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CLICK-AND-DRIVE E-TAILING SERVICE: CONSUMERS' PERCEIVED CONVENIENCE AND COST

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ABSTRACT

E-tailing, coupled with the rise of internet mobility, allows cross-shopping options with different types of methods to receive goods, such as the click-and-drive model, to suit the modern lifestyle. Individuals with time pressures and constraints, such as those subject to long working hours or other commitments that take up much of their day, may find click-and-drive a convenient option. This paper investigates the influences of unobserved factors such as perceived convenience, travel time, travel distance, time pressure, product quality risk, and perceived relative advantage, as well as observed factors such as demographic factors, on the likelihood of using click-and-drive for grocery shopping, based on the utility theory. Ordered probit estimation on cross-sectional data collected from 351 respondents revealed that the potential to save time as well as perceived convenience and relative advantage increase the likelihood of consumers using click-and-drive for their shopping. Perceived product quality risk is a deterrent against the adoption of click-and-drive services. Consumers are generally uncomfortable buying perishable items, such as fish, via online channels. The findings have valuable implications for retailers intending to establish and improve click-and-drive offerings, especially with the aim of achieving contact-free transactions post-COVID-19.

Keywords: Online shopping, E-tailing, Click-and-drive, Cost, Convenience, Utility

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1. INTRODUCTION

Malaysia has witnessed significant growth in its e-commerce market, positioning itself as one of the largest and fastest-growing markets in Southeast Asia. With a market worth $9.2 billion in 2022, it is expected to reach $16.6 billion by 2026, reflecting a compound annual growth rate (CAGR) of 16.1% (Dong, 2022). This growth has been fuelled by factors such as increased mobile

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internet penetration, government initiatives, and secure online payment systems (Dong, 2022; MDEC, 2022; MCMC, 2018; Roger, 2018). The COVID-19 pandemic has further accelerated the expansion of e-commerce, as consumers increasingly turn to online platforms, including for groceries, to minimize contagion risks and navigate lockdown measures (Gu et al., 2021; OECD, 2020). The widespread adoption of e-commerce during the pandemic is likely to have a lasting impact on the retail landscape, with a significant proportion of consumers intending to continue using digital solutions even after the return to normalcy (Google et al., 2021).

In response to the rise of pure online grocery players, traditional brick-and-mortar retailers have proactively invested in online shopping platforms and self-collection facilities, even predating the pandemic (Roger, 2018; Hübner et al., 2016). These retailers leverage e-commerce technologies to enable customers to order groceries online for home delivery or opt for convenient in-store collection, saving time and providing flexibility (Pantano & Priporas, 2016). Click-and-drive services have emerged as a solution to address the challenges of in-store collection. These services involve pick-up kiosks located adjacent to grocery stores but separate from the main store, offering a drive-through experience where customers can collect their goods without leaving their vehicles. In countries like France, click-and-drive has gained significant traction, surpassing the market share of online grocery home delivery with thousands of drive-through stations nationwide. Some retailers also provide click-and-drive options at independent warehouses to cater to customers residing in suburbs (Hübner et al., 2016; Colla & Lapoule, 2012).

However, while click-and-drive has been successful in certain countries like France, its adoption and reception have been mixed in other regions. For example, the United Kingdom predominantly relies on home delivery as the primary mode of e-grocery, suggesting that customer receptivity to various e-grocery channels varies based on market maturity and unique customer behaviors and expectations within the domestic grocery sector (Hood et al., 2020; Milioti et al., 2020; Vakulenko et al., 2018). Therefore, the question arises as to whether the click-and-drive model will be embraced by grocery shoppers in Malaysia to make it a worthwhile venture for businesses.

Malaysia, being a highly urbanized nation with a strong internet penetration rate and well-developed infrastructure (MCMC, 2018), presents an ideal environment for the implementation of click-and-drive services. Traditional grocers can easily tap into the online sales market by offering self-collection facilities like click-and-drive. This approach proves to be practical and cost-effective, as it minimizes fixed costs, utilizes existing facilities, provides flexibility, reduces logistics expenses, and avoids delivery-related challenges. Such advantages are especially beneficial in densely populated cities, where traffic congestion is a common issue (Morganti et al., 2014; Goethals et al., 2012). In the case of Penang, a highly industrialized state with a dense population and high vehicle ownership, introducing click-and-drive as an option aligns with the region's efforts to address traffic congestion and improve transportation efficiency (Dermawan, 2022; Tan, 2019; Fernandez, 2014). By allowing time-strapped Penangites to collect their ordered groceries during their daily commutes, click-and-drive offers a time-saving solution. Moreover, compared to home delivery, click-and-drive provides greater flexibility since customers are not required to be present at home to receive their groceries (Milioti et al., 2020; Pantano & Priporas, 2016). With its added convenience and flexibility, click-and-drive can be a valuable offering for businesses in Penang, catering to the needs of busy consumers who prefer to conveniently pick up their groceries within a short driving distance.

