Value creation through expanding the online distribution channel

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Abstract

Purpose: Current literature provides limited insights into the supply chain contexts within which e-commerce can create higher value for firms. To address this literature gap, this research explores the value potential and thus value creation process of e-commerce initiatives for supply chain distribution channel expansions.

Design/methodology/approach: Using secondary data collected from multiple sources, this research conducted an event study to examine the stock market reactions to the announcements of e-commerce initiatives of Chinese firms.

Findings: The results indicate that the e-commerce initiatives increase average firm value by CNY 295.29 million in a three-day window around the initiative's announcement date. Moreover, we find that such stock market reactions are more positive for firms with poor operating performance, and more negative when firms deploy initiatives on their own (rather than third-party) platforms. Further, companies that integrate or complement their online sales with an offline sales channel experience more positive stock market reactions.

Originality/value: This study provides new insights into the value creation process of e-commerce from an operation and supply chain process perspective.

Keywords: e-commerce; event study; abnormal returns; distribution channel, China

1. Introduction

Stakeholders in general and investors in particular are paying increasing attention to the booming e-commerce (EC) market. Especially in thriving economies such as China, the relatively recent adoption and development of EC (e.g., Alibaba and JD.com) has created a boom on the stock exchanges (Luckerson, 2014). In particular, Alibaba raised more than US$21.8 billion during its IPO on the New York Stock Exchange in 2014, representing the biggest IPO in the U.S. history (Krantz, 2014).

Research and industry examples alike have provided evidence that EC initiatives can have a positive impact on firm sales. In particular, prior studies have suggested that EC increases sales in three different ways: market expansion, brand switching, and relationship deepening (Geyskens *et al.*, 2002). However, contradictory arguments have also been observed. Various reports and research have highlighted concerns regarding the possible drawbacks of EC, such as increased channel conflict and intensified price competition, which may hurt a company's future cash flows (Tsay and Agrawal, 2004). Thus, while the benefits of EC initiatives are recognized from a revenue perspective, the cost implications are less clear, suggesting that the overall performance impact due to EC initiatives may be more complicated than expected. Subsequently, our research attempts to provide a more complete assessment of the performance impact of EC initiatives. In particular, we investigate how firms' EC initiatives affect their share prices, a proxy for overall firm value that takes sales and other performance implications into account.

Adopting an EC model does not only cause change to the demand side in terms of

consumer behavior but requires changes to supply chain structures and operations processes (Geyskens *et al.*, 2002; Power and Singh, 2007). Power and Singh (2007) have noted that IT-based supply chains must be accompanied by fundamental organizational change. Therefore, it is unlikely that firms with different operations processes and supply chain structures will gain the same benefits from EC initiatives. Subsequently, we further examine how the impact of EC initiatives on share prices varies across different operational and supply chain conditions. Specifically, we explore how contextual operational and supply chain factors, in terms of operating cycle, platform ownership, and online–offline channel integration, affect the value creation of EC in terms of increased stock prices.

Conducting an event study of 310 e-commerce initiatives announced by Chinese firms between 2010 and 2017, our research shows that e-commerce initiatives do create value for firms in terms of increased stock prices. Moreover, the stock market reactions to e-commerce initiatives are more positive for firms with longer operating cycle but more negative when firms deploy the initiatives on their own (rather than third-party) platforms. Further, companies that integrate their online and offline sales channels experience more positive stock market reactions. These findings advance our understanding of how EC initiatives create value and how operations and supply chain management is a key factor in terms of process efficiencies and distribution strategies when considering EC initiatives. In particular, our research highlights the important roles that operating performances, supply chain distribution platforms, and the integration of sales channels play in affecting the value creation potential of EC initiatives. Our research not only encourages firms (especially those with long operating cycle)

to invest in EC to create value but also urges them to take advantage of third-party platforms and offline channels in order to reap more benefits from their EC initiatives.

2. Literature and hypotheses

2.1. Stock market reactions to e-commerce initiatives

Prior studies have suggested that EC can contribute to a firm's future cash flows by reducing costs such as transaction costs and distribution costs and improve sales in terms of reaching new markets or increasing market shares in existing markets (Geyskens *et al.*, 2002; Homburg *et al.*, 2014; Subramani and Walden, 2001). In terms of cost reductions, previous research identified that adding EC, as a form of channel distribution expansion (Van Bruggen *et al.*, 2010), increases inter-channel competition and thus contributes to increasing distribution efficiencies. Geyskens *et al.* (2002) highlighted that distribution cost reductions can be attributed to ease of transaction processing (reducing human errors and customer disputes). Further, inventory cost reductions can be attributed to decreases in intermediaries, and marketing functions passed over to customers (Hoffman *et al.*, 1995). Thus, efficiency is increased through increasing economies of scale of the production and purchasing power (Homburg *et al.*, 2014). EC initiatives can help firms to disperse their supply chains and expand their markets by reaching Internet users who have never visited the firms' physical stores before. This benefit is particularly important nowadays because consumers are buying more and more products and services online (Farber, 2016). On the other hand, firms can use EC to enable consumers to switch from other competing brands, especially when the focal firms do

