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When Do Firms Add Digital Platforms? Organizational Status as an Enabler to Incumbents' Platformization

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When Do Firms Add Digital Platforms? Organizational Status as an Enabler to Incumbents' Platformization

Completed Research Paper

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Abstract

Prior research has expanded our understanding of the platform business and its success factors, but scant attention has been paid to the launch of digital platforms by “pipeline” firms. Our study examines the effect of a firm’s status on the strategic decision to launch a digital platform and its consequences. By analyzing panel data of Fortune China 500 companies, we found that high-status incumbents are more likely to add a digital platform than their low-status counterparts, indicating that status can be seen as a promoter of launching digital platforms. However, once a digital platform is added, high-status firms are slower in improving performance than their low-status counterparts. Thus, status may serve as an inhibitor of a firm’s dedication to the new platform business. This research contributes to our understanding of the social contingency of digital transformation and the important constraints that must be overcome for incumbent firms to successfully transit.

Keywords: Digital platforms, organizational status, firm performance, digital transformation, business model innovation, digital economy

Introduction

In the last decade, digital platforms have increased their significance in the global economy. The digital platform economy is expected to generate a global revenue worth \$60 trillion in 2025, rising to 30% of the total economy from less than 2% in 2020 (McKinsey 2020). In China, the proportion of platform-based enterprises doubled from 5.2% in 2013 to more than 10% in 2019 (National Bureau of Statistics of China 2022). As digital platforms enhance their power and influence over the economy, we have also observed many attempts, with a few successful cases, of launching digital platforms by incumbent firms. For example, Sinopec Corp, the largest oil and petrochemical product supplier in China, launched its digital platform—

Epec.com—in 2015 with the domestic version and in 2017 with the international version. Epec.com has become a global platform providing procurement, sales, and financial and general services, which claimed to achieve a transaction volume of more than \$39 billion for the first three years.

Digital platforms trigger such growth. A digital platform refers to “a set of digital resources that enable value-creating interactions between external producers and consumers” (Constantinides et al. 2018, p. 381). Digital platforms facilitate interactions and transactions among multiple parties, allowing value to increase nonlinearly because of the power of network effects (Cusumano et al. 2019). In particular, as digital platforms require the digitization of products and layered modular architecture, product and industry boundaries have become more fluid (Yoo et al. 2010). Hence, digital platforms not only create opportunities for cross-boundary industry disruption but also offer more flexibility in adjusting their digital resources to satisfy customers’ needs (Bharadwaj et al. 2013).

However, understanding of incumbent firms that launch digital platforms is limited, particularly about the antecedents and consequences of this launch. This is especially true for “transaction platforms,” which facilitate exchanges of information, products, and services among multiple people and organizations (Cusumano et al. 2019). For example, in their seminal work, Cusumano et al. (2019) selected 25 transaction platforms, among which all started their businesses based on the Internet (i.e., digital natives). In addition, a majority of the firms in their sample are “born-platform companies,” meaning that they started out as platforms. This case implies that a gap between digital platforms and traditional pipeline businesses¹ may be hard to overcome because of the differences in the way of thinking and practice. According to the McKinsey survey (2019), a large majority of incumbents in pipeline businesses are willing to participate in the platform economy and acknowledge the importance of speed and winner-takes-all dynamics. However, they are only half as likely to launch their own digital platforms as digital natives (23% vs. 43%). This evidence shows the challenges that incumbent firms face in building an industry platform that benefits from product/service complementarities, scalability, and expandability, based on data on users and their networks (Gawer 2014).

Our study primarily attempts to explain the source of the variation among incumbents in their decisions to launch their own digital platforms and in their performance after the digital platform addition. Unlike founding a firm based on a digital platform, for incumbent firms, the launch of digital platforms is an important element of their adaptation to the changes in business environments that are driven by new digital technologies—social, mobile, analytics, cloud, and Internet of Things—that is, digital transformation (Sebastian et al. 2017). In a business environment that requires digital technologies to be fully embraced in a firm-level strategy (Bharadwaj et al. 2013), the launching of incumbents’ digital platforms should be understood as a strategic and organizational change process that requires legitimacy from stakeholders and substantial disruption of organizational structure, routine, and culture (Vial 2019). Such a fundamental organizational change may make it difficult to achieve a desirable outcome (Dobrev et al. 2003) but may positively affect performance if the business environment is more dramatically reconfigured (Haveman 1992). In practice, cases of platform failure outnumber successes. Acknowledging the difficulties in transforming organizations, our study attempts to shed light on the performance implications of the digital platform launched by incumbent firms.

To explain variations among incumbents, one approach is to focus on organizational capabilities (Karimi and Walter 2015). Differences in organizational capabilities can explain the decisions to launch digital platforms, which can be regarded as competitive reactions to the environmental change (Sambamurthy et al. 2003), and the differential return to the investment in new infrastructure (i.e., digital platforms; Aral and Weill 2007). Although we acknowledge the importance of organizational capabilities, our study focuses on whether a firm’s position-based competitive advantage in the pipeline business can be transferred to the platform business.

Specifically, we propose that an incumbent’s status influences its decision to embrace a digital platform in its business. *Organizational status* can be defined as the prestige accorded to an organization’s position in a hierarchical order that is socially constructed by the agreement and acceptance of multiple subjects (e.g., peer firms, third-party critics, consumers; Washington and Zajac 2005). Organizational status serves as a signal of quality (Podolny 1993) but differs from other signals, such as reputation, which is based on a firm’s

¹ A pipeline business model denotes the value-chain model, which is based on a classic linear process of activities, where inputs (i.e., parts of products) from one side and outputs (i.e., a finished product) from the other.

historical performance rather than social comparison (Washington and Zajac 2005). Once attained, status provides various advantages, such as more access to high-status affiliations and higher returns from investment in quality (Benjamin and Podolny 1999). Status is transferable from one market to another, helping a firm's entry into a new market and formation of new market relationships. This notion is evidenced in commercial banks' entry into investment banking (Jensen 2003). These advantages can make launching their own digital platforms appear more advantageous to companies.

