

**Managing Relationships with a Platform:  
An Empirical Study of Publishers' e-Book Offerings on Amazon Kindle**

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March 27, 2018

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Keywords: interorganizational relationships, product offering decision, complementors,  
value creation and appropriation, book publishing

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**Abstract**

Tension between value creation and value appropriation can arise when firms form relationships with a platform. While creating value collectively, these relationships strengthen the network effects which increase the platform's ability to appropriate value. This shift in bargaining position could restrain cooperation between the firms and the platform, thereby diminishing joint value creation. We analyze e-book data to study product offerings as a strategic mechanism that publishers use when managing relationships with Amazon Kindle. We find that publishers make product offering choices that increase value creation while alleviate appropriation risks. Compared to small publishers, large publishers make product decisions that are more protective of their own interests and less conducive to Kindle's success. We discuss our findings in relation to theory and future research.

## INTRODUCTION

Platforms facilitate transactions between distinct groups of customers (Hagiu 2014). For example, Apple's iTunes platform facilitates transactions between music record labels and listeners; Amazon's Kindle platform facilitates transactions between book publishers and readers. The platform business model is characterized by the cross-side network effects (Caillaud and Jullien, 2003) – the more sellers (buyers) on the platform, the more attractive the platform is to buyers (sellers), which in turn attracts even more sellers (buyers) to the platform. When a seller participates on a platform they create value together (Ceccagnoli et al., 2012; Huang et al., 2013; Wen and Zhu, 2017). However, by joining the platform the seller strengthens the network effects which increase the platform's bargaining power to appropriate value (MacDonald and Ryall, 2004). Recognizing this tension between value creation and value appropriation, the seller may limit its participation on the platform.

To see an example we turn to the music industry. In November 2014 Big Machine Records – the label company that represents music artists such as Taylor Swift and Tim McGraw – pulled all the songs by Taylor Swift from the music platform Spotify where her songs have been streamed by more than 16 million listeners in the prior month. Losing Taylor Swift could reduce Spotify's attractiveness to the listeners. As Spotify made repeated pleas to the label, Big Machine Records attributed the withdrawal decision to incompatibility in business models between the platform and the label company. Ironically (or perhaps strategically), Big Machine Records continued to offer the songs by Tim McGraw on Spotify.

The Big Machine Records and Spotify example suggests that sellers leverage product offerings as a strategic mechanism to manage their relationships with platforms. As sellers participate on a platform they selectively choose what products to offer and what products to

withhold, while taking into account the value creation and value appropriation potentials.

However, the literature has yet to develop a theory on such product offering mechanism. In order to develop the theory, important questions – such as the types of products to offer and withhold, and the decision heterogeneity across sellers – need to be addressed.

In this paper, we conduct a systematic empirical examination of the product offering mechanism to lay the groundwork for future theory development. We collect and analyze data on book publishers' engagement with Amazon's Kindle during the formative years of the platform. We evaluate the publishers' product offering decisions by comparing their portfolios on the Kindle platform and those in the printed book channel. Guided by theories on value creation-appropriation and network effects, we focus our analyses on three types of products: (1) high demand products that could create substantial value, (2) competitive products that could strengthen the network effects, and (3) important products that generate most revenues for the sellers and thus could be most exposed to the value appropriation risks. We also compare the product offering decisions between the large and the small publishers, because they might face different extent of the value creation-appropriation tension.

Our results show that publishers that participate on Kindle (the joiners) offer only about half of their printed book portfolios in their e-book portfolios, a clear indication that product decisions for Kindle e-books are distinct from those for printed books. Additional analyses show that larger joiners offer smaller proportions of their printed books portfolios as e-books. Specifically, the large joiners are less likely than the small joiners to offer their competitive products, and they tend to withhold their top-revenue products from Kindle while small joiners do not. These decisions by the large joiners could hinder the development of the platform's network effects. Yet, both large and small joiners offer their high-demand products on Kindle, a

decision that helps publishers create more values through savings in variable costs. The key implication from these empirical patterns is that although both large and small publishers take advantage of the efficiencies created by Kindle, compared to the small publishers, the large publishers make product decisions that are more protective of their own interests and less conducive to Kindle's success. Taken together, our findings support the notion that firms use product offerings as a strategic mechanism to manage their relationships with platforms.

This study contributes to several areas of strategy research. First, we highlight that firms use product offerings as a strategic mechanism to manage interorganizational relationships with platforms. Our findings demonstrate how product assortment strategy enables the firm to balance value creation benefits and value appropriation risks, thus laying the groundwork for future theory development. Second, we extend the research on competitive dynamics between a platform and its complementors. Whereas prior work (e.g., Iansiti and Levien, 2004; Gawer and Henderson, 2007; Huang et al. 2013; Zhu and Liu, 2016; Wen and Zhu, 2017; Parker and Van Alstyne, 2017) tends to study situations in which the platform has considerable power over individual complementors (McIntyre and Srinivasan, 2017), our findings show that value creation activities between the platform and the complementors might stall when both parties have comparable bargaining powers over the value they jointly create (Brandenburger and Stuart, 1996). Third, our study connects the two broad strategy literature streams of interorganizational relationships and platforms. By focusing on the network effects (Katz and Shapiro, 1994; Rochet and Tirole, 2003; Eisenmann et al., 2006; Boudreau and Hagiu, 2009) as the source of value appropriation power, our study expands the extant interorganizational relationships literature that tends to emphasize value appropriation hazards that stem from relation-specific investments (e.g., Williamson, 1985) or knowledge transfers (e.g., Khanna et

al., 1998; Ceccagnoli et al. 2012). Finally, we contribute to the growing empirical research on the impact of digital technology on information products such as music (e.g., Waldfogel, 2012), television (e.g., Waldfogel, 2009), movies (e.g., Waldfogel, 2016), blogs (e.g., Sun and Zhu, 2013), and newspapers (e.g., Seamans and Zhu, 2014). Given the historical and continuing importance of book publishing, our study adds to the relatively scarce literature on how this industry manage the challenges in the digital age (Waldfogel and Reimers, 2015; Chen et al., 2017).

## **MANAGING RELATIONSHIPS WITH PLATFORMS THROUGH PRODUCT OFFERINGS**

### **Value Creation and Value Appropriation in Interorganizational Relationships**

How firms create and appropriate value is a central question in strategy research (Brandenburger and Stuart, 1996). Firms can create value through interorganizational relationships if the resources of each partner are more valuable when working together than in isolation (Doz and Hamel, 1998). These relationships are particularly important when the firms' resources are complementary – i.e., a firm's ability to create value from its resources requires that the resources be utilized in conjunction with the resources of another firm (Dyer and Singh, 1998). For example, book publishers need the complementary resources of retail channels to reach consumers. Likewise, book retailers need the supply from publishers.

In order to profit from interorganizational relationships, a firm must also be able to appropriate the value it helps to create (Dyer et al., 2008). Prior research argues that the amount of value a firm can appropriate is determined by the scarcity of the resource the firm brings to the relationship (Pfeffer and Salanick, 1978; Collis and Montgomery, 1998). The greater the scarcity of the firm's resource, the greater the proportion of the value the firm can appropriate.

Value appropriation is also determined by the industry structure, according to the research on value-based strategy and co-opetition (Brandenburger and Stuart, 1996). Theoretical models show that value capture by a firm decreases with the number of competitors (MacDonald and Ryall, 2004). Accordingly, in an interorganizational relationship the firm that is in the more concentrated industry can appropriate the greater portion of the joint value created.

### **Value Creation-Appropriation Tension and Network Effects**

Strategic tensions can arise in relationships when value creation and value appropriation are interdependent (e.g., Williamson, 1985; Khanna et al., 1998; Katila et al., 2008). Consider the case where by investing into a relationship the firm strengthens the bargaining power of the partner, thereby reducing the value the firm can appropriate. Foreseeing this shift in bargaining power, the firm might become wary of the relationship.

The value creation-appropriation tension can be salient in relationships between firms and a platform. Whereas recent research has examined the threat of entry by the platform into the firms' product spaces as the value appropriation mechanism (e.g., Ceccagnoli et al., 2012; Zhu and Liu, 2016; Wen and Zhu, 2017), we focus on another important mechanism – the network effects that characterize the platform business model (Katz and Shapiro, 1994; Rochet and Tirole, 2006) – as the source of the tension. When a firm participates on a platform the firm strengthens the platform's network effects, which could weaken the firm's value appropriation ability vis-à-vis the platform. This is because network effects help platforms achieve increasing return to scale (Eisenmann et al., 2006) and economies of scale (Hagiu, 2007), both of which strengthen with platform size and can increase industry concentration (Bain, 1954; Sun and Tse, 2007).

In situations where a platform connects sellers to buyers, network effects enable the platform to outcompete the non-platform sales channels and erode the latter's market shares. For example, Apple's iTunes platform has substantially eroded the market share of music sales through the compact disc retail channel. Therefore, by reshaping the industry structure in a manner that increases industry concentration, network effects could generate for a platform substantial value appropriation power (MacDonald and Ryall, 2004).

Recognizing this potential outcome of the network effects, firms might see relationships with a platform as a double-edged sword. On the one hand, the platform offers the firms a value creation opportunity: through the platform the firms could reach more buyers and economize variable costs related to logistics. On the other hand, by joining the platform the firms strengthen the platform's network effects, which in turn strengthens the platform's bargaining position to appropriate value. As a result, we expect firms might become wary of the relationship and restrain their cooperation with the platform.

We further expect that the tension could be more acute for larger firms than for smaller firms. This is because while the cost savings in efficiency improvements is greater for larger firms due to their larger sales volumes, the larger firms also strengthen the network effects more because their resources are more able to attract buyers to the platform. Therefore, larger firms have greater motivation than smaller firms to strategically manage their relationships with platforms.

At the limit, a firm might even eschew interorganizational relationship with a platform. Should this happen, the firm would forgo the opportunity to create value with the platform. Alternatively, as we argue below, firms might opt to engage with the platform strategically by

balancing the value creation potentials and value appropriation risks associated with the network effects.