not have physical stores in their competitors' areas. Finally, by utilizing various EC tools and technologies, firms can use EC initiatives to deepen customer relationship and enhance customer experience, thus generating higher sales (Rigby, 2011). Geyskens *et al.* (2002) summarized what they described as "demand-side advantages" via EC as market expansion, brand switching, and relationship deepening.

However, multiple studies have also highlighted that the costs of adopting an EC initiative can (initially) outweigh its benefits. Brick and mortar retailers may simply see a shift of customers moving to the EC channel (Alba *et al.*, 1997). Companies may also notice a power shift to consumers in terms of knowledge and price comparisons. Further, distribution costs may actually increase in terms of high fixed start-up costs (Geyskens *et al.*, 2002). Transactions costs may also increase when adding an EC channel through price reductions, while current sales channels may view the EC channel as a competition rather than a complementation (Alba *et al.*, 1997).

Nevertheless, taken together, the reduction in costs and increase in sales can contribute to a firms' future cash flows, thus resulting in positive stock market reactions. Although some practitioners are concerned with the possible drawbacks of EC, such as increased channel conflict and intensified price competition that may hurt firms' future cash flows (de Figueiredo, 2000; Tsay and Agrawal, 2004), empirical evidence suggests that the potential benefits of EC outweighs its drawbacks (Pavlou and Fygenson, 2006; Dehning et al., 2004). A well cited business value model by Barua et al. (1995) suggests that the impact of EC is observable at the strategic business unit level and that the value development is process driven (Chircu and

Kauffman, 2000). Wiengarten et al. (2013) conducted a comprehensive literature view on IT business value research. They concluded that depending on the level of strategic alignment and contextual factors the value development is generally positive (Melville et al., 2004). Informed by the prior studies, as well as the relatively contradictory cost reduction hypothesis and sales improvement mechanisms discussed above, we propose our default hypothesis:

H1. Stock markets react positively to EC initiative announcements.

2.2. Conditional considerations and e-commerce announcements

We further explore the contextual factors that may affect a company's ability to generate business value through EC. In our second hypothesis, we propose that the magnitude of potential benefits could vary across firms with different performances in terms of operating cycle prior to EC initiatives. A firm's operating cycle—the time for a firm from selling the inventory to collecting cash from the customers—is a key operational performance indicator. A shorter operating cycle indicates a stronger capability to turn inventory into cash quickly. EC initiatives enable companies to be closer to their customers, reduce lead times and streamline distribution processes (Geyskens *et al.*, 2002; Homburg *et al.*, 2014).

One aspect of the behavioral theory of the firm proposes that companies develop aspirational performance levels that they try to meet through various managerial and operational changes or initiatives that are the result of a problemistic search (Cyert and March, 1963). A managerial reaction, a quick fix solution, is to streamline inventory and distribution and sales channels by investing in EC. Thus, EC could be a viable option for companies that

are experiencing performance difficulties. This is especially the case in the context of this study, China, where technological solutions and innovations are still relatively inexpensive (Dahlman, 2007; Lee and Tang, 2018). Whilst prices for IT in terms of hardware might globally be at a similar level, the prices for implementation, service and maintenance may differ, being relatively cheap in China[1]. Thus, this puts Chinese firms at an advantage point leading to a noticeable stock market reaction.

Shareholders might be aware of performance difficulties in turning inventory into sales (i.e., cash). If a company has a longer operating cycle investors might view this as a great opportunity if that company would initiate EC and subsequently improve performance. The longer the operating cycles the greater the opportunity to improve performance and thus generating shareholder value. In conclusion, a firm that has greater difficulties can potentially expect higher performance improvements through EC initiatives. Longer operating cycles are accompanied by longer inventory days, indicative of performance inefficiencies from an inventory management perspective. Moreover, longer operating cycles could also be indicative of distribution concern in terms of processes or from a sales perspective.

EC initiatives enable poorly performing firms, especially those with limited geographic coverage across a country, to reach new customers in remote areas virtually and thus increase sales. Moreover, with new EC initiatives, firms do not have to establish physical stores, which enables them to potentially operate at lower inventory levels through inventory pooling and

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[1] https://www.industryweek.com/environment/viewpoint-why-china-cheaper

decreased distribution lead times. Therefore, we expect firms with longer operating cycles to benefit more from EC initiatives. Subsequently, we propose:

H2. The stock market reactions to EC initiative announcements are more positive for firms with longer operating cycles.