However, despite such status advantages, it should not be taken for granted that high-status firms can maintain their advantages in their digital platforms. For example, GE Digital's Predix Platform was a highly anticipated digital platform launched by one of the most admired companies, but it was not successful. This real-world example may not be an exception. That is, although high-status commercial banks have successfully entered into investment banking, the positive status effect diminishes as they accumulate more experience in investment banking (Jensen 2003). Thus, our study attempts to solve this empirical puzzle of *whether status positively affects performance after launching a digital platform*.

Considering recent theoretical developments that address key mechanisms of how incumbent firms can enhance their competitiveness by embracing digital technologies, such as shaping agility (Sambamurthy et al. 2003) and achieving flexibility (Drnevich and Croson 2013), status is more likely to constrain performance after launching a digital platform. Although status provides advantages in launching digital platforms, status may constrain the fit of incumbent firms with platform business. A firm's position in the market shapes expectations about its role and performance, and its level of conforming to these expectations affects its performance. As a firm's positional competitive advantage, status shapes positive consumer expectations under uncertainties regarding the quality of service (Podolny 1993). If their actions and performance fail to meet the expectations, then they are likely to be more severely penalized (Phillips et al. 2013). Given their previous successful experience, high-status organizations may suffer from transitioning based on the new rules of the game (Barnett and Pontikes 2008). Thus, although status allows incumbent firms to launch digital platforms more quickly, it may also impede their pivoting to the platform business.

We explore our hypotheses about the effect of organizational status on decisions and the consequences of a firm's digital platform launch using data on publicly listed enterprises in China. Several born platform digital natives, such as Alibaba, ByteDance, and Tencent, have achieved global success. In the last decade, many incumbent firms in China have also introduced their own digital platforms, providing an ideal context for the study. According to our analysis of *Fortune* China 500 firms, status promotes incumbent firms to add their own digital platforms but does not necessarily aid their transformation to achieve a better fit for these platforms.

We believe that our study makes several contributions to the literature. First, our research enhances the understanding of the variations in incumbents' launch of digital platforms. Rather than focusing on capability-based competitive advantages, we specifically explore the effect of organizational status, which is a competitive advantage based on a firm's position in the market. Our findings imply that a firm's position-based advantage accrued from the pipeline business can facilitate a decision to start its digital platform. Second, the result of this study provides information on the relationship between organizational status and organizational change. Although status can provide more freedom for organizations to initiate innovative changes, it may also constrain a firm's attempt to broaden its scope (e.g., Phillips et al. 2013). We believe that our findings provide a nuanced account of this theoretical puzzle. Finally, our research contributes to the knowledge about incumbents' digital transformation. By showcasing the potential constraint of adding digital platforms to existing businesses, our findings confirm that a successful digital transformation requires companies to not only develop digital capabilities but also ensure organizational fit (Vial 2019).

Theoretical Backgrounds and Hypotheses

Launching a Digital Platform in Incumbent Firms

Theories about the important factors that constitute a good platform strategy as opposed to traditional strategies in pipeline businesses have been well established (Cusumano et al. 2019). Acknowledging the growing importance of digital platforms, early studies tend not to differentiate between digital and non-

digital platforms; rather, they emphasized the difference between traditional and platform businesses and strategies (e.g., Eisenmann et al. 2008). These studies mainly focused on platforms as markets (Gawer 2014), which facilitate transactions that link otherwise disconnected parties. In later studies, scholars called attention to platforms as innovation facilitators that provide the technological architecture and templates for product innovation (Gawer 2014). The advantages and key success factors of a digital platform to facilitate better innovation performance have been suggested, such as recognizing a trade-off between openness and platform control (Boudreau 2012) and achieving good platform leadership based on a sound vision, governance structure, and management of relationships within the ecosystem (Gawer and Cusumano 2014). The need to adopt platforms and the corresponding new strategies for traditional pipeline firms to innovate their value have also been investigated, with examples such as Nike, Intel, Microsoft, and Cisco (Gawer and Cusumano 2002). However, although the new digital era requires fundamental shifts in strategy and organization, many incumbents have initially responded by adopting digital shifts within each functional area rather than changing how they create and capture value (Bharadwaj et al. 2013).

The study of 25 incumbents (Sebastian et al. 2017) emphasizes the importance of having digital platforms that provide agility and flexibility to seize fluid opportunities in successful digital transformation. However, incumbent firms may face more difficulties in launching digital platforms than in other cases of adopting innovation and/or new business models. Other forms of innovation adoption or general business model integration require coordination and control within the organization. However, adding a digital platform imposes additional complexity by coordinating interactions among various external parties with divergent interests in the ecosystems (Yoo et al. 2010). As such, the transformation by adding a digital platform to its existing business poses a significant challenge to an incumbent firm, such as the potential for industry disruption, the need for better coordination among various parties, and the requirement for changes in organizational structure and culture (Vial 2019).

Regarding the incumbents' launch of digital platforms, prior literature focused on the superior performance of digital platforms compared with pipeline businesses while acknowledging industry differences and varying capabilities (Karimi and Walter 2015). In many contexts, firms with traditional pipeline businesses have competitive disadvantages compared with platform companies because of higher transaction costs, less flexibility, and physical constraints (Van Alstyne and Parker 2017). Compared with industry control samples (which are non-digital platform companies that are comparable in revenue), firms with digital platforms outperform in both profitability and market valuation, indicating better current and future performance (Cusumano et al. 2019). To effectively compete against digital platforms that dominate the market, incumbents are forced to either create their own digital platforms or participate in existing ones (Van Alstyne and Parker 2017). When new and disruptive business models invade a market, established corporations are likely to react and defend themselves by implementing the invader's business model into their current one (Casadesus-Masanell and Zhu 2013). However, what factors affect this choice of reactions (i.e., the launch of digital platforms vs. participation in other platforms) across incumbent firms remains unclear.