Although studies have explored various factors influencing consumers' channel preferences for grocery shopping and online purchasing behavior, there is limited literature specifically examining the click-and-drive model and consumer expectations in economies similar to Penang or congested island states/cities (Pantano & Priporas, 2016; Xie et al., 2016). Additionally, research on customer preferences regarding goods delivery is also scarce, resulting in a lack of comprehensive understanding of omnichannel retail distribution, particularly in terms of direct-to-customer or store deliveries (Miquel-Romero et al., 2018; Yuen et al., 2018). Therefore, this study aims to fill this gap by investigating the role of perceived cost and convenience in consumers' adoption of click-and-drive services, specifically targeting working adults in densely populated and congested states or cities, with a focus on Penang, Malaysia. The insights gained from this research will be valuable for businesses aiming to enhance their services and offerings, particularly for retailers seeking to implement an omnichannel retail strategy.

2. LITERATURE REVIEW

2.1 E-tailing

Studies on e-tailing are ample, but gaps exist. For example, Wu et al. (2014) measured consumers' perceived convenience in terms of e-shopping value in Taiwan but did not consider click-and-drive as an alternative delivery channel. Huang and Oppewal (2006) studied situational factors such as time and fees against motivations to shop online but did not consider click-and-drive or situations outside the UK. Roslan et al. (2016) surveyed consumers' travel distance and time for grocery shopping but did not explain the differences and trade-offs between the two variables. Malaysian consumers perceive buying fish online as risky (Ghazali et al., 2006), but the findings may be out of date because the study was conducted more than a decade ago, before widespread internet mobility. Yuen et al. (2018) found the relative advantage of self-collection over home delivery to be an influential factor in the choice of the delivery channel; however, they did not look into the click-and-drive model and only considered the situation in Singapore, which has a contrasting vehicle ownership rate.

2.2 Likelihood of Using Click-and-drive in E-tailing

The typical economic individual is one who emphasises self-interest and acts rationally to maximise personal utility. Commonly, the concept of utility is employed to study or model consumption behaviour in economics, particularly in the study of consumer choices. In these models, studies use information such as budget and consumer preference to predict the choices consumers will make. Utility is subjective and, hence, difficult to quantify. Thus, the revealed preference theory was developed in the 1930s by Samuelson to explain consumers' consumption behaviour without taking utility into consideration (Richter, 1966). Given that revealed preference data is based on actual behaviour, the use of these techniques proves difficult when forecasting demand for new services. Experiments using hypothetical choices were developed to obtain a better understanding of utility theory for goods and services that have not been on the market or popular with consumers. According to Pearmain et al. (1991), researchers can infer data on preferences (liking or disliking for each option) and behavioural intentions (what the person would intend to do) by using stated preference techniques.

The computation of utility would be influenced by monetary and non-monetary considerations and personal attitudes that maximise utility from the decision. If the perceived benefits are larger than the perceived cost, consumers will be most likely to use the service, and vice versa if the perceived cost is larger. Thus, if the individual consumer chooses to use click-and-drive, he or she is assumed to receive a net benefit or utility from the service. The benefits of using click-and-drive include the reduction in time and effort involved in shopping, convenience, budget and time savings that allow for spending on other activities, and the satisfaction of getting needed groceries; conversely, the costs of using click-and-drive may be the risk of getting low-quality or stale groceries, and longer travel time and distance. Existing literature reveals perceived convenience (Wu et al., 2014), travel time (Huang & Oppewal, 2006), self-described time pressure (Ortlinghaus et al., 2019), travel distance (Roslan et al., 2016), product quality risk (Ghazali et al., 2006), and perceived relative advantage (Yuen et al., 2018) to affect consumers' choices of where and how to shop for groceries.

2.3. Perceived Convenience

Convenience is known as the potential to accomplish a task with the least energy expenditure (Morganosky, 1986). Consumers seek to accomplish a task at their best convenience with the least expenditure of effort (Morganosky & Cude, 2000). Echoing that statement, convenience is found to be the main motivator of online shopping adoption (Miquel-Romero et al., 2018). Anesbury et al. (2016) found time saved via online shopping is largely confined to time spent travelling to and from the store, movements within the facility, and queues at the cashier counter. Thus, as compared to home delivery, click-and-drive seems less appealing given the need to travel to stores to collect goods (Schröder & Zaharia, 2008). Convenience, however, is context-driven and differs across situations and individuals (Hand et al., 2009). Mounting time pressure and constraints may hinder individuals from being available at home for home deliveries (Milioti et al., 2020; Pantano & Priporas, 2016). Depending on the lifestyle and characteristics of the individuals, consumers may perceive click-and-drive to be convenient despite having to bear the logistical costs of travelling to the store to pick up goods. Thus, it is believed that increased consumer perceived convenience leads to increased utility of using click-and-drive, resulting in a higher likelihood of consumers choosing click-and-drive in e-tailing.

2.4 Travel Time

Click-and-drive requires consumers to spend time travelling to the store to pick up goods. Studies find that most shoppers in Selangor, Malaysia, travel within 30 minutes for food and groceries (Roslan et al., 2016). In examining shoppers in South England, Huang and Oppewal (2006) found that a 15-minute difference in travel time to the grocery store had a greater impact on the relative preference to shop online or in-store as compared with a delivery fee of £5.00 (approximately US$6.50). Echoing the impact of travel time on click-and-drive, 91 percent of pick-up points in France are situated within a 10-minute drive for customers (Morganti et al., 2014). Interestingly, online shoppers do not differ from in-store shoppers in terms of time spent choosing the merchandise, and time is only saved from travelling and waiting (Anesbury et al., 2016). Click-and-drive, albeit still requiring shoppers to travel to the store, offers the benefit of reduced shopping time via a drive-through collection at one's convenience. Consistent with previous studies, the time needed to access stores is believed to influence consumers' satisfaction with the service, but the features of click-and-drive were not adequately considered. Based on the literature, it is inferred that a lower perceived travel time increases the likelihood of consumers choosing click-and-drive

for grocery shopping.