### **Product Offerings on Platforms**

Anecdotal evidence such as the Big Machine Records and Spotify example suggests that firms leverage product offerings as a strategic mechanism to manage their relationships with platforms. This gives rise to our central idea that when firms participate on a platform they strategically choose what products to offer and what products to withhold, while taking into account the value creation and value appropriation potentials. However, because prior research has yet to develop the theory of sellers' product strategy on a platform, we adopt an exploratory approach and use the value creation-appropriation and network effects theories as we discussed earlier to guide our empirical effort. The theories lead us to focus on the following three product characteristics – product demand, product competitiveness, and product importance to the seller. Our goal is to document the sellers' decisions based on these product characteristics and interpret our results as providing evidence for product offering as a strategic mechanism.

#### *Product Demand*

Firms participate on a platform with the intent to create more value. Platforms can help firms to enhance value creation by lowering the logistics costs associated with each transaction (Hagiu 2007). Because total marginal costs savings increase with transaction volume, firms benefit more from offering high-demand products than lower volume niche products (Elberse, 2008; Hagiu and Wright, 2015). For this reason, sellers would be motivated to offer their high-demand products on the platform. However, offering high-demand products may attract more buyers to

the platform, and thus enhance the platform's network effects that could diminish the seller's ability to appropriate the value created.

In light of this tradeoff, whether or not sellers offer their high-demand product becomes an empirical question. If sellers do not offer their high-demand products, they gain less from the value creation potential but they might constrain the platform's value appropriation power. Conversely, should sellers decide to harness the platform's value creation potential by offering the high-demand products, they might try to limit the platform's bargaining power through other product decisions.

### *Product Competitiveness*

Whereas sellers use their competitive products to rival each other, when sellers offer their competitive products on a platform they add to the platform's network effects. This is because, to the extent that product competitiveness is a result of product quality, it can influence the buyers' willingness to participate on the platform.

A case in point is the fall of Atari – the once dominant video game console in the 1980's – when opportunistic game developers flooded the platform with low-quality games that drove gamers to abandon the platform (Hagiu, 2014). The main cause of Atari's demise was not the lack of games, but the large proportion of low quality products on the platform.

Therefore, it is conceivable that sellers use their competitive products as a leverage to promote or suppress the development of the platform's network effects. In particular, sellers that are concerned about the platform's value appropriation power might withhold their competitive products. Conversely, sellers that see the platform as an important value creation opportunity could help the platform succeed by offering their competitive products.

### *Product Importance to the Seller*

Apart from influencing the platform's network effects, sellers can also look internally to safeguard their products from appropriation by the platform. We expect this defensive strategy would be more applicable to the products that are most important to the sellers. In particular, sellers could be most harmed when the products that generate the most revenues for them are exposed to appropriation risks from the platform. Therefore, evidence on the withholding of the most important products is an indication of strategic decision by the sellers.

Product importance could be central to the seller's product strategy for another reason. Analogous to our earlier argument on product competitiveness, to the extent that the revenue share of a product to a seller corresponds to product quality, the decision by the seller to withhold the important products could also represent a lever that could affect the platform's network effects.

In addition to the preceding arguments, one might also expect the seller's outside options could influence the product offering decisions on platforms. For example, the existence of alternative sales channels might cause the seller to consider any cross-channel cannibalization effects. We comment further on this in the discussion section.

## **EMPIRICAL CONTEXT**

We empirically examine product offering decisions by publishers on the Amazon Kindle e-book platform.

## **e-Books**

The first e-book was created on July 4 1971 when a freshman at the University of Illinois typed the U.S. Declaration of Independence on a mainframe computer. Since then, advances in technology have enabled commercial intermediaries to facilitate digital transactions of e-books between publishers and consumers. Firms began investing in digitizing books and developed dedicated e-book reading devices. An example of a commercial e-book pioneer is Gemstar ebook, owned by Gemstar-TV Guide International, which in 2000 launched its e-book reading devices along with two e-books. With demand far below expectation, Gemstar ebook ceased operations in 2003. Other notable companies that ventured into e-books around that time include Adobe, Microsoft, Palm, and Sony.<sup>1</sup>

E-books have lower cost than printed books (Waldfogel and Reimers, 2015). Table 1 presents typical cost breakdowns by book types. The average costs of a printed book and an e-book are roughly \$9 and \$3, respectively. E-books also have lower marginal costs than printed books. Assuming that we can categorize royalty, printing, storage, and shipping as marginal costs while design, digitizing, typesetting, and editing as fixed costs, the marginal costs of a printed book and an e-book are about \$7 and \$2, respectively. The marginal cost difference gives the e-book format cost advantage over the printed book format. In particular, when the sales quantity is large, the e-book's marginal cost advantage would generate substantial variable cost savings for the publishers.

[Insert Table 1 here.]

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<sup>1</sup> See Lebert (2009) for a history of e-books.

## **Amazon Kindle**

Founded in 1994, Amazon began as an online bookstore selling printed books and shipping them by mail to customers. In 2007 Amazon introduced its own e-book reading device, named Kindle, and began selling e-books that are digitized in a Kindle-propriety format. The Kindle platform connects publishers and readers. Publishers digitize their books using software tools provided by Amazon and sell the digitized contents on the platform. Readers purchase e-books from the Kindle Store and download the digital contents to their Kindle devices. In 2015, Kindle has become the dominant e-book platform with 74 percent share of the U.S. e-book market.<sup>2</sup>

Kindle's business model has features of both a platform and a reseller (Hagiu, 2007). Under Kindle's pricing policy, the publisher of an e-book sets a suggested retail price (SRP) that must be consistent with the SRP the publisher provides to other retail channels. Notwithstanding the SRP, Amazon retains sole and complete discretion to set the final price. Such extent of control over pricing that Amazon maintains make Kindle more similar to a reseller than a platform. Still, network effects are essential to Kindle's success – the more publishers (readers) there are on Kindle, the more attractive is Kindle to the readers (publishers). Therefore, Kindle has the defining characteristics of a platform.

## **Publishers**

We focus on publishers of a particular type of books – travel guides – primarily for research design advantages. Travel guidebooks provide information that helps tourists to organize travel itineraries. A typical guidebook includes information such as accommodation, dining, transportation, and tourist attractions at a travel destination.

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<sup>2</sup> Source: Author Earnings (<http://authorearnings.com/report/october-2015-apple-bn-kobo-and-google-a-look-at-the-rest-of-the-ebook-market/>) [Last accessed on 2017-6-14]

The key research design advantage from focusing on travel guidebooks is the ease of defining and observing product categories based on destination countries. Typically, a travel guidebook has a specific destination location focus, which we can infer readily from the title (e.g., *Lonely Planet Italy* is a guidebook by Lonely Planet, and Italy is the destination country.)

Another research design advantage is that the product category demand generally corresponds to the number of tourists visiting the country. Thus, we can infer the publishers' demand expectations on each product category. In comparison, predicting the demand for fictions would be more difficult (Caves, 2000). As we discuss later, the product category definition also enables us to construct additional variables on other dimensions of product category characteristics, such as the competitive strength of a publisher in a product category and the financial importance of a product category to a publisher.

Finally, we seek a set of publishers that are active in both printed books and e-books. A meaningful number of travel guide publishers participate in both channels during our sample period. Focusing our analysis on this set of publishers facilitates within publisher comparisons of product offerings on the Kindle platform and those in the printed book channels.

## **DATA AND DESCRIPTIVE STATISTICS**

We collect e-book data from Amazon.com. The data covers the period from the Kindle launch in November 2007 to the end of 2013. We chose this sample period because we want to focus on the formative years of Kindle when the platform needed to develop the network effects necessary for success, and the book publishers still have non-trivial bargaining power vis-à-vis the platform. We also analyze data on printed books from Nielsen Bookscan, which contains book-

level information including the title, publisher, publish date, price, and sales revenues. The data on printed books spans the period between 2005 and 2013.

We identify 113 English language travel guide publishers that were active at the time of Kindle launch in 2007. We define a product category as a tourist destination country (e.g., Italy, France, China, etc.). Because some product categories have very little sales activity, we focus on product categories with aggregate industry-level printed book sales of over \$100,000 between 2005 and 2007. We also exclude the U.S. from our product category list, because publishers tend to treat U.S. as a distinct category. Travel guidebooks on the U.S. typically focus on a regional, state, city, or specific topic (e.g., New England, Florida, San Francisco, Disney World with kids). Focusing on non-U.S. destinations helps ensure the publishers' decisions are relatively comparable across the product categories. Our final dataset contains information on 19 publishers that joined the Kindle platform and their product decisions on 95 product categories.<sup>3</sup>

### **Publishers' Participation on Kindle**

In Table 2 we compare the publishers that joined Kindle (N=19) to those that did not (N=94).

The results in Panel A show that joiners tend to be substantially larger than non-joiners:

Publishers that joined Kindle had greater revenue from printed book sales than those that did not (\$20.7M versus \$1.2M, p-val=0.008). Also, the joiners had more product categories in their printed book portfolios than the non-joiners (58 versus 13 countries, p-val=0.000).

Among the 19 joiners, the early joiners tend to be larger in terms of revenues than the late joiners. In Panel B we compare the publishers that joined Kindle before 2011 (early joiners) to

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<sup>3</sup> The 95 product categories represent destination countries that account for 98 percent of American outbound tourists between 2004 and 2013. Of the 113 publishers, 20 joined Kindle. Because one publisher that joined Kindle offered only titles on a single destination country, we exclude this publisher from the final dataset.

those that joined in 2011 or after (late joiners). The average printed books revenues of the early joiners are greater than that of the late joiners (\$31.5M versus \$2.2M, p-val=0.008). In terms of their printed book portfolio sizes, however, the early joiners' and the late joiners' are not statistically distinguishable from each other (59 versus 56 countries, p-val=0.81).

[Insert Table 2 here.]

