GOVERNANCE AND COOPETITION IN PLATFORM ECOSYSTEMS: SWINGS OF A PENDULUM

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ABSTRACT

Platform ecosystems are one of the dominant organizational forms of the digital age. Research advocates two approaches for optimal ecosystem performance: balancing centralization and decentralization in governance, and balancing coopetition—the interplay of cooperation and competition. Despite the intertwined nature of these two approaches, we know little about their mutual effects and their impact on ecosystem evolution over time. Based on the metaphor of a swinging pendulum, we propose a conceptual model that incorporates different governance regimes ranging from centralized to decentralized and varying coopetition intensities ranging from competition-dominant to cooperation-dominant in platform ecosystems. Contrary to common wisdom suggesting the existence of one optimal path to platform governance, we argue that coopetitive tensions inherent in each initial governance regime trigger distinct paths of governance recalibration. Our essay contributes to a dynamic perspective on the interplay of governance and coopetition in platform ecosystems.

Keywords: platform governance, dynamic governance, governance trajectory, platform ecosystem coopetition, dynamic coopetition, coopetitive tension

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INTRODUCTION

Digital platform ecosystems that align multilateral economic actors "for a focal value proposition to materialize" (Adner, 2017, p. 42) represent a prevalent organizational form in the digital age (Gawer, 2022; Jacobides et al., 2018). Platform governance, defined as the formal and informal rules steering value creation and capture among ecosystem actors (L. Chen et al., 2022; Kretschmer et al., 2022; Wareham et al., 2014), is considered decisive for ecosystem performance (Pidun et al., 2020; Zhang et al., 2020). At the same time, research points to the importance of platform orchestrators' management of interdependent tensions, one of the most critical ones being the interplay between cooperation and competition, known as coopetition (Daymond et al., 2022; Hannah & Eisenhardt, 2018; Jacobides et al., 2024; Kretschmer et al., 2022; Rietveld & Schilling, 2021). While too much cooperation can keep firms from capturing enough value to sustain themselves in the long run, too much competition may result in an ecosystem's focal value proposition failing to emerge (Adner, 2017; Moore, 1993).

Managing coopetitive tensions has been a core topic in the literature since the early days of strategic management research as a discipline ultimately interested in explaining lasting firm performance (Dagnino & Ritala, 2025; Leiblein & Reuer, 2019; Nag et al., 2007; Rumelt et al., 1994). Initially anchored in game theory (Brandenburger & Nalebuff, 1996; von Neumann & Morgenstern, 1947) and later in coalition formation (Thompson, 1967), coopetition found its greatest application so far in strategic networks and alliances (Dyer & Singh, 1998; Gulati, 1998; Gulati et al., 2000; Jarillo, 1988; Lavie et al., 2007). With the upsurge of platform ecosystems, a different context comes into focus (Adner et al., 2019; Bailey et al., 2022; Giustiziero et al., 2021; Menz et al., 2021; Reischauer & Hoffmann, 2023), one in which complementarities rather than contracts shape interfirm relationships (Jacobides et al., 2018, 2024), thereby underlying the critical role of governance (Kretschmer et al., 2022; Rietveld & Schilling, 2021). While "effective governance" (L. Chen et al., 2022, p. 168; Wareham et al., 2014, p. 1212) relies on balancing cooperation and competition, the multilateral nature of ecosystems "leads to a continual shift in the balance between cooperation and competition" (Ansari et al., 2016, p. 1849), suggesting an ambiguity concerning the interplay of governance and coopetition for ecosystem performance.

Research advocates two independent approaches to achieve optimal ecosystem

performance. On the one hand, the literature indicates that governance should calibrate an optimal mixing between centralization and decentralization (e.g., Y. Chen et al., 2020; Eisenmann, 2008; Furr & Shipilov, 2018; Hsieh & Vergne, 2023; O'Mahony & Karp, 2022). On the other hand, research on coopetition argues for a balanced intensity of cooperation and competition (e.g., Ansari et al., 2016; Das & Teng, 2000; Gnyawali & Ryan Charleton, 2018; Hannah & Eisenhardt, 2018; Wareham et al., 2014). However, these two approaches do not affect the development of ecosystems in isolation; different governance design choices lead to different coopetitive dynamics in the ecosystem (e.g., Cennamo & Santalo, 2013; Cennamo & Santaló, 2019; Gawer, 2022; Hannah & Eisenhardt, 2018). Yet, extant research fails to consider this interplay systematically. This is unfortunate, given that distinct governance regimes may entail distinct coopetitive tensions, causing dynamics that could explain (part of) the heterogeneity and fast-paced evolution of platform ecosystems. Adopting a dynamic perspective on the interplay between governance and coopetition would help clarify the structural role of governance in balancing cooperation and competition beyond initial ecosystem formation (L. Chen et al., 2022; Rietveld & Schilling, 2021; Schmidt & Foss, 2023).

Such a theoretical development is important for two main reasons. First, the governance literature clearly favors shared governance in terms of efficiency and effectiveness (Y. Chen et al., 2020; Furr & Shipilov, 2018; O'Mahony & Karp, 2022), as this form of governance counteracts distribution challenges observed in fully centralized governance regimes and functional challenges seen in fully decentralized governance regimes (Jacobides et al., 2024). While one might expect shared governance regimes to dominate, closer examination of scholarly inquiry and practice reveal that centrally governed platforms prevail in reality (Gawer, 2022; Jacobides et al., 2024). The few examples of shared governance regimes point to significant challenges, including lengthy consensus-based decision-making, high levels of bureaucracy, complex conflict management, and value capture tensions (e.g., Eisenmann, 2008; Furr & Shipilov, 2018; Goldsby & Hanisch, 2022). Second, coopetition literature has traditionally centered around dyadic interfirm relationships and only recently started focusing on the multilateral ecosystem level (e.g., Ansari et al., 2016; Hannah & Eisenhardt, 2018; Reischauer et al., 2024; Zhang et al., 2020). Consequently, governance has played a subordinate role thus far, as relationships between actors

engaged in coopetition are governed by contracts, as in alliances or buyer-supplier relationships (Dyer et al., 2018; Gulati, 1998; Minà & Dagnino, 2025). In contrast, interfirm relationships in platform ecosystems underlie non-generic complementarities coordinated by the platform as the technological infrastructure (Cennamo, 2021; Jacobides et al., 2018, 2024). Thus, the interdependence of governance and coopetition has only been at the periphery of scholarly debate (e.g., Cennamo & Santalo, 2013; Cozzolino & Rothaermel, 2018; Hannah & Eisenhardt, 2018) but, to the best of our knowledge, never their primary focus. Given the historically unprecedented pace of change associated with the digital age (Adner et al., 2019; D'Aveni et al., 2010), the meaning and means of achieving optimality in governance and a balance in coopetition over time remain unclear. Hence, we ask: *How does governance balance cooperation and competition in platform ecosystems over time?*

We build on the metaphor of a swinging pendulum to theorize three distinct governance-trajectory paths that account for various governance regimes (based on their level of centrality) and coopetition intensities (based on their weighting of cooperation and competition). We argue that as platforms evolve, an initial governance regime triggers specific coopetitive tensions over time that require ongoing governance adjustments—a process we refer to as "recalibration"—to safeguard the ecosystem's success in the long run. Given the historically conditioned path dependence of platform-governance regimes after their establishment, we expect governance recalibration for a given platform to occur *within* a defined spectrum demarcated by the initial path of governance trajectory being followed. After such recalibration, a transient stable state emerges, which persists until new coopetitive tensions arise in response to governance recalibration and cause the pendulum to start oscillating again.

We contribute to the platform ecosystem literature in several ways. First, we extend the extant literature on platform governance by putting debates on optimality in governance regimes into perspective (e.g., Hanisch et al., 2023; Wareham et al., 2014; P. J. Williamson & De Meyer, 2012). Our findings suggest the absence of a "right" governance regime and illustrate that optimality is transient until challenged by ongoing coopetitive tensions, some of which are difficult to predict ex ante. We thus advocate a broader, more faceted approach to optimality in governance that acknowledges heterogeneities across platforms over time. Building on the literature on trajectories and

path dependence, we contribute to a dynamic perspective on governance across distinct trajectory paths (e.g., Jacobides et al., 2024; Rietveld & Schilling, 2021; Wareham et al., 2014) and introduce recalibration as a means of ecosystem orchestration that can "shape future governance choices" (L. Chen et al., 2022, p. 173). As we mostly observe endogenous forces triggering continuous governance recalibration, we add to the burgeoning view that governance regimes are central to ecosystem differentiation and performance. We thereby contribute to recent debates on different approaches to ecosystem management, which range from "winner-take-all (or most)" (e.g., Cennamo & Santalo, 2013) to "rising tides lifts all boats" (e.g., Khanagha et al., 2022) outcomes.

Second, we contribute to the coopetition literature by introducing platform ecosystem coopetition as a manifestation of coopetition that accounts for the peculiarities of platform markets. We thereby add to a multi-level perspective (Gnyawali & Ryan Charleton, 2018; Minà & Dagnino, 2025) and a dynamic view of coopetition, which ties into recent research exploring the temporal dimension of coopetition (Hannah & Eisenhardt, 2018; Hoffmann et al., 2018; Slawinski et al., 2024). By positioning governance as an organizational antecedent to coopetition in platform ecosystems and coopetitive tensions as a trigger of the reciprocal interplay between governance and coopetition, we further inform research on coopetitive tensions and enrich coopetition research from a governance perspective (Bengtsson & Kock, 2014; L. Chen et al., 2022; Chiambaretto et al., 2025; Hoffmann et al., 2018).