Digital platform adoption may pose varying challenges to different firms in gaining support for their changes. For example, at the micro-level, the shift from pipeline businesses to digital platforms poses a significant challenge to organizational identity, which refers to how organizational members define whom they are based on what they believe to be the central core and the enduring character of the organization (Altman and Tripsas 2015). As their identity changes, organizational members face difficulties in making sense of their organization. This implies that in a firm where strong identification with their existing pipeline business exists, members may constrain efforts to completely transform into a digital platform company. For example, a historically self-defined "innovative" organization may be less likely to adopt a platform business model because doing so will likely pass the creative role to outsiders involved in the platform and, in turn, dim the organizational identity of being innovative (Altman and Tripsas 2015). However, Altman and Tripsas (2015) focused more on an organization's self-viewed identity rather than an externally derived identity, meaning that they do not consider the necessity of resolving market uncertainties. To better explain how an incumbent adopts a digital platform, we must account for the interplay between organizations and their social environments.

At the macro-level, the profound change required to transition from pipeline businesses to digital platforms can create a conflict between old and new institutional logic (Bharadwaj et al. 2013; Gawer and Phillips 2013). Institutional logic serves as a criterion for assessing legitimacy; thus, it can affect the process and

outcome of adopting digital platforms. This view suggests that the decision and management of a digital platform adoption require the consideration of the cognitive constraints likely imposed by proponents of old institutional logic and/or opponents of new institutional logic. Consistent with these studies, we consider the influence of an organizational characteristic that shapes the perceptions of both internal and external stakeholders—that is, *organizational status*—in explaining the source of variance in digital platform adoption.

Regarding the consequence of launching a digital platform, enhanced information technology offers more flexibility in creating and capturing value (Drnevich and Croson 2013). Suppose incumbents can achieve a balance between new and existing innovation capabilities by leveraging digital technology in existing products/services and developing new processes, managing internal work arrangements and external exchange partners, maintaining control, and achieving flexibility (Svahn et al. 2017). In such a case, they may excel in their businesses because of increased options (Sambamurthy et al. 2003).

To manage both pipeline and platform businesses well, the nature of conflicts and the similarity between them should be understood, which often requires a phased approach regarding the separation and integration between the two (Markides and Oyon 2010). This study implies that the most critical challenge comes from managing potential conflicts between old and new staff and adapting to the environment. In this sense, incumbent firms that have a strong foothold in the existing business through improved core activities (i.e., better management of relationships with consumers and suppliers; Altman and Tripsas 2015) may experience more difficulties in successfully adapting to the new way of competing while adhering to the old way of competing on the digital platform. This result is consistent with the notion that organizational change has a more deleterious effect on previously better-fitted firms (Hannan and Freeman 1984). Considering the aforementioned, we will examine how status affects performance after the launch of a digital platform.

Status and Digital Platform Launch

The success of digital platforms hinges on a firm's ability to leverage network effects and bring in diverse suppliers and consumers (Miric et al. 2021). Demand-side economies of scale or network effects are more likely to be achieved by fulfilling users' expectations regarding the dominance of a platform. As the number of consumers using a platform increases, the benefits will also increase because the firm will enhance quality, increase available complementary products and services, and improve post-purchase services. Thus, higher consumer expectations about a platform's dominance induce a greater probability of achieving network effects in reality (Katz and Shapiro 1985). To leverage these network effects, the quality of products and services that the platform offers should be guaranteed even when the number of consumers is relatively small (Hagiu and Rothman 2016) and to secure the exclusive participation of so-called "marquee" users, who can attract many followers on the platform (Eisenmann et al. 2006). Thus, if a firm can successfully address quality concerns that potential online consumers may have and attract more marquee users, then the firm is more likely to increase the economies of scale of a platform.

In this regard, we expect organizational status to positively affect an incumbent firm's decision to launch its own digital platform. First, a high-status firm can have a more positive outlook in building network effects. Incumbent firms enjoy numerous status advantages in their legacy businesses, such as greater influence over actors in the market (Podolny and Page 1998); stronger commitment from partners (Castellucci and Ertug 2010); greater bargaining power (Ozmel et al. 2017); ability to charge premium prices (Uzzi and Lancaster 2004) and mandate lower prices in transactions (Benjamin and Podolny 1999); and high visibility to stakeholders through media coverage and analyst coverage (Jensen and Kim 2014). In existing businesses, high-status incumbents have likely enjoyed disproportionate benefits, such as better access to tangible and intangible resources (Stuart et al. 1999) compared with their low-status counterparts. These advantages are likely to shape positive expectations about the firms' prospects as platform owners. Given that high status generally increases confidence to promote innovation and produces a tendency to interpret their behaviors in a more optimistic way (Frank 1985), high-status incumbents are likely to have more positive expectations about building a high-quality platform and attracting platform participants. Thus, high-status incumbent firms are motivated to try a digital platform with more confidence and boost its prospects.

To add a new and unfamiliar business model, from another aspect, a low-status incumbent may be more hesitant because they must overcome potential skepticism about its quality and potential disadvantages in

its infrastructure (Bothner et al. 2012). Thus, low-status incumbent firms have additional challenges in addressing psychological barriers that potential participants may have and ensuring the necessary resources to build a digital platform. Furthermore, low-status actors can be more cautious about taking any risky actions if they stand at the crossroad of survival between continuing participation in the field and being permanently eliminated (Prato et al. 2019). For these reasons, we expect status to be a very important enabling factor in a firm starting its own digital platform. Thus, we posit the following:

Hypothesis 1: Ceteris paribus, high-status firms are more likely to launch their own digital platforms than low-status firms.

Status and Firm Performance after the Digital Platform Launch

Although organizational status may promote incumbents' digital platform launch, high expectations from both internal and external stakeholders do not necessarily convert to the success of the platform. On the one hand, we can expect a positive status effect on performance after the digital platform launch. Status serves as a signal of quality when consumers cannot determine the actual quality under information asymmetry and uncertainty, which is more common in technology-intensive industries (Podolny 1993). When consumers have higher expectations about the quality of a digital platform, their willingness to use it is likely to increase (Katz and Shapiro 1985). Thus, it may help secure an initial consumer base. Status signals also make potential partners, such as complementors and service suppliers, less hesitant to enter into relationships with the focal firm (Stern et al. 2014). Accordingly, status increases the chances of attracting more consumers and suppliers who are also of high status. In other words, the greater economic benefits of high-status affiliations for high-status occupants (Benjamin and Podolny 1999) may also attract high-status participants. Thus, digital platforms launched by high-status incumbent firms are likely to have higher positive consumer expectations by mitigating their quality concerns, which is important for the success of digital platforms.

