The Tension Between Creatives and Suits: The Effect of Resource Endowments on Firm Outcomes

by

Dongwook Kim

Bachelor of Arts in International Studies, Hankuk University of Foreign Studies, 2012

Master of Science in Business Administration, Seoul National University, 2015

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This dissertation was presented

by

Dongwook Kim

It was defended on

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and approved by

John Prescott, Thomas O'Brien Chair of Strategy, Organizations and Entrepreneurship

Ravi Madhaven, Professor of Business Administration, Organizations and Entrepreneurship

Susan Cohen, Associate Professor of Business Administration, Organizations and Entrepreneurship

Lingling Pan, Assistant Professor of Business Administration, Organizations and Entrepreneurship

Asli Arikan, Associate Professor of Strategy, Dept. of Management & Information Systems

Dissertation Chair: Sharon Alvarez Thomas W. Olofson Chair in Entrepreneurship, Organizations and Entrepreneurship

The Tension Between Creatives and Suits: The Effect of Resource Endowments on Firm Outcomes

Dongwook Kim, PhD

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This study examines the long-term effect of resource endowments at market entry on future firm outcomes namely creative performance and efficiency in revenue generation in the context of the global video game industry. We shine a light on the importance of resource endowments by suggesting that the impact of resource endowments might be larger in the creative industry, where some firms want to achieve creative performance over revenue generation. We find that resource endowments matter more than exogenous imprinting when firms are interested in creative performance. We also find that resource endowments can impact ongoing investments that might increase both types of firm outcomes. This suggests that resource endowments might have more importance than previously suggested and that resources and capabilities related to developing creative products are stickier and are more likely need to be developed in the sensitive periods such as market entry.

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1.0 Introduction

Resource-based theory (RBT) suggests that a firm's performance depends on its endogenous bundle of resources and capabilities (J. Barney, 1991; Coen & Maritan, 2011; Levinthal & Myatt, 1994). Valuable resources that are socially complex, causally ambiguous, and path-dependent are sticky, cannot be acquired, and thus must be internally developed over time (J. B. Barney, 1986). While RBT acknowledges that important capabilities are path-dependent, only a small number of studies examine the firm's resources at market entry, resource endowments, and their impact on future firm choices (Coen & Maritan, 2011; Vergne & Durand, 2010). RBT assumes that the stream of small decisions in the past matter but does not state if any period is more important (Sydow, Schreyögg, & Koch, 2009). Also, RBT assumes that the choice of investing in resources matters more than the context in which these choices are made (Arend, 2009; Rumelt, 1991).

However, imprinting theory suggests that there is a certain period when firms are more susceptible to particular exogenous conditions (Stinchcombe, 1965). Imprinting theory explains firm outcomes as a result of exogenous conditions during market entry leaving a long-lasting impact on firms (Marquis, 2003; Mathias, Williams, & Smith, 2015). According to this theory context at entry prevails over managerial choice. While both RBT and imprinting theory implies that history matters, they offer different insights. RBT suggests that path dependency makes managerial choices of initial endowments matter over exogenous conditions (J. Barney, 1991; Dierickx & Cool, 1989; Zott, 2003). Imprinting theory suggests exogenous conditions during the sensitive periods of market entry matter more and these exogenous conditions can prevail over endogenous firm choices having a long-lasting, stamping impact on firms' performance (Marquis

& Tilcsik, 2013; Stinchcombe, 1965). This tension brings up the question, when does the influence of endogenous resources endowments compared to exogenous conditions matter more to future firm outcomes? Do resource endowments matter more depending on the characteristics of resources and capabilities that are necessary to achieve certain firm outcomes? For example, can endogenous resources during market entry matter more to achieving creativity that requires socially complex resources and capabilities than the environment? Likewise, can endogenous resources during market entry matter less than exogenous conditions to achieve revenue generation that require more general than socially complex?

This paper considers resource-based theory and imprinting theory perspectives simultaneously and empirically tests for their predictions. Specifically, this study tests these hypotheses in the context of the global video game industry, which is both a high-tech and a creative industry. This unique industry allows us to observe the imprinting effects of exogenous conditions and the effect of resource endowments on future firm outcomes, specifically creative performance, and efficiency in revenue generation. We test whether the resource endowments can have a stronger impact than exogenous imprinting on creative performance that might require stickier resources and capabilities than efficiency in revenue generation. We also test whether resource endowments can impact ongoing investments that might increase both types of firm outcomes.

By demonstrating support for our hypotheses, we shine a light on the importance of timing in the development of resources and capabilities and the types of performance they enable. We find that resource endowments matter more than imprinting when firms are interested in creative performance, and that resource endowments can impact the effectiveness of ongoing investments in creativity. This suggests that resources and capabilities related to developing creative products

— capabilities that are stickier, socially complex, and causally ambiguous—are more likely to need to be developed in the sensitive stages of firm founding or market entry. Figure 1 depicts our theoretical framework.

2.0 Theoretical Development

2.1 Resource endowments and exogenous imprinting

The resource-based theory assumes that resource endowments – resources and capabilities an organization possesses in its market entry stage – give managers choices as to how they invest and develop in the future (Coen & Maritan, 2011; Teece, Pisano, & Shuen, 1997). Resource endowments are not viewed as a source of sticky stagnation but viewed as chips you have in your pocket before you begin the game. They are a stake in the game, not a predictor of how the game ends. A firm may achieve distinctive competency based on how managers make use of their resources and capabilities, establishing a unique bundle of resources *vis à vis* their competitors (Mahoney, 1992; Teece, 2006).

In contrast, imprinting theory assumes that firms are stamped by prominent environmental conditions during the sensitive period, such as founding or market entry (Mathias et al., 2015). Stinchcombe (1965) originally proposed that organizations founded during the same historical period would have similar structural characteristics because they faced the same challenges within the environment. This stamping process leads to exogenous environmental conditions during sensitive periods having a long-lasting influence on a firm's survival, future investment decisions, and future operating practices (Colombo & Piva, 2012; Kriauciunas & Kale, 2006; Mathias et al., 2015). In this view, firms inherit technologies, industry context, and the external environmental origins of the firm (Geroski, Mata, & Portugal, 2010; Mathias et al., 2015; Tsai, MacMillan, & Low, 1991).

Imprinting researchers have largely ignored the effects of endogenous change enabled by resources and capabilities (Marquis & Tilcsik, 2013; Simsek, Fox, & Heavey, 2015). Imprinting assumes that managers are cognitively bounded and thus have no choice but to choose certain elements that fit the environment (Baron, Hannan, & Burton, 1999; Bryant, 2014; Wang, Du, & Marquis, 2019). In this view, firms do not create their choices at market entry but instead choose from what is available in the environment (Alvarez & Barney, 2007). In other words, the agency in imprinting theory is limited to reacting to the environment, creating a long-lasting inertial rigidity that can be costly for firms to overcome.

Unlike imprinting theory, RBT does not suggest resource endowments have a stamping process. Instead, RBT suggests that resources are path-dependent, a stream of small decisions in a specific sequence that converge towards a certain outcome (Ray, Barney, & Muhanna, 2004; Schreyögg & Kliesch-Eberl, 2007). Yet what is unknown is whether decisions at a certain period such as market entry might have a bigger impact than others. Borrowing the notion of the sensitive period from imprinting theory and applying it to resource endowments, we suggest that when firms are trying to achieve creativity resource endowments at market entry might have a larger impact on the future firm outcome than we have previously assumed.

One of the important decisions firms make in the market entry stages is to focus a greater portion of their resource endowments on creating innovations or focus more of their resources on commercializing innovations (Gans & Stern, 2003; Teece, 1986, 2006). While innovation is concerned with creating a novel and useful new product, commercialization is concerned with making the innovative product a commercial success that involves market analysis, sales, and distribution (Dutta & Hora, 2017; Gans & Stern, 2003).