2.5. Self-described Time Pressure

Consumers with time pressure, or those that claim, "I do not have time to shop for groceries," have a predisposition to consider time as scarce and plan to utilise it wisely (Milioti et al., 2020; Kleijnen et al., 2007). Consumers pressured by time seek refuge in online shopping as opposed to visiting a store in order to save time (Hand et al., 2009). They dislike the time spent waiting to be served or queuing at the checkout counter. Thus, the impatient consumer would seek the shortest queue and pursue options that save time (Wang et al., 2012). The benefits of saving time have been cited as being significant for consumers to move their shopping to an online space (Pantano & Priporas, 2016). Studies show that time pressure and the perceived relative advantage of an online shopping channel have a positive relationship with choosing to shop online, and as time-pressured consumers seek to make the best use of their time, time-saving options for grocery shopping should be valuable to them (Kleijnen et al., 2007; Verhoef & Langerak, 2001). For the case of click-and-drive, consumers can collect their orders via drive-through during their daily commute, effectively saving their shopping times and avoiding the need to make separate grocery trips, queue up, and look for a parking space (Milioti et al., 2020). Thus, it is assumed that a higher self-described time pressure leads to a better likelihood of consumers choosing click-and-drive for grocery shopping.

2.6. Travel Distance

Distance travelled by consumers to stores has been identified as a defining factor in the choice of shopping location according to studies done in the Netherlands (Veenstra et al., 2010) and Beijing (Mai & Zhao, 2004). The effects of travel distance can be explained by its associated cost, as long travel distances increase travel costs, thus creating a barrier against shoppers visiting offline stores (Jin et al., 2018). It is also inferred that click-and-drive shopping channels shall be put under similar scrutiny in terms of travel distance as the ship-to-store or collect-in-store programme would only benefit consumers within a driving distance from the designated physical stores (Gallino et al., 2017). For instance, Rosland et al. (2016) found that hypermarket shoppers in Shah Alam, Malaysia, prefer the closest store within 10 km, while Morganti et al. (2014) note that on average, French populations are located 1.6 km from the nearest drive-through stations in urban areas and 6 km in rural areas.

While it is easy to agree with the notion that consumers seek the shortest distance travelled for their grocery shopping, the utility trade-offs are not straightforward. A study conducted in five small towns in Minnesota, USA, finds that most consumers choose to shop in discount stores close to where they live despite other obvious benefits such as product assortment and low price (Brennan & Lundsten, 2000). However, results from the survey conducted on college student grocery shoppers in a Midwest college town uncover, surprisingly, a positive relationship between travel distance and customer satisfaction (Hsu et al., 2010). This indicates that other variables (e.g., price and time) and convenience considerations may be at play, and each variable should be viewed on a relative basis or against different consumer segments. Concerning click-and-drive, it is assumed that a lower perceived travel distance increases consumers' likelihood of adopting click-and-drive for grocery shopping.

2.7. Product Quality Risk

The fear of product quality not meeting the customer's initial expectations is known to adversely impact preferences for online shopping (Ortlinghaus et al., 2019). The lack of an avenue for consumers to inspect the merchandise before a purchase is cited as one of the major shortfalls of online shopping for home delivery, as shoppers are not able to carefully evaluate the products before purchase (Thakur & Srivastava, 2015). Searching for goods that require a lesser extent of direct examination (e.g., electronics, toilet paper) is perceived as less risky for online purchase compared to goods requiring a higher degree of examination or perishables like fish and raw meat (Ortlinghaus et al., 2019; Ghazali et al., 2006). Among the most cited reasons, according to the research, are the desire to touch, feel, smell, and inspect the products before purchase, concerns about the foods' freshness after delivery home, and difficulty in returning spoiled food (Ghazali et al., 2006). However, click-and-drive offers the opportunity to check the goods during collection. Hence, the cost of waste could be reduced. Also, as e-tailing becomes much more common nowadays, the risk perception of modern consumers needs to be reviewed. Referencing the literature, it is reasoned that higher perceived product quality risks reduce the likelihood of consumers adopting click-and-drive.

2.8. Perceived Relative Advantage

Yuen et al. (2018) find that consumers' perception of the advantages of self-collection services relative to other shopping channels influences a customer's intention to use the self-collection service. Pantano and Priporas (2016) noticed many individuals live alone and work during the day, thus limiting the possibility of them staying home and anticipating the courier to deliver goods purchased online. Unattended home delivery, on the other hand, faces security concerns as well as a lack of willingness to pay for delivery costs and reception box setup costs, making it difficult to implement this model (Hübner et al., 2016; Goethals et al., 2012).Under time pressure or when the availability to receive delivered goods is unknown, the possibility for consumers to shop online and collect goods at their own time may be a valuable option (Milioti et al., 2020; Miquel-Romero et al., 2018). These individuals wish for supermarkets to be open 24 hours a day, 7 days a week, or operating until 10 or 11 p.m. to sufficiently meet their needs for shopping or the collection of goods (Geuens et al., 2003). The wider and more flexible self-collection window may be seen as an advantage as compared to the shorter home delivery window during fixed time slots. Therefore, it is hypothesised that a higher perception of relative advantage from click-and-drive leads to higher utility from using the service and, thus, a better likelihood of its adoption for grocery shopping.