### **Printed Book versus e-Book Portfolios**

Table 3 focuses on the sample of publishers that joined Kindle. Here, we report the number of product categories in the publishers' e-book and printed book portfolios. Column (a) shows the number of product categories in the publisher's Kindle portfolio. Columns (b) and (c) show the number of product categories in the printed book portfolios measured in two different ways. Column (b) includes only the printed books published in the two-year window at the time the publisher joined Kindle. Column (c) includes only the printed books with positive sales at the time the publisher joined Kindle.

Comparisons of the portfolios in the two channels indicate that publishers offered a subset of their printed book portfolio as e-books. On average, publishers offered 52 percent (16 out of 31) of their recently published printed book product categories as e-books, or 30 percent (16 out of 54) of their printed books with positive sales.<sup>4</sup> These findings strongly suggest that product decisions for Kindle e-books are distinct from product decisions for printed books.

We also observe differences in the e-book to printed book ratio between the large and the small publishers. Compared to an average publisher, the largest publishers offer a smaller proportion of their printed book portfolios as e-books. The five largest publishers offer 30

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<sup>4</sup> The categories in which firms released e-books comprised about 45 percent of their total print sales.

percent (17 out of 56) of their recently released titles on Kindle. This finding suggests that large publishers might be more reluctant than small publishers about offering e-books on Kindle.

[Insert Table 3 here.]

## **REGRESSION ANALYSIS**

The descriptive statistics show that publishers' product offering decisions on Kindle e-book are more selective than those on printed books. Moreover, the small and the large publishers make these decisions differently. We conduct regression analysis to further assess these decisions.

The objectives of our regression analysis are twofold. First, we seek to document the product characteristics that influence the probability of a product category being offered on Kindle. We focus on three product category characteristics: (1) expected demand for the product category; (2) publishers' competitiveness in the product category; and (3) proportion of sales the publisher generates from the product category. Second, based on these product characteristics we investigate whether small and large publishers make the product offering decisions differently. Note that our ultimate objective is not to test specific hypotheses, but to document empirical findings that aid future theory development (Bettis et al., 2014).

### **Variable Definitions**

The dependent variable, *Product Release<sub>ic</sub>*, is coded to equal 1 if publisher *i* releases at least one e-book in product category *c* during the first two years the publisher joins Kindle, and zero otherwise. We focus on this time window because the publisher makes the entry decision and the product offering decision jointly. We choose to examine two-year instead of one-year period because this is more aligned with the industry product cycle (Wheeler and Wheeler, 2007).

We include the following independent variables that capture the three product category characteristics. We measure the  $Demand_c$  of product category  $c$  by taking the natural log of American tourists (in thousands) that visit the destination country covered by category  $c$ . We obtain the tourist data from the United Nation World Tourism Organization. A category with higher number of tourists indicates greater demand. A positive coefficient estimate on  $Demand_c$  would be consistent with publishers offering on Kindle the high-demand products, as opposed to the niche products.

We measure the  $Competitiveness_{ic}$  of publisher  $i$  in category  $c$  based on the publisher's market share of the product category's total printed book sales. A higher value of  $Competitiveness_{ic}$  indicates that the publisher is stronger in the product category. A positive coefficient estimate on  $Competitiveness_{ic}$  would be consistent with publishers offering their more competitive products, as opposed to offloading their less competitive products on Kindle.

We measure the  $Importance_{ic}$  of the product category to the publisher based on product category  $c$ 's share of publisher  $i$ 's total printed books sales. A higher value of  $Importance_{ic}$  indicates that the product category accounts for a larger proportion of the publisher's printed books revenue (i.e., these could be their "top-sellers.") We also include the square of  $Importance_{ic}$  to capture any nonlinearity present. An inverted-U relationship between  $Product Release_{ic}$  and  $Importance_{ic}$  would be consistent with publishers offering their important products on Kindle but withholding their most important products.

We calculate the independent variables based on the average values during the three years prior to the publisher joining Kindle. We use a three-year window to smooth out year to year variability that may be present from publishers' product release cycles, so that the

information contained in our variables more closely mirror the information that is relevant to a publisher's decisions. Using windows of one, two, or five years provide similar results.

We control for the influence of concurrent printed book releases. The dummy variable *Released Print Book<sub>ic</sub>* equals 1 if publisher *i* released a printed book in product category *c* in the two-year window when the publisher joined Kindle, and zero otherwise. We include this control because otherwise our results on e-book releases might spuriously capture the publisher's decision to invest in generating the contents on the destination country rather than the decision to offer the e-book on Kindle. Similarly, because publishers may want to invest in content on growing categories, we control for the product category's *Growth Rate<sub>c</sub>*, measured by the prior three year sales growth rate of product category *c*. We also control for the influence of printed book *Price<sub>c</sub>*, measured by the average price in category *c* during three years prior to the *Product Release<sub>ic</sub>* window. Finally, the ability to access the Internet in a destination country may influence consumers' accessibility and willingness to purchase digital travel guidebooks, use an e-reader like Kindle, or substitute free content from the Internet. Therefore, we control for the *Internet Access<sub>c</sub>* in each country, using International Telecommunication Union's measure of the proportion of the population that can access to the Internet in the year prior to the publisher's participation on Kindle. We present the summary statistics and correlations in Table 4.

[Insert Table 4 here.]

## **Regression Model**

We analyze the publishers' product decisions using fixed effect logit models estimated via conditional maximum likelihood (Chamberlin, 1980). Specifically, we model publisher *i*'s

choice of whether to release a Kindle e-book in product category  $c$  within two years of joining Kindle as:

$$Product\ Release_{ic} = f(Demand_c + Competitiveness_{ic} + Importance_{ic} + Importance\ Squared_{ic} + Publisher\ Fixed\ Effects + controls)$$

with the fixed effects conditioned out of the equation. This empirical method follows prior research on geographical location strategy (e.g., Alcácer and Chung, 2014). Because every publisher in our sample has offered e-books in more than one product category, we can account for publisher fixed effects by conditioning them out of the equation. This approach enables us to isolate the product characteristics effects from the firm-level effects, thereby improving the identification of our key variables. However, interpretation of the coefficient estimates from a fixed effect logit model does not reveal particularly useful information. Therefore, in an effort to aid interpretation, we apply the method proposed by Kitazawa (2012) to estimate the average semi-elasticities and report them in the tables.<sup>5</sup>

## REGRESSION RESULTS

### Product Characteristics: Demand, Competitiveness, and Importance

Table 5 presents the findings on the likelihood of Kindle e-book offerings based on the product category characteristics. In Models 1 to 3 we examine each characteristic individually. Model 4 is the full model. We discuss the results based on the full model.

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<sup>5</sup> The average partial effect in a fixed effect logit model depends on the individual (firm) fixed effect  $\alpha_i$ , which cannot be consistently estimated when time  $T$  (or our case, categories,  $c$ ) is fixed. Similarly, the semi-elasticity  $\frac{\partial \ln \Pr[y_{ic}=1|x_{ic}, \alpha_i]}{\partial x_{ic}} = \beta \frac{1}{1 + \exp[\beta x_{ic} + \alpha_i]}$  also depends on  $\alpha_i$ . However, Kitazawa (2012) shows that unlike the average partial effect, we can consistently estimate the semi-elasticity. To bypass dealing with  $\alpha_i$ , Kitazawa uses the following formula:  $E[semi - elasticity] = \beta(1 - E[y_{ic}])$ , where  $E[y_{ic}] = \bar{y} = \frac{1}{nC} \sum_{i=1}^n \sum_{t=1}^C y_{ic}$ .

The estimate on  $Demand_c$  is positive (0.230, p-val=0.000), indicating that publishers tend to offer e-books in the high-demand product categories. Because  $Demand_c$  is calculated as the natural log of the number of tourists, the coefficient reported in the table is the average elasticity, as opposed to the semi-elasticity. The finding suggests that that a 10 percent increase in  $Demand_c$  increases the probability of product release by 2.3 percent.

The semi-elasticity of  $Competitiveness_{ic}$  is positive (0.02, p-val=0.000), indicating that publishers are more likely to offer on Kindle the products which they have strong market shares. The magnitude is also meaningful: moving from the fifth percentile to the ninety-fifth percentile on  $Competitiveness_{ic}$  increases the likelihood of appearance on Kindle by 56 percent.<sup>6</sup>

The semi-elasticity of  $Importance_{ic}$  is positive (0.189, p-val=0.000), and the semi-elasticity of  $Importance\ Squared_{ic}$  is negative (-0.002, p-val=0.000). Together these two estimates suggest an inverted-U relationship between  $Importance_{ic}$  and  $Product\ Release_{ic}$ : Publishers are less likely to offer on Kindle the product categories that constitute a small proportion of sales; more likely to offer those that constitute a medium proportion of sales; and less likely to offer those that constitute a high proportion of sales. This finding is consistent with the notion that publishers withhold from Kindle their top selling products. Indeed, when we examine the data we find that eight of the 19 participating publishers withheld their top-selling product category from Kindle.<sup>7</sup>

We assess the reliability of the results in several ways. We note that  $Importance_{ic}$  – measured by the percentage of sales a product category  $c$  contributes to publisher  $i$  – could be

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<sup>6</sup> This is the percentage change in the probability. To express the probability increase in terms of percentage points, we calculate the percentage increase to a base probability as follows. Using the mean unconditional probability in the sample of 13 percent, moving from the fifth to ninety-fifth, increases the probability of product release by 7.28 (0.13 x 0.56 x 100%) percentage points to 20.28 percent.

<sup>7</sup> Similarly, 12 publishers withheld their second most important product category, and 10 withheld their third most important product category.

influenced by the overall market demand for the product category and the competitiveness of the publisher vis-à-vis the competitors. The results in Models 3 and 4 are consistent with this notion: the result on *Importance<sub>ic</sub>* is weaker in Model 4 (where *Demand<sub>c</sub>* and *Competitiveness<sub>ic</sub>* are included) than in Model 3 (where *Demand<sub>c</sub>* and *Competitiveness<sub>ic</sub>* are excluded). Despite the smaller magnitudes, the inverted-U relationship between *Importance<sub>ic</sub>* and *Product Release<sub>ic</sub>* remains robust in Model 4.