This firm choice of resource endowments between innovation and commercialization might have a bigger impact on firms that want to achieve higher creative performance (Chaston, 2008;

Tschang, 2007). Researchers in the creative industry posit that some firms are only interested in making original, novel products, that some firms are more concerned with creative performance and less dedicated to financial returns (Caves, 2002; Chaston & Sadler-Smith, 2012). Capabilities to achieve higher creative performance are socially complex and causally ambiguous (Ranft & Lord, 2002) because innovations in creative industries are particularly uncertain; there is no *ex-ante* known demand for creative products (Dunlap, McDonough, Mudambi, & Swift, 2016). Scholars argue that creative product development requires a different set of routines than typical rational and efficient routines that do not capture the nonlinear, irrational, and illogical process of highly creative product development (Chaston, 2008; Howkins, 2005; Tschang, 2007). These firm routines in creative product development are part of socially complex, and casually ambiguous capabilities that are more likely to be developed slowly over time in a path-dependent manner (J. Barney, 1991; Dierickx & Cool, 1989; Lippman & Rumelt, 1982; Nelson & Winter, 1982).

The process of path dependency builds on the initial resources and capabilities over time due to the forward and backward dependency of organizational choices and routines (Collis, 1994; Gavetti & Levinthal, 2000). This form of persistence is likely to be stronger with experience-based capabilities such as creativity and innovativeness, and will lead to capability lock-in for self-reinforcing activities (Sydow et al., 2009). This lock-in effect creates a buffer against the external sources of change and preserves the self-reinforcing processes of resource development (I. Arikan, Koparan, Arikan, & Shenkar, 2019; Sydow et al., 2009). Therefore, firms that have made the conscious decision of investing in resource endowments of innovation are more likely to have higher creative performance through this lock-in effect and increasing returns to related capabilities. Thus, in the case of creative performance, resource endowments might have a stronger impact than what is imprinted from the external conditions.

Hypothesis 1 (H1). *The effect of a firm's resource endowments at market entry focused on innovation rather than commercialization on a firm's future creative performance will be stronger than the effect of exogenous conditions at market entry (i.e., external imprinting).*

However, not all types of firm outcomes can be insulated from the external shocks by the path dependency of resources and capabilities and increasing returns from the lock-in effect. In the case of efficiency in revenue generation, external conditions in the market entry stage, such as economic or technological conditions, might have a greater impact (Huynh, Patton, Arias-Aranda, & Molina-Fernández, 2017; Simsek et al., 2015). To meet consumer demands firms need coordination activities that relate to exogenous elements such as enhancing efficiency in product distribution and strict production schedules (Naldi & Zahra, 2007; Rothaermel & Hill, 2005). These coordination and production schedules need tight organizational structures that help them achieve higher efficiencies and solve specific problems (Tschang, 2007). These structures are developed and influenced by external environments when firms are first entering the market and will be imprinted like an organizational blueprint (Mathias et al., 2015; Stinchcombe, 1965). As these firms are imprinted by reacting to exogenous conditions such as consumer preferences and macro-economic conditions, their efficiency in revenue generation may be more impacted by the imprinting of exogenous conditions at the time of market entry, rather than endogenous resource endowments.

Hypothesis 2 (H2). *The effect of exogenous conditions at market entry (i.e., external imprinting) on a firm's future efficiency in revenue generation will be stronger than the effect of a firm's resource endowments at market entry focused on commercialization rather than innovation.*

We suggested that in the case of creative performance the effects of resource endowments could be stronger than the exogenous conditions at the market entry stage. And that for efficiency in revenue generation exogenous conditions might matter more. In the next section we suggest that at least in the creative industry, once a firm has entered the market with resource endowments focused on either innovation or commercialization, it is not easily overcome, even with investments on the other side of the spectrum. The effect of resource endowments is sticky for both firm outcomes of creativity and efficiency.

2.2 Resource endowments and ongoing investments

This choice of emphasis between innovation and commercialization will have a long-lasting impact on future firm choices because these fundamental resource allocation decisions to develop routines made by the firm may be engraved in firms like DNA and are almost impossible to change (I. Arikan et al., 2019). It is not surprising to observe firms that have more investment in creative product development have higher creative performance. Firms that started with a focus on innovation and had resource endowments focused on innovation might be better at creating and retaining value from future investing in creative resources.

First, firms with more resource endowments focused on innovation at market entry might have better know-how and routines in utilizing new investments to increase creative performance (Helfat & Peteraf, 2003; Nelson & Winter, 1982). Developing new products in the creative industry requires routines of openness and autonomy supporting non-linear and often unpredictable processes of creative product development (Howkins, 2005). This creative process requires distinct routines and know-how that are a result of the accumulation of direct experience and support over a long period (Chaston & Sadler-Smith, 2012; Gino, Argote, Miron-Spektor, & Todorova, 2010). Firms that entered the market with resources and endowments of innovation will have accumulated more direct experience in capabilities related to creative product development. Without the right routines and know-how established, firms cannot achieve creative success even with ongoing investments in creative product development (Chaston, 2008; Schmalz & Dyer-witheford, 2016).

Second, firms that had more resource endowments focused on innovation at market entry will be more likely to be supportive of creative product development. The creative literature suggests that to produce unusual but useful ideas employees need organizational support and encouragement of risky new ideas (Amabile, 1988; Amabile, Conti, Coon, Lazenby, & Herron, 1996). Creative ideas flourish when the work environment provides extrinsic rewards such as compensation but also intrinsic motivation such as enthusiasm and a common understanding to achieve the most creative products (Amabile, 1988). A shared vision that is essential to achieving creative success is usually constructed early on (Johnson, 2007; Perry-Smith & Mannucci, 2017). Thus, firms with more resource endowments focused on innovation rather than commercialization at market entry will be more likely to better support investments in ongoing creative product development leading to higher creative performance.

Hypothesis 3 (H3). *The greater the firm's resource endowments at market entry are focused on innovation rather than commercialization, the stronger the relationship between ongoing investment in creative product development and its creative performance.*

Creative and innovative products are often assumed to inevitably lead to commercial success. In most cases, however, without investments in market-related capabilities, creativity by itself rarely results in financial success (Roy & Cohen, 2017; Teece, 2006; Verona, 1999). The more a firm has higher market-related capabilities such as licensing intellectual properties (IP), distribution, or marketing, the higher its efficiency in revenue generation (Adams, Fontana, & Malerba, 2016; Dutta & Hora, 2017). We suggest that firms that had resource endowments of commercialization might benefit more from investing in market-related capabilities.

Firms that focused on resource endowments of commercialization at market entry are more likely to be built towards structures and standardization that increase efficiency (Gans & Stern, 2003; Hitt, Hoskisson, & Ireland, 1990; Verona, 1999). These standardized routines with strict systems and structures are better at dealing with incremental innovations that involve more problem solving than creativity (Alvarez & Barney, 2001; Hitt et al., 1990). Managers in these firms have less commitment and support for creativity or innovation. However, their routines and know-how towards efficiency will help push their products to commercial success by utilizing capabilities such as licensing, marketing, and identifying the best distribution networks (Cozzolino & Rothaermel, 2018; Roy & Cohen, 2017; Toh & Polidoro, 2013). They will prefer incremental improvements that can yield high efficiency in revenue generation even if it has little creative value (Dutta & Hora, 2017; Lampert, Kim, & Polidoro, 2020).

On the contrary, firms with initial resource endowments of innovation at market entry may not have the routines and know-how suitable to transform creative innovations "into a valuable proposition for customers" (Gans & Stern, 2003: p. 334). For example, in September 2018, the award-winning *Telltale Games* suddenly closed after 14 years of operation. *Telltale Games* had made significant investments early on in creating and developing novel artistic games that won various video game awards. However, their attempts to expand that success, and market their games on other platforms did not go well. They had not made early investments in market-related capabilities that could support this expansion. According to former employees, the company had been struggling with managing distribution to different platforms (Gilbert, 2019). Industry experts noted that the management team was "blindly confident" about their product and assumed that the distribution of its products would take care of itself (Farokhmanesh, 2018).

Hypothesis 4 (H4). *The greater the firm resource endowments at market entry are focused on commercialization rather than innovation, the stronger the relationship between ongoing investments in market-related capabilities and the firm's efficiency in revenue generation.*

3.0 Methods

3.1 Empirical Settings

The empirical setting of this study is the global video game industry. First emerged in the late 1970s, the video game industry is now the biggest entertainment industry with market size of $178.1 billion in 2021 and over 3.24 billion users worldwide (Clement, 2022). The video game industry is considered both a creative industry and a high-tech industry where creativity and efficiency are required to develop new products and commercialize them. Unlike in the 80s when less than 10 developers were able to develop and publish video games, now it is not uncommon for a single project to consist of hundreds of people in specialized teams (Balland, De Vaan, & Boschma, 2013). As developing video games is becoming more and more complex and costly to develop, commercialization processes such as marketing, production, and distribution have become as important if not more than the development of creative product itself (Tschang, 2007). This duality of the video game industry makes it perfect for our analysis of two distinct resource endowments of innovation and commercialization.