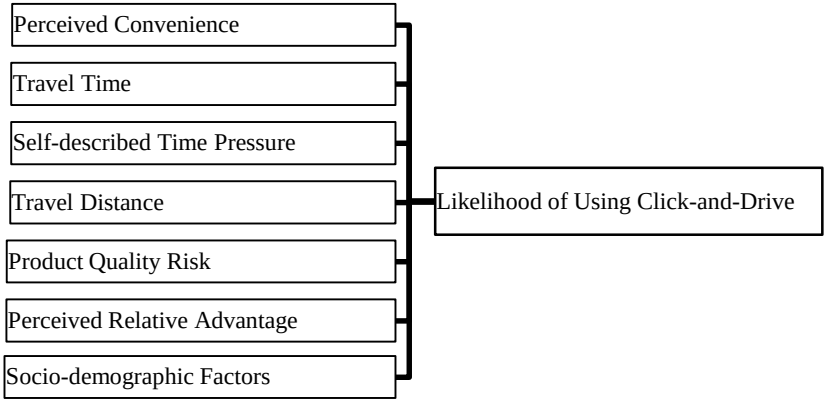
2.9. Demographics

Tamimi & Sebastianelli (2016) found that while there is no gender effect on perceived e-tailer quality, age has an influence, with older respondents placing a higher relative value on security compared to younger ones. Frequent online shoppers place less relative importance on retailer reputation, suggesting experience does make a difference in choosing who to buy from. On top of that, a higher frequency of online shopping was found to decrease the probability of consumers using click-and-collect, an indication of trust and resistance to change (Milioti et al., 2020). Hood et al. (2020) found that females, more affluent households, and those in the 25–44 age group are most likely to use home delivery for groceries. Furthermore, while overall usage is lower, males and skilled manual workers have a particular preference for collection facilities. Studies also found that marital status and education level influence the choice of shopping location and channel,

respectively (Roslan et al., 2016; Chocarro et al., 2013). Therefore, it is established that socio-demographic factors influence the likelihood of consumers choosing click-and-drive grocery shopping.

Figure 1 depicts the conceptual framework of the study. The likelihood of using click-and drive is influenced by perceived convenience, travel time, travel distance, self-described time pressure, product quality risk, perceived relative advantage and socio-demographic factors.

Figure 1: Conceptual Framework



3. METHOD AND DATA

3.1. Research Approach

As mentioned in the introduction, the click-and-drive service has not been widely established, especially in developing countries like Malaysia. As compared to countries like France, the US, and the UK, where thousands of drive-through systems are widely available, the self-collection method is only in its early stages. According to the Malaysian Communications and Multimedia Commission (MCMC), online shoppers comprised up to 53 percent of internet users in 2018, growing from 48.8 percent two years ago. Nonetheless, only two percent of grocery shopping in Malaysia was conducted online (Roger, 2018; Toh, 2017), and there are only two retailers in Malaysia that offer a click-and-drive service (Aeon 2018; Devi, 2018). Hence, the study uses the stated preference approach to investigate the likelihood of consumers using click-and-drive. A hypothetical statement was designed to obtain consumer preference for the click-and-drive service.

3.2. Questionnaire Design

This study collected data with a structured questionnaire (see Appendix 1). This method is deemed adequate when the variables of interest and means of measurement are well known (Sekaran & Bougie, 2010). The items in the questionnaire were adopted from the literature. The responses on independent variables, which were evaluated as deciding factors for click-and-drive usage, were collected via a six-point Likert scales measurement items. Six-point Likert scales tend to give higher discrimination and reliability values than the 4-point and 5-point Likert scales (Leung,

2011). However, the issue of selecting the 6-point Likert scales over the others more depend on the empirical setting and the technique of analysis (Chang, 1994). According to Chomeya (2010), six-point Likert scales is more appropriate for a study with many variables, and for behavioral studies. Those variables are defined as perceived convenience, travel time, self-described time pressure, travel distance, product quality risk and perceived relative advantage. The items were adopted from existing literature as shown in

Table **1**.