Finally, given that the digital age provides novel opportunities and challenges for collaborative strategies (Lumineau et al., 2021; Malhotra et al., 2021), our dynamic lens on managing coopetitive tensions through governance recalibrations adds to debates on how digitalization challenges prevalent management theories about organizations and ways of organizing in the light of dynamic environments (Bailey et al., 2022; Giustiziero et al., 2021; Menz et al., 2021; Teece, 2020).

The remainder of the essay is structured as follows. After reviewing related literature on coopetition and governance in platform ecosystems, we develop a conceptual model based on the swinging pendulum metaphor that accounts for the dynamic interplay between coopetition and governance. We then close with a discussion of our propositions, including their scholarly and practical implications, and directions for future research.

RELATED LITERATURE

Coopetition in Platform Ecosystems

Although extant research on cooperation and competition illuminates why one firm outperforms another, research on the two topics has emerged as two largely separate streams, each viewing one strategic orientation as disadvantageous relative to the other (Hoffmann et al., 2018). However, with the increase in market and technological uncertainties since the late 1980s, firms have progressively started cooperating with competitors, which has led to an upsurge in coopetition as a strategy in its own right and as a research branch (Afuah, 2000; Brandenburger & Nalebuff, 1996; Dowling et al., 1996; Lado et al., 1997). Scholars generally agree that coopetition involves the distinct co-occurrence of cooperation (between rivals in critical markets or activities) and competition (between partners in critical markets) among firms with the aim of creating and capturing value for each other (Brandenburger & Nalebuff, 1996; Chiambaretto et al., 2025; Czakon et al., 2020).

Simultaneous cooperation and competition can take various forms (for a review, see Hoffmann et al., 2018). One dimension relates to the balance between or magnitudes of cooperation and competition (e.g., Bengtsson et al., 2010; Bengtsson & Kock, 2000; Gnyawali & Ryan Charleton, 2018; Lado et al., 1997; Luo, 2007). This dimension is usually characterized in terms of the intensity of competition (i.e., low to high) and the intensity of cooperation (i.e., low to high) with their manifold combinations (i.e., competition-dominant coopetition; balanced coopetition; cooperation-dominant coopetition). Typically, balanced coopetition involves regular oscillation between low coopetition intensity (i.e., low cooperation and low competition) and high coopetition intensity (i.e., high cooperation and high competition) (Gnyawali & Ryan Charleton, 2018). Other dimensions of cooperation and competition include their temporality (i.e., simultaneous versus sequential), manifestness (i.e., direct versus indirect), and effects (i.e., constraining versus reinforcing) (Hoffmann et al., 2018). Similarly, coopetition can be differentiated by classifying the coopetitive firms' value-chain activities as horizontal coopetition (i.e., between firms operating in the same industry) or vertical coopetition (i.e., in buyer-seller relationships) (Dowling et al., 1996), or by examining the number of actors involved (i.e., bilateral versus multilateral) (Ansari et al., 2016).

Due to its paradoxical nature of "two diametrically different logics of interaction" (Bengtsson & Kock, 2000, p. 412), coopetition is considered a double-edged sword (Bouncken & Kraus, 2013). First, it constitutes "a strategy that holds the greatest potential for firms' performance" (Le Roy & Czakon, 2016, p. 3). Coopetition offers certain benefits—it can help with the allocation of strategically relevant resources, risks, and costs (Gnyawali & Park, 2011); foster innovation (Yami & Nemeh, 2014); and facilitate expansion into new markets and new customer segments (Wu et al., 2015). Second, coopetition is considered susceptible to interference (Park & Russo, 1996; Park & Ungson, 2001), especially in the context of multi-partner arrangements (Lavie et al., 2007), which reflect the risky and tense nature of coopetitive relationships (Bengtsson et al., 2016; Bengtsson & Raza-Ullah, 2025; Chiambaretto et al., 2019), their complex management (Park & Ungson, 2001), and the potential for multifaceted opportunistic behavior (Belderbos et al., 2012; Das & Teng, 1998; Lavie, 2006). Accordingly, coopetition involves various tensions, which cause imbalances in these relationships, such as role conflicts, knowledge leakages, relational instabilities ranging from power imbalances to opportunism, and a lack of commitment (Hoffmann et al., 2018; Minà & Dagnino, 2025). These coopetitive tensions arise due to the conflicting logics of cooperation and competition—while competition means "pursuing one's own interest at the expense of others, cooperation is the pursuit of mutual interests and common benefits" (Das & Teng, 2000, p. 85). Various tension-management approaches—such as organizational or temporal separation (Hoffmann et al., 2018)—promise to address the inherent trade-off between both forces.

While coopetition occurs at multiple levels of analysis (e.g., inter-individual, intra-organizational, inter-organizational, network), research has traditionally focused on dyadic interfirm relationships (for recent reviews, see Czakon et al., 2020; Minà & Dagnino, 2025). Only recently has coopetition research started to examine multilateral interorganizational relationships, where multiple stakeholders engage in complex, interdependent, coopetitive relationships at a systemic level. Examples include studies of coopetition in nascent ecosystems (Fang et al., 2021; Hannah & Eisenhardt, 2018), in connection with disruptive innovation (Ansari et al., 2016) or technology investments (Kapoor & Lee, 2013), and between incumbents and entrants (Cozzolino et al., 2021; Cozzolino & Rothaermel, 2018; Reischauer et al., 2024). One branch of the literature

on coopetition in ecosystems deals exclusively with the coopetitive dynamics that arise in platform ecosystems when the interdependence between an orchestrator embedded in a network of complementors (e.g., third-party sellers or app developers) is supported by a digital platform as the technological architecture (Gawer, 2014; Jacobides et al., 2018). The increased use of digital technologies by cooperating competitors to create and capture value for each other is known as "digital coopetition" (Reischauer & Hoffmann, 2023). For example, in a quasi-experiment investigating the relationship between platform gatekeeping (i.e., policies for controlling platform access) and the willingness to share knowledge, Zhang et al. (2020) find that a lapse in gatekeeping due to an exogenous shock results in greater competition among complementors and less cooperation, as knowledge is shared less frequently. In their study on coopetition in the context of standard setting, Miller and Toh (2020) reveal the conditions under which firms voluntarily share some of their patents with other ecosystem members. They find that such disclosure increases the value and returns of non-disclosed complementary components owned by the patent holder. Zhu and Liu (2018) investigate the coopetitive dynamics within Amazon's marketplace by examining the platform owner's entries into complementors' spaces. They reveal that Amazon aims for successful product spaces of third-party sellers and prefers those that rely on less platform-specific investments. When investigating incumbent firms dealing with entrant platforms, Reischauer et al. (2024) coined the "slipstream strategy," which refers to cooperation and competition simultaneously and sequentially manifesting at changing intensities over time.

Governance in Platform Ecosystems

With their modular, interdependent structure of core and complementary components linked by design rules and an overarching value proposition, platform ecosystems are amalgamations of organizations—meta-organizations (L. Chen et al., 2022; Gulati et al., 2012; Kretschmer et al., 2022)—located on the continuum between pure markets and hierarchical organizations (Kretschmer et al., 2022; Makadok & Coff, 2009; O. E. Williamson, 1975). Their distinct nature requires new governance regimes (Gawer, 2014, 2022). Platform governance encompasses the formal and informal rules steering value creation and capture by mechanisms of incentive and control among ecosystem actors, including one or more orchestrators, complementors, and users (L. Chen et al.,

2022; Klein et al., 2019; Kretschmer et al., 2022; Wareham et al., 2014). Compared to traditional organizations in which decision-making is hierarchically steered and the degree of influence increases from the lowest to the highest management level, complementors and users in platforms act autonomously, and make independent decisions within the platform's boundaries (Kretschmer et al., 2022).

Platform-governance design requires specifications on the scope of action for the ecosystem's members. While control-related governance mechanisms deal with the establishment and enforcement of an ecosystem's rules and norms (e.g., access control, behavioral control), incentive-related governance mechanisms capture the influence of the behavior of key ecosystem members and ecosystem outcomes (e.g., the provision of (non-)monetary rewards, resource sharing, conveyance of autonomy) (L. Chen et al., 2022). A closely related issue is the degree of centrality of the platform's governance, which refers to the distribution of authority among ecosystem actors (Rietveld & Schilling, 2021). A distinction is often made between platforms in which platform leaders hold strong, centralized authority (i.e., centralized platform ecosystems), and platforms with either a weak central authority (i.e., shared platform ecosystems) or no central authority (i.e., decentralized platform ecosystems) (Y. Chen et al., 2020; Eisenmann, 2008).