However, new business models based on digital platforms require different approaches to the rules of organizing activities to connect customers, suppliers, operating system providers, and related institutions such as government and investors (Zott and Amit 2007) from firms' pipeline business. Increased complexity and uncertainty in their business because of the operation of a new platform business model (Gawer and Phillips 2013) require firms to make significant changes in the organizational structure, process, culture, and strategy (Vial 2019). Business model integration studies also suggest that simultaneously managing two business models to achieve the desired performance is difficult (Casadesus-Masanell and Zhu 2013; Markides and Oyon 2010). Thus, meticulously aligning incumbent firms' internal capability and governance structure with the new business model based on digital platforms becomes a challenge (De Reuver et al. 2018).

We argue that achieving the organizational transformation necessary for the success of digital platforms is more difficult for high-status firms. Considering that the existing high-status pipeline business has been so successful, the necessary change and adaptation to the new business environment can appear to be contraindicated to high-status firms. The business environment generally favors highly reproducible organizational structures that guarantee reliability and accountability (Hannan and Freeman 1984). Therefore, more successful firms (i.e., high-status firms) are more likely to be inert (Barnett and Pontikes 2008). In general, an attempt to change the organizational structure poses a greater risk of failure owing to its disruptive impact during the change process (Dobrev et al. 2003). The disruptive effect is even more critical if the change involves the organizational core, including the organization's mission, authority structure, technology, and marketing strategy (Hannan and Freeman 1984). While this negative effect of organizational core change—independent of the potential positive effect of change by increasing organizational fit to the new environment (DiMaggio and Powell 1983)—has been widely verified for most organizations (Dobrev et al. 2003; Miller and Chen 1994), the impact is greater for more successful firms (Barnett and Pontikes 2008). Specifically, managers who achieve success in one context are likely to have a biased assessment of their ability to adapt to the new environment while adhering to the existing approach to the competition, risking their organization's fate in the new context (Barnett and Pontikes 2008). Thus, despite of more resources needed to effectively implement their digital platform strategies, high-status incumbents will likely be slower in adapting to the new business model.

Another source of the negative effect of organizational status on transformation toward digital platforms is the firm's commitment to relationships with existing partners. When organizational change challenges the

authority and privilege of core stakeholders, the coordination and control of the divergent interests of different stakeholder groups become more complex and difficult to achieve (Klein et al. 2019). Such a balancing effort to maintain existing users and attract new users requires more sophisticated management, as evidenced by mixed empirical findings on the effect of the simultaneous pursuit of exploitation and exploration within an organization (Lavie et al. 2010). As high-status firms are deeply embedded in the institutional environment (Askin and Bothner 2016), their changes are even more complex. Radical changes in the institutional environment may provide legitimacy to organizational change (Haveman 1992) and more supportive actions from stakeholders (Klein et al. 2019). Hence, high-status firms may alleviate stakeholders' concerns about their strategic changes effectively. However, the social penalty associated with violating expectations from existing stakeholders can be more severe (Phillips et al. 2013). Higher expectations about the quality of high-status firms' digital platform can help attract new participants. However, if the platform fails to meet these expectations, it can backfire to a greater extent and expedite cascading negative network effects (Jensen 2006).

In addition, individuals associated with high-status positions are less likely to initiate or support divergent changes from the institutional status quo (Battilana 2011) as the institutional transformation such as the change in institutional logic increases status mobility (Lounsbury 2002), implying a threat to their high status. Institutional logics guide decisions and actions by providing the basis of attention and the choice of solutions by granting legitimacy (Gawer and Phillips 2013). As an incumbent firm adds a digital platform to its pipeline business, individuals within the incumbent firm face the tension between traditional supply chain logic and platform logic (Gawer and Phillips 2013). The two logics are different "in terms of industry structure, organizational identities, nature of industry leadership, source of authority and legitimacy, and basis of mission" (see Table 1 in Gawer and Phillips 2013, p. 1043). While conflicts are likely to arise from the tension between new practices and organizational identity (Gawer and Phillips 2013), employees are more firmly attached to their organizations that are viewed as being more prestigious by outsiders (Smidts et al. 2001). Thus, resistance to change because of the conflict between new practices and organizational identity may be greater in high-status firms, delaying the complete transformation to a state that requires the embrace of new logic.

By contrast, low-status incumbents are less susceptible to concerns about satisfying existing stakeholders compared with high-status firms. The disappointment of stakeholders can lead to a negative feedback process for firms to lose users from their platforms (Backus et al. 2022). Given low stakeholders' expectations, low-status firms can be more immune to the violation of existing stakeholders' expectations and thus may avoid critical penalties and critiques from audiences due to violations of stakeholders' expectations (Phillips et al. 2013). In addition, the status-mobile opportunity created by the industry-wide transformation of institutional logics may motivate low-status firms to become more fully dedicated to the new business under the new logic (Lounsbury 2002). Therefore, the negative process effect of transformation to a digital platform can be smaller for low-status incumbents. Consequently, we expect that among firms that add digital platforms, high-status firms will experience lower performance than their low-status counterparts, at least in the short term. Thus, we posit the following:

Hypothesis 2: The higher the firm status, the less the overall performance increases after the digital platform addition.

Methodology

Data and Sample

We examine the effect of status on an incumbent firm's decision to start its own digital platforms and its consequence in the context of China. Chinese companies have experienced tremendous industrial transitions from the launch of digital platforms since the government began promoting policy initiatives regarding the digital economy, such as "Internet Plus" and "Made in China 2025". As a result, China represents one of the world's most vibrant digital economies.