Different strategic choices in Internet channel expansion may have different implications for complexity and uncertainty. This is especially the case in the emerging, dynamic Chinese online marketplace. Thus, we explore how investors interpret the complexity and uncertainty embedded in two essential strategic choices for EC, i.e., platform selection and channel integration, and react differently to firms' EC initiatives. First, the integration of an electronic distribution channel with existing processes can make the system initially more complicated (Choudhury and Karahanna, 2008). Routines need to be created or recreated, process tasks redefined, and processing adjusted (Dionysiou and Tsoukas, 2013). Failure to do so can have negative performance consequences. Choosing the option of outsourcing this process, and thus the inherent complexity to a third-party platform, might benefit companies in terms of their performance. Investors may view that complexity, and the risk of disruptions with negative consequences, is reduced when companies do not develop their own distribution channel, but rather, sell their products and services through a third-party provider. Further, by employing technological and commercial capabilities (that are higher than their own) from external providers, uncertainties from disruptions and fluctuations in demand (sales) might be reduced. Again, shareholders may view this as a positive sign for companies initiating EC.

For example, some major third-party platforms such as Tmall.com and JD.com provide

one-stop services for firms to sell products over those platforms without much concern about

site maintenance, secure payments, and on-time delivery (Phillips, 2015). These popular third-

party platforms are attracting an increasing number of daily visitors (see, e.g.,

http://www.alexa.com/siteinfo/tmall.com), helping firms to increase the visibility of their

products to potential customers. Visibility is an important consideration in the Chinese context,

because Chinese consumers, compared with Western counterparts, rely less on web search

engines (e.g., Baidu) when they are looking for brands or products (Decollas, 2017), thus

making it more challenging for self-owned EC sites to be discovered by Internet users.

On the other hand, it could be argued from an uncertainty perspective that, when

outsourcing the EC channel to a third party, control is handed over to the external provider.

Thus, uncertainty could also increase because the platform is not owned by the company itself

(Barthelemy, 2003). The company may need additional resources or processes to deal with

sales forecast and order fulfillment requirements. In addition, through outsourcing, the

distribution channel is split into two parts managed by two companies (i.e., the third party).

Thus, the company has lost its direct company contact, which is transferred to the third-party

platform (a service outsourcing triads problem discussed by Li and Choi (2009)). In such

circumstance, the company has greater difficulties in collecting customer information

including trends and feedback for forecasting. We test these opposing views in this research

and thus propose:

> **H3.** Stock market reactions to EC announcements are different between firms
>
> deploying EC on their own platforms and firms selling through third-party

platforms.

Further, a relatively recent strategy that has been deployed by multiple service and product companies is to strategically integrate offline with online sales channels to provide more complex product offerings that increase the product value for customers. This strategy, which is regularly referred to as *online-to-offline* (O2O) EC markets, has caused disruptive changes in many industries such as transportation (e.g., Uber) and the restaurant business (e.g., Yelp) (Xiao and Dong, 2015). When integration capabilities are apparent, customer value is potentially significantly increased, which can lead to increased sales and margins (i.e., through adding services to products) (Kastalli and Van Looy, 2013). An O2O strategy example in the manufacturing environment is the increased mass customization efforts of sport apparel companies, where consumers can customize their shoes online and experience part of the creation/manufacturing process (i.e., final assembly) in the store (e.g., Adidas 3D printing; Thomasson and Michalska, 2017). Combining online services (e.g., the ordering process) and the collection of the offline product (e.g., collection points) has clear implications for a company's supply chain.

Despite the prevalence of this strategy, the benefit of adopting O2O is debatable. For example, Walmart has been struggling with its EC operation even an "order online, pick-up here" policy was applied. Adopting the O2O strategy may also increase the complexity in operations by adding product and service assortments. Processes need to be integrated and coordinated to deal with this increased complexity (Bode and Wagner, 2015).

Aforementioned efforts provide potential benefits in terms of relatively higher revenues

and margins while requiring the management of the complexity. Thus, we examine whether

investors would have a different reaction to companies that employ an O2O strategy in their

EC initiatives:

H4. Stock market reactions to EC initiative announcements are different between

firms that integrate online with offline sales channels and firms that do not.