We apply a more stringent test of the inverted-U relationship by following Lind and Mehlum (2010). The test examines whether the relationship is increasing at low values within the *Importance<sub>ic</sub>* range interval and decreasing at high values within the interval. The Lind and Mehlum test result rejects the null of non-inverted-U shape relationship (p-val=0.011).

We also examine whether there exists an inverse-U relationship between *Demand<sub>c</sub>* and *Product Release<sub>ic</sub>*, and between *Competitiveness<sub>ic</sub>* and *Product Release<sub>ic</sub>*. We do not find an inverse-U relationship in either case. The Lind and Mehlum test results do not reject the null of non-inverted-U shape relationships for *Demand<sub>c</sub>* (p-val=0.400) or *Competitive<sub>c</sub>* (p-val=0.101).

As an additional robustness check, we rerun the analysis in Table 5 on an expanded sample that includes product categories that have less than \$100,000 sales. The results based on this expanded sample are consistent with the main results.

[Insert Table 5 here.]

### **Small versus Large Publishers**

Because the descriptive statistics show that the small and the large publishers make their Kindle product offering decisions differently, we further assess the differences with regression models.

Specifically, we split our sample into two sub-samples based on the median revenue of the publishers. We then examine each sub-sample using the full model specification (Model 4).

Table 6 reports the split-sample analysis results. Models 5 and 6 examine the product decisions by the small publishers and the large publishers, respectively.  $Demand_c$  is positive in Model 5 (0.268, p-val=0.003) and in Model 6 (0.190, p-val=0.029). Both types of publishers offer their popular product categories on Kindle. Although the estimate on  $Demand_c$  elasticity appears larger in the small publisher subsample than that in the large publisher subsample (0.268>0.190), they are not statistically distinguishable (two-tail test p-val=0.49).

$Competitiveness_{ic}$  is positive in both Model 5 (0.037, p-val=0.000) and Model 6 (0.014, p-val=0.009). Both the small and the large publishers tend to offer e-books in their competitive product categories. However, the magnitudes are different. The tendency to offer competitive products is stronger among the small publishers than among the large publishers (0.037>0.014, two tail test p-val=0.016).

We do not find evidence of the inverted-U relationship between  $Importance_{ic}$  and e-book offering in either sub-sample. Although  $Importance_{ic}$  and  $Importance Squared_{ic}$  in Models 5 and 6 have signs that are consistent with the inverted-U relationship, results from the Lind and Mehlum (2010) inverted-U test do not support such relationship.

[Insert Table 6 here.]

Because the descriptive statistics indicate that the large publishers tended to join Kindle earlier during the platform's nascent stage while the small publishers tended to join later, we explore if the results in Models 5 and 6 might be confounded by the effect of the platform's maturity. According to the literature, as a platform matures and develops stronger network effects, firms have higher willingness join the platform (Caillaud and Jullien, 2003). Therefore,

the differences in product decisions might be influenced by Kindle's maturity rather than the size of the publishers.

To assess this potential confounding factor, we examine the product decisions by both types of publishers in the late time period (i.e., between 2011 and 2013) of our dataset. This approach holds the platform's age constant across the two sub-samples.

Models 7 and 8 present the results based on the small and the large publisher sub-samples, respectively, in the late time period. In Model 7,  $Demand_c$  is positive (0.275, p-val=0.007), indicating that small publishers tend to offer their popular products. Although  $Demand_c$  is also positive in Model 8 (0.136, p-val=0.065), the size and statistical significance are slightly weaker than those in Model 7. The evidence for the small publishers offering their high-demand products on Kindle is clearer than that for the large publishers.

The results on  $Competitiveness_{ic}$  indicate that small publishers tend to offer titles from their competitive categories (0.033, p-val=0.000), while large publishers do not (0.002, p-val=0.776). Moreover, the effect of  $Competitiveness_{ic}$  on  $Product Release_{ic}$  is greater among the small publishers than among the large publishers (0.033>0.002, p-val=0.000).

In Model 7  $Importance_{ic}$  is positive (0.119, p-val=0.019) and  $Importance Squared_{ic}$  is statistically indistinguishable from zero (-0.001, p-val=0.236). The results indicate that small publishers tend to offer on Kindle the products that contribute very high proportions of their sales, as opposed to withholding these products. In comparison, the results in Model 8 ( $Importance_{ic}$ : 1.09, p-val=0.000;  $Importance Squared_{ic}$ : -0.036, p-val=0.002; Lind and Mehlum inverted-U test: p-val=0.001) indicate that the large publishers, unlike the small publishers, withhold products that constitute very high proportions of their sales.

Because we observe the inverted-U relationship in Model 8 but not in Models 5-7, we conduct a supplementary analysis to further confirm that large publishers are more likely to withhold products that constitute very high proportions of sales. Indeed, in the results reported in the Appendix 1, we find that the large publishers are about 30 percentage points less likely than the small publishers to offer e-books from their top-five bestselling product categories.

To summarize, the results from our split-sample analysis show both similarity and differences between large and small publishers' product offering decisions. On the one hand, large and small publishers are similar in the sense that they both tend to offer their high demand product categories on Kindle. On the other hand, relative to the small publishers, the large publishers are less inclined to offer on Kindle their competitive products and are more likely to withhold the products that constitute high proportions of their revenues. The evidence is consistent with the descriptive statistics results that small and large publishers make their Kindle product decisions differently. Moreover, these differences suggest that the large publishers are less willing than the small publishers to support Kindle. We comment further on this idea later in the discussion section.

## **DISCUSSION**

We interpret our findings in relation to theory. We begin by describing a null expectation on firm strategy towards a relationship with a new sales channel. We then compare our findings relative to the expectation and discuss the implications for theory and future research.

Our null expectation is that firms, especially those in a mass market industry, would seek to increase market penetration and obtain as close to full product distribution (i.e., the proportion of sales outlets in which the firms' products are available) as possible. As a new sales channel

arises – be it a digital platform or traditional brick-and-mortar channel – firms push their products through the channel. From the sales channel’s perspective, firms are welcome to join the channel provided that capacity is available. In our industrial context, we do not expect capacity to be a limiting factor for Kindle because capacity constraint is far less binding for a digital platform than for a brick-and-mortar channel. Therefore, we expect publishers to engage with Kindle and place all contents there as long as the additional revenues or cost savings cover the digitization cost. In contrast, if publishers eschew engagement with or make discriminating content choices on Kindle, this could signal incompatibility between the publishers and Kindle, or conflicts between sales channels such as cannibalization (e.g., Frazier, 1999; Chen et al., 2017).

### **Decision on Joining Kindle**

Descriptive statistics show that not all publishers joined Kindle. In fact, the majority of publishers in our sample did not. Among the 113 publishers of English language travel guidebooks, only 19 joined. This result departs from our null expectation that publishers take advantage of Kindle as a new sales channels to maximize their reach to customers. In addition, there is a clear pattern of who joined and who did not – the very small publishers were absent on Kindle. According to Table 2, the average publisher that joins Kindle has approximately 20 times the revenue and 4.5 times the number of active product categories as does the average non-joiner.

The absence of the very small publishers on Kindle might be a result of two reasons. The first reason is that the non-joiners do not expect positive net benefit from selling e-books on Kindle. This could be because the very small publishers, due to their limited sales quantities, are

less likely to achieve the variable cost savings on printing, storage, and shipping to justify the upfront learning cost and the direct cost of digitization. The second reason might be that the very small publishers lack technical capability to digitize their books. However, we do not expect this to be the main reason because book digitizing service is available from third-party providers.

### **Decisions on Product Offerings**

Publishers that join Kindle must decide what products to offer on the platform. If the joiners pursue full product distribution, as we described in our null expectation, then we should observe their entire printed book portfolios available as e-books on Kindle.

However, we find that the joiners did not offer their entire portfolios as e-books on Kindle. Publishers offer subsets of their products on Kindle while withholding others from the platform. This result strongly suggests that publishers' product decisions between the printed book channel and Kindle e-book channel are distinct.

We examine further the types of product offerings and withholdings. If sellers use product offering decisions as a strategic mechanism, as we argue, we would expect systematic patterns of product offerings and withholdings based on product characteristics. Our results indicate that, on average, the publishers tend to offer e-books in the high-demand product categories and their competitive product categories. We also find an inverted-U pattern between the product importance to the publisher and the likelihood of product offering on Kindle. This finding suggests that publishers withhold from Kindle their top-selling products, which is consistent with the notion that the publishers safeguard their most important products from appropriation by the platform.

## **Decision Heterogeneity across Publishers on Kindle**

The patterns of product offerings are not entirely the same across the publishers. We observe both similarity and differences in product decisions between large and small publishers, which we elaborate below.

Large and small publishers share similar tendencies to offer their high-demand products on Kindle. Publishers derive benefit from Kindle's variable cost savings technology, especially when the sales quantity is large. Therefore, publishers with very small sales quantities benefit little from Kindle. This could explain why we do not observe in our descriptive statistics the very small publishers joining Kindle. In comparison, publishers with sufficient scale would find the variable cost savings justify the cost of digitizing their contents and join Kindle. Condition on meeting this threshold, the joiners would derive even greater variable cost savings if they offer their high-volume products as e-books. Our results on  $Demand_c$  based on the full sample (Models 1 and 4) and the split samples (Models 5 to 8) provide consistent support to this idea.

Beside the similarity, there are differences in the product decisions between large and small publishers. Small publishers tend to place their competitive products on Kindle but large publishers do not; and large publishers withhold products that constitute large portions of their sales but small publishers do not.

To the extent that product competitiveness and product importance to the seller correspond to product quality, the decision by the large publishers to withhold these products could negatively affect the platform's chances of success. This corresponds to prior research that argues the lack of high quality products is detrimental to a platform's network effects (Hagiu, 2014). In our context, the absence of high quality e-books from the large publishers could curb Kindle's appeal to the consumers, thus harming the platform.