New product development in the video game industry is typically divided into two processes: developing and publishing. Generally, there is a tension found between video game developers (usually referred to as creatives) and managers (usually referred to as suits) during the developing and publishing processes because developers who build the product strive for creativity while managers who commercialize and publish the product strive for business interests (Mollick, 2012; Tschang, 2007). In recent years, firms have started to specialize in either developing the creative product or publishing the product. Typically, game developers specialize in activities such as programming, design, art, and testing of video games. As publishers, game publishers are responsible for activities such as financing, distribution and marketing.

3.2 Sample and data

To test our hypotheses, we merged video game product data from the internet video game database, hand-collected industry awards data, and financial data from CRSP/COMPUSTAT merged database. We collected the video game product data from an internet video game database called MobyGames, a reliable data source used to research the video game industry (Balland et al., 2013; Zhao, Ishihara, Jennings, & Lounsbury, 2018). The product data shows that ten percent of the private and public firms focus on only publishing video games, while about 40 percent focus on only developing, and the rest focus both on publishing and developing activities but tended to be predominantly either one or the other in any given year. Among purely developing firms, about 20 percent were less than 10 years old; but among the purely publishing firms, 7 percent were less than 10 years old. A potential explanation is that publishing firms tend to be larger than developing firms and more financial resources are required to maintain publishing activities (Johns, 2006; Tschang, 2007). While there is a large number of small private firms that focus only on developing, most public game companies such as Ubisoft or Electronic Arts are usually involved in both developing and publishing activities. In our sample 12 percent of public firms that are competing in the video game industry were only involved in publishing across the years, and 6 percent of public firms were only involved in developing across the years.

We hand-collected industry awards data from a total of 63 different organizations that gave out awards between the years 1982 to 2018. In the video game industry, awards are given at the end of every year by various trade magazines and organizations for firms that introduce new game styles, new gameplay, or enhanced graphics. Similar to the Academy Awards, in the movie industry, awards are given in various categories from sound effects, visual effects, game design, and artistic achievement to best storytelling.

Lastly, we collected financial data of firms in the primary SIC code 7372 (prepacked software) and NAICS code 5511210 (software publishers) available in the CRSP/COMPUSTAT merged database. Not all firms in this SIC code develop or publish video games. However, to avoid sample selection bias, we didn't delete firms that do not have records of releasing any video games in the sample. Instead, we used the Heckman 2-stage model to include a control variable that can help decrease the endogeneity of firms that develop or publish games. Details can be found in the appendix section. After merging the data, the final sample in the first stage is an unbalanced panel data from 1981 to 2018 for 1,921 publicly traded firms in SIC code 7372. In the second stage, the number of firms that compete in the video game industry with a record of releasing a product is 933 publicly traded firms.

3.3 Dependent variable

We measured firm outcome in two different ways to test hypotheses; creative performance and efficiency in revenue generation. Because we wanted to isolate the firms' capabilities associated with creativity in developing products and efficiency in commercialization, we didn't use conventional measures such as the number of new products for innovation and sales to test financial performance. Instead, we used the number of awards to measure creative performance, and an increase in revenue divided by an increase in the number of products to measure efficiency in revenue generation. The advantage of these two measures is you can isolate the distinct capabilities of that are associated with them. These capabilities of creativity and efficiency are intertwined in firm performance such as sales, so if we were to use one measure of firm-level performance it would not be as effective.

Simply counting the number of video game products to measure innovation is not appropriate in this study because we wanted to isolate the firms' capabilities to develop new-to-the-world products. Video games that achieve high sales are usually incrementally different from other games or have various add-ons. For example, in 2021, among the top 20 best-selling video games, there was only 1 game based on new IP (Clement, 2022). The video game industry is considered a cultural and creative industry, so the more creative and artistic a game is, the more likely it will receive an award from various award events and publications (Balland et al., 2013; Johns, 2006). For example, The British Academy Games Awards is an annual British awards ceremony honoring creativity and innovation as opposed to commercialization in the video game industry (May, 2019).

Thus, to measure firms' creative performance we counted the number of awards that each firm received. This is not a firm performance measure in a traditional sense since the cost of creativity in achieving those awards is not accounted for. However, we can isolate the firm's creative output using awards. Since the combined number of awards from different sources is often emphasized in the marketing of a video game's creativity, we assumed that each award had equal weight. In short, the creative performance of a firm is captured by the number of awards it received for new games (Miller & Shamsie, 2011; Ray et al., 2004). Since developing a video game sometimes takes more than two years, we counted the number of awards a firm received at time t as a sum of t, t+1, and t+2.

In the video game industry product sales are often used to represent how well a video game company is performing financially. However, we refrained from using simple sales or profit to measure financial performance because we wanted to measure how efficiently firms generate wealth through commercialization. Creativity and efficiency are considered contrasting qualities of firm capabilities that are needed in the video game industry (Mollick, 2012; Tschang, 2007). Thus, to isolate efficiency we used the firm's increase in sales divided by the increase in the number of new products. This measure is not interchangeable with firm performance since the measure is not a net income-based measure with no cost. It helps us isolate how well the firm is creating revenues considering the number of commercialization projects. The higher revenue generated with the lower number of new products would suggest a firm is very efficient in wealth generation with a small number of commercialization projects. Also, adding the output of the number of new products in measuring the efficiency in revenue generation matches the output-based award measure of creative performance. A log transformation was performed, and it was lagged one year.

3.4 Independent variables

3.4.1 Exogenous condition imprinting and resource endowments

To test the imprinting from external conditions we chose the video game crash of 1983 as known as Atari shock as the source of imprinting. This shock caused a large-scale recession in the video game industry decreasing the market value of the industry from $3.2 billion to $100 million by 1985. This shock has affected every firm in the industry regardless of the platform and has changed the process of both product development and commercialization of video games. Similar to other imprinting studies, we have coded 0 if the firm was founded before 1985 and 1 if it was founded after 1984 (Wang et al., 2019).

Innovation activities in the video game industry include tasks that are involved in the development of creative video games. Commercialization activities include tasks such as discovering and managing IP and supporting the publishing in various platforms. Thus, we can assume that developing and publishing activities each require very different resource endowments. To observe how much emphasis firms put on resource endowments of innovation and commercialization at market entry, we measured the ratio of games developed and published in the firm's first year of entering the market. This is a fixed variable having constant value across the years. We use a common transformation method (Wexler, Shaffer, & Cotgreave, 2017) to construct a variable that ranges between -1 and 1 where *d*(*p*) is the number of developed (published) games for each firm in its initial year in the video game industry.

$$\text{resource endowments of Innovation} = \frac{d}{d+p} - \frac{p}{d+p} \tag{1}$$

For ease of interpretation and to capture the polarization between the two resource endowments, we changed the order of the terms in the above calculation for resource endowment of commercialization as follows:

$$\text{resource endowments of commercialization } = \frac{p}{d+p} - \frac{d}{d+p}\,. \tag{2}$$

3.4.2 Ongoing investment in creative product development and market-related capabilities.

By using previous research in the video game industry and archival data from industry professionals, we developed three different measures for ongoing investment in creative product development and market-related capabilities (Balland et al., 2013; Murphy-Hill, Zimmermann, & Nagappan, 2014; Tschang, 2007). First, we measured investment in creative product development by analyzing the end credits of games, which are part of the data that was available on the *MobyGames* website. We observed whether the development credit has design, art, and technology teams.

In the case of creative performance, we refrained from simply creating a counting measure for each of the three ongoing investments based on the number of products. Empirically there are three issues. First, because design, art, and technology interact with each other to create a video game, their combined effect is not likely to be additive. In robustness checks, we also included interactions of these investments with each other, and the main results remained the same. Second, the measurement resource endowments of innovation might depend on the initial use of these creative capabilities of design, art, and technology. Third, totaling up the number of games with such credits does not necessarily reflect a higher investment in these capabilities. Because we couldn't directly test the moderation of resource endowments and ongoing investment in creative product development, we instead decided to test the moderation of three variables that represent resource endowments and three dummy variables that represent ongoing investments in creative product development each year. Instead of using resource endowments as an independent variable, we used each firm's emphasis on design, art, and technology at market entry. By using keywords such as "design", "artist", and "programming" we found the number of games that had a credit of each design, art, and technology. We then divided this number by the number of total games developed in the first year of market entry. Annual ongoing investment in creative product development was assigned as 1 if they had video games with credits of design, art, and technology each year and 0 otherwise.