3. Methodology

3.1. Sample

We conducted an event study to examine the stock market reactions to EC announcements of

Chinese firms. We defined the event as the announcement of listed firms stating that they are

extending their distribution/sales channel (B2B and B2C) to the Internet. Media reports, from

newspapers, magazines and online news sites, were the primary source for event data

collection. The data collection process started by obtaining a list of 3,069 firm names from the

China Stock Market and Accounting Research (CSMAR) database. CSMAR is a

comprehensive database that allows accessing of data on stock trading, financial statements

and relevant media report of China's listed companies. These firms are listed on the Shanghai

and Shenzhen Stock Exchanges. We then searched for media reports of these firms from the

WiseNews database and *Financial News Database. Wisenews* is a consolidated database that

records news from over 350 titles of newspapers, magazines, journals, and newswires

published in mainland China, Hong Kong, Macau, and Taiwan. The *Financial News Database*

is a sub-database in CSMAR providing financial news reports on the China market and

categorizing each news according to the relevant listed company trading codes. The use of two databases enhanced the comprehensiveness of the data collection and facilitated cross-validation among the media reports. The keywords used for the search were combinations of the firm names with "e-commerce", "electronic commerce", "online" and "internet." Two examples of the collected announcement titles are "Suning formally entered e-commerce" in 2010 and "Shunxin agriculture forge e-commerce platform" in 2011. We verified each announcement carefully and eliminated announcements involving confounding events at the event date. The confounding events include the announcements of dividends, merger, signing government contracts, new products, lawsuits, unexpected earnings, and changes in major managers. We retained the earliest announcement if repeated announcements were found for the same firm. In addition, we focused on the first EC initiative of each firm because in a firm's second (or later) EC initiatives, both the firm and investors may learn from the first initiative and thus encounter a different situation (Lo *et al.*, 2014).

As a result, we identified 371 announcements without confounding events over 2010–2017 (March). We further eliminated 61 announcements because the financial data of the associated firms were not complete, or the stocks were not traded on the announcement date. Thus, the final sample consisted of 310 EC initiative announcements. Table 1 shows the statistics of these 310 sample firms.

---Insert Table 1 about here---

Our sample spanned 59 industries. The industries are based on the Chinese industry classification of listed companies. Retail (F52), computer, communication and other

electronical device manufacturing (C39), and pharmaceutical manufacturing (C27) were the three industries with the most EC initiative announcements, accounting for 10%, 7.7% and 6.8%, respectively, of all the announcements. The distribution of the announcements was approximately even across the three industries; thus the cross-dependences among announcements in terms of industry clustering is not a serious concern in our sample (Kothari and Warner, 2007).

3.2. Event study method

We tested H1 based on the cumulative abnormal return (*CAR*), which is a standard measure of the impact due to a focal event used in prior event studies. For a short-horizon event study, the impact should be detected on the announcement day (event day or day 0). However, not every investor might notice the event through public announcements; some investors may obtain the information through leakage via private social networks (Zajac and Westphal, 2004). We included the day prior to the event day (day −1) to deal with potential information leakage. In addition, as public information may not be disseminated to all investors at the same speed, we included the day after the event day (day 1) to deal with potential delay in information dissemination to some investors. Therefore, the event window of *CAR* spanned three days (day −1 to day 1) in our study (Meznar *et al.*, 1994). For robustness, we also reported the *CAR* spans of five days (day −2 to day 2). Based on the market model estimation, the abnormal return on one day (such as day 0) was calculated by the formula:

$$AR_{i0} = R_{i0} - a_i - b_i R_{m0} \qquad (1)$$

where AR_{i0} is the abnormal return of firm i on a focal day, a_i and b_i are the OLS estimated

coefficients of α_i and β_i produced by the following regression model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (2)$$

where R_{it} and R_{mt} are the returns on day t of firm i and market portfolio m, respectively.

We used the China Securities Index (CSI) 300 as the market portfolio, covering 300 composite

stocks listed on the Shanghai and Shenzhen stock exchanges.

Following previous event studies, we used the stock price data of the period day -200

to day -11 to estimate the coefficients for formulas (2) (e.g., Jacobs and Singhal, 2017). We

calculated the CAR as the sum of all the daily mean abnormal returns from day -1 to day 1 and

day -2 to day 2, respectively. We conducted a parametric paired t-test to examine whether the

CARs of our sample firms are significantly different from zero (i.e., null effect). We also

conducted non-parametric Wilcoxon signed rank (WSR) tests as robustness checks.

3.3. Cross-sectional regression

In addition to assessing the direct effect of EC announcements on stock values, we investigate

how contingency factors affected the variation of $CARs$ due to the EC initiative

announcements. To examine H2 to H4, we regressed the CARs (day -1 to day 1 and day -2 to

day 2, in the market model) on the independent variables capturing the variation in firm and

event characters. The measurements of these variables are discussed below.