Why do the small publishers make decisions that support Kindle success while the large publishers do not? We discuss several potential explanations. First, Kindle success might be more beneficial to the small publishers than to the large publishers, because the small publishers lack better outside options in other sales channels. In the printed book channel, for example, large publishers have wider distribution (e.g., penetrate more retail stores), better product placement (e.g., eye level versus top and bottom of the shelf), and stronger in-store support (e.g. branded signage, end-cap positions, more front cover versus spine displays) than small publishers. Even in the digital channel, large publishers are better positioned to start their own e-book channels because of their large product portfolios and strong brands. In contrast, small publishers might be more supportive of Kindle because they are disadvantaged in the other channels. With the playing field more level on a digital platform than in physical bookstores, small publishers are more inclined to support Kindle by offering their high quality products.

Second, because the large publishers are better positioned than the small publishers are in the physical sales channel, the opportunity cost of a weakened physical channel as a result of Kindle's success is greater for the large publishers than for the small publishers. This reasoning, coupled with the idea that the large publishers are more able than the small publishers to enhance the platform's network effects, could explain why the large publishers are more wary of fully supporting Kindle with their high quality products.

Third, the large publishers may reserve their products as bargaining chips against Amazon. There is anecdotal evidence on such bargaining. Dissatisfied with Amazon's e-book policy, Macmillan – one of the six largest publishers in the U.S. – in 2010 threatened to withhold all new books from Kindle for several months after the release of hardcover versions. Amazon ultimately conceded, stating that “we will have to capitulate and accept Macmillan's terms

because Macmillan has a monopoly over their own titles” (Rich and Stone, 2010). In comparison, small publishers may not have the level of complementary assets as the large publishers have as a leverage to effectively bargain with Amazon.

### **Alternative Explanation: Cannibalization between e-Books and Print Books**

Publishers might withhold products from Kindle because they fear cannibalizing their print sales. This represent a potential alternative explanation to the product offering decision that we document. We explore this in three ways.

First, we focus on the profitability of e-books and printed books. Publishers would be particularly concerned when their low-profit products cannibalize their high-profit products, because this would negatively affect the overall profitability. In the present context, if the profitability of an e-book is lower than that of a print book, the publisher would be compelled by the cannibalization concern to withhold the e-book. Financial data in Table 1 does not support this concern, because the per unit profitability for e-books and printed books are comparable.

Second, we review the prior literature that examines the cannibalization between digital and print publishing. An early study on the newspaper industry find that online newspapers had only a small cannibalization effect on physical newspapers (Deleersnyder et al., 2002). More proximate to our industrial context, a recent study by Chen et al. (2017) finds that delays in e-book release on Kindle do not increase print sales of the corresponding book title, a finding that does not offer strong support on cannibalization between e-books and print books.

Third, we conduct an exploratory empirical analysis with our data to evaluate the cannibalization effect. We would be concerned if we find the release of e-book negatively affects print sales. Contrary to this concern, our results (included in Appendix 2) generally show that

Kindle e-book release correlates positively with print sales. In sum, our explorations lead us to believe that cannibalization is not a main factor that drives our results.

## **CONCLUSION**

Guided by the theories on value creation-appropriation and the network effects, we empirically document publishers' e-book offerings on Amazon Kindle with the purpose of understanding whether and how firms use product offering as a mechanism to manage their relationships with platforms.

The empirical results support the notion that firms use product offerings as a strategic mechanism to manage their relationship with platforms. We show that publishers on Kindle offer about half of their printed book portfolios on the platform, indicating that product decisions for Kindle e-books are distinct from those for printed books. Furthermore, larger publishers offer smaller proportion of their product portfolios on Kindle. In particular, they are less likely than the small publishers to offer their competitive products, and they tend to withhold their top-revenue products from Kindle while small joiners do not. These decisions by the large publishers hinder the development of the platform's network effects. Yet, both large and small publishers offer their high-demand products on Kindle, a decision that helps publishers create more value through cost savings. The key implication from these empirical patterns is that while both large and small publishers take advantage of the efficiencies created by Kindle, compared to the small publishers, the large publishers make product decisions that are more protective of their own interests and less conducive to Kindle's success.

The overall picture that emerges from our findings is that firms bring complementary resources to the platform to jointly create value. However, these resources strengthen the

platform's network effects, which increase the platform's ability to appropriate the value that the firms help to create. Sellers respond by making strategic product offering decisions to balance value creation and appropriation risks.

Furthermore, the decision heterogeneity across firms we document indicates that the value creation-appropriation tension is more acute for the large firms. We attribute this result to three interrelated factors: (1) due to their scale the large firms derive more value from the platform's variable cost savings technology than the small firms do, giving the large firms stronger incentives to join the platform; (2) the large firms possess superior complementary resources and therefore they are more able to help the platform succeed, but this could further increase the value appropriation risks, and (3) the large firms have more valuable options outside of the platform than the small firms have, which translates to greater opportunity cost for the large firms should the platform dominates the outside options. These factors – linking several key strategy concepts including industry structure, bargaining power, complementary resources, network effects, multi-homing, and opportunity costs – jointly determine the unique level of value creation and appropriation for each firm that ultimately influence the product offering decisions on a platform.

### **Implications for Research**

By focusing on firms' engagement with a platform, this paper connects the two broad streams of strategy research on interorganizational relationships and platforms. While prior work has extensively considered the value creation-appropriation tension between partners that originate from such mechanisms as relationship specific investments (e.g., Williamson, 1985) and knowledge sharing (e.g., Khanna et al., 1998), we highlight another important mechanism as a

source of the tension – that value creation efforts by firms can alter industry structure through network effects which strengthen the platform’s bargaining power (Katz and Shapiro, 1994; Rochet and Tirole, 2003; Brandenburger and Stuart, 1996; MacDonald and Ryall, 2004). Recognizing the role of network effects specific to firm-platform relationships could advance future research on strategic mechanisms to manage these interorganizational relationships.

Our focus on the formative period of Kindle brings further implications for the research on relationships between startups and established firms. Although startups might concentrate their efforts on seeking partnership with large firms in hope of accelerating growth or improving survival chances (e.g., Stuart et al., 1999), our findings suggest that these resource-rich partners may not offer their best resources to the relationship. In comparison, small partners might be more willing to work cooperatively with startups to create value. This issue on resource withholding might be a fruitful topic for future research to complement the issue on value appropriation as emphasized in prior work (e.g., Katila et al., 2008).

Our findings also bring implications that are specific to the research on platform strategy. Prior work in this literature generally focuses on situations where the platform possesses bargaining power over the complementors (e.g., Iansiti and Levien, 2004; Gawer and Henderson, 2007; Huang et al. 2013; Zhu and Liu, 2016; Wen and Zhu, 2017; Parker and Van Alstyne 2017), and takes the platform operators’ perspective (McIntyre and Srinivasan, 2017) that emphasizes policies such as pricing (e.g., Rochet and Tirole, 2003), investment in quality (e.g., Zhu and Iansiti, 2012), business models (e.g., Boudreau, 2010; Hagiú and Wright, 2014), and corporate scope (e.g., Hagiú and Spulber, 2013). In comparison, the present study examines complementors that possess non-trivial bargaining power. By incorporating the complementors’ value appropriation concerns (e.g., Lavie 2007; Dyer et al. 2008) we help paint a more complete

picture of the platform business model. Importantly, our results underscore the possibility that value creation activities between the platform and the complementors might stall when both parties have comparable bargaining powers over the value they jointly create (Brandenburger and Stuart, 1996), which in turn could threaten the effectiveness of the platform business model.

In addition, our findings suggest multi-homing (e.g., Landsman and Stremersch, 2011) as a source of bargaining power for the complementors. Multi-homing can create or preserve outside options that lead to asymmetric resource complementarity between complementors and platforms. In our context, for example, while Kindle needs the publishers in order to create value from its platform technology, the publishers do not necessarily need Kindle to create value from their book contents because they have the print distribution channel as their outside option. Taking into account the potential asymmetry in resource complementarity when evaluating multi-homing decisions can therefore refine the research on platform strategies. In particular, assessing the extent to which engagement with a successful platform might generate opportunity costs for the complementors in terms of diminished multi-homing options deserves greater attention.<sup>8</sup>

Our findings could inform research on inter-platform price competition (e.g., Cabral, 2011). Kindle has been in competition with other e-book platforms – such as Apple’s iBook and Barnes and Noble’s Nook – not only on the price of the e-reader devices but also on the price of e-books.<sup>9</sup> To the extent that price competition on e-books could decrease their revenues, publishers might safeguard their important revenue sources by withholding from Kindle products

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<sup>8</sup> As an example that further illustrates this point, ride-hailing service customers who multi-home with Lyft and Uber might – despite Uber’s larger network effects benefit – choose Lyft in order to preserve their bargaining power by helping to maintain Lyft as a viable outside option to Uber. See <https://finnscape.com/2014/10/23/use-lyft-instead-uber> [Last accessed June 26 2017.]

<sup>9</sup> See Motoko Rich “Steal This Book (for \$9.99)” *New York Times*, May 16 2009.

that constitute large proportions of their sales.<sup>10</sup> Future research on inter-platform competition could incorporate the impact of complementors' product decisions more fully.

Last but not least, by establishing product offering decisions as a strategic mechanism we make a case for platform studies to go beyond the traditional seller-product assumptions such as homogenous sellers or each seller offering a unique product (e.g., Rochet and Tirole, 2006; Hagiu and Wright, 2014). Product characteristics are multi-dimensional in nature (e.g., Adner and Snow, 2010) and they represent different levers that enable multi-product firms to achieve a better strategic balance between creating values and alleviating appropriation risks in interorganizational relationships. Relaxing these assumptions could open new research questions beyond the inquiry into firms' decisions such as whether to join a platform (e.g., Huang et al. 2013) and which platform to join (e.g., Venkatraman and Lee, 2004; Lee, 2014). In addition, from the platform operators' perspective, our findings also underscore the concerns not only with complementors' participation but also the ways complementors participate. Thus, future theoretical work could direct attention to platform policies that entice value enhancing product support from complementors (McIntyre and Srinivasan, 2017).