In *fully centralized governance regimes* (e.g., Apple), the orchestrator functions as a focal ecosystem actor and has concentrated authority over platform governance, which promotes coordination and accelerates decision-making (Boudreau, 2010; O'Mahony & Karp, 2022). Typically, the degree of formalization is high, as platform owners enjoy exclusive rights to ensure their governance regime is followed. As such, they can significantly influence the platform's processes and outcomes (Boudreau, 2010; Eisenmann, 2008; Rietveld et al., 2019). At the opposite end of the spectrum are *fully decentralized governance regimes* (e.g., Bitcoin) in which various ecosystem actors enjoy distributed governance authority, and engage in joint decision-making, joint rule-setting, and the development of common policies (Y. Chen et al., 2020; Hsieh & Vergne, 2023). Typically, the degree of formalization is low and processes are only loosely defined, although the platform's effectiveness can be high, as participating actors contribute various ideas and solutions (Eisenmann, 2008; O'Mahony & Karp, 2022). Positioned between the two extremes are *shared governance regimes* (e.g.,

Android), which give "community members freedom and rights to participate in platform governance while having some key organizations or individuals sponsor and shape platform governance" (Y. Chen et al., 2020, p. 1311). Shared governance thus mediates between strong centralization and decentralization by balancing the need for control with the need for adaptation (Y. Chen et al., 2020; Shipilov et al., 2023).

The emergence of numerous governance regimes and varying degrees of centrality has enhanced the depiction of governance as a double-edged sword by contrasting "good governance" with "bad governance" (Cusumano et al., 2019). While debates around "good governance" focus on platforms disrupting established industries through innovative business models, products, and services that generate distinctive societal value (e.g., Gawer & Srnicek, 2021; Parker et al., 2016), critical voices highlight "bad governance," and accuse platform orchestrators of abusing their market power and promoting unfair competition (e.g., Jacobides et al., 2024; Zuboff, 2019). The latter typically refers to centralized platforms, which are the dominant type of platform ecosystems and, thus, the main focus of scholarly investigations (Y. Chen et al., 2020; Hsieh & Vergne, 2023; O'Mahony & Karp, 2022). On the one hand, centrally governed platforms are criticized for their "squeezing" strategies, such as increasing service fees (e.g., eBay), restricting access to resources or users (e.g., Facebook), or imitating products (e.g., Amazon) (Wen & Zhu, 2019; Zhu, 2019; Zhu & Liu, 2018). The power asymmetries between one or a few dominant platform owners with sovereignty over customer-related information, significant bargaining power (L. Chen et al., 2022; Moore, 1993), and a large number of resource-dependent complementors (Ozcan & Eisenhardt, 2009) has increasingly fueled calls for platform regulation (Jacobides & Lianos, 2021). On the other hand, decentralized platforms are often assumed to be self-sustaining and to operate autonomously. Yet, this assumption may prove profoundly wrong, as documented in failure cases, such as TradeLens (Goldsby & Hanisch, 2022; Lumineau et al., 2021). As centralized governance regimes suffer from distribution challenges and decentralized governance regimes entail functional challenges (Jacobides et al., 2024), shared governance regimes are favored for achieving optimal effectiveness and efficiency (Y. Chen et al., 2020).

While governance has traditionally been ascribed a key role in fostering the growth of platform ecosystems (Teece et al., 2022), scholars increasingly acknowledge

the need for adjustments in governance to address tensions between value creation and value capture as platforms evolve (L. Chen et al., 2022; Daymond et al., 2022; Wareham et al., 2014). Conceptually, management research typically captures evolutionary changes over time using a trajectory (Swider et al., 2024), defined as "a course of action but [it] also embraces the interaction of multiple actors and contingencies that may be unanticipated and not entirely manageable" (Strauss, 1993, p. 53). As a result, trajectories are less about uniformly recurring changes and more about learning curves in which continuous learning as an absorptive capability triggers progression beyond the original state (Schilling, 2002; Swider et al., 2024). Trajectories evolve gradually through careful screening of the business environment, anticipation of potential areas of conflict, and reflections on past experiences (Daymond et al., 2022; Kuan & Lee, 2023). Accordingly, governance trajectories involve incremental corrections to an initial governance regime in response to unanticipated tensions caused by dynamically changing environments.

DYNAMICS OF GOVERNANCE AND COOPETITION IN PLATFORM ECOSYSTEMS

Throughout their evolutionary cycles, platforms are shaped by the co-evolutionary processes of cooperative and competitive interactions in which ecosystem actors simultaneously strive for joint value creation and individual value capture (Adner, 2017; Ansari et al., 2016; Czakon et al., 2020; Moore, 1993). Building on Brandenburger and Nalebuff (1996) and Jacobides et al. (2018), we define "platform ecosystem coopetition" as the tension between two or more platform ecosystem actors simultaneously involved in cooperation and competition (at the ecosystem level) to create and capture value for each other. Unlike horizontal or vertical coopetition, platform ecosystem coopetition captures the complexity of actors'[1] roles and interactions within and between platform ecosystems as they engage in coopetition. Platform governance serves as an instrument for regulating coopetitive tensions among ecosystem actors (L. Chen et al., 2022; Kretschmer et al., 2022; Rietveld & Schilling, 2021).

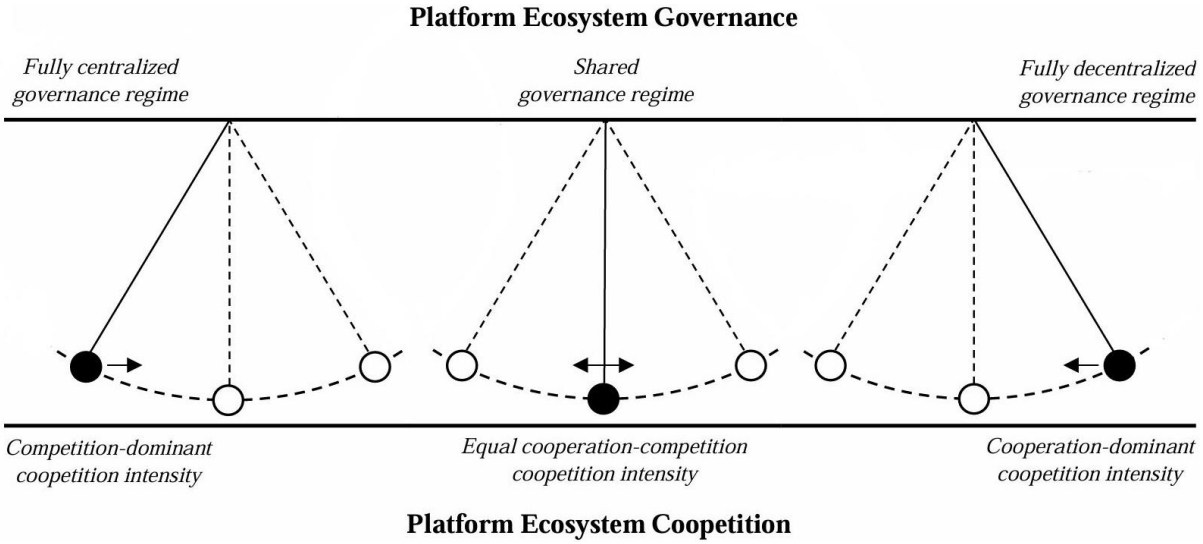
[1] Given the systemic nature of ecosystems, in addition to orchestrators, complementors, and users, ecosystems span external actors, such as regulators and media representatives (Snihur et al., 2018; Thomas & Ritala, 2021). However, for simplicity, we restrict our theoretical reasoning to platform ecosystem coopetition between orchestrators and complementors as two key actors of interest in the strategic management discipline.

With business environments (e.g., goals, roles, markets, and technology) in constant flux, platform ecosystems are "fundamentally dynamic in nature" (D. McIntyre et al., 2021, p. 568). This flexible feature of ecosystems, which are shaped by their endogenous and exogenous environments, calls for the evolution of governance regimes over time (Wareham et al., 2014). To account for the inherent change dynamics of platform ecosystems resulting from the interplay between governance and coopetition, we use the metaphor of a swinging pendulum, which has previously been applied in strategic management research (Dagnino & Minà, 2019; Hoskisson et al., 1999). Governance serves as the initial fulcrum that specifies the "playing field" among ecosystem actors and triggers difficult to predict coopetitive tensions as platforms evolve (Khanagha et al., 2022). We argue that to counteract any unintended consequences of coopetitive tensions that might threaten an ecosystem's specific value proposition, incremental adjustments of the initial governance regime within a given governance trajectory path are initiated by its orchestrator(s), a process we refer to as "recalibration." We propose that this is due to the conditioned path dependency of a platform-governance regime, which entails self-reinforcing mechanisms (e.g., increasing returns, complementarity, learning) that result in organizational lock-in over time (Sydow et al., 2009). As lock-in describes a "state of the system that cannot be escaped endogenously" (Vergne & Durand, 2010, p. 743), organizations stay on one dominant path to avoid the negative outcomes (e.g., sunk costs, high switching costs, broken commitments) associated with choosing alternative paths (Sydow et al., 2009). To ensure continued returns, firms become dependent on one path or, when considering evolutionary dynamics as we do here, a defined spectrum of "comparable paths" (Vergne & Durand, 2011, p. 373) able to replicate proven action patterns over time (Sydow et al., 2009).