We refer to the list of the *Fortune* China 500 as of 2018 and trace status and performance of companies to build on our panel data². *Fortune* China magazine publishes the rankings of 500 companies based on official information of all Chinese companies listed on the Chinese and foreign stock markets. In addition, we collect detailed longitudinal information from the China Stock Market & Accounting Research (CSMAR) database by using the unique stock code identifiers of listed companies in *Fortune* China 500. CSMAR is a well-known Chinese data provider that mainly focuses on publicly listed firms on Chinese stock exchanges (i.e., Shanghai and Shenzhen stock exchanges). We extract firm-level financial data (e.g., total assets, sales revenues), analyst coverage, and other firm characteristics (e.g., ownership) from the CSMAR database. Although the CSMAR database started collecting analyst forecast data in 2001, the majority of firms did not have comprehensive analyst coverage records until 2004 (Xu et al. 2013). Hence, instead of collecting data from the beginning of the CSMAR database service, we extract information from 2004. One of our main variables, *status*, measured by the residual of analyst coverage (Shen et al. 2014), is largely affected by analysts' behaviors in different institutional environments. Therefore, from the collected information, we exclude the list of companies if they are listed in stock exchange markets other than China. We also exclude the list of companies if they are originally founded from digital platform-based business models because we are mainly interested in the effect of platform addition in pipeline firms. After this data processing, we build a set of panel data containing information from 290 companies from 2004 to 2019³. We choose 2018 as the last year of observing a firm's addition of a digital platform to allow at least one year of observation on performance after the addition.

Measures

Dependent variables

We use two different dependent variables to estimate the two hypotheses: (1) the addition of a digital platform is used to test *Hypothesis 1*, and (2) firm performance is used to estimate *Hypothesis 2*. First, *the addition of a digital platform* is encoded as 1 if a firm adopts a platform in its business model at year t and after, and 0 for years before. We measure the addition of a digital platform by reviewing each firm's annual report written in Chinese from 2004 to 2018 and identifying the addition of a digital platform. We identify 83 out of 290 firms that added a digital platform between 2010 and 2018.

Second, *firm performance* is measured by a firm's annual sales. Existing studies suggest that in emerging markets, such as China, more attention should be paid to reflecting the growth of companies than to the profit margin during the transition period (Chang and Hong 2000). Hence, we focus more on the growth of companies by using firm sales than any measures of profit margins.

Explanatory variable

Status is our main explanatory variable for testing the hypotheses. Status provides a signal showing the different expectation levels of firms' unobserved qualities. Hence, the market shows disproportionate attention to firms regarding their status regardless of their actual performance or product quality (Bothner et al. 2012). Following the prior work of Shen et al. (2014)⁴, we use the residuals of analyst coverage as a proxy to measure the status of firms, where analyst coverage represents the optimistic financial reports of firms leading to gaining public exposure and attention. By using the residuals instead of the direct measure of analyst coverage (i.e., counting the number), we expect to control for the direct valuation impact of analyst coverage on firm performance where firms show similarities in size, profitability, risk, and others (Mehran and Peristiani 2010). The reason is that firms can bribe analysts to write exaggerated coverages,

² People may assume that firms listed on *Fortune* China 500 can have a sample selection bias because of their high rankings within the industry. We are concerned more about the reliability of our collected data than the possible sample selection bias as we collect data that are officially reported to the Chinese government. We statistically compare the sample of *Fortune* China 500 and non-*Fortune* China 500 companies included in CSMAR database, and found that the average status score between the two groups is not significantly different (290 for *Fortune* 500 vs. 290 for non-*Fortune* 500 firms in 2018, t -statistics = -1.35 ($p > 0.05$)).

³ We finish our observation window as of December 2019 because we cannot control for the economic shock triggered by the COVID-19 situation in which the uses of digital platforms are unexpectedly accelerated in response to preventing the spread of the pandemic. Such an unexpected change is not the scope of our study.

⁴ Despite the different regulation system and degree of information asymmetry in the US and China, it is similar that high-status firms attract more attention from the public, which includes the analyst coverage.

and firms with low analyst coverage can signal the discounted value in the market more than those with high analyst coverage.

Following existing studies (Shen et al. 2014), we measure the residuals of analyst coverage by regressing the natural log-transformation of analyst coverage ($\ln(analyst_{it})$) on $firm\ size_{it}$ (log-transformation of total assets), ROA_{it} (net income over total assets), return volatility (ret_{it}), standard deviation of monthly returns of a focal firm over a given year), $growth_{it}$ (the gap between total assets at time $t-1$ and total assets at time t divided by total assets at time t), and $leverage_{it}$ (the ratio of firm debt to total assets). The model is described as follows.

$$\ln(analyst_{it}) = \alpha_0 + \delta_0 \times firm\ size_{it} + \delta_1 \times ROA_{it} + \delta_2 \times ret_{it} + \delta_3 \times growth_{it} + \delta_4 \times leverage_{it} + \epsilon_t \quad (1)$$

Control variables

We control for variables that can potentially affect our response. As with our regressors, we use several controls as follows. *Slack resources* refer to the ratio between current assets and current liabilities, representing the availability of firms' resources in identifying new business opportunities (Agusti-Perez et al. 2020). *Diversification* is encoded as 1 if a firm contains more than one GICS two-digit industry, and 0 if a firm operates a single GICS two-digit industry (Mackey et al. 2017). Diversification represents a firm's willingness to add a new industry to increase discretion and flexibility across different industries (Miller and Chen 1994). *Industry peer pressure* refers to the ratio between the accumulated number of firms adding digital platforms and the total number of firms in the same two-digit code GICS peer group (Fligstein 1985). Industry peer pressure represents the peer effects of other firms' decisions on a focal firm's decision to add a digital platform (DiMaggio and Powell 1983). *Firm ownership* is denoted as 1 if a firm is a state-owned enterprise (SOE), which has fewer budget constraints and more resource access (Chen et al. 2014), and 0 if otherwise. SOEs receive more privileges and credits from the Chinese government than non-SOEs, nevertheless not necessarily representing higher performance because of low efficiency (Zhou et al. 2017). *Firm size* is measured by the log transformation of total assets of a firm, representing the market power and the fluidity of accessing various resources. *Relative size* refers to the extent to which the firm may preempt with greater resources than rivals (Bothner 2005). Relative size is measured by the ratio between a focal firm's total assets and the largest firm's total assets in the same two-digit code GICS peer group. *Firm age* is measured by the log transformation of the tenured period of a firm in the industry since its establishment. *Leverage* is measured by firm debt divided by total assets, representing the extent of slack financial resource depletion regarding a firm's financial capability (Stickney 1993). Return on equity (*ROE*) refers to the ratio of net income and shareholders' equity, representing a way to proxy firm performance. From the variance inflation factors (VIF), we also ensure the concern about multicollinearity; all VIF values are within the threshold (< 10).

