were thereby easier to exchange and harder to regulate at the beginning of the 21st century. In addition, streaming platforms include a very large amount of complementors (artists), which generates important tensions, making it a key factor for the emergence of digital parasites. In smaller industries where platforms can attract less complementors, the emergence of digital parasites may therefore unfold in different fashion. Therefore, because the music industry has some specific characteristics it would be valuable to explore whether our findings replicate in other settings.

Yet, it is important to note that our work puts greater emphasis on institutional factors (regulations, norms and values), intellectual protection, technological change, business model innovations, and platform governance mechanisms, all elements that can be observed in other

contexts. For instance, industries such as video game, movies or software heavily rely on intellectual property, innovations, or platform governance, and all of them have also faced complications related to digital piracy when technologies and internet connections improved over time. In the same vein, Uber has exploited institutional voids to challenge established regulations with its innovative business model, and ultimately managed to formalize its activity. More recently, the development of money laundering in the fintech industry also indicates that digital platform business models can unintentionally pave the way for illegitimate activities by challenging existing regulations. All these elements suggest that the insights developed in the three studies in this thesis are likely to be replicated in other industrial contexts.

However, there are other limitations in this thesis that could be addressed by future research by testing our findings in other institutional, industrial and technological contexts. For instance, the data has been collected in developed economies with strong formal institutional authorities. As we argue that institutional factors play a central role in the emergence of disruption, it is important to assess the applicability of our process model across different institutional contexts. For instance, it would be interesting to explore whether the process of business model innovation and scaling by informal firms are comparable between developed and developing economies, as the influence of formal and informal institutions differs drastically between these two contexts. In the same vein, scholars could explore whether the strategies used by incumbents are similar in developing economies, where formal institutions are less advanced and the informal economy more prevalent.

Besides, the emergence of artificial intelligence represents an ideal setting to test our findings with a different technology than the Internet, as it is currently challenging regulations, especially regarding artistic creativity, which opens up opportunities for entrepreneurs to develop illegal activities. To illustrate, some individuals are now using artists' voices and songs to train artificial intelligences to write songs following their artistic touch, without their initial

approval. As a response, the SACEM—which is a French organism managing authors' rights—opted out of data mining techniques aimed at training artificial intelligence to generate musical content, and is now requiring a prior authorization for such data mining activities to ensure fair compensation for authors. Yet, the efficacy of this institutional approach is debatable, as the pace of artificial intelligence progress may induce institutional instability and complicate legal actions. This creates an ideal context for scholars to explore how different technologies may affect the process of informal disruption, as well as the strategies deployed by incumbents to adapt. Finally, the rapid development of artificial intelligence is also likely to facilitate the introduction of new business models. Therefore, it would be valuable for scholars to explore how these new business models may pave the way for illegal practices.

CONCLUSION

In this thesis, we looked at the emergence of illegal practices in the context of rapid digitalization, which is a complex phenomenon that can be addressed from diverse perspectives. We attempt to explain the different factors that enable the emergence of such practices from an institutional and a stakeholder theory perspective. From an institutional point of view, rapid digitalization leads to institutional instability that facilitates the inception and scaling of illegal business models, while at the same time hindering adaptation from established firms. From a stakeholder theory perspective, digitalization facilitates the introduction of novel business models that, despite benefiting society at various levels, may actually generate negative externalities for some stakeholders. In the case of digital platforms, these negative externalities hinder the performance of complementors, which in turn legitimize collaboration with illegal organizations offering to boost performances and capture greater revenue.

We argue that investigating illegal practices and the relationship with digitalization is important because technologies are evolving rapidly, which is likely to facilitate illegal practices if not managed properly. Recent technological improvements such as artificial

intelligence seem to corroborate our findings, suggesting that more research is required to fully understand and control this phenomenon. To illustrate, some individuals in music are now using artists' voices and songs to train artificial intelligences to write songs following their artistic touch, without their initial approval. Challenges and debates are arising in the music ecosystem on how to properly protect musical content from being used to train artificial intelligence without the artists' prior consent. Other industries such as the fintech face similar challenges, where anonymous transactions have rapidly gotten easier, which enables to finance criminal activities more easily. These observations suggest that, when technologies are rapidly evolving, illegal practices are likely to emerge because regulating them will become more challenging, but also because new business models may legitimize and facilitate them.