For illustrative purposes and clarity, we consider three distinct trajectory paths at the platform-ecosystem level that feature various governance regimes (i.e., fully centralized, shared, fully decentralized) and coopetition intensities (i.e., competition-dominant, equal cooperation and competition, cooperation-dominant). Drawing on L. Chen et al. (2022), we focus on selected incentive and control mechanisms serving value creation and capture purposes and interfirm collaboration more broadly (Castañer & Oliveira, 2020). Each governance trajectory involves a unique path dependency

featuring a gestalt of related paths. More precisely, for a given platform, we expect pendulum swings *within* the spectrum of its initial governance trajectory as opposed to a single platform oscillating between the full pendulum cycle. Figure 1 offers a schematic representation of our conceptual model. We start our theoretical reasoning with the center trajectory, as it depicts the default in extant research on governance and coopetition in platform ecosystems. We then discuss the two outer trajectories.

Figure 1: Swinging Pendulum of Governance and Coopetition in Platform Ecosystems



Trajectory I: Shared governance regime and coopetition with cooperation and competition at equal intensities

As platform ecosystems are "characterized by relationships that are neither as independent as arm's-length market contracts, nor as dependent as those within a hierarchical organization" (Rietveld et al., 2019, p. 1232), they are categorized as hybrid meta-organizations (L. Chen et al., 2022; Kretschmer et al., 2022). Accordingly, they combine many loosely coupled entities that mainly execute their activities independently of each other and feature elements of centralized and decentralized governance regimes (Kretschmer et al., 2022). An implicit assumption in this literature is that platform ecosystems should balance various areas of tension, such as the interplay between cooperation and competition (e.g., Daymond et al., 2022; Kretschmer et al., 2022; Rietveld & Schilling, 2021), within their governance regimes. For example, Hannah and Eisenhardt (2018) assert that ecosystems' success relies on firms balancing cooperation and competition by strategically managing bottlenecks (i.e., when firms face component obstacles that impede ecosystem growth). Similarly, Wareham et al.

(2014) suggest that tensions, such as those arising from individual and collective goals among heterogeneous ecosystem actors, need to be balanced through effective governance regimes because "if a thousand flowers grow, inevitably, some will be undesirable and harmful to the ecosystem" (p. 1212).

Shared governance regimes perform better than their purely centralized or decentralized counterparts and are, thus, deemed the epitome of effective platform governance (Y. Chen et al., 2020; Wareham et al., 2014). Shared governance does not necessarily imply that all governance decisions and outcomes are shared equally among ecosystem members. It can feature various blends of centralized (e.g., platform access, value distribution) and decentralized (e.g., autonomy in product development and pricing) governance (Boudreau, 2010; L. Chen et al., 2022; Y. Chen et al., 2020). For instance, while Amazon strictly controls the behavior of complementors by evaluating their performance through transaction records (indicative of centralized governance), decisions on product pricing lie entirely with the complementors (indicative of decentralized governance) (L. Chen et al., 2022). From the platform literature, we deduce that shared governance regimes are favored to achieve balanced coopetition featuring either high cooperation and competition, or low cooperation and competition. However, as we argue next, shared governance regimes develop coopetitive tensions over time that require governance recalibration within a spectrum of related paths along the same trajectory.

The Eclipse innovation platform is a rare example of how an organization transitions through our metaphorical pendulum's full spectrum of governance regimes. O'Mahony and Karp (2022) document how the platform, which was initially founded and governed by IBM with access by invitation only, quickly transitioned to an open access mode, with IBM still controlling key governance dimensions to create a leading innovation platform with the help of an open-source community. Tensions between IBM and the members of Eclipse, who were concerned that IBM would use the jointly generated knowledge proprietary, led to Eclipse being converted into a non-profit organization with the intention of sharing leadership among its members. However, the shared governance approach prevented any firm from taking the lead, creating a "leadership vacuum" (O'Mahony & Karp, 2022, p. 550) and reducing member engagement to a minimum due to a lack of clarity on how their contributions would be

used. Eclipse eventually transitioned to decentralized governance, featuring unrestricted access and collective governance, which best facilitated open innovation.

Platform owners use symbolic strategies such as quality featuring or awards to promote selected complements. Investigating Google Android and the Google Play Award, Foerderer et al. (2021) show that affected complementors further invest in their complements and attract other complementors into their market segment, but also increase multihoming. While they did not document any governance recalibration in response, multihoming weakens platform differentiation, thereby suggesting granting rewards to exclusive complements only (Rietveld et al., 2019).

Sticking to the exclusivity strategy, in the context of the video-gaming industry, Cennamo and Santalo (2013) empirically investigate two popular platform-owner strategies for network growth that were introduced simultaneously and with equal intensities (i.e., high cooperation and high competition within and between platform ecosystems): app exclusivity (i.e., securing apps by increasing cooperation based on exclusivity agreements) and app competition (i.e., increasing the number and variety of apps by increasing competition among complementors). They find that pursuing the dual strategy with equal intensity reduces the individual benefits of each strategy to such an extent that the platform's performance declines. This approach results in a hostile market environment due to conflicting incentives (growth/innovation versus quality) among complementors "because the configuration of activities they jointly require can be incompatible" (Cennamo & Santalo, 2013, p. 1344). A shared governance regime that is not strictly orchestrated and allows any complementor to openly access the ecosystem poses particular challenges for high-quality app producers. This is because high coopetition intensity harbors coopetitive tensions to the extent that both cooperation and competition are inherently paradoxical, and high intensity of both in the long term results in one of the two suppressing the other (Bengtsson & Kock, 2000; Slawinski et al., 2024). Efforts to advocate equally for self-interest and mutual interest are considered highly complex and demanding (Gnyawali & Ryan Charleton, 2018). When compared, self-interest becomes more crucial, resulting in competition dominating cooperation (Park & Russo, 1996; Reischauer et al., 2024; Slawinski et al., 2024). The dual strategy example shows how platforms develop difficult-to-predict coopetitive tensions over time that require recalibration of governance that controls behavior to ensure both

growth and quality for users and complementors alike.

Low coopetition intensity also entails coopetitive tensions, as limited commitments to individual value capture and joint value creation can threaten an ecosystem in the long run (Gnyawali & Ryan Charleton, 2018). Examples in this regard often refer to industry-standard-setting projects in which a few coopetitors share governance in a consortium structure with the aim of cooperating to develop a standard (e.g., the platform's technology) but compete in providing distinct yet compatible versions of that standard (Eisenmann, 2008; Leiponen, 2008; Miller & Toh, 2020). As firms typically contribute voluntarily without direct compensation, consortia are associated with weak incentives (Makadok & Coff, 2009). However, even at low coopetition intensities, coopetitive tensions will not vanish, as evident from the R3 consortium, initially started by nine founding banks interested in jointly exploring the potential of blockchain technology for financial markets. While the consortium members jointly developed the Corda platform, various founding members decided to exit the consortium over the years due to coopetitive tensions. With the number of members steadily increasing due to broader access, internal disagreements regarding expansion financing also increased, which ultimately led Goldman Sachs to terminate its membership, as it saw its influence on consortium decisions diminishing (Nash, 2016). Similarly, JPMorgan left R3 after internal discord arose on technical matters, ultimately leading the firm to work on its own blockchain-based solution (Rolfe, 2017).

The opposite situation, in which an initially shared governance regime gradually decentralizes over time, can also be expected. A prominent example of such a case was the TradeLens platform, which Maersk and IBM founded to develop the largest blockchain-based platform for global trade. While all decision-making power was initially concentrated between the two founding members, they found it difficult to attract a critical mass of ecosystem members, as potential members were skeptical of the governance regime. As a result, TradeLens gradually decentralized its governance and allowed ecosystem members to participate in decision-making (Goldsby & Hanisch, 2022). However, in 2022, TradeLens announced its discontinuation, as it was not possible to achieve its vision of a neutral and profitable industry platform ecosystem (Cecere, 2022). Another case highlighting the difficulties of shared governance regimes is found in Facebook's failed attempt to launch the digital currency Facebook Libra.

Regulators raised concerns about regulatory responsibilities and unclear liability rules in the case of financial crimes, which led to significant tensions among the platform's actors and, ultimately, to multiple prominent members ending their involvement (Goldsby & Hanisch, 2022). Although Facebook's governance power within the Libra Association was limited, it was still criticized for trying to play a more central role in decision-making, which made continuation of the project even more challenging given the firm's historical controversies surrounding the loss of trust (e.g., Cambridge Analytica) and antitrust proceedings (Y. Chen et al., 2020). Consequently, shared governance regimes with low coopetition intensity may not prevent one party or a few powerful parties from taking a significant share of control over the development of the ecosystem and using common interests to their own advantage.

Based on the above, we highlight that the coopetitive tensions involved in shared governance regimes aimed at achieving balanced coopetition (e.g., high or low coopetition) over time are difficult for the ecosystem actors involved to predict ex ante. Such tensions can cause severe ecosystem destabilization or even demise. We argue that governance recalibration towards more centralization or decentralization, depending on the desired intensity of cooperation and competition, within a defined spectrum of the shared governance trajectory is necessary to ensure ecosystem success in the long run. Consequently, we propose:

> **Proposition 1:** *A shared governance regime and coopetition with cooperation and competition at equal intensities in platform ecosystems lead to coopetitive tensions likely to trigger a recalibration in the governance regime towards gradually increasing centralization (competition) or decentralization (cooperation).*

Trajectory II: Fully centralized governance regime and competition-dominant coopetition intensity

Network effects, which occur directly through a large user base or indirectly through the availability and range of complements, are often seen in the emergence and persistence of dominant platforms (Bonardi & Durand, 2003; Eisenmann et al., 2011; Jacobides et al., 2018; D. McIntyre & Srinivasan, 2017). The literature predicts a "winner takes all (or most)" outcome in which the firm that achieves an early competitive advantage

quickly occupies all or most of the market (Cennamo & Santalo, 2013; Schilling, 2002), as evident in such cases as Microsoft's operating system or Airbnb's accommodation-sharing system (Cusumano et al., 2019). This rapid progress helps eliminate a key challenge to platform growth known as the "chicken and egg" problem—to benefit from strong network effects, platform owners rely on increasing numbers of both complementors and users, but complementors and users are only willing to join the platform if large numbers of the other party are present (Caillaud & Jullien, 2003).