We used operating cycle to measure a firm's operating performance for H2. A shorter

operating cycle indicates a stronger capability to turn inventory into cash quickly. We

calculated the variable as the sum of days of inventory and accounts receivable (Lo *et al.*, 2014). Another form of operating cycle is the sum of days of inventory and accounts receivable minus days of accounts payable (Hendricks *et al.*, 2009). Our results remain consistent with this alternative measure.

Self-own platform was coded as a variable for H3. If the announcement mentioned that the firm would build its own online platform for EC, the variable was coded as "1," and "0" otherwise. Our sample did not include announcements when no relevant information was given.

In recent years, the concepts of Internet plus and online-to-offline (O2O) have emerged, motivating Chinese firms to integrate online and offline channels. Internet plus refers to integrating the Internet into the operations of traditional industries (e.g., manufacturing and retail) (Wang *et al.*, 2016). In O2O models, the orders of one channel can also be fulfilled by another channel, which increases the flexibility and resource utilization in both channels (Zhao *et al.*, 2016). We coded a binary variable (*Channel integration*) in line with the announcement. If the announcement mentioned a plan to use Internet plus or O2O models or other similar integration approaches, the variable was coded as "1." If a firm was simply to create a new online channel without mentioning any plan to integrate this with the current channel, the variable was coded as "0."

Two coders were in charge of the coding process for the variables of *Self-own platform* and *Channel integration* independently. One author verified each coding result and made the final judgement if there were disputes between the coders. An example of the announcement

stating the use of O2O strategy and third-party platform is from Aokang International (603001.SH) on March 13 2013, entitled "Aokang International advance O2O business with Alibaba." Another example of an announcement stating the use of O2O strategy, but a self-own platform is from Youngor (600177. SH) on April 30 2015, entitled "Youngor develops O2O sales platform." We expect that the investors would react more positively to the announcements which state that the online-offline channels will be integrated than the ones did not mention the status of offline channels.

We also included several control variables in the regression analysis. First, *firm size* measured by total assets and *financial performance* measured by return-on-assets were controlled for, because large (in terms of assets) and profitable firms may have more resources to expand their sales channels. Second, *financial leverage,* measured by the ratio of debt to equity, was controlled for (Wiengarten *et al.*, 2017), because investors of firms with a high level of leverage may be more sensitive to the cash flow prepared for debt repayment. Third, *inventory* measured by inventory days was controlled for because new sales channels may facilitate the reduction of inventory levels, or the firm would need extra inventory to fulfill the additional orders from the new channel. Fourth, *firm age* was included since older firms may have higher organizational inertia (Miller and Chen, 1994) and tend to use traditional sales channels. We also included the *business model* of the firm as a control variable. We coded the firm as using a B2B (coded as 1) or B2C (coded as 0) model based on whether the firm was providing an industrial product or a consumer product. Further, *financial slack* was controlled for because firms with better liquidity tend to have a stronger cash flow, which could facilitate

channel expansion. Financial slack was measured by the quick ratio, which is current assets

minus inventory, divided by current liabilities. The announcement may state that a firm use

both self-own and third-party platform for the initiative, thus, we coded this circumstance in a

binary variable named *both platforms* ("1" for both platforms were used, "0" for single platform

was used). Finally, we included dummy variables to control for the effects relating to year and

industry such as economic conditions and industry rivalry. We performed a natural logarithm

transformation on *operating cycle*, *firm size*, *firm age,* and *inventory* to correct for skewness

and reduce the concern of multi-collinearity. The *self-own platform* and *business model* data

were obtained from the announcements. *Firm age, year*, and *industry* data were taken at the

year of the event; data of other independent variables were taken at the year prior to the event.

Therefore, we are confident that the analysis results do not suffer from reverse causality. In

summary, the regression model is specified as followed:

$CAR_i = \beta_0 + \beta_1(Firm\ size_i) + \beta_2(Inventory_i) + \beta_3(Financial\ performance_i) + \beta_4(Financial$

$leverage_i) + \beta_5(Firm\ age_i) + \beta_6(Business\ model_i) + \beta_7(Financial\ slack_i) + \beta_8(Both$

$platforms_i) + \beta_9(Operating\ cycle_i\ (H2)) + \beta_{10}(Self\text{-}own\ platform_i\ (H3)) + \beta_{11}(Channel$

$integration_i\ (H4)) + Industry_i + Year_i + Residual_i$ (3)

4. Results

4.1. Event analysis of CARs

In Table 2, we examine whether the stock market reacts positively to EC announcements (H1).