Important market-related capabilities in the video game industry often include finding marketable external IP, marketing the product to the public, and distribution (Murphy-Hill et al., 2014; Tschang, 2007). Thus, we measured market-related capabilities in three ways: distribution, licensing, and marketing. Distributing on many platforms is a critical capability for companies to reach more users. Thus, the number of distribution channels, or how many platforms your game can be played on could be very important for efficiency in revenue generation. So, for ongoing investment in distribution, we counted the number of different platforms on which each firm published each year. Firms often make licensing deals with firms that have IP, including movies or books that can be developed into video games. We measured ongoing investment in licensing by counting the number of games the firm released based on license deals. Since there are so many video games being published in the market, consumers often rely on video game critics' reviews of video games; therefore, one of the important jobs is to market their video games to the critics (Muddle, 2017). We measured ongoing investment in marketing by a dummy variable that indicates 1 if they received a critic score by video game critics that year. The summary statistic is presented in Table 1.

Insert Table 1 here

3.5 Control variables

3.5.1 Firm effects

We controlled for firm characteristics such as age, R&D intensity, and current number of products, all of which can have an impact on both firm outcomes. To control for firms' current activities, we controlled the ongoing number of products developed and published, and the number of add-ons. Studies in the imprinting literature imply that variables in the founding stage might have a strong effect but might dissipate as time goes by (Marquis, 2003). Hence, we controlled firm age, the number of years from firm founding. Additionally, we controlled for R&D intensity, which can influence both firm creativity and efficiency in revenue generation (Cohen & Levinthal, 1994). R&D intensity was measured by the investment of R&D as a percentage of sales (Cohen & Levinthal, 1994; Makri, Hitt, & Lane, 2010).

3.5.2 Industry and time effects

In our sample, some firms entered the video game industry enabled by the emergence of online publishing via platforms such as Appstore by Apple Inc. or Steam by Valve. Therefore, we controlled for this effect by creating an indicator variable that takes the value of 1 when the year is after 2007 and 0 otherwise.

3.6 Robustness checks and supplemental analysis

We adopted a two-stage estimation approach to account for the sources of biases based on self-selection in video game industry entry decisions (Shaver, 1998) The Appendix details these robustness checks and models.

3.7 Statistical Analysis

We employed two different statistical models based on two different dependent variables that captured the effectiveness of focusing on either of the two types of resource endowments. The possible values of creative performance are nonnegative integers. When the dependent variable is a skewed count variable, negative binomial regression is often used (Cameron & Trivedi, 1998). Negative binomial regression is similar to regular multiple regression, but the dependent variable is a count that follows a negative binomial distribution. Hence, for creative performance, we used a negative binomial regression.

For efficiency in revenue generation, a continuous variable, we used a random-effects linear model. Two basic models for the analysis of panel data were a fixed-effects model and a random-effects model. Because the independent variable, resource endowment, is constant across years, we used a random-effects model (Nwakuya & Ijomah, 2017). We applied a robust clustered standard errors estimation to control for possible heteroskedasticity for both models. We tested for multicollinearity using variance inflation factor (VIF). The mean was 2.39, with a maximum of 5.43, indicating that in most cases, multicollinearity was not a serious concern. We also tested for serial correlation using the Wooldridge test for autocorrelation. We found no serial correlation issues.

To test the relative importance of resource endowments compared to imprinting from exogenous conditions in Hypothesis 1 we used dominance analysis. When concluding the importance of a predictor, simply comparing the statistical significance or comparing the regression coefficient can lead to numerous mistakes (Courville & Thompson, 2001). Using a weighted arithmetic average of the marginal contribution of each predictor, dominance analysis ranks the contribution of each predictor by starting with only one predictor and to models that include all predictors (Azen & Budescu, 2003; Budescu & Azen, 2004). We employed dominance analysis using a log-linear negative binomial model for creative performance and a linear model for efficiency in revenue generation. In the case of creative performance using negative binomial regression, we used a log-likelihood measure and for efficiency in revenue generation, we used R^2 to explain the greater share of variation.

4.0 Results

Insert Table 2 here.

In Table 2 we tested whether the impact from resource endowments can be more important than exogenous imprinting for different types of firm outcomes. In Model 2 and 4 we tested the impact of both resource endowments and imprinting on each creative performance and efficiency in revenue generation. The resource endowments of innovation ($\beta = 0.40$, $p = 0.052$) have a positive and significant impact on creative performance while imprinting does not. In Model 4 we tested the impact of both resource endowments and imprinting on efficiency in revenue generation. The exogenous imprinting ($\beta = 0.21$, $p < 0.05$) has a positive and significant impact on efficiency in revenue generation while resource endowments do not. We then ran a dominance analysis to test which predictor has relatively more impact on the dependent variable. The result shows that in the case of creative performance resource endowment (ranked 6^{th}) generally dominates exogenous shock (ranked 9^{th}). For efficiency in revenue generation, on the other hand, exogenous shock (ranked 7^{th}) generally dominates resourced endowment (ranked 9^{th}). We concluded that both H1 and H2 are supported.

In Table 3 we first tested whether the different resource endowments at market entry affect the creative performance in Model 5. We found that emphasis on design endowments ($\beta = 0.68$, $p < 0.05$) had a significant and positive relationship with creative performance. Consistent with the theory, industry practices suggest game design, which is comparable to directing in the movie industry, is most important and underlies the whole development process of video games (Pinelle, Wong, & Stach, 2008; Tschang, 2007).

In Model 6, we added indicator variables that represent ongoing investments in creative product development each year. Among three ongoing investments, technology (β = 0.80, $p < 0.05$) was positive and significant. In Models 7 to 9, we tested the moderating effect of high emphasis on design at the market entry stage on the ongoing investments of art, design, and technology. None of the moderation was significant by themselves. However, in Model 12, when all three variables were added, high design endowments at market entry (β = 1.23, $p < 0.01$) had a positive and significant moderation on the relationship between the ongoing investments in design and creative performance. Figure 2 demonstrates the slope difference. Slope tests (t = 5.45, $p < 0.01$) show that ongoing investments in design capabilities were more strongly related to creative performance when firms had high (β = 1.46, $p < 0.01$) than low intensity in design at market entry (β = -0.56, *ns*). We concluded that H3 is supported.

Insert Figure 2 here.

Models 11 to 15 in Table 3 test the interaction of resource endowments and ongoing investments in market-related capabilities. In Model 11, we first tested the direct effect of investments in these three ongoing investments in market-related capabilities. Ongoing investments in marketing (β = 0.21, $p < 0.05$) had a positive and significant relationship with efficiency in revenue generation. In Models 12 to 14, we added interaction terms. All three variables of ongoing investments in distribution (β = 0.04, $p < 0.05$), licensing (β = 0.04, p = 0.085), and marketing (β = 0.28, p= 0.064), had positive and significant moderation effects by the resource endowment of commercialization. Slope tests for all 3 moderations were significant. We concluded that H4 is supported. Figure 3 demonstrates the slope differences of each market-related capability.

Insert Figure 3 here.

5.0 Discussion

While studies in the resource-based view stress the importance of historical matters and path dependency of resources and capabilities, few studies observe firms' resource endowments and their effects (Coen & Maritan, 2011; Maritan & Lee, 2017). In particular, the long-term effects of socially complex endogenous resources endowments at market entry have been largely ignored. This study suggests that this endogenous managerial choice on resource endowments during sensitive periods can have a larger impact than exogenous imprinting depending on what firm outcome they are trying to achieve between creative performance and efficiency in revenue generation. We also find that resource endowments have an enduring effect on future investments regardless of firm outcomes.

5.1 Resource-based theory and resource endowment

RBT emphasizes the importance of path dependency of resources and capabilities. Yet to date, with few exceptions, there has been a paucity of empirical research on a firm's initial choice of resource endowments that might affect future resource and capability development (I. Arikan et al., 2019; Coen & Maritan, 2011). Still, the limited work in this area shows the importance of resource endowments for firms' future outcomes and for future investments in resources. For example, Coen and Maritan (2011) use computer simulations to theoretically model how initial firm capability endowments matter for firms' future capability development. Arikan *et al.*, (2019) show that capabilities and resources that have a heritage component might last beyond the initial stage.