Most dominant platforms are based on fully centralized governance regimes that allow platform owners to exert significant power and control over their ecosystem members, thereby creating high entry barriers. Moreover, the tendency to prioritize individual value-capture interests over collective value-creation interests (Y. Chen et al., 2020; Zhu, 2019) has led to an independent research stream on platform competition (Cennamo, 2021; Cennamo & Santalo, 2013; Rietveld & Schilling, 2021; Rochet & Tirole, 2003). An implicit assumption in this stream of literature is that competitive interactions are paramount for survival in a highly competitive environment. Consequently, cooperative interactions are downgraded or even taken for granted. While cooperative interactions are limited to complementors joining a focal platform and, thereby, supporting it as a collective, as soon as complementors contribute to a platform, competitive interactions prevail with complementors mainly competing for users' attention (Meyer et al., 2024). The platform literature shows that fully centralized governance regimes typically manifest in competition-dominant coopetition intensity. However, as we discuss below, centralized governance regimes create coopetitive tensions over time that require governance recalibration.

Innovation platforms are a case in point in which resource pooling through knowledge sharing and joint innovation prevail to stimulate demanding customer needs for ongoing complementary innovations. While firms such as Apple are known for their "closed and reigning governance approach with tight central control" (Kang & Suarez, 2022, p. 1778), Apple fosters initiatives of selective cooperation that allow complementors to develop high-quality complements by providing tools (e.g., software development kits, opening up application programming interfaces) and organizing temporary gatherings for app development support (Qiu et al., 2017). Initiatives like these benefit cohesion and trust within an ecosystem (Kretschmer et al., 2022) and

facilitate the spread of platform technologies (Fang et al., 2021). Similar patterns can also be observed among incumbents and entrant platforms. In the event of technological discontinuities disrupting incumbents' complementary assets, incumbents tend to join forces among themselves to protect from the over-expropriation of value by new platform entrants and consolidate their bargaining power (Cozzolino & Rothaermel, 2018). However, recent research suggests how premium carmakers selectively cooperate with platforms such as Apple over time by first cooperating on non-differentiating elements of digital extensions and then competing on quality as a differentiating element (Reischauer et al., 2024). Findings like these suggest that coopetitive tensions among incumbents can be mitigated by selectively increasing collaboration that benefits innovation on demand-related complementary assets.

Another way centralized platform owners use to counteract coopetitive tensions is to rewards selected complementors. One telling example is Apple's launch of the "App Store Small Business Program", which, due to increasing criticism from developers considering the 30 % standard commission rate unfair, lowered the commission rate to 15 % for eligible small businesses. While differential revenue-sharing models indeed benefit small businesses, interestingly, positive spillovers from cross-side network effects make platforms profit the most, thereby increasing platform welfare for all parties involved (Bhargava et al., 2022). A similar "rising tide lifts all boats" approach is evident from Google's entry into Google Photos, which boosted user attention to photography apps and complementary innovation of affected apps (Foerderer et al., 2018). Examples like these suggest that orchestrators of initially fully centralized governance regimes can use (non-)financial incentives to enhance ecosystem welfare without compromising their proprietary interests.

Coopetitive tensions resulting from fully centralized governance regimes and competition-dominant coopetition intensity can be found in intra-platform and inter-platform ecosystems, as evident in the case of access control between Amazon and Apple in the e-book market. After Amazon launched its Kindle with the proprietary e-reader format AZW in 2007, Apple put considerable pressure on Amazon through the introduction of its multifunctional iPad tablet and iBook application in 2010, which allowed e-books to be read via the non-proprietary E-PUB format (Ritala et al., 2014). Amazon started a price war by reducing its Kindle price by USD 70 but soon decided to

cooperate with Apple by making the Kindle application available on Apple's iPad. However, Apple did not offer the reverse (Adner et al., 2020). Despite its fully centralized governance regime, Amazon demonstrated its willingness to open its offerings to competitors by shifting competition from the medium (i.e., e-book reader) to the content provided (i.e., e-books), as doing so supported its customer-centric value proposition (Ritala et al., 2014).[2] This example illustrates how governance regimes that feature strong competition evolve incrementally by augmenting cooperation to preserve an ecosystem's value proposition while balancing the need for control and adaption. Importantly, the case of the iOS 7 jailbreak, in which a lapse in platform access control reduced knowledge-sharing among complementors (Zhang et al., 2020), highlights the importance of the path dependency of an initial governance regime, which provides complementors with a reliable working environment.

Complementors are not always at the mercy of powerful centralized orchestrators. For instance, Apple partly decentralized its governance regime when singer Taylor Swift publicly protested the company's plan to pause artists' royalty payments during Apple Music's three-month free trial period. Swift's influence and announcement that she would keep one of her albums off the Apple Music ultimately forced Apple to promise to fully compensate artists during the promotional period (H. McIntyre, 2015; Théberge, 2021). Following a similar logic, Karanović et al. (2021) use the case of Uber to outline the extent to which cooperation among complementors to counteract rules imposed by platform owners can result in governance changes. While pricing decisions were initially centrally governed by Uber, Uber drivers collectively boycotted the platform to protest the strong price competition among themselves. Complementors demanded Uber to allow them to decide independently whether to accept a ride based on the fare. The coopetitive tensions between Uber as platform owner and its complementors could only be countered by partially decentralizing the governance regime (see also Karanovic et al., 2023). Both anecdotal examples of behavioral control are consistent with our argument that endogenous pressures from single or multiple influential complementors can force orchestrators of centralized

[2] Amazon's coopetitive logic differs from that of other business areas. For example, for Amazon Marketplace, the firm initially focused on cooperating with third-party sellers to establish an ecosystem. Over time, it increasingly competed with its complementors by entering their product spaces (Ritala et al., 2014; Zhu & Liu, 2018).

governance regimes to partly deviate from their initial path and move more towards decentralization to ensure ecosystem stability and success.

The above demonstrates the trajectory of governance regimes that are initially fully centralized with competition outweighing cooperation, which might then recalibrate towards partial decentralization of governance to enhance cooperation and ensure ecosystem success over time. In sum, we propose:

> **Proposition 2:** *A fully centralized governance regime and competition-dominant coopetition intensity in platform ecosystems lead to coopetitive tensions likely to trigger a recalibration in the governance regime towards gradually increasing decentralization (cooperation).*

Trajectory III: Fully decentralized governance regime and cooperation-dominant coopetition intensity

A key organizational characteristic of platform ecosystems is the division of decision authority and control rights (Kretschmer et al., 2022). In particular, the rapid spread of digital technologies, such as blockchain, has created new opportunities to decentralize decision-making and control (Hanisch et al., 2023; Lumineau et al., 2021; Murray et al., 2021) with the benefit of motivating "cooperation among participants when there are valuable complementarities that can be realized through co-development or innovation" (Kretschmer et al., 2022, p. 411). The most distinct manifestation of an organization based on blockchain technology—the decentralized autonomous organization (DAO) (Murray et al., 2021)—lacks a central authority responsible for administrative instructions and task allocation (Lumineau et al., 2021). Instead, decentralization "enables peers to work autonomously based on a system of on-chain (machine consensus) and off-chain (voting rights) mechanisms of governance that support community decision-making and drive distributed trust among peers" (Santana & Albareda, 2022, p. 2).

Decentralized governance regimes are portrayed as self-governing, making formal coordination structures seem irrelevant (Y. Chen et al., 2020; Goldsby & Hanisch, 2022; Lumineau et al., 2021). In the prominent example of the lending platform MakerDAO, the goal of the ecosystem's actors is to maintain the stability of the USD-pegged cryptocurrency "DAI" cooperatively through a few formalized governance

structures, while competition is mainly observed outside the ecosystem to stay ahead of rivals (Zhao et al., 2022). Even non-blockchain-based platforms, such as Linux or Stack Overflow, show that while complementors compete to develop unique complements, they ultimately have more incentive to cooperate (e.g., by sharing knowledge about their users' characteristics and preferences) to improve the quality of their applications. This ultimately results in the retention of more users on the platform as a collective (Lee & Cole, 2003; Shipilov et al., 2023; Wareham et al., 2014; Zhang et al., 2020). We deduce from the literature that fully decentralized governance regimes typically manifest in cooperation-dominant coopetition in platform ecosystems. However, as we argue below, their combination requires governance recalibration as a platform evolves. This recalibration unfolds within a defined spectrum of the platform's initial governance path and involves elements of centralized governance.