Table 1: Measurement Items

Ind. Variables	Measurement Items	Sources
Perceived Convenience	1. When I make a purchase from this online store, I save time. 2. It is easy to shop for a product/service in this online store. 3. The effort that I must make to purchase from this online store is low.	(Wu et al., 2014)
Travel Time	1. It is easy to access the collection point. 2. It does not take much time to reach the collection point. 3. I was able to access the service provider's location quickly.	(Berry et al., 2002)
Self-described time pressure	1. I am always busy. 2. I usually find myself pressed for time. 3. Generally, I have little time for shopping.	Ortlinghaus et al (2019)
Travel Distance	1. The travel distance is close to my home. 2. The travel distance is close to my workplace. 3. The travel distance is close to my children's school.	(Mai & Zhao, 2004)
Product Quality Risk	1. I do not feel secure when buying fish online. 2. I feel uncertain about the quality of fish when purchasing online. 3. It bothers me when I am unable to try/feel, see/touch the fish prior to purchase. 4. Buying fish online is convenient. 5. Buying fish online reduces the hassle of travelling physically to the retail outlet, finding parking space and queueing to make payment.	(Ghazali et al., 2006)
Perceived Relative Advantage	1. Using self-collection improves my overall goods collection experience 2. Using self-collection makes it easier to receive my goods. 3. Using self-collection enables me to receive my goods more quickly. 4. Using self-collection is advantageous. 5. Using self-collection is the best way to receive my goods.	(Yuen et al., 2018)

The items on perceived convenience were adopted based on Wu et al. (2014). The items for self-described time pressure were taken from Ortlinghaus et al. (2019). The questions for travel time and travel distance were referred directly from Berry et al. (2002) and Mai and Zhao (2004), respectively, because their research focused on visits to physical retail stores and is thus representative of the cost perspective of click-and-drive. Ghazali et al. (2006) used product quality risk perceptions to measure the consumer's perception of buying experience goods via click-and-

drive. Finally, the items on relative advantage used by Yuen et al. (2018) were used to observe shoppers' perceptions of relative advantage from click-and-drive as compared to home delivery. Before the actual survey was administered, the questionnaire was pretested with a small convenience sample to make sure the questions could be well understood, ambiguous sentences were identified, the arrangements of questions were logical, and the questions were as free as possible from bias and unintended anchoring.

3.3. Unit of Analysis and Sample

A careful selection of the unit of analysis, as Sekaran and Bougie (2010) assert, allows the collection and aggregation of data in a meaningful way for the subsequent data analysis. In this study, the units being analysed are adults above the age of 21 with a full-time job who possess their own vehicle. The terms mentioned are also the pre-requisites of the questionnaire. Adults working, living, or studying in the vicinity of the Bayan Lepas Industrial Zone are selected as the sampling frame of the study as they fulfil several key characteristics of the unit of analysis. Firstly, this group of people is representative of an urban working population. Next, they are more likely to fulfil key requirements to be eligible respondents, such as adequate exposure to smartphones and e-tailing, possess their own transport, and have a full-time job. Samples were collected between February and April 2020.

Krejie and Morgan's sampling calculation was referred to obtain the appropriate sample size (Krejcie & Morgan, 1970). The total employment in Penang was estimated at 830,000 persons (*Department of Statistics Malaysia Official Portal*, 2019). Hence, the sample size needed for the study was 323. The non-probability sampling method was employed for this study. It saves time and cost in the process of identifying potential subjects in the population.

3.4. Model Specification: Ordered Probit Model

The dependent variable is the likelihood of consumers using a click-and-drive service, which is estimated using an ordered probit model. The data for this variable was collected via a set of six-point Likert scale measurement items.

The likelihood and determinants of using click-and-drive in Penang Island, Malaysia were expressed as different likelihood categories on six-point Likert scales, where 1 stands for 'strongly disagree' and 6 stands for 'strongly agree'. The study makes use of the ordered probit model that could be derived from a latent variable model. The standard error term is assumed to be normally distributed.

Suppose the underlying relationship to be characterized as: $y^* = X^T\beta + \varepsilon$
where y^* is the exact but unobserved dependent variable (perhaps the likelihood of using click-and-drive); X is the vector of independent variables, and β is the vector of regression coefficients to estimate. Further, suppose that while y^* cannot be observed, instead the categories of response can be observed as:

$$y = \begin{cases} 0 \quad if\ y^* < 0 \\ 1 \quad if\ 0 < y^* \le u_1 \\ 2\ if\ u_1 < y^* \le u_2 \\ \quad . \\ \quad . \\ \quad . \\ N \quad if\ u_{N-1} < y^* \end{cases}$$

Then the ordered probit technique uses the observations on y, which are a form of censored data on y^*, to fit the parameter vector β.

4. RESULT AND DISCUSSION

4.1. Respondent Profile

Table 2 depicts the respondent profile. Amongst the 351 valid responses, males comprise a slightly higher proportion (52 percent). The largest cohort belongs to the younger working population below 30 years old (47 percent), followed by the Millennials aged between 30 - 39 (41 percent), and Generation X aged 40 and above (7 percent). Most of the respondents are single (64 percent) and a vast majority graduated with a tertiary degree (96 percent) and own a personal vehicle (98 percent). This group of people most likely possess the pre-requisites for using the click-and-drive service: internet access and vehicle ownership. Around 57 percent of the respondents live within 4 km from the nearest grocery store and 73 percent earn less than RM7999. Less than half have used click-and-collect (24 percent), heard about click-and-drive (31 percent), or bought groceries online (36 percent). Overall, 70 percent of respondents expressed a willingness to use click-and-drive.