In the market model analysis, the average *CAR* of three-day window (day -1 to day 1) is

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significantly positive (1.126%, $p < 0.05$). The average *CAR* of the five-day window (day −2 to day 2) is also significantly positive (1.280%, $p < 0.05$). Given the average market value of firms in our sample is 26,231.26 million Chinese Yuan (CNY), the announcement increases firm value by 295.29 million CNY in the three-day window and 335.68 million CNY in the five-day window. In addition, we present results from market adjusted returns to examine whether the *CAR* is biased by time and industry clustering (Brown and Warner, 1980). The market adjusted *CARs* of the three-day and five-day windows are 1.245% and 1.615%, respectively, which are significant at the 0.01 level. Thus, we conclude that H1 is supported.

In addition, we conducted non-parametric WSR tests to increase the robustness of the event analysis. In the market model analysis, the median *CAR*s of the three-day and five-day windows are 0.31% and 0.46%, respectively, which are significant at the 0.05 level. In the market adjusted model, the median *CAR*s of the three-day and five-day windows are 0.67% and 0.43%, respectively, which are significant at the 0.01 level. We also examined the *CAR*s from day −10 to day −3 and found that the change is non-significant ($p > 0.1$), which indicates the information leakage concern is not serious in the period prior to our event window. These tests offer additional support to H1.

---Insert Table 2 about here---

4.2. Cross-sectional regression results

Table 3 shows the descriptive statistics and correlations of variables in the regression analysis. The average VIF is 1.644 and no single VIF is larger than four, which suggests that multi-

collinearity is not a serious concern in our analysis.

---Insert Table 3 about here---

---Insert Table 4 about here---

Table 4 presents the regression results documenting under what circumstances shareholders will react more positively to EC initiative announcements. The dependent variable of the models in Panel 1 is *CAR* of day −1 to day 1 and in Panel 2 is *CAR* of day −2 to day 2 from the market models. The control models in both panels contain all control variables. The full models examined H2, H3, and H4. In H2, we posit that markets react more positively to the EC announcements of poorly performing firms. The coefficients of operating cycle in the full models are 0.027 (Panel 1, $p < 0.01$) and 0.028 (Panel 2, $p < 0.05$), respectively. A deviation of one standard deviation **above** the operating cycle mean (1.091) increases the *CAR*s by 2.946% to 3.013%. This change equates to an increase of market value by 772.74 million and 790.31 million CNY, respectively. Thus, H2 is supported.

H3 posits that markets react differently to the EC initiative announcements of firms using self-owned platforms and third-party platforms. The coefficients of *Self-own platform* in the full models are −0.029 (Panel 1, $p < 0.05$) and −0.036 (Panel 2, $p < 0.01$). Using a self-owned platform decreases the *CAR*s by 2.86% to 3.63%. This equates to a decrease of market value of 750.21 million and 952.19 million CNY, respectively. Thus, H3 is supported, suggesting that stock market reactions are more negative for firms using self-owned platforms than third-party platforms.

H4 posits that markets react differently to the EC initiative announcements of firms

with and without the integration of online with offline channels. The coefficients of *Channel integration* in the full models are 0.035 (Panel 1, $p < 0.05$) to 0.050 (Panel 2, $p < 0.01$). The channel integration strategy increases the *CAR*s by 3.53% to 4.98%. This equates to an increase of market value of 925.97 million and 1307.63 million CNY, respectively. Thus, H4 is supported, suggesting that the stock market reactions are more positive for firms with rather than without the integration of online with offline channels.

5. Discussion and Conclusion

This research explored the extent of value generation by conceptualizing the dependent variable through changes in a company's stock prices (CAR). Our results indicate that in the context of the Chinese market, EC initiatives do create value from a stock market (i.e., shareholder) perspective. We further explore the contextual conditions under which companies are more likely to generate value. We explored this through the contextual factor of a firm's operating performance, distribution mode, and channel integration. Our results indicate that companies that are in a performance dip (i.e., long operating cycles) and that use external electronic distribution channels (third-party platforms) create higher value through EC. Further, companies that initiate EC by integrating online with offline sales channels are in a superior position to create value in terms of stock evaluations.

Unlike prior EC studies conducted in the Western context, we studied the potential value in the Chinese context (e.g., Ferguson *et al.*, 2005; Subramani and Walden, 2001). We believe that conducting our study in China provided a much-needed, diversified insight into

the value creation process of EC. From an operations and supply chain perspective, China has been consistently growing into a hub from a logistics and production perspective and also from an innovation perspective (Bhalla *et al.*, 2008). Furthermore, the Chinese context of our study provides the important nuance of our first hypothesis. We explored the market reactions in a market largely untested in relation to the studied phenomena, i.e., China. Whilst the company level performance implications of EC are largely known, the stock market reactions of the shareholder have not extensively studied. This research thus provides important insights from a managerial as well from an investor's perspective.