The governance evolution of Wikipedia shows the necessity of adapting a fully decentralized governance regime by integrating selected elements of centralized governance to balance the need of a peer-produced encyclopedia for distributed knowledge generation and high-quality content. Aaltonen and Lanzara (2015) show how Wikipedia's governance evolved in three phases. With Wikipedia's launch, it lacked managerial capacity, which manifested in a fully decentralized governance structure in which the few available volunteers wrote, discussed, and edited jointly created content. With the growing knowledge corpus and popularity of Wikipedia, however, the organization's growth phase required increasing formalization of roles and routines for knowledge sharing, culminating in the launch of the Wikimedia Foundation. The firm's maturity phase led to a shift from content quantity to quality, which led to additional routines, norms, and rules that resolved tensions among contributors in content ownership while keeping Wikipedia efficient. Once volunteer online communities establish a strong competitive position, they benefit from a larger active contributor community and increased contributor motivation in joint value creation compared to comparable platforms with a weaker competitive position (Loh & Kretschmer, 2023).

Supportive instruments such as revenue-sharing can equally act as a source of motivation to complementors. Backed by a formal model, Bhargava (2022) shows that revenue-sharing tensions among orchestrators and complementors can be mitigated by moderate and customized revenue-sharing models that account for complementor

heterogeneities, which benefits the welfare of ecosystem members and ecosystem performance as a whole, compared to "one-rate-for-all" agreements. Such differential treatment of complementors results in "endogenizing both their participation in the platform and level of output while capturing both codependence with the platform (creating revenue by bringing viewers and advertisers into the system) and competition against the platform and within creators (all vying for a share of revenue)" (Bhargava, 2022, p. 5234). Compared to a purely centralized approach (e.g., single revenue-sharing rate) or decentralized approach (e.g., lengthy negotiations with each complementor), a shared governance approach that combines the central control of standardized incentives for value-creation (e.g., development toolkits) with differential revenue-sharing, seems to temper a tug-of-war among ecosystem members but prosper altogether.

Voting mechanisms in which peers hold governance tokens to be used for collective decision-making are supported by automated technologies, such as smart contracts encoded on blockchain protocols (Murray et al., 2021; Santana & Albareda, 2022). However, the literature offers empirical examples of how such access control mechanisms, which were initially designed to strengthen cooperative interactions, can be exploited. For instance, in a recent study on DAO Decentraland, a leading platform for three-dimensional virtual worlds, Goldberg and Schär (2023) analyzed the extent to which large-scale voters strategize their timing of votes and how their voting power influences the outcomes of governance decisions within the ecosystem. In contrast to the suggestions in the decentralized governance literature, they show that governance decisions are influenced by a few individuals (e.g., one influential voter dominated almost 30 % of all polls) who do not always act in the interests of their peers. This eventually fuels "dependencies, rent extraction behavior and […] hold-up problems" (Goldberg & Schär, 2023, p. 1). These results suggest that fully decentralized governance regimes that are initially characterized by high cooperation and comparatively low competition intensity can adopt more centralized structures when powerful ecosystem actors find unanticipated ways to exploit their dominance in their own interests (see also Hsieh & Vergne, 2023), thereby minimizing cooperation within the ecosystem and increasing competition.

Although decentralization is typically associated with technologies like blockchain, fully decentralized governance regimes can also create heterogeneities

among ecosystem actors in non-blockchain-based platform ecosystems. For example, after Google acquired Android in 2005, it initially retained Android's decentralized governance regime and limited its control over Android information and app distribution. While the open-source licensing of Android's operating system enabled complementors to cooperate for innovation purposes, and to differentiate themselves by tailoring Android to their hardware and software needs, it also created coordination problems and fragmentation among complements, as well as compatibility issues (Bresnahan & Greenstein, 2014). Android was also increasingly subjected to platform "forking," with partners like Amazon exploiting shared resources collectively developed on Android to build competing platforms, such as Fire OS (Karhu et al., 2018). As a result, Google found itself forced to centralize parts of Android's governance by means of behavioral control. For instance, it introduced the Open Handset Alliance and the Google Play app store "to ensure security, compatibility, and consistency" (Y. Chen et al., 2020, p. 1326). Hence, over time, the fully decentralized governance regime moved towards relatively more centralization, thereby ultimately resembling a form of shared governance. However, such learning experiences are not necessarily based on first-hand experience—they can also be drawn from the lessons of others. For example, the decline of the once-dominant video-game manufacturer Atari in the 1980s due to the uncontrolled flooding of the market with inferior games was a worst-case scenario for Nintendo and led it to introduce "draconian governance rules" (Hagiu, 2014, p. 76) to ensure it maintained rigorous behavioral control of the platform's quality and reputation.

Based on the above, we deduce that fully decentralized governance regimes in platform ecosystems entail coopetitive tensions among ecosystem members, which can destroy some of the collaboratively created value. Consequently, recalibration of the governance regime towards more centralization (competition) within its predefined path is required. Hence, we propose:

> **Proposition 3:** *A fully decentralized governance regime and cooperation-dominant coopetition intensity in platform ecosystems lead to coopetitive tensions likely to trigger a recalibration in the governance regime towards gradually increasing centralization (competition).*

DISCUSSION

Building on the metaphor of a swinging pendulum, we develop a conceptual model consisting of three governance trajectories that account for the dynamics of governance regimes (based on their level of centrality) and coopetition intensities (based on their weighting of cooperation and competition). Our main argument is that as platforms evolve, a given governance regime elicits coopetitive tensions that are difficult to fully anticipate ex ante. To ensure ecosystem success, these tensions require governance recalibration within a spectrum encompassing the given governance trajectory. After recalibration, a transient stable state ensues, which lasts until new coopetitive tensions result in a new swing in our metaphorical pendulum.

Theoretical Contributions

We contribute to the nexus of governance and coopetition in platform ecosystems in three ways. First, we add to the platform-governance literature by challenging current wisdom on the "right" governance regimes for maximizing growth-enhancing network effects (L. Chen et al., 2022; Hanisch et al., 2023; Rietveld et al., 2021; Wareham et al., 2014; P. J. Williamson & De Meyer, 2012). Notably, the extant literature on platform governance refers to shared governance regimes as the ideal type of orchestration (Y. Chen et al., 2020; Eisenmann, 2008; Hsieh & Vergne, 2023; O'Mahony & Karp, 2022). Our findings imply that when taking a dynamic perspective on governance, a single "optimal" governance regime only exists temporarily. Eventually, coopetitive tensions, which are integral to any given governance regime, will force the trajectory toward a related governance path to minimize potential ecosystem harm. In other words, what qualifies as the "optimal" governance regime may be "optimal" only for a limited time and depends on the given trajectory of the ecosystem as instantiated by the initially designed governance regime. As platforms evolve, certain calibrations of governance in terms of the degree of centralization and coopetition may be required, making optimality a moving target. We argue that a transient optimum of governance and coopetition occurs when both forces are temporarily concerted until unpredictable dynamics in a platform's environment trigger governance recalibration. As such, "there is a steady state in which opposing forces [e.g., cooperation and competition] hold each other in check until the build-up of tension turns the static relationship into dynamic interplay—

the point when the steel cable snaps" (M.-J. Chen et al., 2007, p. 101) or, to stick to our metaphor, the pendulum swings.

We draw on the literature on governance trajectories to explain the evolutionary patterns of three archetypes of governance regimes, which depend on where a platform is positioned in relation to our metaphorical pendulum. For shared governance regimes with coopetition characterized by equal cooperation and competition intensities, we argue that the resulting coopetitive tensions can be accounted for by incrementally increasing either decentralization (cooperation) or centralization (competition). For fully centralized governance regimes with a competition-dominant coopetition intensity, we suggest addressing coopetitive tensions by gradually increasing decentralization (cooperation). For fully decentralized governance regimes with a cooperation-dominant coopetition intensity, we propose counteracting coopetitive tensions using stepwise increases in centralization (competition). We thereby show that each "extreme" scenario entails coopetitive tensions, which require governance recalibration within a broader spectrum of shared governance regimes over time. This finding is in line with related research favoring mixtures of centralized and decentralized governance (e.g., Y. Chen et al., 2020; Eisenmann, 2008). We expand the governance trajectory literature by proposing three ranges of related governance trajectories close to each initial governance regime (Vergne & Durand, 2011). This stems from the path dependence inherent in platforms after an initial governance regime is chosen, as that initial governance regime is associated with a bounded trajectory for each governance regime. This ensures that governance recalibrations fit a platform's focal value proposition and overall identity (O'Mahony & Karp, 2022; Shi et al., 2024).

Our notion of dynamic governance yields a question about the triggers of governance recalibration.[3] We primarily observe endogenous triggers, which are influenced by the behavior of ecosystem actors (e.g., among orchestrators and complementors or among complementors themselves), provoking coopetitive tensions. Accordingly, behavioral changes seem to trigger feedback loops that require the orchestrator(s) to assess whether coopetitive tensions positively or negatively affect an ecosystem's value proposition. The feedback managers receive thus enables them to

[3] We extend our gratitude to an anonymous reviewer for suggesting that we elaborate on this aspect.

compare “whether their performance is above or below their aspiration levels for certain goals” (Makarevich, 2018, p. 3252). Given the detection of a deviation, we suggest governance recalibration is inevitable. In line with path dependency and behavioral theory, as managers avoid making overly risky decisions, we expect a recalibration within the vicinity of the initial governance regime (Cyert & March, 1963; Gavetti et al., 2012). However, as managing coopetitive tensions “remain[s] an ongoing challenge as the challenges confronting managers continue to evolve along with the organization and its environment” (Weiser & Laamanen, 2022, p. 17), ongoing governance recalibrations over time become likely (Eisenmann, 2008; Smith & Besharov, 2019). We expect orchestrators to learn from their experiences, which will likely trigger future decisions on governance recalibration (L. Chen et al., 2022; Schilling, 2002).