Extending previous work on RBT, our research develops a context-specific measurement for resource endowments, ongoing investments in creative product development and market-related capabilities to illustrate that ongoing investment is important, but its effectiveness might depend on where the firm originates. This research shows empirically that the choice of resource endowments between innovation and commercialization developed in the market entry stage can be stickier than we have thought. Supporting the research in creativity and the creative industries, we show that firms that have resource endowments of innovation will have better firm outcome when they have ongoing investments in creativity.

5.2 Ambidexterity

Our findings also have implications for firms that strive to be ambidextrous in creative industries by focusing on both innovation and commercialization (O'Reilly & Tushman, 2008; Tushman & O'Reilly, 1996). The supplemental analysis done in this paper, found in Appendix Table A2, shows that in the market entry stage, ambidexterity—investing in both innovation and commercialization—had no positive impact on either creative performance or efficiency in revenue generation. Even more remarkable, compared to firms that pursued only innovation or only commercialization, firms that tried to do both had negative consequences for both creative and efficiency in revenue generation. These findings indicate how challenging it is for firms to be ambidextrous in uncertain conditions (O'Reilly & Tushman, 2008; Tushman & O'Reilly, 1996). Ebben and Johnson (2005) find that firms attempting to pursue both efficiency and flexibility performed worse off than those with a single, focused strategy. Other studies suggest that rather than attempt to adapt over long periods, it may be more efficient for companies to pursue a single strategy until they fail (Anand & Singh, 1997; Dew, Goldfarb, & Sarasvathy, 2006). We found that, at least in the creative industry, pursuing both innovation and commercialization is an ineffective strategy with significant negative implications on firm outcomes (Lin, Yang, & Demirkan, 2007; O'Reilly & Tushman, 2008).

5.3 Pivoting

Since its introduction as part of the Lean Startup methodology by entrepreneurs (Ries, 2011), pivoting has been widely used in the popular press. There are many anecdotal stories of successful pivoting of technology ventures such as *Twitter*, which started as a podcast company *Odeo*. Similarly, *Slack* was founded to build one product, failed, changed its product, and is now worth more than $20 billion (Clark, 2019). However, pivoting was originally defined as "a structured course correction designed to test a new fundamental hypothesis" about a venture (Ries, 2011, p. 149). The strategy literature has also become enamored of the notion of pivoting and has defined pivoting as "a change in a firm's strategy that reorients the firm's strategic direction through a reallocation or restructuring of activities, resources, and attention" (Kirtley & O'Mahony, 2020).

However, the research on pivoting has produced results that are inconsistent with the urban myth of fast, flexible change. The usual notion among practitioners is that pivoting is a common phenomenon where a firm changes its strategy by changing its direction. However, a recent study found that pivoting is not only rare but also a process of incremental decisions over time (Kirtley

& O'Mahony, 2020). We argued that some impact of resource endowments could be engraved in firms like genetics, and it is very challenging for them to change. Our study suggests that the resource endowment of a firm will have a long-lasting impact, continuously affecting strategic decision-making such as investing in related resources. Resource endowments could be one of the reasons that reorienting strategic direction is challenging. Researchers mainly assume that managers have trouble changing and pivoting their firms due to a lack of information (Sapienza, Autio, George, & Zahra, 2006). Our study suggests that firms' past commitments to certain resource at the sensitive stage might lead them into a trajectory that is very hard, if not impossible, to reverse.

5.4 Limitations

We note limitations and some opportunities for future research. First, it might be challenging to replicate this study in different industry contexts since our findings may be specific to creative industries. Second, we did not take into account acquisition strategies of firms in this study for developing new capabilities. Future studies could examine whether resource endowments can affect the integration strategies of acquiring firms leading to creative outcomes after acquisitions. Target firms that were allowed autonomy or hybrid forms might sustain their capabilities after integration processes, making it easier for acquiring firms to learn (Graebner, 2004; Paruchuri, Nerkar, & Hambrick, 2006). Research could examine whether technological game developing capabilities would be easier for firms to learn through acquisition.

6.0 Conclusions

In this study, empirical evidence supports that resource endowments at market entry might be more important than exogenous imprinting for creative performance. We also show that resource endowments have lasting effects on future firm choices in ongoing investments. Depending on whether firms' resource endowments are focused on innovation or commercialization, it can influence the effectiveness of investing in resources and capabilities. Perhaps the advice to entrepreneurs and managers should be about the implications of firms' origins for future investments and firm outcomes.

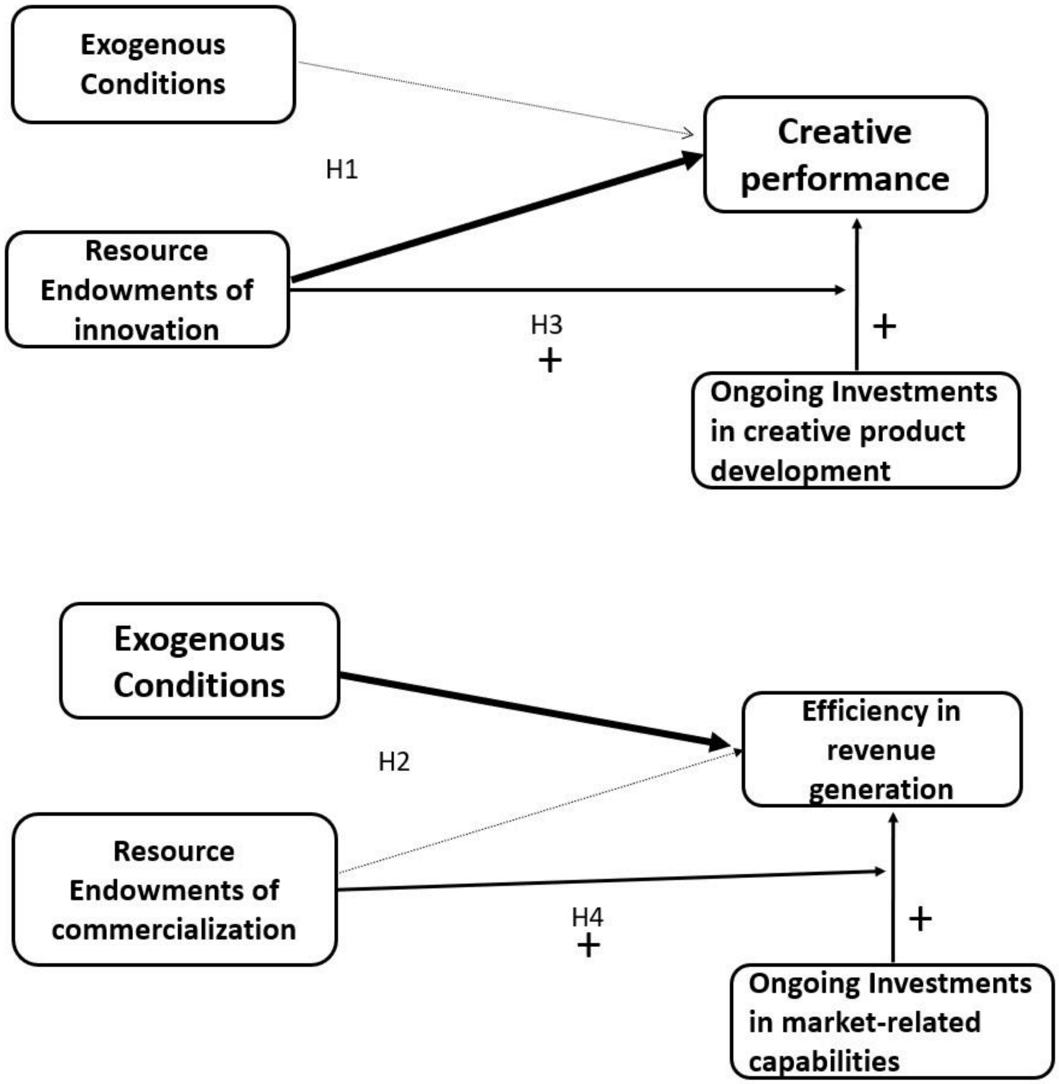

Figure 1 Theoretical model

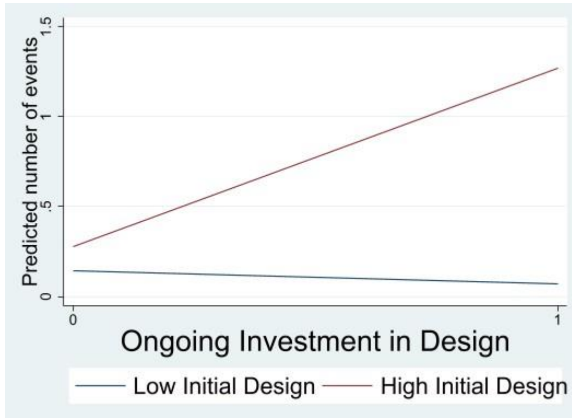

Figure 2Average marginal effects of the interaction of high emphasis in design at market entry and the ongoing investments in design on creative performance