Although more and more firms in general, and Chinese companies in particular, are responding to the internal and external stakeholder pressure to sell products and services to their customers via EC, it is unclear how firms can generate high levels of value in EC from an operational and supply chain perspective. In particular, some underperformers in traditional sales channels are exposed to the intensified competition in online markets and the resulting competitive disadvantage they may face when adopting EC. Nevertheless, our research suggests that, in contradiction to this perception, prior poor performing (operationally) firms are able to benefit more from the adoption of EC. More specifically, we find that firms with longer operating cycles can gain higher returns from EC. This finding might be due to the capability of EC to enable firms to increase sales, reduce costs and lead times, and better match supply and demand (Geyskens et al., 2002; Homburg et al., 2014; Subramani and Walden, 2001), thus, helping firms who are not performing well in their traditional channels. These performance gains are even more pronounced when taking into account the considerable

geographical spread of China and the relatively limited geographical coverage of those underperformers (Dobbs et al., 2013). Therefore, our results should encourage Chinese firms with low operating performance to take advantage of the capabilities of EC in the Chinese context, transforming the disadvantages they are facing in these contexts.

Chinese firms may follow the practices of their Western counterparts when adopting EC. For instance, Chinese firms may follow Western firms to develop their own EC sites rather than use third-party EC platforms. Firms in the Western world traditionally rely more on their own websites than third-party websites to sell products to customers (PwC, 2017). Our results challenge this traditional view by showing that Chinese firms benefit less when deploying EC through their own platforms. Such a contradiction might be due to differences in consumer behaviors in China when compared with other developed countries. In particular, Chinese consumers are used to visiting third-party EC platforms directly rather than relying on search engines when looking for products (Decollas, 2017), thus making self-owned EC sites less visible. Moreover, due to security, privacy, counterfeit, and other concerns, Chinese consumers trust popular and familiar third-party platforms more than obscure self-owned websites (EU SME Centre, 2014). Therefore, instead of encouraging Chinese firms to follow their Western counterparts and develop their own EC sites, we urge them to make use of popular third-party EC platforms to reap more benefits, especially when they have a lack of resources to develop their own sites.

Another important managerial implication of our research is that companies initiating EC can significantly increase their generated value by following an O2O strategy. Multiple

industry examples of successful O2O business models provide anecdotal evidence on the potential added value of O2O for stakeholders and customers. Our results have empirically confirmed that stock market reactions to EC initiative announcements are more positive when firms integrate online with offline sales channels. Thus, management is well advised to develop process capabilities to integrate offline with the newly added online sales channels.

Further, a strategy that combines online and offline sales channels (i.e., O2O) enables companies to offer more products and services. This seems to equip companies with capabilities valued by shareholders, who appreciate the future gains that such a strategy may entail (Kastalli and Van Looy, 2013). Thus, shareholders increase their confidence in such a company and EC initiatives have a stronger impact on firm value generated on the stock market. Despite O2O EC marketplaces requiring high levels of process coordination and integration, which is indicative of capability to successfully deal with the complexities of channel expansion through EC initiatives, it seems that outsourcing the distribution sales function to a third-party platform is an appropriate approach for companies to focus on the complexity of the product itself.

6. Limitations and Future Research

As with all research of this nature, there are some limitations that need to be considered when interpreting our results. These limitations also in turn provide new opportunities for future studies.

Firstly, we rely on the event study methodology to assess the short-term stock market reactions to EC announcements. Future research could adopt alternative methodologies to

measure the long-term impact of EC initiatives (e.g., measure abnormal operating performance; see Barber and Lyon (1996) for details) and verify the conclusion made in our research.

Moreover, our focus on stock market reactions also implies that our sample is constrained to large, publicly-listed companies, which may limit the generalizability of our findings to private and small firms. This limitation is a particular concern because small and medium-sized enterprises (SMEs) in China have accounted for more than 50% of total EC sales (Phillips, 2015). It thus is necessary for future research to gain a better understanding of whether and how EC could benefit SMEs in China. Similarly, our research also excludes foreign firms that provide products and services to Chinese customers via EC. While more and more foreign firms are trying to enter the Chinese market through EC, they may face quite different challenges such as cultural differences and regulatory requirements, which are worth further investigation.