## **Limitations**

There are a number of limitations in this study, which open additional opportunities for future research. The present study does not examine the consequences of sellers' product offering decisions on the platform, so we cannot conclude the effectiveness of the mechanism. Examining

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<sup>10</sup> In our context, a low price on the e-book version of a book title could exert price pressure on the print book version of the same title.

the effectiveness of product offerings as a strategic relationship management presents a direction for future research.<sup>11</sup>

Another limitation is that our empirical context covers only a specific set of publishers. We focus on publishers of travel guidebooks because of the products' well-defined characteristics that are conducive to analyses. This focus could raise two important concerns. The first relates to implementation. When the product characteristics are less well-defined (e.g., creative writings such as fictions (Caves, 2000)), how might the sellers make the product offering decisions? The second concern relates to the plausibility of our argument. Travel guidebooks account for only a small fraction of the total book publishing market, thus strategic actions by publishers in this segment alone is unlikely to make significant impact on Kindle's overall success. Nevertheless, to the extent that publishers from other segments share similar value creation-appropriation concerns – as indicated by the Macmillan example we raised earlier – they might make product offering decisions that are similar to the ones we document in the travel guidebook segment. Together the various segments of the publishing industry would be quite influential to Kindle's success. Future work that examines product offering decisions in broader contexts could address these concerns more directly.<sup>12</sup>

Finally, we examined only the existing complementors. A platform can attract entry of new complementors, and could even take actions that subsidize the new complementors to promote entry.<sup>13</sup> The new complementors add to the platform's network effects, thus counter the

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<sup>11</sup> Several years after the introduction of Kindle the traditional content delivery mechanism for books was still, as the *New York Times* put it, “far from dead” (Alter, 2015). The resilience of print books might be a suggestive anecdotal evidence on the effectiveness of the publishers' strategic behaviors towards the e-book platform.

<sup>12</sup> Our findings based on travel guidebook publishers' behaviors towards Kindle appear to be consistent with observations in other media industries, such as the tension between Big Machine Records and Spotify in the music streaming industry (Peters, 2014); that between the Hollywood studios and Netflix in the movie streaming industry (Nocera, 2016); and that between movie theaters and MoviePass in the movie exhibition industry (Finley, 2018).

<sup>13</sup> For example, Amazon offered Kindle Direct Publishing service to authors so that they can self-publish their e-books for free. Source: [https://kdp.amazon.com/en\\_US/](https://kdp.amazon.com/en_US/) [last accessed Feb 28 2018]

strategic behaviors of the existing complementors. Future research could explore the dynamics between existing and new complementors and the impact on platforms.

In conclusion, by taking the firms' perspective to evaluate their interorganizational relationships with a platform this study highlights the tension between value creation and value appropriation that stems from the network effects. Our empirical findings on the Amazon Kindle e-book platform support the idea that firms use product decisions as a strategic mechanism to manage this tension. The results we document should facilitate more comprehensive theory development on the relationships between firms and platforms.

## References

- Adner R, Snow D. 2010. Old technology responses to new technology threats: demand heterogeneity and technology retreats. *Industrial and Corporate Change*, 19(5):1655-1675.
- Alcácer J, Chung W. 2014. Location strategies for agglomeration economies. *Strategic Management Journal*, 35(12): 1749-1761.
- Bain JS. 1954. Economies of scale, concentration, and the condition of entry in twenty manufacturing industries. *American Economic Review*, 44(1), 15-39.
- Bettis R, Gambardella A, Helfat C, Mitchell W. 2014. Quantitative empirical analysis in strategic management. *Strategic Management Journal*, 35(7): 949-953.
- Boudreau K. 2010. Open platform innovation: Granting access vs. devolving control *Management Science*, 56(10): 1849-1872.
- Boudreau K, Hagiou A. 2009. Platform rules: regulation of an ecosystem by a private actor. In *Platforms, Markets and Innovation*, Gawer A (ed). Edward Elgar Publishing.
- Brandenburger AM, Stuart HW, 1996. Journal of Economics & Management Strategy, 5(1):5-24.
- Cabral, L. 2011. Dynamic price competition with network effects. *Review of Economic Studies*, 78(1): 83-111.
- Caillaud B, Jullien B. 2003. Chicken & egg: Competition among intermediation service providers. *RAND journal of Economics*, 34(2): 309-328.
- Caves RE. 2000. *Creative industries: Contracts between art and commerce*. Harvard University Press: Boston.
- Ceccagnoli M, Forman C, Huang P, Wu DJ. 2012. "Cocreation of Value in a Platform Ecosystem: The Case of Enterprise Software." *MIS Quarterly* 36(1): 263-290.
- Chamberlain G. 1980. Analysis of covariance with qualitative data. *Review of Economic Studies*, 47(1): 225-238.
- Chen H, Ho YJ, Smith MD. 2017. The impact of ebook distribution on print sales: Analysis from a natural experiment. *Management Science*, *Forthcoming*.
- Collis D, Montgomery CA. 1998. Creating corporate advantage. *Harvard Business Review*. 76(3): 70-83.
- Deleersnyder I, Geyskens I, Gielens K, Dekimpe MG. 2002. How cannibalistic is the internet channel? A study of newspaper Industry in the United Kingdom and The Netherlands. *International Journal of Marketing Research*, 19(4): 337-348.
- Doz YL, Hamel G. 1998. *Alliance advantage: The art of creating value through partnering*. Harvard University Press: Boston.
- Dyer JH, Singh H. 1998. The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *The Academy of Management Review*, 23(4) 660-679.
- Dyer JH, Singh H, Kale P. 2008. Splitting the pie: rent distribution in alliances and networks. *Managerial and Decision Economics*, 29(2-3), 137-148
- Eisenmann TR, Parker G, van Alstyne M. 2006. Strategies for two-sided markets. *Harvard Business Review*, 84(10).
- Elberse A. 2008. Should you invest in the long tail? *Harvard Business Review*, 86(7/8) 88.
- Finley A. 2018. A Plan to Lure Moviegoers off the Couch. *Wall Street Journal* (Feb 23). <https://www.wsj.com/articles/a-plan-to-lure-moviegoers-off-the-couch-1519428086?emailToken=57c19ba60f0990ab8390ec6f6ae21fcd8jDP1dhaLKfZ9171C8cjB2r>

- tv%2Bnztltg51EsLEqbEqM0y%2Be4nVIt%2Fxf6JtWQxtJfhrCZ6ngw%2FHowqnXAuKutHnWVViBbch%2B6ET1NsAIGR2uI%3D [Feb 28 2018]
- Frazier GL. 1999. Organizing and managing channels of distribution. *Journal of the Academy of Marketing Science*, **27**(2):226-240.
- Gawer A, Henderson R. 2007. Platform owner entry and innovation in complementary markets: Evidence from Intel. *Journal of Economics & Management Strategy*, **16**(1): 1-34.
- Hagiu A. 2007. Merchant or two-sided platform? *Review of Network Economics*, **6**(2).
- Hagiu A. 2014. Strategic decisions for multisided platforms. *Sloan Management Review*, **55**(2): 71.
- Hagiu A, Spulber D. 2013. First-party content and coordination in two-sided markets. *Management Science*, **59**(4): 933-949.
- Hagiu A, Wright J. Marketplace or Reseller? *Management Science*, **61**(1): 184–203.
- Huang P, Ceccagnoli M, Forman C, Wu DJ. 2013. Appropriability mechanisms and the platform partnership decision: Evidence from enterprise software. *Management Science*, **59**(1), 102-121.
- Iansiti M, Levien R. 2004. The keystone advantage. Harvard Business School Press, Boston.
- Katila R, Rosenberger JD, Eisenhardt KM. 2008. Swimming with sharks: Technology ventures, defense mechanisms and corporate relationships. *Administrative Science Quarterly*, **53**(2): 295-332.
- Katz ML, Shapiro C. 1994. Systems competition and network effects. *Journal of Economic Perspectives*, **8**(2): 93-115.
- Khanna T, Gulati R, Nohria N. 1998. The dynamics of learning alliances: Competition, cooperation, and relative scope. *Strategic Management Journal* **19**(3): 193-210
- Kitazawa Y. 2012. Hyperbolic transformation and average elasticity in the framework of the fixed effect logit model. *Theoretical Economics Letter*, **2**: 192-199.
- Landsman V, Stremersch S. 2011. Multihoming in two-sided markets: An empirical inquiry in the video game console industry. *Journal of Marketing*, **75**(6): 39-54.
- Lavie D. 2007. Alliance portfolios and firm performance: A study of value creation and appropriation in the U.S. Software industry. *Strategic Management Journal*, **28**(12): 1187-1212.
- Lebert Marie. 2009. A short history of e-books. Project Gutenberg. <http://www.gutenberg.org/etext/29801> (accessed March 27 2018).
- Lee RS. 2014. Competing platforms. *Journal of Economics & Management Strategy*, **23**(3), 507-526.
- Lind JT, Mehlum H. 2010. With or without U? The Appropriate Test for a U-Shaped Relationship. *Oxford Bulletin of Economics and Statistics*, **72**(1), 109-118.
- MacDonald G, Ryall MD. 2004. How do value creation and competition determine whether a firm appropriates value? *Management Science*, **50**(10): 1319-1333.
- McIntyre D.P., Srinivasan, A. 2017. Networks, platforms, and strategy: Emerging views and next steps. *Strategic Management Journal*, **38**(1): 141-160.
- Nocera J. 2016. Can Netflix survive in the new world it created? *New York Times* (June 15), [http://www.nytimes.com/2016/06/19/magazine/can-netflix-survive-in-the-new-world-it-created.html?emc=eta1&\\_r=0](http://www.nytimes.com/2016/06/19/magazine/can-netflix-survive-in-the-new-world-it-created.html?emc=eta1&_r=0)
- Parker G, Van Alstyne M. 2017. Innovation, openness, and platform control. *Management Science* (forthcoming).