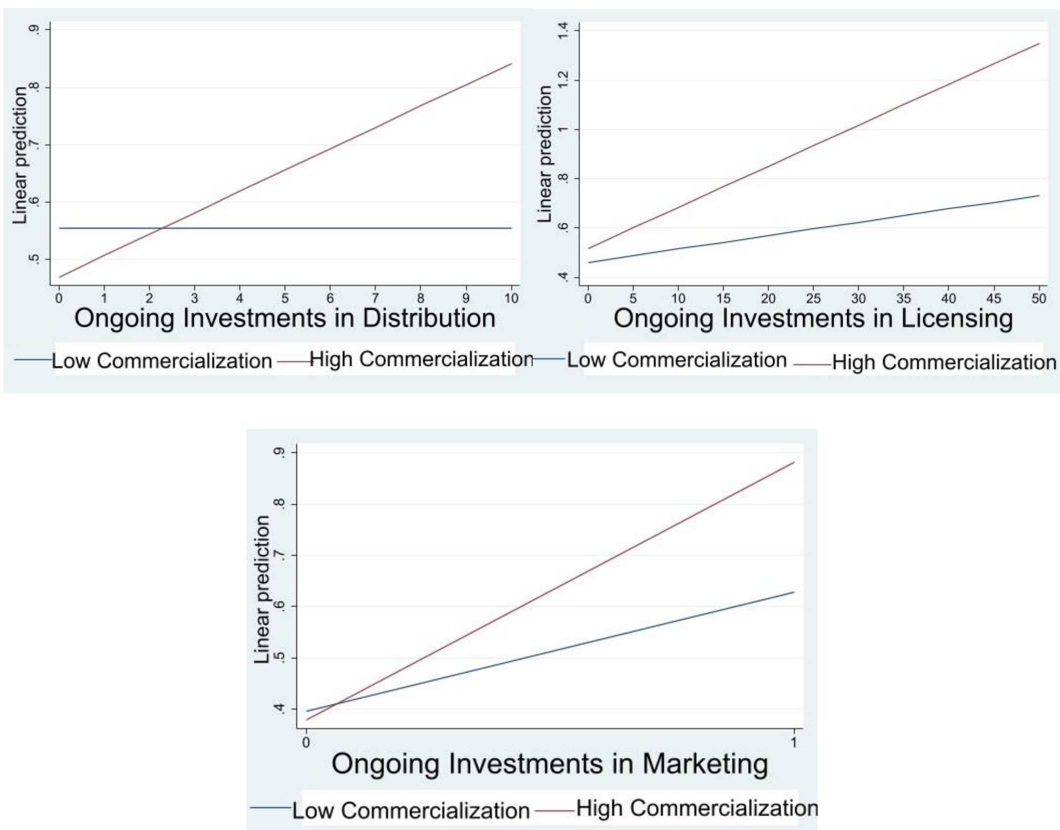

Figure 3 Average marginal effects of the interaction of resource endowments of commercialization and the ongoing investments in market-related capabilities on efficiency in revenue generation

Table 1a Summary statistics

	Explanatory variables	Definition	Obs.	Mean	S.D.	Min	Max
(1)	Creative performance	Number of awards cumulated over t, t+1, t+2	5030	1.93	11.74	0	302
(2)	Efficiency in revenue generation	Increase in sales divided by increase in number of new products (lagged and logged)	3775	.36	1.37	-7.13	10.32
(3)	Resource endowments of commercialization	Ratio of games published at t=0	3297	.00	.67	-1	1
(4)	Resource endowments of innovation	Ratio of games developed at t=0	3297	.00	.67	-1	1
(5)	Ongoing investment in design	Dummy=1 if a game design team is included in credits	5030	.11	.31	0	1
(6)	Ongoing investment in art	Dummy=1 if an art team is included in credits	5030	.41	.34	0	1
(7)	Ongoing investment in tech	Dummy=1 if a technology team is included in credits	5030	.11	.31	0	1
(8)	Ongoing investment in distribution	Number of platforms a firm has published	5030	2.71	4.04	0	14
(9)	Ongoing investment in licensing	Increase in number of products that were based on license deal	3533	-.03	2.99	-8	7
(10)	Ongoing investment in marketing	Dummy=1 if a game has received a critic score	5030	.22	.42	0	1
(11)	R&D intensity	Investment of R&D as a percentage of sales	5030	.84	1.93	-6.90	6.87
(12)	Firm age	Number of years since firm founding	5030	12.12	9.89	1	71
(13)	New games published	Number of games published at time t (logged)	5030	.95	1.57	0	7.67
(14)	New games developed	Number of games developed at time t (logged)	5030	.77	1.29	0	6.88
(15)	Add-on products	Number of add-ons and DLCs at time t (logged)	5030	.32	.98	0	7.60
(16)	Estimated probability of introducing games	Inverse Mill’s ratio from first stage	5030	-13.76	7.68	-22.56	0
(17)	Online publishing	Dummy=1 if year >2008	5030	.54	.49	0	1

Table 1b Summary statistics (continued)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Creative performance	1.00									
(2) Efficiency in revenue generation	0.13***	1.00								
(3) Commercialization resource endowments	-0.04**	0.08***	1.00							
(4) Innovation resource endowments	0.04**	-0.08***	-1.00***	1.00						
(5) Ongoing investment design	0.14***	-0.03*	-0.20***	0.20***	1.00					
(6) Ongoing investment art	-0.05***	-0.06***	-0.18***	0.18***	0.58***	1.00				
(7) Ongoing investment tech	-0.05***	-0.05***	-0.17***	0.17***	0.72***	0.72***	1.00			
(8) Ongoing investment distribution	0.18***	0.17***	0.01	-0.01	-0.01	-0.06***	-0.03**	1.00		
(9) Ongoing investment licensing	-0.03*	0.05***	-0.01	0.01	0.03*	-0.01	-0.01	0.01	1.00	
(10) Ongoing investment marketing	0.28***	0.19***	-0.14***	0.14***	0.11***	-0.01	-0.01	0.58***	0.05***	1.00
(11) R&D intensity	0.19***	0.35***	0.06***	-0.06***	-0.06***	-0.10***	-0.09***	0.26***	0.01	0.18***
(12) Firm age	0.43***	0.19***	0.01	-0.01	0.05***	-0.11***	-0.12***	0.29***	0.02	0.28***
(13) New games published	0.39***	0.27***	0.09***	-0.09***	0.03**	-0.11***	-0.08***	0.80***	0.06***	0.59***
(14) New games developed	0.45***	0.21***	-0.11***	0.11***	0.08***	-0.05***	-0.04***	0.72***	0.09***	0.69***
(15) Add-on products	0.44***	0.23***	-0.01	0.01	0.02	-0.08***	-0.05***	0.59***	0.02	0.41***
(16) Estimated probability of introducing games	-0.06***	0.18***	-0.03*	0.03*	-0.24***	-0.17***	-0.23***	-0.28***	0.01	-0.24***
(17) Online publishing	0.02	0.02	-0.03	0.03	-0.09***	0.01	-0.02*	-0.10***	-0.03*	-0.30***

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(11) R&D intensity	1.00						
(12) Firm age	0.27***	1.00					
(13) New games published	0.31***	0.39***	1.00				
(14) New games developed	0.27***	0.41***	0.79***	1.00			
(15) Add-on products	0.31***	0.44***	0.70***	0.58***	1.00		
(16) Estimated probability of introducing games	-0.21***	-0.04***	-0.29***	-0.28***	-0.13***	1.00	
(17) Online publishing	-0.05***	0.21***	-0.15***	-0.16***	0.09***	0.46***	1.00

