**Factors Influencing Intentions To Return Express Delivery Packages For Next Use In A Developing Country**

**ABSTRACT**

The rapid growth of the e-commerce and logistics industries has generated a considerable amount of express packaging waste, which is steadily harming the environment. Thus, achieving a sustainable e-commerce system has become crucial. This study aims to identify the factors that affect intentions to return Express Delivery Packages (EDPs) for next use by applying the extended Theory of Planned Behaviour (TPB) in a developing country context. The research data were gathered through an online survey in Thailand. In total, we received 426 responses using convenience sampling. This paper constructs a model and analyses the empirical data with Covariance-Based Structural Equation Modelling (CB-SEM). The results reveal that attitude, subjective norm, perceived behavioural control, and awareness of consequence significantly impact intentions. Surprisingly, the hypotheses for convenience, incentive, and risk perception, on the other hand, do not affect intention to return. The contributions to the literature on reverse logistics are to improve understanding of the consumers’ perspective as well as provide insights to the government and express delivery operators in understanding the relative magnitude of factors that lead to the intention to return EDPs and form strategies that will encourage the involvement of more friendly practises, in line with circular goals.

**Keywords:** Theory of Planned Behaviour, Circular Economy, Reverse Logistics, Package, Intention to Return

1. **INTRODUCTION**

With the exponential growth of the e-commerce business, the logistics industry has been closely following along with a tremendous increase in demand for courier and delivery services. Regarding data from [Lebow (2021)](#_ENREF_23), almost half of the countries with the fastest growth in e-commerce in 2020 were developing countries. While delivery packages are recognized as the backbone of last-mile delivery services, the rise of e-commerce leads to a significant increase in delivery package waste if the recycling management system is ineffective.

Reusing Express Delivery Packages (EDPs) is becoming more important for protecting the environment as it can reduce waste and extend the product’s life cycle ([Lai, Kuah, Kim, & Wong, 2022](#_ENREF_22)). Several people would agree that after delivery, most packing materials, particularly corrugated cardboard boxes, are still in good shape. [Abejón, Bala, Vázquez-Rowe, Aldaco, and Fullana-i-Palmer (2020)](#_ENREF_2) indicated that single-use cardboard boxes are less environmentally beneficial than reusable plastic containers. However, [Koskela, Dahlbo, Judl, Korhonen, and Niininen (2014)](#_ENREF_20) discovered that corrugated cardboard boxes may be preferable to reusable plastic crates if a thorough recycling policy is adopted. As a result, these materials are reusable for numerous delivery cycles.

In response to this situation, proper management is essential, which may be executed more effectively using reverse logistics. Reverse logistics (RL) is the process of moving goods backwards from the point of consumption to the point of origin to regain the value of the products or ensure proper disposal methods ([Govindan, Soleimani, & Kannan, 2015](#_ENREF_14)). To accomplish long-term sustainable development, RL is a crucial element of green supply chain management, which aims to reduce waste and mitigate negative consequences caused by economic activity ([M. Wang, Wang, & Chan, 2021](#_ENREF_37)). Returning EDP activities require the involvement of every member of society, particularly consumers, who are the first connection in the RL chain ([Valle, Rebelo, Reis, & Menezes, 2005](#_ENREF_34)). Therefore, understanding the customers' intentions in take-back programmes is crucial for the effective implementation of RL management ([Budijati, Subagyo, Wibisono, & Masruroh, 2016](#_ENREF_7)).

Additionally, the consumer viewpoint is considered the least important when considering RL ([Khan, Ahmed, & Najmi, 2019](#_ENREF_18)). RL focuses primarily on the supplier’s or manufacturer’s perspective. Many countries have conducted research and analysis on consumers’ intentions with various products, such as plastic packaging ([Khan *et al.*, 2019](#_ENREF_18); [Reijonen, Bellman, Murphy, & Kokkonen, 2021](#_ENREF_28)) and e-waste ([Kianpour *et al.*, 2017](#_ENREF_19); [Kumar, 2019](#_ENREF_21); [Mokkhamakkul, 2022](#_ENREF_26)). However, in a developing country context, it may have some unique behaviours that impact their intentions to return EDPs. For this reason, it is crucial to thoroughly examine the consumer’s intentions in a developing country.

Thus, this paper intends to close this gap by investigating perspectives on RL for consumers who own EDPs. This research aims to provide the government and express delivery operators with a basic understanding of how consumers intend to return EDPs for next use. Additionally, this research intends to pinpoint insights that inspire customers to contribute more to the return of EDPs. Furthermore, this research contributes to formulating strategies that may be implemented to increase participation in returning activities and encourage them to manage their express packages appropriately, leading to more sustainable online shopping. With this foresight in mind, this investigation is conducted to determine the answer to the question, “What are the factors influencing the intention of customers towards the return of EDPs?”