Analyses and Results

To test *Hypothesis 1*, we use the Cox proportional hazards model to estimate the hazard rate of adding a digital platform, where the hazard means the probability of adding a digital platform in our empirical context. The Cox proportional hazards model is widely used in diffusion studies, such as the adoption of new governance practices (Davis 1991). Thus, to predict an incumbent firm's launch of its first digital platform, Cox proportional hazards model well serves the purpose. Moreover, this model accounts for the issue of data censoring once the addition of digital platforms occurred in firms. Furthermore, the hazard model provides the benefit of specifying the baseline model without considering the pre-assumption of normality of our data (Gu et al. 2022). The hazard rate $h(t)$ representing the probability of firm i that adds a digital platform at time t is described as follows:

$$h(t|x) = h_0(t) \exp(\alpha_1 \times status_{i(t-1)} + \gamma_1 X_{i(t-1)} + \sigma_{k(i)} + \tau_{(t-1)}) \quad (2)$$

where $h_0(t)$ is the baseline hazard function, $X_{i(t-1)}$ contains all the time-varying control variables, $\sigma_{k(i)}$ and $\tau_{(t-1)}$ are industry and year fixed effects. The results of testing the proportionality assumption of the Cox proportional hazards model failed to reject the null hypothesis ($p = 0.76$), thus suggesting our model does not violate the pre-assumption of the Cox proportional hazards model. Table 1 shows the results.

Variables	Model 1	Model 2
$status_{i(t-1)}$	0.218** (0.105)	0.281** (0.113)

Observations	2,890	2,890
Number of firms	290	290
χ^2 (df)	4.330** (1)	1,549.980*** (24)
Log pseudolikelihood	-433.4	-378.9
Year fixed effects	No	Yes
Industry fixed effects	No	Yes
Control Variables	No	Yes

Notes: * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parentheses.

Table 1. The Results of Cox Proportional Hazard Model

In Model 1, the estimation results show that the coefficient of status is significant and positive in the addition of digital platforms at the 0.05 level. That is, higher-status firms are more likely to be associated with adding digital platforms. In Model 2, we include control variables to our model denoted in Model 1 for testing H1. The coefficient of status remains significant and positive in the addition of digital platforms at the 0.05 level, representing that higher-status firms are 28.1% more likely to add digital platforms than low-status firms. Thus, the result supports *Hypothesis 1*.

To test *Hypothesis 2*, we use fixed-effects panel data models to examine the effect of status and the moderating effect of adding digital platform in boosting a firm’s performance. The main model to predict firm performance after the digital platform launch is as follows:

$$\ln(sales_{it}) = \beta_1 status_{i(t-1)} + \beta_2 dgt_add_{i(t-1)} + \beta_3 status_{i(t-1)} \times dgt_add_{i(t-1)} + \gamma_2 C_{i(t-1)} + \delta_1 Z_i + v_k \quad (3)$$

$$+ \omega_{(t-1)} + \varepsilon_{i(t-1)}$$

where $C_{i(t-1)}$ includes all the control variables, Z_i is the firm’s fixed effects, $v_{k(i)}$ is the industry fixed effect, $\omega_{(t-1)}$ is the year fixed effects, and $\varepsilon_{i(t-1)}$ is the error term. Using Eq. (3), we test our model coefficient with various specifications, as shown in Table 2.

Variables	Model 1	Model 2	Model 3	Model 4
$status_{i(t-1)}$	0.047*** (0.017)	0.053*** (0.015)	0.053*** (0.015)	0.061*** (0.016)
$dgt_add_{i(t-1)}$	-	-	0.033 (0.038)	0.054 (0.037)
$dgt_add_{i(t-1)} \times status_{i(t-1)}$	-	-	-	-0.104*** (0.039)
Constant	23.571*** (0.01)	6.825*** (1.243)	6.844*** (1.243)	6.872*** (1.235)
Observations	3,439	3,439	3,439	3,439
Number of firms	290	290	290	290
R-squared	0.004	0.406	0.406	0.408
Control Variables	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes

Notes: * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parentheses.

Table 2. The Results of Fixed-Effects Regression

In Model 1, we only include the main explanatory variable, status (column 1 of Table 2). The coefficient of status is positive and significant at the 0.01 level. In Model 2, we include control variables to increase the explanatory power of Model 1. The coefficient of status is positive and significant at the 0.01 level, and R² increases from 0.004 to 0.406 after adding the controls. In Model 3, we add the addition of a digital platform, which does not qualitatively change the result of status. Finally, in Model 4, we test *Hypothesis 2* using an interaction term of status and the addition of a digital platform. The coefficient of the interaction is negative and significant at the 0.01 level, showing that the effect of status is weakened on firm performance after adding a digital platform. The higher-status firm is likely to have lower firm performance. Hence, the result supports *Hypothesis 2*.

We then draw a two-dimensional plot of the marginal effect of the interaction term between status and the addition of digital platform on firm performance (Figure 1). The Y-axis presents the predicted marginal effect of interaction term on firm performance, whereas the X-axis shows the addition of a digital platform from 0 (meaning not adding a digital platform) to 1 (meaning adding a digital platform) depending on the change of status. The plot shows that in the addition of a digital platform, the effect of a high-status firm decreases, whereas the effect of a low-status firm increases on firm performance.