As we observe endogenous triggers initiating changes in governance regimes over time, we might expect platforms to evolve in various ways within the three suggested governance trajectories due to distinct characteristics inherent in each platform. Ceteris paribus, this would suggest recalibration is a process without drift that permits the coexistence of various governance regimes across platforms even at comparable maturity stages. For example, while our findings seem to imply that competition dominates over cooperation in transaction platforms (i.e., fully centralized governance), cooperation dominates over competition in innovation platforms (i.e., fully decentralized governance), and a mixture of both is found in hybrid platforms that combine transactions and innovation (i.e., shared governance) (Cusumano et al., 2019). In reality, we observe distinct heterogeneities in governance regimes regardless of the ecosystem type, which suggests that governance is as unique to each ecosystem as its focal value proposition.

In addition, this essay extends debates regarding dynamics in platform competition (Cennamo & Santalo, 2013) by considering various governance regimes as an additional source of heterogeneity in ecosystem performance. For example, while some scholars observe a “winner-takes-all (or most)” approach (Cennamo & Santalo, 2013; Schilling, 2002) in platform competition, others identify a “rising tide lifts all boats” approach that combines competition and cooperation (M.-J. Chen & Miller, 2015; Khanagha et al., 2022). Our conceptual framework adds a level of differentiation at the ecosystem level that may explain why we do not always observe winner-takes-all

(or most) outcomes. For example, the extant literature would predict that Android would win over iOS due to similar platform functionalities and outputs that limit opportunities for ecosystem differentiation. However, differences in governance regimes might provide differentiation (beyond product functionalities and output) in value-creation and value-capture opportunities for complementors, thereby allowing seemingly similar platforms to coexist. While platform-competition research focuses on differentiation on the demand side, our findings have implications for the supply side, as governance regimes add a differentiation element for the complementors that orchestrators need to attract. Given that the "purposes platform governance serves and how various governance instruments and design features in digital platforms help achieve organizational goals" (L. Chen et al., 2022, p. 173) remain unclear, we believe that governance recalibration as a means of ecosystem orchestration assists in differentiating from competition. In terms of designing a governance regime that enables differentiation and the management of interdependent tensions, with coopetition being the focus of attention, ecosystem orchestration ultimately means that any negative tensions can be addressed by recalibrating the platform's governance over time.

Second, we contribute to the coopetition literature by extending multilateral coopetition to the platform setting, where complementarities rather than contracts serve as the basis for interfirm relationships. While ecosystems have exhibited coopetitive properties since their inception (Moore, 1993), theoretical and empirical contributions on this aspect have only emerged recently (exceptions include Ansari et al., 2016; Cozzolino & Rothaermel, 2018; Hannah & Eisenhardt, 2018; Reischauer et al., 2024; Zhang et al., 2020). Lascaux (2020) suspects this is "due to the difficulties inherent in researching large, loosely coupled entities, but also because of the serious problems with developing or sustaining trustful relationships between dispersed systems populated by heterogeneous agents" (p. 12). With our notion of platform ecosystem coopetition, we propose a manifestation of coopetition that accounts for the uniqueness of platforms, which is hardly considered in other conceptualizations of the interplay between cooperation and competition (for reviews, see Hoffmann et al., 2018; Minà & Dagnino, 2025). By extending research on coopetition to the multilateral ecosystem level, which encompasses loosely coupled, heterogeneous actors, we advance a multi-level perspective on coopetition (Gnyawali & Ryan Charleton, 2018).

At the same time, we contribute to our understanding of the boundaries of ecosystems (Gawer, 2021), which might "breathe new life into governance theory" (L. Chen et al., 2022, p. 174). The latter matters for coopetition literature, where governance has played a subordinate role thus far. This is reasonable, as most of the coopetition literature deals with inter-firm relationships in which governance is primarily shaped by contracts (e.g., Dyer et al., 2018; Minà & Dagnino, 2025; Slawinski et al., 2024). However, as such contracts play a subordinate role (or sometimes no role) in platform ecosystems, we see an opportunity to enrich the coopetition literature from the platform-governance perspective.

While our concept of dynamic governance as a means to tackle coopetitive tensions adds to the process perspective in coopetition research, we believe that our notion of dynamic coopetition enhances the temporal perspective of coopetition inquiries (Gnyawali & Ryan Charleton, 2018; Hannah & Eisenhardt, 2018; Hoffmann et al., 2018; Reischauer et al., 2024; Slawinski et al., 2024). In this regard, we put the prevailing view that cooperation and competition should be balanced at equal intensity into perspective. For example, Hannah and Eisenhardt (2018) conclude that such a balance is a success criterion for ecosystems and emphasize the bottleneck strategy, which, in contrast to component or system strategies, facilitates parity between cooperation and competition. Similarly, others consider a balance between cooperation and competition optimal, and often point explicitly to this being ensured through governance (e.g., L. Chen et al., 2022; Gnyawali & Ryan Charleton, 2018; Kretschmer et al., 2022; Reischauer et al., 2024; Rietveld & Schilling, 2021; Wareham et al., 2014; Zhang et al., 2020). Given the inherent coopetitive tensions we find for balanced coopetition, we join burgeoning research advocating against equally balanced cooperation and competition over time (Reischauer et al., 2024; Slawinski et al., 2024). Instead, we demonstrate that governance and coopetition are subject to reciprocity, as both evolve as dynamically as ecosystems (Daymond et al., 2022; Gawer, 2014). Similarly, we uncover instabilities arising from the interplay between governance and coopetition in platforms, thereby informing research on coopetitive tensions (Bengtsson & Kock, 2014; Czakon et al., 2020; Hoffmann et al., 2018; Minà & Dagnino, 2025).

Finally, through our dynamic understanding of governance and coopetition in platform ecosystems, we address several calls for investigations into the interplay of

these two factors from an evolutionary perspective (e.g., Daymond et al., 2022; Kretschmer et al., 2022; Rietveld & Schilling, 2021). Specifically, we join the burgeoning literature stream that considers governance as a mediator between cooperation and competition (Hanisch et al., 2023), and accounts for transitions of the governance regime throughout a platform's evolution (O'Mahony & Karp, 2022; Wareham et al., 2014) to address coopetitive tensions. More broadly, as strategy in the digital age entails fundamental qualitative changes in representing, connecting, and aggregating data (Adner et al., 2019), which create novel opportunities and obstacles for interfirm collaboration (Lumineau et al., 2021; Malhotra et al., 2021), our dynamic lens on governance and coopetition as two intertwined mechanisms of value creation and capture helps illuminate how digitalization affects our understanding of organizations and organizational processes (Bailey et al., 2022; Giustiziero et al., 2021; Menz et al., 2021). By showing that fast-paced times like these require dynamic governance regimes that allow for equally dynamic coopetitive tensions to be addressed over time to ensure a platform's long-term success, we further enrich debates on how increasingly dynamic business environments impact the tenets of strategic management (Teece, 2020).

Implications for Practice

Our essay has important implications for practice. We have argued that governance recalibration addresses coopetitive tensions of an endogenous nature, which suggests that this process is inherently in the locus of control of managers. Unlike previous research, which advises managers to strive to balance cooperation and competition at parity, we show that the tensions associated with this approach require managers to decide in favor of increased cooperation (decentralization) or competition (centralization) by means of governance recalibration. Given the dynamic nature of ecosystems, we view recalibration as an ongoing process inherent in an ecosystem's evolution, which results in no single, optimal governance regime but different optimal regimes over time. These regimes are then challenged by new and unforeseen coopetitive tensions. While this may give the impression that managers are continually in "trial-and-error" mode to find their momentary optimal governance regime, we suggest the existence of an "all-clear" signal: after a platform commits to an initial governance regime, it becomes path dependent, which curtails the room managers have

to maneuver governance trajectory. This implies less drastic pendulum swings for a single platform and prevents managers from navigating along the entire spectrum of a pendulum swing (see also Eisenmann, 2008).[4] Instead, they must steer adjustments within the spectrum of one of our three proposed governance trajectories. Consequently, orchestrators should not simply regard governance as a tool for counteracting coopetitive tensions (ego-system). Instead, they must preserve the fit of the governance with an ecosystem's identity and focal value proposition (Jacobides, 2022). This ensures platforms maintain their supply and demand over time, and sets clear expectations for future ecosystem stakeholders. Our theory should prompt managers to consider platform governance on two coherent architectural levels: a superior, static level that forms the ecosystem's backbone and that aligns with an inferior, dynamic level that permits governance recalibrations to counteract coopetitive tensions.

Finally, our findings imply that managers think about governance and coopetition as non-binary but relational continua, moving along a spectrum of manifestations, meaning that they represent a complementary duality rather than contradictory dualism (see also Hsieh & Vergne, 2023; Wareham et al., 2014). This implies moving from "either/or" thinking to "both/and" thinking that treats both governance and coopetition as a matter of degrees rather than as a dichotomy (Smith & Lewis, 2011).