This study is organised into five sections. Section 1 outlines the research’s background. Section 2 discusses the literature review, which includes the theoretical background and hypothesis development. The research methodology is explained in Section 3. Section 4 presents the research’s results. Section 5 covers the discussions, theoretical contributions, and practical implications. Lastly, in conclusion, limitations are described in Section 6.

1. **LITERATURE REVIEW**

**2.1 Theoretical Background**

It is necessary to comprehend human behaviour’s mental mechanisms ([Khan *et al*., 2019](#_ENREF_18)). The Theory of Planned Behaviour (TPB) is a well-known research model that includes three psychosocial variables: attitude, perceived behavioural control, and subjective norms, which are used to examine an individual's behavioural intention together with subsequent behaviour (Ajzen, 1991). These variables describe the emotional inclination towards the desired behaviour, the assessment of a consumer's own control abilities, and the perceived social pressure, respectively. The TPB has been widely used in several disciplines, including business, education, environment, and technology studies, to explain different behavioural intentions.

Nonetheless, several efforts have been made to adjust and extend the TPB model to improve the ability of prediction. In the context of return and recycling intentions, the extended TPB model has been utilised to describe diverse behaviours by incorporating additional components such as convenience, awareness of consequence, and incentive. ([Khan *et al*., 2019](#_ENREF_18); [Kumar, 2019](#_ENREF_21); [Mokkhamakkul, 2022](#_ENREF_26)). Nevertheless, very few focused studies investigate the behavioural intentions of returning EDPs adopting an extended TPB framework in a developing country context.

As previously stated, this study incorporates convenience, incentive, awareness of consequence, and risk perception into the extended TPB model. Therefore, the proposed model includes seven variables that may impact the intention to return EDPs.

* 1. **Hypotheses Development**
		1. **Attitude**

 Attitude refers to an individual’s positive or negative emotional response to a behaviour, which is formed by the conceptualization of his or her evaluation of that action (Ajzen and Fishbein, 1980). Numerous studies have demonstrated that an individual’s attitude influences their behaviour positively (Cattapan, Vilaisri, & Chinchanachokchai, 2023; [Kumar, 2019](#_ENREF_21); [Tsai & Tiwasing, 2021](#_ENREF_33); [Q. Wang, Zhang, Tseng, Sun, & Zhang, 2021](#_ENREF_38)). Furthermore, according to Zhu & Thøgersen (2023), attitude emerges as the primary determinant influencing consumers' purchase intentions towards sustainable products. However, few studies have revealed an insignificant correlation between attitude and return intention ([Khan *et al*., 2019](#_ENREF_18); [Kianpour *et al*., 2017](#_ENREF_19); [Mokkhamakkul, 2022](#_ENREF_26)). Nevertheless, based on the majority of supporting facts, we hypothesise in this study that an individual’s attitude towards a behaviour would impact their intention to return EDPs.

H1: Attitude has a significant impact on the intention to return EDPs.

* + 1. **Subject Norm**

The subjective norm refers to the social pressure a person has committed or not committed to doing a particular action (Ajzen, 1991). The impact of family, friends, and colleagues on behavioural intentions is inevitable. A person is more likely to act in a manner that is liked by those who are important to them. The concept of subjective norms has been utilised in different studies on human conduct. A number of research demonstrated a substantial positive relationship between subjective norms and the intention to recycle or return ([Khan *et al*., 2019](#_ENREF_18); [Kumar, 2019](#_ENREF_21)). In contrast, [Mokkhamakkul (2022)](#_ENREF_26) indicated that subjective norms had a negative impact on return intention. It is thus essential to investigate this relationship to verify these assertions. Therefore, we propose the next hypothesis as

H2: Subject norm has a significant impact on the intention to return EDPs.

* + 1. **Perceived Behavioural Control**

Perceived behavioural control refers to a person’s perception of their control over the performance of specific behaviours. Ajzen (2002) indicated that perceived controllability and self-efficacy are two lower-level components relating to behavioural intention. Self-efficacy refers to an individual’s confidence in their capacity to accomplish a certain task. While the level of control a customer has over their behaviour influences the customer’s intention to act. Several research have identified a positive relationship between perceived behavioural control and return or recycling intention ([Kumar, 2019](#_ENREF_21); [Mokkhamakkul, 2022](#_ENREF_26)). In contrast, few studies have demonstrated that perceived behavioural control has an insignificant relationship with return intention ([Khan *et al*., 2019](#_ENREF_18)).