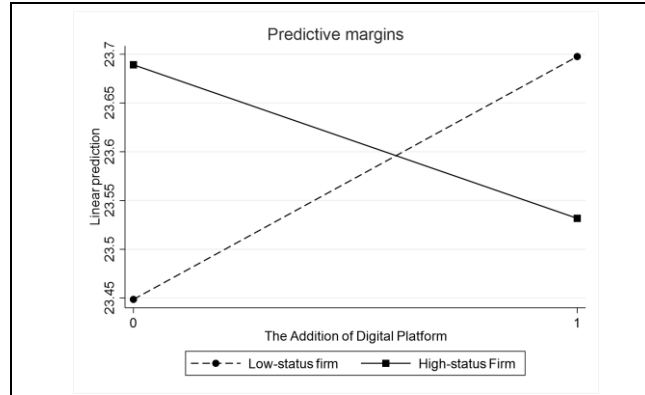


Figure 1. Marginal Effect of the Addition of Digital Platform and Status

Robustness Checks

We conduct a series of additional tests to validate the robustness of our results. First, we examine the potential reverse causality concerns derived from the firm-specific characteristics in status and firm performance. More specifically, in our data, state-owned firms in some industries, such as energy and heavy industry, can be high-status firms from the beginning. They are highly likely to have better firm performance than other firms as they can receive orders for various projects from the government. Hence, such performance enables them to have higher status and keep increasing higher firm performance than other firms. We apply the generalized method of moments (GMM) method with Arellano-Bover/Blundell-Bond dynamic panel data estimation (Arellano and Bover 1995; Blundell and Bond 1998). The GMM model controls the potential endogeneity driven by the time-invariant unobserved heterogeneity and reverse causality leading to the inconsistency and biasedness of our estimates (Arellano and Bover 1995).

In particular, we use the first- and second-order lagged dependent variables, $\ln(sales_{i(t-1)})$ and $\ln(sales_{i(t-2)})$, as our instrumental variables to control the endogeneity of status by assuming that status is not correlated with the error term. We examine the robustness of the exogeneity of our GMM model using several empirical tests to estimate that the error term is not serially correlated. Model 1 and Model 2 of Table 3 report that the AR test for zero autocorrelation in first-differenced errors rejects the null at the first order ($p = 0.001$, for Model 1 and Model 2) and cannot reject the null at the second order ($p = 0.391$ and 0.491 , respectively, for Model 1 and Model 2), thus suggesting that the instruments are statistically valid. The Hansen J overidentification tests also confirm the validity of the instrumental variables ($p = 0.114$ and 0.293 , respectively, for Model 1 and Model 2). Therefore, we confirm the orthogonality condition of our original model, meaning that our instrument variables can be used as the proper specification to control for the dynamic aspect of our model. Our analysis (shown in Table 3) shows that the coefficient of $dgt_add_{i(t-1)} \times status_{i(t-1)}$ is negative and significant at the 5% level. The result is qualitatively consistent with our previous result from Table 3; thus, *Hypothesis 2* holds.

Variables	Model 1	Model 2
$\ln(sales_{i(t-1)})$	0.542*** (0.079)	0.544*** (0.091)
$\ln(sales_{i(t-2)})$	-0.124*** (0.026)	-0.113*** (0.028)
$status_{i(t-1)}$	0.053** (0.024)	0.054** (0.026)
$dgt_add_{i(t-1)}$	0.010 (0.033)	0.051 (0.049)
$dgt_add_{i(t-1)} \times status_{i(t-1)}$	-	-0.147** (0.062)
Observations	3,162	3,162
Number of firms	290	290
Model fit (χ^2 (df))	37,266.98*** (22)	29,856.67*** (23)
Control Variables	Yes	Yes
Year fixed effects	Yes	Yes
Arellano-Bond test for autocorrelation		
First order	$p = 0.001$	$p = 0.001$
Second order	$p = 0.391$	$p = 0.491$

Hansen test of overidentifying restrictions		
χ^2 (df)	93.29 (78)	106.17 (99)
Prob > χ^2	0.114	0.293
Notes: * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parentheses.		

Table 3. The Results of Dynamic Panel Regression (GMM)

Second, we apply a quasi-experimental design approach in our empirical framework to control for the time-invariant unobserved heterogeneity in the addition of a digital platform by firms. We use the difference-in-differences (DID) model to compare the firm performance of firms that add digital platforms (the treatment group: $Treat_{i(t-1)}$), with the firm performance of firms that do not add digital platforms, before and after the platform addition ($Period_{i(t-1)}$). Accordingly, the treatment time (i.e., the year a firm adds a digital platform) for each firm varies from 2010 to 2018. We examine the variation in incumbents' digital platform addition across years to identify the impact of launching a digital platform on firm performance by following existing studies (Chan and Ghose 2014; Jin and Leslie 2003; Mousavi and Gu 2019; Sun and Zhu 2013).

Furthermore, we apply a dynamic propensity score matching (dPSM) approach (Rosenbaum and Rubin 1985) to our DID model to confirm if the covariates have similar distribution between the treatment and control groups. Following Rishika and Ramaprasad (2019), we apply the dPSM method to a set of firm-specific variables and match firms at the yearly level in our DID model. We also apply nearest-neighbor matching and caliper matching in our dPSM-based DID model (Foerderer 2020). Our regression analysis before the addition of a digital platform confirms the change in firm performance between treated and non-treated groups follows the parallel trend.

Table 4 shows our DID results. In Model 1, we test the average treatment effect of adding a digital platform on firm performance. The coefficient of $Treat_{i(t-1)} \times Period_{i(t-1)}$ remains insignificant, and the coefficient of $status_{i(t-1)}$ is positive and significant at the 0.01 level, which is consistent with prior findings. In Model 2, we include the interaction term between the treatment effect and $status_{i(t-1)}$, and the coefficient is negative and significant at the 0.05 level. The result is qualitatively similar to the results of our main model. Hence, we conclude the robustness of our model.

Variables	Model 1	Model 2
$Treat_{i(t-1)} \times Period_{i(t-1)}$	0.054 (0.040)	0.065 (0.041)
$status_{i(t-1)}$	0.054*** (0.017)	0.064*** (0.017)
$Treat_i \times Period_{i(t-1)} \times status_{i(t-1)}$	-	-0.102** (0.041)
Constant	6.450*** (1.401)	6.469*** (1.390)
Observations	2,974	2,974
Number of firms	283	283
R-squared	0.418	0.420
Control variables	Yes	Yes
Time fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
Notes: * p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parentheses.		