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Table 1: Descriptive statistics of sample firms, n = 310

	Number of employee (thousand)	Sales volume (Million CNY)	Total Assets (Million CNY)	Market value (Million CNY)	Firm age
Mean	10.16	19430.85	21112.68	26231.26	16.45
Median	3.87	4782.15	3363.69	8978.40	16.00
Std. Deviation	27.43	79524.55	159550.03	70344.13	5.03
Minimum	0.08	113.96	23.66	824.00	3.00
Maximum	376.20	1247271.00	2786045.00	811334.45	37.00

Table 2: Event analysis of EC initiatives; n=310

	Market Model			Market Adjusted Model		
	Mean	t	p	Mean	t	p
Abnormal return day -1	0.587%	2.502	0.013	0.625%	2.694	0.007
Abnormal return day 0	0.454%	1.926	0.055	0.449%	1.622	0.106
Abnormal return day 1	0.084%	0.292	0.77	0.171%	0.559	0.577
Cumulated abnormal return day -1 to 1	1.126%	2.398	0.017	1.245%	2.587	0.010
Cumulated abnormal return day -2 to 2	1.280%	2.150	0.032	1.615%	2.785	0.006

Table 3: Descriptive statistics and correlations of variables

No.	Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1	CAR day -1 to 1	0.011	0.083												
2	CAR day -2 to 2	0.013	0.105	.845**											
3	Firm size	22.446	1.357	.009	-.005										
4	Inventory	4.393	1.37	-.068	-.059	-.006									
5	ROA	0.059	0.065	.022	-.001	-.044	-.044								
6	Financial leverage	1.309	1.644	.031	.060	.282**	.103	-.274**							
7	Firm age	16.455	5.035	.060	.051	.141*	.103	-.142*	.160**						
8	Business model	0.21	0.408	-.102	-.072	.082	-.052	-.125*	.085	-.025					
9	Financial slack	1.663	2.262	-.069	-.103	-.362**	-.084	.165**	-.297**	-.238**	-.058				
10	Both platforms	0.117	0.321	-.029	.000	.222**	.014	.057	.163**	-.071	-.137*	-.103			
11	Operating cycle	4.908	1.091	-.063	-.054	-.090	.463**	-.081	.066	.039	.025	.053	-.007		
12	Self-own platform	0.771	0.421	-.099	-.081	.064	.054	-.114*	.149**	.072	.149**	-.063	-.162**	.097	
13	Channel integration	0.316	0.466	.192**	.211**	.003	.032	-.003	.136*	.059	-.197**	-.078	-.008	.018	.123*

Note: ** indicates $p < 0.01$; * indicates $p < 0.05$; two-tailed test; n =310

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Table 4: Cross-sectional regression analysis (market model)

n=310; Two-tailed test	Panel 1: dependent variable: *CAR* of day -1 to day 1						Panel 2: dependent variable: *CAR* of day -2 to day 2					
	Control Model			Full Model			Control Model			Full Model		
Independent variables	Coef.	S.E.	*p*	Coef.	S.E.	*p*	Coef.	S.E.	*p*	Coef.	S.E.	*p*
Intercept	-0.955	6.080	0.875	7.211	6.852	0.293	-4.033	8.723	0.214	7.253	9.358	0.438
Firm size	0.000	0.004	0.962	0.002	0.004	0.603	-0.001	0.005	0.850	0.001	0.005	0.802
Inventory	0.000	0.005	0.924	-0.017	0.008	0.041	-0.002	0.006	0.665	-0.019	0.009	0.044
ROA	0.118	0.084	0.159	0.119	0.085	0.162	0.114	0.104	0.273	0.110	0.106	0.302
Financial leverage	-0.001	0.002	0.787	-0.002	0.002	0.415	0.002	0.004	0.589	0.001	0.005	0.886
Firm age	0.001	0.001	0.262	0.002	0.001	0.097	0.001	0.001	0.701	0.001	0.001	0.391
Business model	-0.027	0.010	0.008	-0.021	0.011	0.054	-0.020	0.012	0.097	-0.010	0.012	0.402
Financial slack	-0.005	0.002	0.049	-0.005	0.002	0.044	-0.008	0.003	0.023	-0.008	0.003	0.027
Both platforms	-0.009	0.013	0.506	-0.009	0.012	0.492	0.000	0.016	0.996	0.000	0.014	0.975
Operating cycle (H2)				0.026	0.010	0.008				0.028	0.011	0.015
Self-own platform (H3)				-0.029	0.013	0.026				-0.036	0.016	0.025
Channel integration (H4)				0.035	0.012	0.004				0.050	0.014	0.000
Industry dummies	Included			Included			Included			Included		
Year dummies	Included			Included			Included			Included		
Chi^2	78.021			99.306			90.347			112.932		
Incremental Chi^2				21.286		0.000				22.585		0.000