Table 2: Respondent Profile

Demographic Factors	*Categories*	*Frequency*	*Percentage (%)*
Gender	Male	183	52
	Female	168	48
Age	<30	164	47
	30-39	146	41
	40 & above	41	12
Marital Status	Single	223	64
	Others	128	36
Education	College/University	338	96
	Others	13	4
Monthly Household Income	≤RM7999	255	73
	RM8000 & above	96	27
Likelihood to use Click-and-Drive	Yes	244	70
	No	107	30

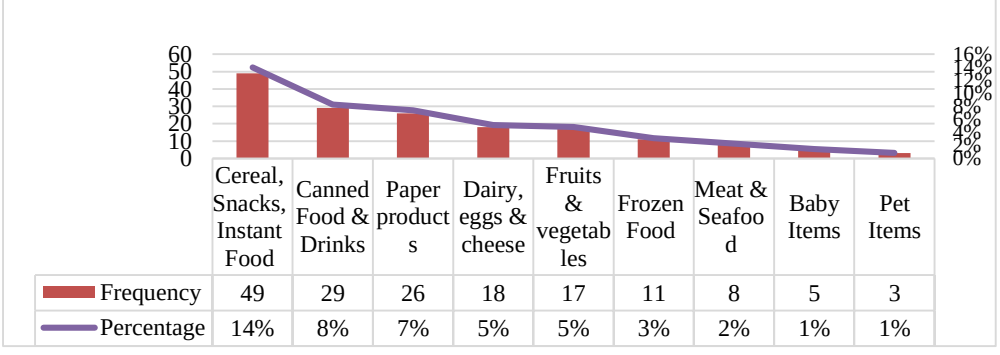
Based on the descriptive analysis conducted on the survey, females generally shop more, both in-store and online, than men. However, males are more likely to shop for groceries online. Both genders generally do more shopping in-store and their attitudes toward click-and-drive are equally encouraging. Data also shows single people tend to shop less. The analysis also reveals that online shopping overall is more popular among the younger generation (below 30 years old) as compared

to the population aged above 40 years old, who are less willing to use click-and-drive services. Those earning above RM7999 tend to shop more both in-store and online than their lower-income counterparts, reflecting the difference in spending power. Also, data show that respondents live on average 4 km away from the nearest grocery store, which is within close driving distance. Interestingly, those living more than 4 km away from stores do not show higher average online shopping frequency.

Notably, more than half of respondents who have or have not used click-and-collect respectively expressed willingness to use the click-and-drive. Similarly, over half of those who have or have not heard about click-and-drive are willing to use the click-and-drive respectively. However, those who have used click-and-collect or heard about click-and-drive show a higher willingness to use click-and-drive. Out of the 22 percent of online shoppers who faced issues in recent online purchases, over 67 percent are willing to use click-and-drive. This indicates that familiarity with online shopping may contribute to the likelihood of using click-and-drive, in contrast to the findings from Milioti (2020).

Online shopping is found to be popular, yet not all product types are treated the same. While 80 percent of respondents shop online, only 36 percent bought groceries. Shampoo, toothpaste and personal care products are purchased by most online grocery shoppers (23 percent) followed by detergent and cleaning supplies (16 percent), and cereal, snacks and instant food (14 percent). Fruits and vegetables, frozen food as well as meat and seafood have been purchased by less than 5 percent of the respondents respectively. This suggests that consumers in Penang are generally uncomfortable buying perishable items online.

Figure 1: Groceries Purchased Online



4.2. The Likelihood of Using Click-and-drive (Ordered Probit Model)

Table 3 shows the abbreviations and descriptions of the variables for the model.

Table 3: Definition of Independent Variables

Abbreviation	Explanation	Data Type
Convenience	Convenience is consumer's perceived potential to accomplish a task with the least energy expenditure.	Likert

TTime	Travel time to be spent by consumers travelling to the store to pick-up their goods via click-and-drive.	Likert
DescribeSelf	Consumer's self-described time pressure.	Likert
Distance	Distance to be travelled by consumers to the store to pick-up their goods via click-and-drive.	Likert
Quality	Consumer's perceived risk of product quality not meeting initial expectations when buying via click-and-drive.	Likert
RelAdv	Perceived advantages of click-and-drive relative to the other collection channels.	Likert
Age	Age is a continuous number.	Cont. no
Gender	Gender takes a value of 1 if Male, and 0 otherwise.	Binary
Income1	Monthly household income level takes a value of 1 if the monthly household income is more than RM7999, and 0 otherwise.	Binary
Status	Marital status takes a value of 1 if single, and 0 otherwise.	Binary

4.3. Results

4.3.1. Multicollinearity

Multicollinearity among variables was tested as shown in

Table **2**. Besides *TTime* and *Distance* (0.6121) as well as *RelAdv* and *Convenience* (0.5503), the other correlations are less than 0.50. Hence, we do not have to worry about the multicollinearity problem.

Table 2: Multicollinearity Test Result

	TTime	*Distance*	*RelAdv*	*Convenience*	*Quality*	*DescribeSelf*
TTime	1.0000					
Distance	0.6121	1.0000				
RelAdv	0.3140	0.2862	1.0000			
Convenience	0.3125	0.2368	0.5503	1.0000		
Quality	0.1618	0.1856	0.0216	0.0694	1.0000	
DescribeSelf	0.1195	0.1539	0.1577	0.1452	0.0171	1.0000

4.3.2. Ordered Probit Estimation

As shown in

Table 5, the chi-square statistics indicate that we can reject the null hypothesis where all the coefficients of the explanatory variables are zero. Hence, the model is statistically significant in explaining the likelihood of consumers using click-and-drive.