H3. Perceived behavioural control has a significant impact on the intention to return EDPs.

* + 1. **Convenience**

[Tonglet, Phillips, and Read (2004)](#_ENREF_32) emphasised that convenience is a significant predictor of return and recycling behaviours. When recycling is perceived as convenient, less complication, and recycling drop-off locations are more familiar, recyclers are more likely to utilise them ([Sidique, Lupi, & Joshi, 2010](#_ENREF_32); [Gonul Kochan, Pourreza, Tran, & Prybutok, 2016](#_ENREF_15)). Moreover, previous studies have revealed a significant correlation between convenience and perceived behavioral control (Kumar, 2019; Worasatepongsa & Prakthayanon, 2022), as well as between convenience and intentions (Kitjaroenchai & Chaipoopiratana, 2022). Additionally, convenience has been recognized as a crucial determinant influencing behavioural outcomes, thus assuming a prominent driver of behaviour (Ding et al., 2018).

H4: Convenience has a significant impact on perceived behavioural control.

H5: Convenience has a significant impact on the intention to return EDPs.

* + 1. **Incentive**

There are divergent opinions regarding financial incentives. Some argue that financial incentives are insufficient to stimulate motivation and intentions ([Voorberg, Jilke, Tummers, & Bekkers, 2017](#_ENREF_35)). Some indicate that incentives obviously work in the short term, but the desired change in behaviour can disappear in long term ([Gneezy, Meier, & Rey-Biel, 2011](#_ENREF_13); [Zeiske, van der Werff, & Steg, 2021](#_ENREF_40)). Nevertheless, in the context of environmental considerations and waste reduction, extensive research has consistently demonstrated that incentives serve as supplementary benefits or inducements that promote environmentally friendly behaviours (Singh, Chakraborty, & Roy, 2018). Specifically, numerous studies have identified financial incentives as the primary driver for behavioral change, encouraging individuals to actively participate in waste management activities such as recycling and waste reduction, all of which are crucial for the establishment and sustainability of a circular economy ([Abila, 2018](#_ENREF_3); [Maki, Burns, Ha, & Rothman, 2016](#_ENREF_25); [Mokkhamakkul, 2022](#_ENREF_26); [Singh et al., 2018](#_ENREF_31)). In this research, incentives were incorporated into the framework as a variable of interest in order to investigate their impact on individuals' return intentions.

H6: The incentive significantly impacts the intention to return EDPs.

* + 1. **Awareness of Consequence**

When studying customer intention, it is essential to evaluate the consequences caused by a particular action ([Khan *et al*., 2019](#_ENREF_18)). When an individual feels that an action will result in favourable outcomes, it is probable that they will keep a positive outlook and continue the behaviour ([Khan *et al*., 2019](#_ENREF_18)). Several papers have demonstrated the beneficial impact of consequence awareness on return intention ([Khan *et al*., 2019](#_ENREF_18); [Wan, Cheung, & Qiping Shen, 2012](#_ENREF_36); [Z. Wang, Guo, & Wang, 2016](#_ENREF_39)). Few studies, however, have identified an adverse connection between consequence awareness and intention ([Kumar, 2019](#_ENREF_21); [Q. Wang *et al.*, 2021](#_ENREF_38)).

H7: Awareness of consequence has a significant impact on attitude.

H8: Awareness of consequence significantly impacts the intention to return EDPs.

* + 1. **Risk Perception**

Risk perception is the sense of unpredictability or the possible adverse repercussions of a certain occurrence ([Jacobs & Worthley, 1999](#_ENREF_17)). It is impacted by a number of variables, including the severity of perceived consequences, cautious behaviours, and concerns resulting from risks ([Champion & Skinner, 2008](#_ENREF_8)). The research showed that throughout the COVID-19 epidemic, individuals perceived an extremely high risk of infection, and the whole population was filled with tension, anxiety, and fear ([Cori, Bianchi, Cadum, & Anthonj, 2020](#_ENREF_9)). Moreover, previous research has consistently shown that risk perception has a positive impact on both intention and behaviour across various contexts ([Li, Cao, Chen, and Guo, 2022; Poolsawat, 2021)](#_ENREF_24). This article, therefore, discussed risk perception in health and safety to explore the impact of COVID-19 on consumers intentions to return EDPs.

H9: Risk perception significantly impacts the intention to return EDPs.

