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Order Fulfilment and Consumer Behaviour in Online Retailing

Nguyen, D.H.

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Chapter 6: General conclusions and findings

With this thesis, we investigate the relationship between order fulfilment attributes and consumer purchase behaviour in online retailing. In this section we highlight the main findings and contributions of each chapter as well as the relationships between them. We then discuss the managerial relevance of the thesis and formulate directions for future research.

1. Findings and contributions

Our findings in the thesis make a contribution to literature at the interface of marketing and logistics by offering a better understanding of consumers' expectations regarding order fulfilment in online retailing. Based on the systematic literature review in Chapter 2, we indicated key elements for each of the three order fulfilment factors: three elements of inventory management (including product selection and assortment, product availability and product condition); four elements of last-mile delivery (i.e. delivery information and options, shipping and handling charges, delivery and order tracking); and five elements of returns management (i.e. returns procedure, returns preparation, returns options, refunds and returns handling). All these elements influence one or more of the three dimensions of online consumer behaviour (purchase, repurchase and product return) in an integrative framework. We also found that very little research has been conducted on the use of strategies and incentives to steer consumer behaviour or, consequently, to manage related order-fulfilment activities better. We demonstrated that the relationship between order fulfilment and online consumer behaviour can differ across product categories. The findings also showed that trust and perceived risk can play a mediating or moderating role in the relationship. For more integrative approaches on this relationship, we use the proposed framework to empirically study the impacts of order fulfilment dimensions on repurchase intention across three product categories.

In Chapter 3 we used a conjoint analysis to investigate consumer preferences for delivery attributes in online retailing: delivery speed, time slot, daytime/evening delivery, delivery date, and delivery fee. The study focused on three product categories: convenience goods, shopping goods, and specialty goods. We found that the most important attribute in shaping consumer preferences is the delivery fee, followed by non-price related delivery attributes (i.e. delivery speed, time slot, daytime/evening delivery, and delivery date). The results show that

preference structure for these attributes is similar across the three product categories. Furthermore, a cluster analysis was employed to identify consumer segments that have different attribute preference patterns. Based on this we identified a group of consumers who care more about the non-price attributes than others do. These consumers are mainly characterized by their gender and annual income. Last, we run simulations to examine the extent to which online consumers adopt new delivery services and how online consumers compromise between the different service attributes.

Practice shows that online retailers offer a variety of delivery methods and shipping fee policies. In Chapter 4 we therefore investigated how consumers value delivery methods, shipping fee structures, order value, and travel time, in terms of online purchase intention in different scenarios. Using a laboratory experiment, we found that online purchase intention for unconditional free shipping is higher for home delivery and delivery at a retail store. There is a significant interaction effect between shipping fee structures and order value on the purchase intention, such that a higher order value has a greater impact than a low order value for threshold-based free shipping compared to unconditional free shipping and flat-rate shipping. We also demonstrated that short travel time is preferred for delivery to a collection point or retail store as an interaction between travel time and delivery method exists. Last, given the longer opening times, delivery to a collection point is preferred over delivery to a retail store.

As the Chapter 3 and 4 provided insights into consumer preferences for delivery options in the new online retail landscape, in Chapter 5 we tested our integrative framework developed in Chapter 2 to provide a broader lens to study the impacts of order fulfilment aspects (including inventory management, last-mile delivery, and returns management) on consumer repurchase intention with trust in an online retailer as mediator. We found that inventory management is positively related with repurchase intention; but surprisingly, last-mile delivery and returns management are not. Moreover we showed that trust in an online retailer partially mediates the relationship between inventory management and repurchase intention and fully mediates the relationship between returns management and repurchase intention. The results of multi-group analyses in this study indicated that the impact of inventory management on repurchase intention for convenience goods is higher than that for specialty goods and that there is a significant difference between convenience goods and shopping goods and between convenience goods and specialty goods in regard to the impact of trust in an online retailer on

repurchase intention. We thus contributed to the literature by examining the relationship between order fulfilment and consumer behaviour in an integrated approach (Chapter 5).

2. Managerial insights

The results of our studies in this thesis provide a number of important insights for retailers and logistics service providers into understanding online consumers in relation to logistics aspects, thus helping the companies properly implement order fulfilment strategies to meet consumers' expectations.