- Peters M. 2014. Big Machine's Scott Borchetta explains why Taylor Swift was removed from Spotify. *Billboard Magazine* (Nov 8). <http://www.billboard.com/articles/news/6312143/big-machine-scott-borchetta-explains-taylor-swift-1989-removal-from-spotify-nikki-sixx> [June 16 2016]
- Pfeffer J, Salancik G R 1978. *The External Control of Organizations: A Resource Dependence Perspective*, Harper & Row: New York.
- Rich M, Stone B. 2010. Publisher Wins Fight With Amazon Over E-Books. *New York Times* (Jan 31), <http://www.nytimes.com/2010/02/01/technology/companies/01amazonweb.html>
- Rochet JC, Tirole J. 2003. Platform competition in two-sided markets. *Journal of the European Economic Association*, **1**(4): 990-1029.
- Seamans RC, Zhu F. 2014. Responses to entry in multi-sided markets: The impact of Craigslist on local newspapers. *Management Science*, **60**(2): 476-493.
- Stuart TE, Hoang H, Hybels RC. 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly*, **44**(2): 315-349.
- Sun M, Tse E. 2007. When does the winner take all in two-sided markets? *Review of Network Economics*, **6**(1).
- Sun M, Zhu F. 2013. Ad revenue and content commercialization: Evidence from blogs. *Management Science*, **59**(10): 2314-2331.
- Venkatraman N, Lee CH. 2004. Preferential linkage and network evolution: A conceptual model and empirical test in the US video game sector. *Academy of Management Journal*, **47**(6), 876-892.
- Waldfoegel J. 2009. Lost on the web: Does web distribution stimulate or depress television viewing? *Information Economics and Policy*, **21**(2): 158-168.
- Waldfoegel J. 2012. Copyright protection, technological change, and the quality of new products: Evidence from recorded music since Napster. *Journal of Law and Economics*, **55**(4): 715-740.
- Waldfoegel J. 2016. Cinematic explosion: New products, unpredictability and realized quality in the digital era. *Journal of Industrial Economics*, **64**(4), 755-772.
- Waldfoegel J, Reimers I. 2015. Storming the gatekeepers: Digital disintermediation in the market for books. *Information Economics and Policy*, **31**: 47-58.
- Wen, W, Zhu F. 2017. Threat of Platform-Owner Entry and Complementor Responses: Evidence from the Mobile App Market." (pdf) Harvard Business School Working Paper, No. 18-036.
- Wheeler T, Wheeler M. 2007. *Unlikely Destinations: The Lonely Planet Story*. Periplus Editions (Hong Kong) Ltd.
- Williamson OE. 1985. *The economic institutions of capitalism*. The Free Press: New York.
- Zhu F, Iansiti M. 2012. Entry into platform-based markets. *Strategic Management Journal*, **33**(1): 88-106.
- Zhu F, Liu Q. 2016. Competing with complementors: An empirical look at Amazon.com. Harvard Business School Working Paper, No. 15-044.

**Table 1. Cost Structure Comparison**

	Hardcover book	e-book
Consumer price	\$26.00	\$9.99
Publisher is paid	\$13.00	\$6.99
Publisher's cost		
Author's royalty	3.90	1.75-2.50
Printing, storage, shipping	3.25	-
Design, typesetting, editing	0.80	-
Digitizing, typesetting, editing	-	0.50
Marketing	1.00	0.60
Profit before overhead*	\$4.05	\$3.51-4.26

\* Overhead include salaries, utilities, and rent.

Source: Motoko Rich "Math of Publishing Meets the E-Book" *New York Times* February 28, 2010.

**Table 2. Publishers' Participation on Kindle**

Panel A. Publishers that joined Kindle versus those that did not

	<u>All Publishers</u> (N=113)		<u>Joined Kindle</u> (N=19)		<u>Did Not Join Kindle</u> (N=94)		<u>Joiners vs. Non- Joiners</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>p-value</u>
Print Revenue (\$M)	4.5	13.8	20.7	28.5	1.2	2.7	0.008
Print Product Categories	20	25	58	30	13	16	0.000

Panel B. Early joiners versus late joiners

	<u>Early Joiners (N=12)</u>		<u>Late Joiners (N=7)</u>		<u>Early vs. Late Joiners</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>p-value</u>
Print Revenue (\$M)	31.5	31.4	2.2	1	0.008
Print Product Categories	59	34	56	25	0.810

Note: Data based on printed books sales between 2005 and 2007.

**Table 3. Number of Product Categories on Kindle and Printed Books Channels**

	<u>Kindle e-Book</u>	<u>Printed Book</u>	
	(a)	(b) <u>Recent Release</u>	(c) <u>Sales &gt; \$0</u>
All publishers on Kindle (N=19)	16	31	54
e-book to printed book ratio		0.52	0.30
5 Largest publishers by revenue			
Frommers	23	68	75
Lonely Planet	25	99	149
DK Eyewitness	5	47	54
Fodors	21	43	64
Rick Steves	13	21	22
Average (N=5)	17	56	73
e-book to printed book ratio		0.30	0.23

**Table 4. Statistics on Publishers that joined Kindle**

## Panel A. Sample Statistics

		Mean	SD	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
1	Product Release <sub>ic</sub>	0.13	0.33	0.00	0.00	0.00	0.00	1.00
2	Demand <sub>c</sub>	5.60	1.81	2.01	4.42	5.85	6.72	8.21
3	Competitiveness <sub>ic</sub>	4.57	12.59	0.00	0.00	0.00	1.36	27.77
4	Importance <sub>ic</sub>	0.67	3.27	0.00	0.00	0.00	0.39	2.87
5	Released Print Book <sub>ic</sub>	0.15	0.36	0.00	0.00	0.00	0.00	1.00
6	Price <sub>c</sub>	18.00	2.19	14.96	16.79	17.83	19.33	21.25
7	Growth Rate <sub>c</sub>	4.88	45.66	-43.45	-20.75	-4.25	17.26	84.06
8	Internet Access <sub>c</sub>	39.56	26.91	1.90	15.90	35.60	63.41	85.02

## Panel B. Correlations

		1	2	3	4	5	6	7	8
1	Product Release <sub>ic</sub>	1.00							
2	Demand <sub>c</sub>	0.23	1.00						
3	Competitiveness <sub>ic</sub>	0.24	0.00	1.00					
4	Importance <sub>ic</sub>	0.24	0.24	0.07	1.00				
5	Released Print Book <sub>ic</sub>	0.35	0.28	0.29	0.24	1.00			
6	Price <sub>c</sub>	-0.05	-0.27	-0.01	-0.04	-0.08	1.00		
7	Growth Rate <sub>c</sub>	-0.03	-0.06	0.06	-0.03	0.01	-0.02	1.00	
8	Internet Access <sub>c</sub>	0.13	0.33	-0.03	0.12	0.12	-0.34	-0.06	1.00

**Table 5. Kindle e-Book Product Offering Decisions**

Dependent variable: *Product Release<sub>ic</sub>*.

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
Demand <sub>c</sub>	0.297			0.230
	(0.000)			(0.000)
Competitiveness <sub>ic</sub>		0.019		0.020
		(0.011)		(0.000)
Importance <sub>ic</sub>			0.271	0.189
			(0.000)	(0.000)
Importance Squared <sub>ic</sub>			-0.002	-0.002
			(0.000)	(0.000)
Released Print Book <sub>ic</sub>	1.46	1.753	1.282	1.119
	(0.000)	(0.000)	(0.000)	(0.000)
Price <sub>c</sub>	0.038	0.0002	-0.004	0.027
	(0.454)	(0.995)	(0.930)	(0.577)
Growth Rate <sub>c</sub>	-0.002	-0.002	-0.001	-0.001
	(0.437)	(0.252)	(0.444)	(0.594)
Internet Access <sub>c</sub>	0.008	0.012	0.008	0.008
	(0.075)	(0.001)	(0.021)	(0.066)
Observations	1,805	1,805	1,805	1,805
# of Product Categories	95	95	95	95
# of Publishers	19	19	19	19
Log pseudolikelihood	-477	-493	-467	-455
Pseudo R-Sq	0.16	0.13	0.18	0.20

Conditional maximum likelihood estimates of fixed effect logit model. Semi-elasticities reported. P-values calculated from robust standard errors that account for within publisher clustering are reported parentheses. Lind and Mehlum (2010) p-value for inverse-U test is 0.001 in Model 3 and 0.013 in Model 4.

**Table 6. Product Decisions by Small versus Large Publishers on Kindle**

Dependent variable: *Product Release<sub>ic</sub>*.

	<u>Model 5</u>	<u>Model 6</u>		<u>Model 7</u>	<u>Model 8</u>	
	Small Publishers	Large Publishers	Cross-Sample <i>t</i> -test (Model 5 vs. Model 6)	Small Publishers	Large Publishers	Cross-Sample <i>t</i> -test (Model 7 vs. Model 8)
Demand <sub>c</sub>	0.268	0.190	0.078	0.275	0.136	0.139
	(0.003)	(0.029)	(0.488)	(0.007)	(0.065)	(0.269)
Competitiveness <sub>ic</sub>	0.037	0.014	0.023	0.033	0.002	0.031
	(0.000)	(0.009)	(0.016)	(0.000)	(0.776)	(0.000)
Importance <sub>ic</sub>	0.166	0.245		0.119	1.09	
	(0.004)	(0.024)		(0.019)	(0.000)	
Importance Squared <sub>ic</sub>	-0.001	-0.003		-0.001	-0.036	
	(0.037)	(0.611)		(0.236)	(0.002)	
Released Print Book <sub>ic</sub>	2.08	0.563		2.56	0.937	
	(0.000)	(0.108)		(0.000)	(0.036)	
Price <sub>c</sub>	0.030	0.004		0.011	-0.025	
	(0.582)	(0.966)		(0.711)	(0.722)	
Growth Rate <sub>c</sub>	0.001	-0.004		0.000	0.0004	
	(0.674)	(0.237)		(0.784)	(0.725)	
Internet Access <sub>c</sub>	0.010	0.005		0.008	-0.002	
	(0.031)	(0.512)		(0.243)	(0.761)	
Observations	950	855		950	855	
# of Product Categories	95	95		95	95	
# of Publishers	10	9		10	9	
Log pseudolikelihood	-222	-190		-187	-239	
Pseudo R-Sq	0.24	0.18		0.24	0.37	

Conditional maximum likelihood estimates of fixed effect logit model. Semi-elasticities reported. P-values calculated from robust standard errors that account for within publisher clustering are reported parentheses. Lind and Mehlum (2010) inverse-U test in Model 8 has p-value of 0.001.