Table 4. The Results of Difference-in-Differences Estimation

Discussion

This study explores the digital platform launches by incumbents in the pipeline business. Existing studies have not examined a firm's advantages stemming from its industry position as a cause of the variation in the success of a digital platform launch. As an explorative study on the effect of a firm's position as an important determinant of the outcomes of launching digital platforms, our study focuses on organizational status. We argue that organizational status is particularly relevant to digital platform launches, as status draws people into developing a relationship with firms (Benjamin and Podolny 1999). However, we also found that high-status firms may be slower to achieve their intended performance level.

Theoretical and Practical Implications

First, our results contribute to the literature on digital platform strategy, which has broadened our understanding of how to successfully launch digital platforms and leverage them to achieve growth

(Cusumano et al. 2019). With regard to the launch of digital platforms, attracting platform participants is essential to achieve network effects through various means, including subsidies (Eisenmann et al. 2006) and non-pricing incentives (Li and Agarwal 2017). Our findings suggest that status can be regarded as an important incentive for attracting initial users. From the incumbent firm that considers starting its own digital platform, this incentive shapes a positive expectation about the digital platform launch, making it easier to implement. From the perspective of potential participants, status of a platform owner may provide a high expectation about their chance of success (Srinivasan and Venkatraman 2018). For incumbents whose digital capabilities are questionable, potential participants may still try the digital platform in hopes of enhancing their status if the incumbents have a high status. In this case, the motivation for participation is similar to conspicuous status consumption, a phenomenon that refers to consumer behavior of buying luxury products to show off their social status. As platform participation helps exploit the opportunity to enhance social status, status can be considered an important intangible asset that can be mobilized (Piazza and Castellucci 2014) in developing a digital platform strategy. Our evidence shows that high-status incumbent firms may not transfer their status to achieve sufficient network effects. However, our finding suggests that at least in the initial stage, status works as an enabler of the digital platform launch.

Second, our finding on the negative effect of status on performance after the digital platform launch makes an important contribution to the digital transformation literature. Both academia and practitioners suggested that the way to transform incumbents successfully is to increase their fitness in the digital environment while acknowledging the difficulties in moving from legacy systems (Sebastian et al. 2017). Our study adds value to the literature by identifying status as an inhibitor of digital transformation. According to our results, status helps incumbents add a digital platform but prevents them from pivoting (Davenport 2022). This biased pattern of behavior stemming from past successes will lower the chance of successful digital transformation, and status may be one way to capture this tendency. This implies that a fast response to the digital environment by launching a digital platform cannot be easily equated with the success of digital transformation. Moreover, managers should carefully monitor internal practices and processes after the digital platform launch.

Third, our findings contribute to the status literatures by showing that strategic changes are more costly for high-status firms. Researchers found that high-status actors are prone to distraction and complacency, often reducing their efforts to maintain performance levels (Bothner et al. 2012). However, there have been limited studies on how status determines the consequences of adopting discontinuous innovation and initiating fundamental change. The digital platform launch involves fundamental shifts in strategy, leadership, structure, technologies, and even organizational culture. Thus, we predict that high-status firms with stronger legacies would experience more resistance to implementing fundamental changes and decreasing the odds of success. Specifically, we attempt to identify the divergent roles of status in promoting and inhibiting changes, depending on the stage of transformation. High-status firms have advantages in seizing opportunities and mobilizing resources to launch digital platforms. However, their legacy challenges their implementation of new business models, even after launching digital platforms, which reduces firm performance.

Finally, our study provides suggestions and insights to CEOs and top management teams. According to McKinsey (2019), almost 70% of firms that pursue digital transformation do, in fact, fail. The needs for different approaches to reconfigure the organizational process around digital technologies and innovation has been suggested (Park et al. 2020). In our research, we also suggest that different approaches are necessary to accommodate digital platforms successfully. Our findings suggest that high-status firms facing competition from born-digital-platform companies can start their own digital platforms expecting potential status advantages, but that these firms may not achieve their intended outcome. They must reconfigure their capability-building and entrepreneurial action processes around the new digital platform (Sambamurthy et al. 2003), but often the relationships and practices that the firm has developed its status inhibit it from pivoting to the platform business. This implies that firms face different challenges and need different digital platform strategies. For example, low-status firms may focus on mitigating concerns about their quality and future potential as platform owners, and often require a strategy to manipulate their low-status identities. On the contrary, high-status firms that have successfully implemented pipeline business models need to establish a well-defined roadmap for digital platform launches and digital transformation and build dynamic capabilities to innovate business models successfully.

Limitations and Future Research

First, our sample includes only large Chinese companies on the *Fortune* China 500 list. Although the sample choice can effectively exclude firms that lack the resources and capabilities to add a digital platform, the low-status firms in this sample may have a higher status than other firms in China. Specifically, the higher performance of low-status incumbents in our sample may be an artifact of sample selection, whereas the negative effect of high-status incumbents can still hold. Although a firm could be relatively low in terms of social standing, low-status firms among *Fortune* 500 firms may have higher status than non-*Fortune* 500 firms. Thus, the possibility of a non-linear effect of status on performance in the case of a digital platform launch still exists. To address this concern, we selected non-*Fortune* 500 firms in the CSMAR database and compared our status measures between them and *Fortune* 500 firms. Based on t-test results, we did not find a significant difference between the two groups in average status scores. However, our finding should be cautiously interpreted in a way that high-status firms can face more challenges to make their own digital platforms successful. In addition, Chinese companies are known to be adaptive and digital-friendly and tend to have agile and innovative organizational culture (e.g., Haier, Ping An). Future research can extend the sample to include common-sense low-status firms that are at the crossroads of choosing whether to survive or vanish in the market and/or in more diverse countries.

Second, we could not identify cases of failed attempts at a digital platform launch. As our data are quite up-to-date, a longer observation window is required to verify how many firms launched their own digital platforms but eventually closed them down. In addition, our study did not consider how an incumbent adds a digital platform. Incumbent firms have various options when considering how to add a new business model, for example, through internal development, creation of a subsidiary, or purchase of an already established platform company. Specifically, acquisition can be an important means of pursuing a digital platform strategy (Miric et al. 2021). In studying the means of adding digital platforms, we can better theorize how status affects digital platform launch and performance.

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