As aforementioned, this study includes convenience, incentive, awareness of consequence, and risk perception in the extended TPB model. Therefore, the proposed model includes seven constructs synthesised from academic literature that may impact the intention to return EDPs.



**Figure 1** The conceptual framework for an extended TPB model

1. **METHODOLOGY**

 To examine the hypotheses outlined in the previous section, a structured questionnaire and measurement procedures were employed to collect and analyze survey responses.

**3.1 Questionnaire Design**

 The questionnaire is structured according to the extended TPB. The first draft of the questionnaire was validated by three academic experts. Subsequently, 50 respondents were chosen for pre-declaration. The relevance and diversity of questions in the research data were assessed. The final draft was adjusted and finalized based on the comments collected to create the final version of the questionnaire.

              The questionnaire is divided into three sections. The first section is on the measurement variables, as shown in Table 1. The questionnaire employs a Likert-type scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”) to scale responses to the TPB constructs. Next, demographic information about the respondents, such as gender, age, education level, and income level, is contained in the second section. The third section concentrates on the respondent's characteristics, including the frequency of express deliveries received and the condition of delivery packages.

**Table 1** Instrument Source

|  |  |  |
| --- | --- | --- |
| **Constructs** | **Items** | **References** |
| Attitude | 4 |  |
| Subjective Norm | 4 | ([Kumar, 2019](#_ENREF_21); [Tonglet *et al*., 2004](#_ENREF_32); [Q. Wang *et al*., 2021](#_ENREF_38)) |
| Perceived Behavioural Control | 3 |  |
| Convenience | 4 | ([Kumar, 2019](#_ENREF_21); [Sidique, Lupi, & Joshi, 2010](#_ENREF_30)) |
| Incentive | 5 | ([Abila, 2018](#_ENREF_3); [Nduneseokwu, Qu, & Appolloni, 2017](#_ENREF_27)) |
| Awareness of Consequences | 4 | ([Q. Wang *et al*., 2021](#_ENREF_38)) |
| Risk Perception | 5 | ([Li *et al.*, 2022](#_ENREF_24)) |
| Intention to Return | 4 | ([Kumar, 2019](#_ENREF_21); [Q. Wang *et al.*, 2021](#_ENREF_38)) |

**3.2 Data Collection and Sample**

We conducted our research in Thailand to investigate the intention to return used delivery packages in developing nations, as Thailand had the ninth-fastest retail e-commerce sales growth in the world in 2020, at 40%, and the largest increase among developing countries in Southeast Asia. Moreover, Thailand generated 27.06 million metric tonnes of waste in 2016, with the number expected to rise annually. Furthermore, nearly half of Thailand’s waste is inappropriately disposed of (Prasertwit and Kanchanasuntorn, 2021).

Respondents were selected through a convenience sampling method. The sample population included people with an age of 18 and over, who have purchased online and received parcels. Data collection began after approval by the Ethics Committee in Human Research at Walailak University (WUEC-22-195-01). The questionnaire was submitted online through Google Forms; it was directly sent to all respondents via Facebook, LINE Chat, and Instagram. A total of 480 questionnaire responses were gathered. After removing the invalid and logically confusing questionnaires, 426 valid questionnaires were obtained. The sample number meets the minimum requirement of at least 385 samples according to an appropriate sample size with a 95% confidence level (Cochran, 1977).

**3.3 Data Analysis**

Covariance-Based Structural Equation Modelling (CB-SEM) using AMOS is employed to validate the questionnaire’s rationality, which primarily tests the data’s reliability and validity (Joseph F. Hair, Sarstedt, Pieper, & Ringle, 2012). In addition, it is used to evaluate the model’s prediction abilities and degree of fit. Reliability is utilized to evaluate the model’s internal consistency, while validity testing is primarily classified into convergent and discriminant validity (Carmines & Zeller, 1979). Moreover, SPSS was used for descriptive statistics throughout this study.

1. **RESULTS**

**4.1 Preliminary Data Analysis**

**4.1.1 Respondents’ Descriptive Statistics**

A sample of 426 respondents was examined. Appendix A summarises the respondents’ characteristics. According to the findings, 68% of the respondents are female. The majority of respondents (52%) were between the ages of 21 and 30, and 64% held a bachelor’s degree. Regarding monthly income, most respondents (46%) earned less than 20,000 Thai Baht. The average monthly number of delivery packages was less than 5 (54%). It is worth noting that more than 90% of the parcels were in good to excellent condition.