## **APPENDIX 1. Large Publishers vs Small Publishers and Likelihood of Kindle Release**

In Table 6 we find that the large publishers are more likely than the small publishers to withhold from Kindle their top selling products (i.e., the inverse-U relationship between *Product Release<sub>ic</sub>* and *Importance<sub>ic</sub>*). In this appendix, we conduct a supplementary analysis to further investigate this difference.

We restrict our sample to each publisher's top five product categories in terms of print sales.<sup>14</sup> These represent the publishers' very high *Importance<sub>ic</sub>* product categories. The dependent variable *Product Release<sub>ic</sub>* takes the value of one if the publisher releases an e-book on Kindle from the product category, and zero otherwise. The main independent variable, *Large Publisher<sub>i</sub>*, takes the value of one if the publisher's total printed book sales revenue is above the median, and zero otherwise. In addition, we include the right-hand side variables from the full specification. We use across firm variance to identify the effect, which we estimate using a logit model. A negative coefficient estimate on *Large Publisher<sub>i</sub>* would be consistent with the idea that the large publishers are more likely than the small publishers to withhold these product categories from Kindle. We report the average partial effects in Table A1.1, with the p-values in parentheses.

In Model A1 the estimate on *Large Publisher<sub>i</sub>* is negative (-0.311, p-val=0.016). The large publishers are 31 percentage points less likely than the small publishers to release a book from a top five product category. This finding offers additional supportive evidence that the large publishers are more likely than the small publishers to withhold from Kindle their top selling products.

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<sup>14</sup> Because not all publishers have positive printed book sales in five or more categories, we are only able to include the categories in which the publishers have positive printed book sales.

In Model A2 we expand the sample to the top 10 product categories.<sup>15</sup> The estimates on *Large Publisher<sub>i</sub>* are similar across the models. As an additional robustness check we exclude the variables *Importance<sub>ic</sub>* and *Importance Squared<sub>ic</sub>*. The estimate on *Large Publisher<sub>i</sub>* remains robust.

**Table A1.1 The effect of *Importance* on *Product Release*, by *Publisher Size***

Dependent variable: *Product Release<sub>ic</sub>*.

	<u>Model A1</u>	<u>Model A2</u>
	Top 5 Product Categories	Top 10 Product Categories
Large Publisher <sub>i</sub>	-0.311	-0.322
	(0.016)	(0.002)
Demand <sub>c</sub>	-0.021	0.064
	(0.744)	(0.016)
Competitiveness <sub>ic</sub>	0.004	0.004
	(0.433)	(0.244)
Importance <sub>ic</sub>	0.012	0.014
	(0.456)	(0.317)
Importance Squared <sub>ic</sub>	0.000	-0.000
	(0.996)	(0.751)
Released Print Book <sub>ic</sub>	0.452	0.256
	(0.000)	(0.000)
Price <sub>c</sub>	-0.031	-0.018
	(0.665)	(0.495)
Growth Rate <sub>c</sub>	0.001	0.002
	(0.713)	(0.350)
Internet Access <sub>c</sub>	0.003	0.001
	(0.338)	(0.732)
Observations	91	178
Log pseudolikelihood	-52	-102
Pseudo R-Sq	0.16	0.13

Average partial effects and p-values calculated from robust standard errors that account for within publisher clustering are reported.

<sup>15</sup> On average, the top five product categories account for 38 percent of publishers' total sales, and the top 10 product categories account for 46 percent of the total sales.

## APPENDIX 2. Cannibalization between e-Books and Print Books

Publishers might withhold products from Kindle because they fear cannibalizing their print sales. This represent a potential alternative explanation to the product offering decision that we document. In this appendix we conduct an exploratory empirical analysis with our data to evaluate the cannibalization effect.

We begin by analyzing the print sales-Kindle release relationship on a firm-product category-year panel stretching from the year prior to the Kindle launch date to the end of our data (2006-2013). As in our main tables, we restrict our analysis to product categories with at least \$100,000 in revenue. To measure sales, we use the natural log of the firm's print sales volume in the product category (i.e. country destination).<sup>16</sup> Our main independent variable, *Kindle Release*<sub>ict</sub>, takes the value of 1 when the publisher *i* releases its book for product category *c* in year *t* on Kindle, and 0 otherwise. We would be especially concerned if we find the release of e-books in a product category correlates negatively with the print sales volume in the same product category.

We control for the average price of the firm's print book offerings<sup>17</sup> (*Price*<sub>ict</sub>), the demand for the product category (*Demand*<sub>ct</sub>) using based on the natural log of tourists to the destination country, the lag of importance and competitiveness (*Importance*<sub>ic,t-1</sub>; *Competitiveness*<sub>ic,t-1</sub>), the average age of the firm's product offerings in years (*Age*<sub>ict</sub>), whether the publisher released a print book in that category in that year (*Released Print Book*<sub>ict</sub>), and whether the publisher was independent or part of one the big-five publishing companies (*Big Five*<sub>it</sub>). We include year and product category fixed effects, and in some

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<sup>16</sup> Using the raw value sales, total revenue, or natural log of revenue yield similar results.

<sup>17</sup> Prices are a choice and therefore endogenous, thus making our models reduced form estimates. Note that price does not vary much within-publisher. Results do not change if we remove price from the models.

models, publisher fixed effects.<sup>18</sup> We cluster errors at the publisher level and report the resulting p-values in the table in parentheses.

We begin with a pooled linear model (Model 1 Table A2.1). We find that a firm's print sales in a product category is about 37 percent higher when it releases a book on Kindle (0.367; p-value 0.042). Imposing publisher fixed effects (Model 2), and in addition, restricting the sample to publishers that joined Kindle (Model 3) yield similar results.

Cannibalization may be a greater threat to publishers' best performing products. To more closely examine this potential effect, we constrain the sample to joiners' top ten product categories (Model 4). We find a positive but insignificant coefficient estimate on *Kindle Release*<sub>ict</sub>. Constraining the sample to only large joiners, we continue to find a positive but insignificant coefficient estimate (Model 5). It is possible that the cannibalization concerns weigh more on publishers that derive a significant amount of revenue from only a few product categories. To account for this, we include only product categories that fall into the 95<sup>th</sup> percentile in importance, and then we rerun Models 4 and Models 5 on this sample. We find a positive but statistically insignificant coefficient estimate on *Kindle Release*<sub>ict</sub>.

We control for whether the firm releases a new print book in year  $t$ . However, the sample includes some firm-year observations where the firm releases a print book in year  $t$  but delays the release of the Kindle e-book to year  $t+1$ . Delaying the release could mute the cannibalization effect and bias our estimates. To control for this possibility, we rerun

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<sup>18</sup> Because demand and price do not vary substantially for all product categories over time, we also rerun the analysis dropping both variables when including product category fixed effects and vice versa. All resulting estimates of the effect of *Kindle Release* on sales volume are similar to what is reported in Table A2.1.

the models in Table A2.1 using only observations in which the firm releases a new print book. We find very similar results.

Overall, our regression results do not indicate the release of Kindle e-books harm print books sales. We do, however, recognize the possibility of reverse causality. Because e-book release is an endogenous decision, the estimates could be a result of publishers releasing e-books from their popular product categories. Nevertheless, if publishers are concerned about cannibalization between e-books and print books, they would probably avoid launching e-books that could cannibalize their popular products.

**Table A2.1 Panel Analysis of Print Sales Volume**

Dependent variable:  $\ln(\text{Print Sales Volume})_{ict}$

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>	<u>Model 5</u>
Method	OLS	Fixed Effect (Publisher level)	Fixed Effect (Publisher level)	Fixed Effect (Publisher level)	Fixed Effect (Publisher level)
Sample	All	All	All Joiners	All Joiners' Top 10 Ranked Product Categories in Importance <sub>ic,t-1</sub>	Large Joiners' Top 10 Ranked Product Categories in Importance <sub>ic,t-1</sub>
Kindle Release <sub>ict</sub>	0.367	0.316	0.319	0.222	0.015
	(0.042)	(0.000)	(0.050)	(0.211)	(0.725)
Demand <sub>ct</sub>	0.201	0.061	1.006	0.734	-0.153
	(0.051)	(0.447)	(0.238)	(0.168)	(0.471)
Competitiveness <sub>ic,t-1</sub>	14.327	6.25	5.195	3.206	1.900
	(0.000)	(0.009)	(0.000)	(0.016)	(0.042)
Importance <sub>ic,t-1</sub>	1.134	7.08	12.586	7.455	6.022
	(0.205)	(0.000)	(0.003)	(0.000)	(0.019)
Age <sub>ict</sub>	-0.208	-0.202	-0.146	-0.040	0.034
	(0.000)	(0.611)	(0.001)	(0.436)	(0.119)
Released Print Book <sub>ict</sub>	0.405	0.186	.064	0.014	0.011
	(0.000)	(0.00)	(0.121)	(0.020)	(0.109)
Price <sub>ict</sub>	-0.039	0.176	0.349	0.648	0.085
	(0.168)	(0.235)	(0.311)	(0.182)	(0.334)
Big Five <sub>it</sub>	1.149				
	(0.000)				
Product Category Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	8,077	8,077	1,589	313	182
R-Square	0.54	0.43	0.53	0.74	0.92

P-values calculated from robust standard errors that account for within publisher clustering are reported in parentheses.