One critical exogenous factor neglected thus far that can significantly influence governance regimes and related managerial activities is platform regulation (L. Chen et al., 2022). As a result of 20 years of unregulated growth, which led some of the world's largest (platform) firms to "resemble nation-states" (Parker et al., 2016, p. 156), platforms face the likelihood of increasing regulation, especially in the United States and Europe (Murcia & Suddaby, 2024). Our dynamic perspective on the interplay between governance and coopetition intensifies the field of tension in which policymakers operate. More specifically, current competition law seems to be: a) too limited in addressing the peculiarities of platform markets, with platform firms often playing dual roles as neutral gatekeepers and for-profit firms, and b) too slow in establishing a legal framework that is both swift and reliable (Jacobides et al., 2024;

[4] We expect drastic swings along the entire spectrum of our metaphorical pendulum only when platforms are in the start-up phase and orchestrators are experimenting with different governance regimes (e.g., Eclipse case mentioned earlier). As soon as a platform reaches a mature stage in which an initial governance regime has been selected, we expect its governance to be path dependent throughout its evolution unless the business model fundamentally changes.

Jacobides & Lianos, 2021). In short, "regulators are applying 20th Century regulatory approaches to control 21st Century monopolies" (Murcia & Suddaby, 2024, p. 4).

We interpret current regulation efforts as targeting platforms with centralized governance regimes as well as competition-dominant coopetition. For example, Europe's Digital Markets Act addresses vertically integrated platforms that offer products and services that compete directly with those of their complementors, which enables them to achieve "a better position, in terms or ranking, […], for their own offering than that of the products or services of third parties also operating on that core platform service" (European Union, 2022, p. 13). We expect this approach to platform regulation to result in affected platforms having more standardized governance regimes and, thus, similar governance trajectories over time. However, the literature on platform-owner entry into complementors' spaces shows mixed empirical results (Zhu, 2019). Some studies point to negative outcomes, such as reduced innovation among complementors (Wen & Zhu, 2019) and a risk of value misappropriation (Zhu & Liu, 2018), while others suggest positive outcomes, such as increased demand for complementors' products, boosted innovation of those products (Foerderer et al., 2018), and enhanced product quality (Gawer & Cusumano, 2002). We therefore caution against focusing exclusively on competition aspects in platform regulation, as doing so may curb innovation (see also Murcia & Suddaby, 2024). To combat legislative inertia, we recommend that legislators consider promising extant platform regulation approaches, such as self-regulation (Cusumano et al., 2021), breakups (Kwoka & Valletti, 2021), incentive-based regulation (Lavie, 2023), or co-regulation of private and public actors across various aspects of governance, known as "layered governance" (Murcia & Suddaby, 2024).

Limitations and Future Research Avenues

Our investigation of dynamic governance and coopetition in platform ecosystems comes with limitations that open up rich opportunities for future research on governance, coopetition, and their interplay.

First, while we elaborated on selected endogenous and exogenous triggers spurring governance recalibration in response to coopetitive tensions in platform ecosystems, we encourage future research to explore alternative triggers to sharpen our

understanding of the rationale of organizations involved. While our essay exclusively refers to platform ecosystems, we believe that our findings can serve as a basis for investigating the dynamics of governance and coopetition in other ecosystems that are partially or not primarily based on the technological infrastructure of platforms (see Jacobides et al., 2018, 2024, for further distinctions). For example, burgeoning research on coopetition among platform-based firms and non-platform-based incumbents suggests the critical role of firm status (Cozzolino & Rothaermel, 2018; Reischauer et al., 2024) and leadership identity (Khanagha et al., 2022; O'Mahony & Karp, 2022) as organizational antecedents influencing the interplay of cooperation and competition. While such an encounter was documented in prompting incumbents to rethink their differentiation strategies (Chang & Sokol, 2022; Miller & Wang, 2024), little is known about the role of governance in managing coopetitive tensions among platform and non-platform firms. Unlike in platform firms, where ecosystem actors make autonomous decisions within a focal governance regime, decision-making processes in traditional non-platform firms tend to be organized along vertical management hierarchies (Kretschmer et al., 2022), resulting in the gathering of both parties in two distinct governance regimes colliding. Future research in the form of rich longitudinal case studies and panel data analysis is needed to expand our collection of endogenous triggers and determine the degrees of governance recalibrations in situations of "ambidextrous governance" (Altman et al., 2022).

Beyond endogenous triggers, we consider studies on exogenous triggers to coopetitive tensions and governance recalibrations equally promising. Given that antitrust regulators increasingly target dominant platform owners, it will be necessary for future research to examine the impact of regulatory changes by policymakers on governance regimes as well as their effects on coopetitive tensions among platform owners, complementors, and users. With several active and pending platform regulation initiatives around the globe, we see great potential in future empirical research that could assist in evaluating their effectiveness and unraveling their (un)intended consequences for various ecosystem stakeholders. Beyond regulatory triggers, future research may also explore other exogenous antecedents, such as environmental triggers (e.g., Slawinski et al., 2024), societal triggers (e.g., Gawer & Srnicek, 2021), or those initiated by emerging technologies such as artificial intelligence (e.g., Reischauer & Hoffmann,

2023) likely to initiate governance recalibrations over time.

Second, while we have focused on coopetition as a central tension in platform governance, we acknowledge that it is only one of several interdependent tensions of critical importance to ecosystem orchestration. Other tensions, such as platform openness versus control and complementor quality versus quantity, have typically been considered from a static perspective and require additional research (Rietveld & Schilling, 2021). We hope that our conceptual model can serve as a basis for future research on ecosystem orchestration, thereby allowing for holistic investigations of the interplay among the manifold tensions in platform governance and their implications on product-level strategies (e.g., pricing) and firm-level strategies (e.g., platform quality). While such process studies would be challenging, platform research would benefit from studying portfolios of interrelated tensions, given that this circumstance mirrors the reality of ecosystem management more closely than their isolated investigations. Which spillover and learning effects in tension management approaches can be observed over time, and how does governance recalibration impact the interplay of several tensions? Studies in this field could build on research on alliance portfolios (e.g., Hoffmann, 2005, 2007; Lavie, 2007; Ozcan & Eisenhardt, 2009; Wassmer, 2010). Moreover, we acknowledge that platform governance regimes have more dimensions than those we selected for our theory development. Future research may build on this limitation and test our theory on other governance dimensions, such as output control and information sharing (L. Chen et al., 2022; Kuan & Lee, 2023) and in how far governance recalibrations in one dimension cause ripple effects on other governance dimensions.

We have presented cases of intra- and inter-platform ecosystem coopetition, and pointed to related dynamics inside and outside a single ecosystem. The complementarity of ecosystems is accompanied by investments that are not fully fungible, as switching among ecosystems entails changes in offerings and coordination costs (Jacobides et al., 2018; Rietveld et al., 2019). While a granular analysis of these platform ecosystem coopetition manifestations exceeds the scope of our essay, we encourage future research that systematically investigates the dynamics of governance and coopetition in light of their ripple effects within and between ecosystems. For instance, we suggest exploring the extent to which the recalibration of governance regimes of a given platform ecosystem in response to coopetitive tensions has a contradictory or non-contradictory

effect on the interplay between governance regimes and coopetitive intensities outside that platform. Such studies might equally build on insights from the alliance literature (e.g., Dyer et al., 2018; Gimeno, 1999; Lavie, 2006).

Finally, we encourage future research to investigate the consequences of governance recalibration for ecosystem stakeholders. Our evolutionary perspective of governance and coopetition challenges the prevailing views of shared governance and balanced coopetition being ubiquitously optimal for ecosystem performance. Given the theoretical nature of our essay, empirical research is needed to verify our conceptual model. By doing so, we could gain a broader understanding of *when* and *for whom* temporal optimality can be observed. To what extent is it contingent upon an ecosystem's maturity level? Is the balance of cooperation and competition, as proposed by Hannah and Eisenhardt (2018), only optimal for ecosystem performance in nascent ecosystems, or, to what extent can differences be observed in the growth, maturity, and decline phases of ecosystems? Beyond financial performance, how do coopetitive tensions and governance recalibrations affect user satisfaction, complementors' innovation ability, or their market entry and exit decisions? Based on prior work that investigated platform and complementor strategies at a specific point in time or a restricted period (e.g., Foerderer et al., 2018; Kang & Suarez, 2022; Zhu & Liu, 2018), replication studies would be fruitful to derive similarities or deviations in strategic behavior in response to coopetitive tensions and governance recalibrations.

CONCLUSIONS

Our essay unites two "double-edged swords" intended to create and capture value in platform ecosystems that, in combination, have largely been overlooked in past research: governance and coopetition. As platforms play a dominant role in today's business landscape and will, most likely, continue to do so, many firms feel motivated to participate in "'platformania'" (Cusumano et al., 2019, p. 12) by orchestrating platform ecosystems or complementing existing ones. Hence, academics and practitioners alike need to understand the impact of the dynamic interplay between governance and coopetition on platform performance. We hope our essay provides fruitful grounds for more theoretical and empirical research on the dynamics of governance and coopetition in the digital age.

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