To conclude, we would like to bring some nuance to the arguments provided throughout this thesis. Indeed, we have been referring to the emergence of illegal practices as a phenomenon with a strong "negative" connotation. It is important to note that illegal practices are not inherently "bad" nor "good", but are rather emerging as responses to persisting issues in industries or ecosystems. For instance, digital piracy emerged as a protest against the overwhelming power of major labels in the music industry. Similarly, stream fraud is an "imperfect" solution introduced to help artists struggling with the current paradigm in music, which is still being criticized to this day. In other words, the emergence of illegal practices should not be seen as a "disease", but rather as a "symptom" of problems that must be addressed by industry leaders and policymakers.

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Appendix

Table IX. Definition of the main Theoretical Concepts

Concepts	Definition	References
Business model	Systems of interconnected, potentially boundary-spanning transactions and activities centered on a focal firm and designed to serve a given product market.	(Amit and Zott, 2001, 2020;Teece, 2010).
Business model innovation	Innovation in business models introduces activities and structures that are new to the world, the product market, or the focal firm.	(Snihur et al., 2021).
Digital parasite	Strategic actor that engages in illicit behaviors to extract value from the platform ecosystem, capture it, and redistribute some of it to other actors.	
Digital platform	Particular type of business model that facilitates interactions between two or more groups of actors, often referred to as providers and users, through a standardized digital interface.	(Chen et al., 2022; Tarzijan & Snihur, 2024).
Disruptive innovation	Disruptive innovation refers to the process by which new ventures propose innovative offerings that can harm incumbent firms' revenues, taking advantage of technological change and business model innovation. Initially, new ventures propose products or services that underperform incumbents, but over time they increase their market share due to performance improvement and novelty.	(Christensen et al., 2018; Cozzolino et al., 2018).
Ecosystem negative externalities	Unintended consequences of platform design that negatively impact one or several categories of participants	(Jacobides et al., 2024; John & Ross, 2022).
Formal institutions	Laws and regulations that are communicated via widely and officially accepted channels, as well as the apparatus enforcing them, defining legally acceptable behaviors.	(Helmke and Levitsky, 2004; Webb et al., 2009; Nason and Bothello, 2022),
Informal disruption	Process during which entrepreneurs from the informal economy develop new value propositions. This is made possible by leveraging technological changes and most importantly avoidance of regulation, to launch novel business models that eventually threaten incumbents' dominance.	

Table IX (cont.). Definition of the main Theoretical Concepts

Concepts	Definition	References
Informal economy	Aggregation of informal firms.	(North, 1990; Webb et al., 2009).
Informal firms	Firms are characterized by activities that are illegal avoidance of taxes or other intellectual property, yet considered legitimate by many consumers.	(North, 1990; Webb et al., 2009).
Informal institutions	Norms, values, and beliefs that define socially acceptable behaviors) and are unwritten and communicated via unofficial channels.	(Helmke and Levitsky, 2004; Webb et al., 2009; Minbaeva et al., 2022)
Institutional incongruence	Mismatch between formal and informal institutions, resulting in consumers either being unaware of informal disruptors' illegality or knowingly infringing regulations with which they disagree.	(Webb et al., 2009; Fredström et al., 2021)
Institutional voids	absence of formal regulations, or the failure to enforce them, which can leave some space for informal firms to generate activity and revenues.	(London et al., 2014; Webb et al., 2014; Darbi et al., 2018)
Platform design	Governance mechanisms and business model implemented by a platform to create, capture and redistribute value among participants while optimizing overall performance.	(Chen et al., 2022; Wareham et al., 2014)
Platform ecosystem	Alignment of heterogeneous and interdependent participants around a digital platform, interacting to generate a focal value proposition that cannot be generated individually.	(Adner, 2017; Lingens et al., 2021; Thomas & Autio, 2020)