Table 2 H1&2: Effect of resource endowments and imprinting on firm outcomes

Dependent variables	Creative performance		Efficiency in revenue generation		Creative performance (N=3297)		Efficiency in revenue generation (N=3165)	
Model	Negative binomial regression[a]		GLS RE		Dominance Analysis[b]			
Explanatory variables	Model 1	Model 2	Model 3	Model 4	Dominance Statistics (Log-Likelihood)	Ranking	Dominance Statistics (R^2)	Ranking
Resource endowments of innovation (t=0)		0.40^{+}			-381.11	6		
		(0.21)			(0.130)			
Resource endowments of commercialization (t=0)				0.05			0.000	9
				(0.06)			(0.00)	
Exogenous Shock Imprinting		0.41		0.21^{*}	-386.33	8	0.006	7
		(0.37)		(0.09)	(0.132)		(0.01)	
R&D intensity	0.13^{***}	0.14^{***}	0.18^{***}	0.19^{***}	-362.57	5	0.252	1
	(0.04)	(0.04)	(0.03)	(0.03)	(0.124)		(0.65)	
Firm age	0.05^{***}	0.07^{***}	0.01	0.02^{*}	-277.54	3	0.040	2
	(0.01)	(0.02)	(0.01)	(0.01)	(0.095)		(0.10)	
New games published	0.59^{***}	0.58^{***}	0.12^{**}	0.11^{**}	-171.05	1	0.020	5
	(0.11)	(0.10)	(0.04)	(0.04)	(0.058)		(0.05)	
New games developed	0.44^{***}	0.32^{**}	0.01	0.07^{+}	-248.68	2	0.006	6
	(0.11)	(0.12)	(0.04)	(0.04)	(0.085)		(0.01)	
Add-on products	0.11	0.12	0.01	-0.05	-312.51	4	0.034	3
	(0.11)	(0.10)	(0.07)	(0.07)	(0.107)		(0.08)	
Prob of introducing a game	-0.09^{***}	0.04	0.10^{**}	0.11^{***}	-387.60	9	0.021	4
	(0.03)	(0.04)	(0.03)	(0.03)	(0.133)		(0.05)	
Online publishing	-0.58^{+}	-0.78^{*}	-0.11	-0.20^{*}	-384.06	7	0.002	8
	(0.34)	(0.33)	(0.09)	(0.09)	(0.131)		(0.00)	
Constant	-5.33^{***}	-5.65^{***}	0.31^{**}	1.63^{**}				
	(0.49)	(0.61)	(0.11)	(0.53)				
χ^2	718.66	441.45	50.58	111.96				
R^2	0.29	0.20	0.14	0.17				
Log-Likelihood	-2,967	-2,700						
Observations	4663	3160	3644	3112				
Number of Firm Clusters	933	183	250	183				
Mean VIF	2.14	1.81	2.10	1.80				

[a]Standard errors in parentheses. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. [b]Dominance statistics is reported. Standard dominance statistics in parentheses.

Table 3 H3&4: Joint effect of resource endowments and ongoing investments on firm outcomes

Dependent variable			**Creative performance**				**Dependent variable**			**Efficiency in revenue generation**		
Model			**Negative Binomial Regression**				**Model**			**GLS RE**		
Explanatory variables	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**	**Explanatory variables**	**Model 11**	**Model 12**	**Model 13**	**Model 14**	**Model 15**
Resource endowments of innovation (t=0)	0.44*	0.37*	0.39*	0.38*	0.38*	0.38*	Resource endowments of commercialization (t=0)	0.05	-0.13*	0.05	-0.02	-0.14*
	(0.22)	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)		(0.06)	(0.07)	(0.06)	(0.05)	(0.06)
Emphasis on design (t=0)	0.68*	0.94**					Ongoing investment in distribution	-0.04*	-0.04*	-0.04*	-0.04*	-0.04*
	(0.34)	(0.36)						(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Emphasis on art (t=0)	-0.30	-0.52	-0.55	-0.52	-0.53	-0.51	Ongoing investment in licensing	0.02	0.02	0.02	0.02	0.02
	(0.62)	(0.62)	(0.62)	(0.61)	(0.61)	(0.60)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Emphasis on tech (t=0)	-0.31	-0.53	-0.10	-0.14	-0.14	-0.08	Ongoing investment in marketing	0.21*	0.20*	0.20*	0.24**	0.21*
	(0.58)	(0.58)	(0.66)	(0.66)	(0.66)	(0.66)		(0.08)	(0.08)	(0.08)	(0.09)	(0.09)
Ongoing investment in design		0.40	0.32	0.41	0.40	0.23	Resource endowments(t=0) × Ongoing distribution		0.05*			0.05*
		(0.29)	(0.31)	(0.29)	(0.28)	(0.34)			(0.02)			(0.02)
Ongoing investment in art		0.17	0.10	0.13	0.11	0.18	Resource endowments(t=0) × Ongoing licensing			0.04^{+}		0.03^{+}
		(0.29)	(0.29)	(0.33)	(0.28)	(0.35)				(0.02)		(0.02)
Ongoing investment in tech		0.80*	0.78*	0.78^{+}	0.78^{+}	0.83^{+}	Resource endowments(t=0) × Ongoing marketing				0.28^{+}	0.09
		(0.40)	(0.40)	(0.40)	(0.43)	(0.47)					(0.15)	(0.14)
High emphasis on design (t=0)			0.42	0.60	0.57	0.50						
			(0.45)	(0.44)	(0.45)	(0.45)						
High emphasis on design (t=0) × Ongoing design			0.42			1.23*						
			(0.35)			(0.58)						
High emphasis on design (t=0) × Ongoing art				-0.12		-0.67						
				(0.41)		(0.50)						
High emphasis on design (t=0) × Ongoing tech					-0.00	-0.50						
					(0.37)	(0.53)						
R&D intensity	0.13**	0.14**	0.13**	0.13**	0.13**	0.14***	R&D intensity	0.19***	0.19***	0.19***	0.19***	0.19***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Firm age	0.06***	0.05***	0.04**	0.04**	0.04**	0.04**	Firm age	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
New games published	0.57***	0.56***	0.57***	0.57***	0.57***	0.61***	New games published	0.17***	0.15**	0.17***	0.16***	0.15**
	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.11)		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
New games developed	0.30**	0.29**	0.14	0.14	0.14	0.09	New games developed	0.05	0.06	0.05	0.05	0.06
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Add-on products	0.15	0.18^{+}	0.05	0.04	0.04	0.04	Add-on products	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Prob of introducing a game	0.04	0.02	0.03	0.03	0.03	0.03	Prob of introducing the game	0.10**	0.10**	0.10**	0.10**	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Online publishing	-0.60^{+}	-0.60^{+}	-0.50	-0.48	-0.49	-0.55^{+}	Online publishing	-0.08	-0.09	-0.08	-0.09	-0.09
	(0.31)	(0.35)	(0.33)	(0.33)	(0.33)	(0.33)		(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Constant	-2.67***	-2.67***	-2.71***	-2.72***	-2.71***	-2.90***	Constant	1.57**	1.63**	1.57**	1.59**	1.62**
	(0.73)	(0.73)	(0.68)	(0.67)	(0.67)	(0.67)		(0.55)	(0.55)	(0.55)	(0.54)	(0.54)
χ^2	378.14	399.11	445.15	388.21	415.35	559.30		142.02	151.19	175.66	156.84	183.90
R^2	0.16	0.17	0.17	0.17	0.17	0.17		0.19	0.19	0.19	0.20	0.20
Log-likelihood	-2,609	-2,577	-2,580	-2,581	-2,581	-2,578						
Observations	4,663	3,160	3,160	3,160	3,160	3,160		3,160	3,112	2,927	2,927	2,927
Number of firm clusters	183	183	183	183	183	183		183	183	183	183	183
Mean VIF	2.08	2.28	2.48	2.49	2.48	2.51		2.17	2.16	2.21	2.19	2.25

Appendix A Robustness checks and Supplemental Analysis

Our sample included all firms in industries that have existing capabilities relevant for the video game industry as well as the *de-novo* video game entrants(Kanode & Haddad, 2009). This approach allowed us to control for sample selection bias and the endogeneity of releasing a videogame at any given year in our study period. In addition, doing acquisitions is also an endogenous decision. Doing acquisitions and the subsequent performance of firms can be driven by unobservable firm characteristics. Therefore, both endogeneity concerns need to be tackled before the main analysis. The two first-stage models yielded a probability of releasing a game and a probability of acquisition. In the second stage, we included the probability of releasing a game in all the models as a control. We included the probability of doing an acquisition only in the second-stage estimations that were related to Hypotheses 3 and 4.