Table 5: Results from the Ordered Probit Model Estimation

Variable	Coefficient		Robust Std. Err
Convenience	0.0858	*	0.0482
TTime	0.0912	*	0.0497
DescribeSelf	0.0429		0.0401
Distance	-0.0095		0.0508
RelAdv	0.1268	***	0.0384
Quality	-0.0857	**	0.0412
Number of observations		351	
Wald chi^2 (6)		46.84	
Prob > chi^2		0.0000	
Pseudo R^2		0.0494	
Log pseudolikelihood		-523.3989	

Note: ****, **, * significant at the 1 percent level, 5 percent level, and 10 percent levels.*

Based on the result in Table 5, perceived convenience is found to have a positive influence on consumers to use click-and drive. One unit increase in each of the scores for *Conv* increases the likelihood by 0.0858. This is consistent with Wu et al (2014) where convenience or savings in time, effort and complications in shopping is a trade-off valued by consumers, encouraging adoption of click-and-drive. Further, the potential to save time encourages consumers to adopt click-and-drive. As observed, one-unit increase in *TTime* score increases the likelihood of click-and-drive by 0.0912. This is consistent with findings from Huang and Oppewal (2006) and Chocarro et al. (2013), where time-saving possibilities positively impact the relative preference of consumers toward a shopping channel, which is the click-and-drive in this case.

In line with previous studies (Ortlinghaus et al., 2019; Ghazali et al., 2006), perceived product quality risks create a lower likelihood to use click-and-drive as each unit increase in *Quality* score reduces the likelihood of usage by 0.0857. The majority of respondents (93 percent) perceives buying fish via click-and-drive as risky and bothersome, echoing findings from the decade-old study done by Ghazali et al. (2006). Based on the data, one unit increase in the score for *RelAdv* increases the probability by 0.1268. Thus, a perceived relative advantage is a significant factor exerting a positive influence on the consumer's likelihood of using click-and-drive, agreeing with (Yuen et al., 2018) that consumers will choose a delivery channel when they see the service as more appealing than the other delivery methods. Nonetheless, *Distance* and *DescribeSelf* do not show significance in this model.

Results from the ordered probit model show that travel time, perceived relative advantage, perceived convenience and perceived product quality risk show significance in the model and influence the likelihood of consumers choosing click-and-drive for grocery shopping. Consistent with the proposed hypothesis, short travel time and better perceptions of relative advantage and convenience leads to a higher likelihood of consumers choosing click-and-drive for grocery shopping. A higher perceived product quality risk reduces the likelihood of consumers using click-and-drive. As a summary, the choice of using click-and-drive is highly influence by the utility or benefits received by the consumer.

5. IMPLICATIONS

To meet the demands of consumers seeking shorter travel times and improved convenience, retailers should focus on refining their click-and-drive collection centers. These centers should be strategically located close to consumers' whereabouts, reducing travel time and distance. Retailers can also explore the idea of establishing shared warehouses or collection stations with other retailers in the neighborhood or near workplaces.

When it comes to click-and-drive services, it is crucial to offer a higher relative advantage compared to other delivery channels. To achieve this, retailers should strive to keep any additional fees for click-and-drive services as low as possible. By minimizing the cost differential, retailers can leverage the consumer's potential cost-convenience trade-off and emphasize the superior benefits of their service. These can include features such as price discounts, a quick and easy collection process, pay upon collection, a wide collection window beyond home delivery time slots, immediate collection upon order, and more. Retailers should highlight the convenience of social distancing, as well as the time and effort saved compared to traditional shopping and queuing at the checkout counter.

While there is positive response to click-and-drive services, it is important to address the perceived quality risk that may deter some customers. Certain items, such as fish, pose a challenge due to customers' uneasiness about buying perishable goods without personal inspection. In the initial stages of developing click-and-drive services, retailers should focus on offering more standard products like shampoo, cleaning supplies, and packaged food. For businesses selling fresh produce and meat products, measures such as freshness and quality guarantees, reliable and inspectable packaging upon collection, and an accommodating product return process should be considered.

Customer segmentation plays a significant role in establishing successful click-and-drive services. While males are more likely to shop for groceries online, the female population generally shops more frequently both online and in-store. Retailers should target male early adopters through marketing efforts and tailor service features to cater to females and families, as they have a higher tendency to become regular customers. Additionally, consumers who are already familiar with click-and-collect or click-and-drive services are more likely to use these services, so retailers should engage in effective marketing and promotional activities prior to launching click-and-drive services.

6. CONCLUSION

This research investigates the role of cost and convenience in working adults' decision to use click-and-drive services for grocery shopping. Overall, respondents in Penang have a positive attitude towards click-and-drive, especially among those familiar with it. The COVID-19 lockdown has increased the importance of online shopping and click-and-drive, providing convenience and flexibility while maintaining social distancing. This model is likely to be well-received in other cities like Wilayah Persekutuan and Johor Bahru, as well as semi-urban cities such as Alor Setar and Malaka. Retailers can use these findings to understand shoppers' preferences

and develop relevant offerings. However, the study's limitations include focusing only on groceries and the need for further research on post-pandemic preferences and in different city contexts. The pandemic has forced businesses to explore online channels like click-and-drive, which have become crucial for survival. Around two-thirds of consumers plan to continue online grocery shopping, with the government providing support through initiatives like PENJANA. Retailers must embrace digital opportunities as part of the evolving retail landscape driven by the government's digital initiatives.