- Consumers select delivery options thinking about their wallet first (findings from Chapter 3 and 4). Some form of free delivery should preferably be offered as consumers are very likely to place most importance on this option. This offer is particularly necessary if retailers want to implement delivery to and pickup of online orders via their stores (Chapter 4).
- Not all consumers are equally sensitive to delivery fees (Chapter 3). It is advisable to design different delivery options, e.g., time slot, delivery speed, or delivery date, in order to provide a reasonably wide mix to cater for individual requirements in terms of convenience or quick delivery. For example, the demand of “I Want It Now” from online consumers is increasing in e-commerce B2C markets (UPS, 2016; Zebra Technologies, 2018). Amazon surprised the online market when they introduced “Instant Pickup” service in the US (Etherington, 2017). The question is how retailers can target the right consumer groups. We suggest that cluster analysis based on importance values of delivery options and consumers' demographics may be used to find the consumer segments. Our study in Chapter 3 reveals that consumer segments share demographic characteristics, including gender and annual income. Specifically, male and middle- to high-income consumers may care more about time slots. Applying higher delivery fee to this group of consumers could be successful. We also recommend that simulation is a useful tool to examine how consumer preferences change in accordance with the new services offered to the consumer group.
- Competitive advantage in online retailing is not anymore reached and maintained through the last mile but rather via inventory management and returns management. Although last-mile delivery has been an important factor of order fulfilment service quality, this factor has become a common feature and an order qualifier nowadays. In most segments offerings of competing logistics service providers are relatively similar providing little ground for competitive discrimination to online retailers when it comes

to last mile delivery from the perspective of a consumer. However, certain segments may still see competitive advantage in delivery, such as deliveries of white goods that require two people to deliver items. Online retailer Coolblue has been successful in the Netherlands in setting up a retailer owned delivery service for white goods. On the whole, however, online retailers cannot solely rely on the good delivery strategy to compete. Given the findings in Chapter 5, we suggest that they should place a special emphasis on inventory management and returns management to achieve competitive advantage in online retailing. For example, they should maintain inventory at sufficient levels to provide timely and in-full delivery, offer a wide range of products, and subsequently show this information to consumers. Product selection and product availability have received growing attention from online consumers (UPS, 2016). Retailers and logistics companies should focus on improving returns services through providing a clear returns procedure, a good consumer support in preparing returns, convenient and appropriate returns channels, and a lenient returns policy. 87% of retailers and logistics service providers agreed that accepting and managing returns is a challenge in the omni-channel retailing (Zebra Technologies, 2018).

- Retailers should not use a “one-size-fits-all” strategy of order fulfillment when selling a wide range of products online (findings in Chapter 5). Specifically, they should place more attention to inventory management for convenience goods than other product categories. Convenience goods (e.g., groceries) are characterized by high volume and low unit costs bought by online consumers. Product availability and selection are vital to a success in the tough competition in the online grocery market (Petro, 2017). Stock-outs of this product type in a webshop tend to cause the consumers to switch to the other webshops.

We conducted the research studies when online retailing was moving from a multi-channel to the omni-channel world in which the physical and online channels are interchangeable and seamless. In the omni-channel retailing landscape consumers still want their online shopping experiences to be fast and convenient. Online retailers and logistics service providers are looking for new technologies (e.g., drones, big data, and robots) and business models (e.g., click-and-collect and crowdsourcing) to meet increasing consumer expectations. Although our studies examined multi-channel retailing, our findings remain relevant with respect to the new trends:

- Drone delivery with its promised advantages such as deliveries at a low cost, deliveries to remote and difficult locations, and express deliveries can be a solution to consumer expectations of low shipping fees, fast deliveries, and short time slots that we found in Chapter 3. A significant amount of research in drone operations has been done in recent years (Otto et al., 2018). Although drone delivery seems to be a niche mode in the future due to many practical problems and constraints (McKinnon, 2016), retailers and logistics companies should be ready for this new delivery method once technological and regulatory issues for drone deployment are solved.
- Companies nowadays store and process larger, more complex datasets from various data sources (e.g., consumers, partners, and social media) than ever before. The challenge of big data including structured and unstructured ones is apparent to online businesses. Managers need to use data analytics at both operational and strategic levels and deal with both predictable and un-predictable decision-making processes (Segars, 2018). The availability of extensive data sets recording revealed consumer behaviour for varying conditions could add further insights to the findings of Chapter 3. For example, predictive analytics using cluster analysis and simulation will allow retailers to anticipate demand patterns with more delivery options, thus possibly offering speedy and cost-effective service to consumers.
- Robotics and automation technologies are significantly enhancing productivity of logistics processes. Omni-channel retailing leads to an increasing number of small individual orders to be handled in warehouses and distribution centers (DHL Trend Research, 2014), an automation approach thus will help to fulfil online orders more efficiently and accurately. In Chapter 5, we indicate that retailers need to focus on inventory management and returns management to gain a competitive advantage in online retailing. This becomes even more challenging in omni-channel retailing as it involves more channels compared to multi-channel retailing. Consumers can select, order, pay and return everywhere independently of each other complicates all three aspects of order fulfilment. The applications of automation and robotics in the two order fulfilment aspects definitely improve productivity, reduce costs, and optimize time-consuming laborious activities.
- To survive in the increasingly competitive e-commerce B2C market, retailers and logistics service providers are experimenting with new delivery methods such as click-and-collect, work-place delivery, and crowd-sourced delivery to consumers. Our findings in Chapter 4 show that home delivery is no longer the only choice of