Self-selecting to release video games. Our sample of firms in the video game industry includes both *de novo* firms and established software companies. It could be that the underlying reasons why firms self-select into the video game industry also derive the performance outcomes as well as their initial resource positions in this industry. Firms that develop or publish a game might be systematically different from firms that do not. So, we estimated the probability of releasing a video game in a given year as the first stage of estimation and used this predicted probability to control for the endogeneity of self-selecting into releasing at least one video game in year *t*.

To estimate the predicted probabilities of releasing games, we have added variables that might affect the likelihood of developing or publishing games in the estimation. We analyzed the business descriptions of well-known video game companies and compared them to other software companies. We found that video game companies often use the word “develop” and “market” to describe their businesses. Therefore, we used a dummy variable that represents firms with business descriptions that involve those two words.

Industry life cycle might have an impact on firms' choice of developing a video game (Balland et al., 2013; Carroll, Bigelow, Seidel, & Tsai, 1996). Industries in the growth stage might offer more economies of scale than new industries and thus support the development of more games. Starting from 1972 to 1981 as Generation 1, there are eight generations in the video game industry (Balland et al., 2013). Among the eight different generations, we added firms found in Generation 4 as dummy variables when there was the greatest number of firms competing in the industry. Firms that are based in cities where many video game companies are present might have a knowledge spillover effect. They might find it easier to find quality human resources in cities with a better pool of human capital. The top-10 cities known to have a high number of video game companies were added as a dummy variable (Bay, 2018). Lastly, the country in which firms are found might affect the probability of releasing games. Therefore, we added the three countries, the U.S., Japan, and Germany, that had the highest number of video game firms. The first-stage equation for estimating the probability of releasing (developing or publishing) a game follows.

Model 1 in Table A1 represents the first-stage model of releasing a game. Assets had a significant impact on increasing the probability of releasing a game. On average, a unit increase of assets increases the odds of releasing a game a factor of 1.43 ($e^{0.36}$). Debt-to-equity was also positive and significant. On average, a unit increase of debt-to-equity increases the odds of developing a game by a factor of 1.37 ($e^{0.32}$). Business description dummy was also significant in increasing the probability of releasing a video game. Their business description increased the odds of releasing a video game by a factor of 3.49 ($e^{1.25}$). Being founded in a different generation had significantly affected the probability of releasing a game. Compared to other generations, firms founded in Generation 4 had decreased odds of releasing a game by a factor of 0.25 ($e^{-1.36}$). We predicted that operating in countries that have the highest number of firms might have an effect. We confirm that operating in the USA had a negative effect, decreasing the odds of releasing a game by a factor of 0.01 ($e^{-4.42}$). Operating in a big city did not have any significant impact.

Endogenous decision to make acquisitions. Similarly, firms that choose to pursue acquisition might be systematically different from firms that do not pursue acquisitions, and this systematic difference might also be driving differences in performance. The first-stage estimation includes covariates that are likely to determine the probability of acquiring a firm in the video game industry. Based on the extant literature, we included firm size, measured by the number of employees, and profitability, measured by lagged return on assets (ROA) (Arikan & Capron, 2010). Firms that had acquisition deals in the past might be more likely to pursue acquisitions in the future (A. M. Arikan & McGahan, 2010; Haleblian, Devers, McNamara, Carpenter, & Davison, 2009). We added prior acquisition experience to the estimation. Also, firms based in cities that have more video game companies might be more likely to pursue acquisitions with the increased availability of target studios. The top 10 cities known to have clusters of video game companies were added as dummy variables (Bay, 2018). Lastly, in the years between 1995 and 2008, the global number of acquisitions in the video game industry surged. Thus, we added an indicator variable that takes the value of 1 if the year is in the period between 1995 to 2008 and 0 otherwise.

The results are presented in Appendix Table 1. The first stage is represented in the Model 2 column. As expected, on average, a one-unit increase in M&A experience increases the odds of pursuing an acquisition deal by a factor of 1.04 ($e^{0.04}$). The acquisition boom years had a positive impact on the probability of acquisition. Firms were more likely to proceed to an acquisition by a factor of 1.19 ($e^{0.18}$) between 1995 and 2008. Firm size was a positive and significant predictor. A one-unit increase in firm size increased the odds of pursuing acquisitions by a factor of 1.02 ($e^{0.02}$). Lastly, being based in a city with a larger number of video game companies increased firms' likelihood of acquiring by a factor of 3.28 ($e^{1.19}$).

Appendix A.1 Supplemental Analyses

Some firms in our study tried to pursue both types of activities at the same time during the early stages. The literature on ambidextrous organizations suggests that pursuing both exploitation and exploration results in better performance than focusing on one strategy (Tushman & O'Reilly, 1996). To address this issue, we made dummy variables for firms that only pursued developing, only pursued publishing, and pursued both. Appendix Table 2 shows the results of the analysis. Firms that pursued both product development and market-related capabilities had no significant relationship with creative performance or sales performance. The results indicate that at least in the creative industry, firms trying to pursue ambidexterity (O'Reilly & Tushman, 2008; Tushman & O'Reilly, 1996) in the founding stages did not have higher firm performance. The results of this analysis suggest that in creative industries such as the video game industry, firms are better by emphasizing either creative product development or market-related capabilities, but not both at the same time.

Appendix Table 1 First-stage Heckman selection model for firm endogeneity

Dependent variable	Probability of releasing a game
Model	**LOGIT**
Explanatory variables	**Model 1**
Total asset	0.36***
	(0.06)
Debt to equity	0.32***
	(0.09)
Business description with capabilities related to the video game industry	1.25***
	(0.23)
Spillover in Top 10 cities with video-game firms (yes=1)	-0.95
	(0.51)
Gen 1	12.78***
	(0.78)
Gen 4	-1.36
	(0.81)
USA	-4.42***
	(0.64)
Japan	-0.44
	(0.59)
Germany	0.76
	(0.53)
Constant	-16.22***
	(0.46)
χ^2	359.38
Log-Likelihood	-1,392
Number of Observations	20,084
Number of Firm Clusters	1,924
Mean VIF	1.20

Standard errors in parentheses
$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Appendix Table 2 Supplemental analysis: effect of initial resource position on ambidextrous firm performance

Dependent variable	Creative performance		Sales performance	
Model	Negative binomial regression		GLS RE	
Explanatory variables	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Both at founding		0.66		-0.09
		(0.35)		(0.11)
Only developing at founding		1.55^{**}		
		(0.53)		
Only publishing at founding				0.23
				(0.15)
R&D intensity	0.06	0.04	0.04^{***}	0.04^{***}
	(0.05)	(0.05)	(0.01)	(0.01)
Firm age	0.06^{***}	0.06^{***}	0.00^{+}	0.00^{+}
	(0.01)	(0.01)	(0.00)	(0.00)
New games published	1.00^{***}	1.03^{***}	0.16^{***}	0.13^{**}
	(0.12)	(0.13)	(0.05)	(0.05)
New games developed	0.49^{***}	0.72^{***}	0.06	0.08^{+}
	(0.15)	(0.18)	(0.04)	(0.04)
Add-on products	-0.07	-0.18	0.07	0.08
	(0.13)	(0.13)	(0.07)	(0.07)
Prob of releasing a game	0.20^{**}	-0.00	0.02^{**}	0.02^{**}
	(0.07)	(0.02)	(0.01)	(0.01)
Online publishing	-0.66^{+}	-0.54	-0.04	-0.04
	(0.34)	(0.36)	(0.02)	(0.02)
Constant	-5.15^{***}	-5.40^{***}	0.82^{***}	2.73^{***}
	(0.46)	(0.51)	(0.21)	(0.53)
χ^2	718.66	711.18	50.58	54.46
R^2	0.29	0.30	0.14	0.15
Log-likelihood	-2,967	-2,904		
Observations	20,024	20,024	20,024	20,024
Number of firm clusters	1,924	1,924	1,924	1,924
Mean VIF	2.09	1.91	2.10	1.87

Standard errors in parentheses
$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

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