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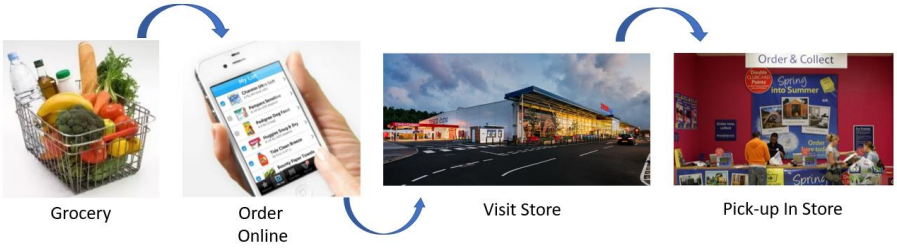
Appendix 1 Questionnaire

Section A Introduction

1. **Click-and-COLLECT**



In click-and-collect, customers purchase goods online and collect them from the pick-up counter at the seller's store.

2. **Click-and-DRIVE**

In click-and-drive, customers purchase goods online and pick-up via a drive-through station which collects and stores goods from different sellers. Goods are carried and placed directly at the storage compartment of the customer's vehicle.

Section B: Consumer Grocery Shopping Experience from different Channels

B1. Have you used click-and-***collect*** before? [ ] Yes [ ] No
B2. Have you heard about click-and-***drive***? [ ] Yes [ ] No
B3. How often do you shop online? _____ times a month
B4. How often do you buy ***groceries*** online? _____ times a month
B5. If the answer to **B4** is not zero, which type(s) of grocery do you buy online?
[ ] Cereals, Snacks, Instant Food [ ] Canned Food & Drinks [ ] Frozen Food
[ ] Dairy, eggs & cheese [ ] Fruits & Vegetables [ ] Meat & Seafood
[ ] Detergent, Cleaning Supplies [ ] Shampoo, Toothpaste, Personal Care
[ ] Paper Products [ ] Others, please specify:_____
B6. How often do you shop at a grocery ***store***? _____ times a month
B7. How far is your home from the nearest grocery shop/supermarket? _____ km
B8. Did you face any problem the last time you did shopping online? [ ] Yes [ ] No
B9. If Yes for **B8**, could you tell what was the problem? _____

B10. How likely would you use click-and-***drive***?

1	2	3	4	5	6
Very Unlike	Unlikely	Slightly Unlikely	Slightly Likely	Likely	Very Likely

Section C: Considerations in using Click-and-DRIVE for Grocery Shopping

Please tick (✓) on the box most relevant to you

1	2	3	4	5	6
Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree

Travel Time	1	2	3	4	5	6
T1. It is easy to access the collection point.						
T2. It does not take much time to reach the collection point.						
T3. I was able to get to the service provider's location quickly.						

Travel Distance	1	2	3	4	5	6
D1. The travel distance is close to my home.						
D2. The travel distance is close to my workplace.						
D3. The travel distance is close to my children's school.						

Perceived Relative Advantage	1	2	3	4	5	6
R1. Using self-collection improves my overall goods collection experience.						
R2. Using self-collection makes it easier to receive my goods.						
R3. Using self-collection enables me to receive my goods more quickly.						
R4. Using self-collection is advantageous.						
R5. Using self-collection is the best way to receive my goods.						

Perceived Convenience	1	2	3	4	5	6
C1. When I make a purchase from this online store, I save time.						
C2. It is easy to shop for a product/service in this online store.						
C3. The effort that I must make to purchase from this online store is low.						

Product Quality Risk	1	2	3	4	5	6
Q1. I do not feel secure when buying fish online.						
Q2. I feel uncertain about the quality of fish from online purchasing platforms						
Q3. It bothers me when I'm unable to try/feel, see/touch the fish prior to purchase.						
Q4. Buying fish online is convenient.						
Q5. Buying fish online reduces the hassle of moving around the retail outlet, finding parking space and queueing to make payment.						

Which of the following best describes you?	1	2	3	4	5	6
P1. I am always busy.						
P2. I usually find myself pressed for time.						
P3. Generally, I have little time for shopping.						

Section D: Socio-Demographic Profile

Please tick (✓) on the box most relevant to you.

F1. Gender: [ ] Male [ ] Female

F2. Age:_____

F3. Marital status: [ ] Single [ ] Others

F4. Number of household members: _____ persons

F5. Education Level:

[ ] Primary [ ] Secondary [ ] Technical/vocational [ ] College/University

F6. Monthly Household Income

[ ] <RM1999 [ ] RM2000-RM4999 [ ] RM5000-RM7999

[ ] RM8000-RM10999 [ ] RM11000-above

F7. What is your main mode of transportation?

[ ] Car [ ] SUV/MPV [ ] Motorcycle [ ] Public Transport

F8. Where do you work?

[ ] Bayan Lepas [ ] Others, please specify: _____

~~~~~~~~**End! Thank you!** ~~~~~~~~
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