consumers in online retailing and delivery at a retailer store or a collection point is good alternative methods. Managers should consider the new delivery methods in their strategies due to advantages of the methods to both companies and consumers. For example, the crowd-sourced delivery model help companies improve capacity utilization and reduce transportation costs by offloading orders during peaks, hence reducing the costs and offering flexible delivery options to consumers. We suggest that gas stations can serve as good pick-up locations (e.g., using lockers) due to frequent visits of consumers in the wide network.

The results of each chapter are briefly summarized in Table 1.

Chapter	Topic	Research questions	Research results
2	A literature review of consumer behaviour and order fulfilment in online retailing	<ul style="list-style-type: none"> • Which order-fulfilment elements influence consumer behaviour related to purchasing, repurchasing, and returning products online and in what way? • What is the relationship between online consumer behaviour and order fulfilment performance? 	<ul style="list-style-type: none"> • The current literature indicates significant impacts of order fulfilment factors (inventory management, last-mile delivery, returns management) on consumer behaviour dimensions • An integrative framework of the relationship between order fulfilment and consumer behaviour (purchase, repurchase, product return)
3	An analysis of consumer preferences for delivery attributes in online retailing	<ul style="list-style-type: none"> • Examine how consumers value delivery attributes and make trade-offs when selecting a delivery option for their online purchases • Examine the consumer preferences across segments and product categories 	<ul style="list-style-type: none"> • The most important delivery attribute to online consumers is the delivery fee • Preference structure for delivery attributes is similar across product categories considered • There is a group of consumers who care about the non-price attributes
4	An analysis of consumer perception of delivery methods and shipping fee structures	<ul style="list-style-type: none"> • Examine how consumers value delivery methods, shipping fee structures, order value, and travel time, in terms of online purchase intention 	<ul style="list-style-type: none"> • There is a significant interaction effect between shipping fee structures and order value on the purchase intention • There is an interaction between travel time and delivery method exists such that short travel time is preferred for delivery to a collection point or retail store • Delivery to a collection point is preferred over delivery to a retail store due to the longer opening times
5	An analysis of the impacts of order	<ul style="list-style-type: none"> • Determine how order fulfilment factors (inventory 	<ul style="list-style-type: none"> • Inventory management is positively related with repurchase

Chapter	Topic	Research questions	Research results
	fulfilment aspects on consumer repurchase intention across product categories	management, last-mile delivery, and returns management) influence consumer repurchase intention in online retailing across three product categories (convenience goods, shopping goods, and specialty goods) • Examine the mediating role of trust in the relationships	intention • Last-mile delivery and returns management are not positively related with repurchase intention. • Trust in an online retailer partially mediates the relationship between inventory management and repurchase intention and fully mediates the relationship between returns management and repurchase intention.

Table 1: Overview of research results of the thesis

3. Suggestions for further research

This thesis provides a study of the relationship between order fulfilment and consumer behaviour in online retailing. Although the results yield valuable insights, they also give rise to supplementary questions that require further research.

First, our studies (except Chapter 2) used cross-sectional data collected from surveys and an experiment. The hypothesized causal relationships in these studies are inferred rather than proven. As consumer behaviour involves in an online buying process from the point of a consumer's visit to a retailer's website to purchase a product until the product is delivered to the consumer (or the product is returned), an analysis with longitudinal and transactional data using company order records may provide a better understanding of the dynamics of the relationship between order fulfilment and consumer behaviour.

Next, our studies focused on specific country (i.e. the Netherlands and the UK). As cross-border e-commerce is globally increasing (AliResearch, 2016; Ecommerce Foundation, 2016b), retailers need to arrange order fulfilment operations in accordance with very diverse shopping habits and consumer preferences. Does inventory management, last-mile delivery, or returns management have similar impacts on consumer behaviour? Future research therefore should account for the cross-border context in investigating the relationship between order fulfilment and consumer behaviour.

Last, although our studies have examined order fulfilment aspects and consumer behaviour dimensions, we did not focus on effects that may impact operations such as consumers' choices of returns channels (Bernon et al., 2016; UPS, 2015b), a new delivery service with a

membership (e.g., Amazon Prime), or showrooming behaviour (Daunt and Harris, 2017; Gensler et al., 2017). Future research that captures these issues would hence enrich our understanding of the relationship between order fulfilment and consumer behaviour.