Table X. Definition of the main Empirical Concepts

Concepts	Definition	References
Digital piracy	Sharing of protected content via online solutions such as Bit-torrent.	EUIPO (2017)
Market-centric approach	Revenue redistribution logic adopted by music streaming platforms that calculates artists' royalties based on their cumulative market share on the platform.	
Stream farms	Illegal organizations that repeatedly stream music titles, which artificially inflate their charts raking to accrue associated revenues and enhance visibility.	
Stream fraud	Artificial creation of online plays or views by human and non-human means to generate income, improving chart position and/or swaying a recommendation system.	Centre National de la Musique (2023)

Table XI. List of Interviews

Organization	Location	Position
Band	- France	- Guitarist
Freelance	- France	- Journalist
Institutions	- France	- Director of development, phono and digital
		- Regional Director
		- Investigator
		- Research fellow
		- Research fellow
		- General direction advisor in charge of green transition and innovation
		- Research fellow
		- Research fellow
		- Public affairs Director
		- CEO
		- Delegate
		- Executive director
		- CEO
		- Delegate
		- Director of research and the legal offer
		- Delegate
	- Finland	- Head of Content Protection
	- United-Kingdom	- Senior Research and Statistics Manager
		- Head of Social Research and Statistics
		- Head of research
	- Spain	- Chief Economist
Label	- Germany	- Director
	- France	- Publishing/Management
		- Financial Director
		- Management controller
		- Project manager
		- Director
Platform employees	- France	- Artist relations manager
		- Head of research
		- Royalties and reporting director
Manager	- France	- Artist manager
		- Label manager
Marketing agency	- France	- Data manager
		- CEO
Music School	- France	- Director
Other	- France	- Marketing project manager
		- Ticket office manager
Total	**38**	

Abstract of the thesis

The rapid technological advancements of the recent decades have profoundly reshaped our society. From the way we interact to the way firms operate, the democratization of digital technologies has generated numerous opportunities that enabled newcomers to introduce novel and competitive business models in many industries. It is therefore no surprise that researchers have thoroughly investigated the impacts of digitalization on strategic management and business practices. However, rapid digitalization has also facilitated the emergence of illegal practices, such as piracy and fraud. Despite the prevalence of these phenomena, the mechanisms linking digitalization and the proliferation of illegal practices remain surprisingly understudied. Throughout the three studies that comprise this thesis, we address this gap by investigating the different factors related to rapid digitalization that enable the emergence of illegal practices. Specifically, we investigate the development of digital piracy and stream fraud in the music industry in order to develop models that explain how and why illegal practices proliferate in a context of rapid digitalization. By doing so, we propose new opportunities for future studies and make contributions to strategic management research, advancing our understanding of disruptive innovation, business models, digital platform governance, and the informal economy.

Résumé de thèse

La société a été profondément transformée par les rapides progrès technologiques des dernières décennies. De la manière dont nous interagissons jusqu'aux pratiques managériales, la démocratisation des technologies numériques a généré d'innombrables opportunités, permettant à de nouveaux arrivants d'introduire des modèles économiques novateurs et compétitifs, et ce dans de nombreuses industries. Il n'est donc pas surprenant que beaucoup de chercheurs en sciences de gestion aient étudié les impacts de la numérisation sur le management stratégique. Cependant, ces rapides avancées technologiques ont également facilité l'émergence de pratiques illégales, telles que le piratage et la fraude. Malgré la prévalence de ces phénomènes, les mécanismes liant la numérisation et la prolifération des pratiques illégales restent étonnamment peu étudiés. À travers les trois études qui composent cette thèse, nous abordons les différents facteurs liés à la numérisation permettant l'émergence de pratiques illégales. Plus précisément, nous étudions le développement du piratage et de la manipulation des streams dans l'industrie de la musique, afin de développer des modèles expliquant comment et pourquoi les pratiques illégales prolifèrent dans un contexte d'avancées technologiques rapides. Ce faisant, nous proposons de nouvelles opportunités de recherche et contribuons à différentes littératures en sciences de gestion, telles que les innovations disruptives, les modèles économiques, la gouvernance des plateformes digitales et l'économie informelle.