We examine four components of returning the EDPs: the intention to return, the establishment of a regular return plan, the desire to persuade others to return, and the readiness to support the return program, if one exists. According to the findings, 70.2% and 69.3% of respondents, respectively, intend to return EDPs and persuade others to do the same. Furthermore, if a return program is offered, 80.6% of respondents are eager to support it. It has been observed that consumer desire to return is unaffected by gender, age, education level, income level, or the quantity of express delivery items received. As a result, it is important to uncover the factors that influence return intention in order to make the return program sustainable and effective.

**4.1.2 Reliability and Validity Analysis**

In order to ensure the reliability and validity of the constructs, the first step is to evaluate their internal consistency by using composite reliability and Cronbach’s alpha (α). It is generally accepted that a reliability threshold of above 0.70 is required for both composite reliability and Cronbach’s alpha (α) when assessing internal consistency (F. Hair Jr *et al*., 2014). As shown in Table 2, the composite reliabilities of constructs ranged from 0.8141 to 0.9615, and the Cronbach’s alpha value ranged from 0.766 to 0.935, which exceeded the acceptable thresholds. As a result, each construct has high internal reliability. Then, in order to test convergent validity, inter-correlations between indicators within the same constructs were evaluated using factor loadings and average variance extracted (AVE). The standardised factor loadings (λ) of all the constructs in the measurement model were significant at p < 0.001 and exceeded 0.5, indicating adequate reliability ([Sarstedt, Ringle, & Hair, 2017](#_ENREF_29)). Furthermore, the AVE ranged from 0.5736 to 0.7521, greater than 0.5 ([Ab Hamid, Sami, & Mohmad Sidek, 2017](#_ENREF_1)). As a result, convergent validity is established.

**Table 2** Reliability and Validity of Construct Indicators

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Constructs** | **Labels** | **Factor Loading (λ)\*** | **Cronbach’s Alpha (α)** | **Average Variance Extracted (AVE)** | **Composite****Reliability (CR)** |
| Attitude (ATT) | ATT1 | 0.897 | 0.864 | 0.6205 | 0.9019 |
|  | ATT2 | 0.825 |  |  |  |
|  | ATT3 | 0.891 |  |  |  |
|  | ATT4 | 0.622 |  |  |  |
| Subjective Norm (SN) | SN 1 | 0.668 | 0.865 | 0.5940 | 0.8906 |
| SN 2 | 0.741 |  |  |  |
| SN 3 | 0.887 |  |  |  |
| SN 4 | 0.852 |  |  |  |
| Perceived Behavioural Control (PBC) | PBC1 | 0.896 | 0.766 | 0.5983 | 0.8141 |
| PBC2 | 0.774 |  |  |  |
| PBC4 | 0.627 |  |  |  |
| Convenience (CON) | CON1 | 0.872 | 0.857 | 0.5736 | 0.8838 |
| CON2 | 0.752 |  |  |  |
| CON3 | 0.885 |  |  |  |
| CON4 | 0.610 |  |  |  |
| Incentive (INC) | INC1 | 0.810 | 0.935 | 0.7521 | 0.9615 |
|  | INC2 | 0.893 |  |  |  |
|  | INC3 | 0.896 |  |  |  |
|  | INC4 | 0.862 |  |  |  |
|  | INC5 | 0.847 |  |  |  |
| Awareness of Consequence (AC) | AC1 | 0.934 | 0.894 | 0.7307 | 0.9311 |
| AC2 | 0.931 |  |  |  |
| AC3 | 0.673 |  |  |  |
| AC4 | 0.766 |  |  |  |
| Risk Perception (RSK) | RSK1 | 0.812 | 0.918 | 0.6680 | 0.9456 |
| RSK2 | 0.829 |  |  |  |
| RSK3 | 0.708 |  |  |  |
| RSK4 | 0.903 |  |  |  |
| RSK5 | 0.911 |  |  |  |
| Intention to return (ITR) | ITR1 | 0.865 | 0.910 | 0.7519 | 0.9394 |
| ITR2 | 0.852 |  |  |  |
| ITR3 | 0.884 |  |  |  |
| ITR4 | 0.797 |  |  |  |

Note: all values (\*p < 0.001)

**4.1.3 Discriminant Validity**

The concept of discriminant validity involves examining the difference between each of the latent variables ([F. Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014](#_ENREF_11)). Establishing discriminant validity is crucial to ensuring that results are accurate and free from statistical discrepancies ([Henseler, Ringle, & Sarstedt, 2015](#_ENREF_16)). To determine whether there is discriminant validity, the Fornell-Larcker criterion, Heterotrait-Monotrait ratio, and crossing loading between the items are utilised. According to the Fornell-Larcker criterion, a specific variable should demonstrate greater variability with its own items compared to the other variables. That is, the correlation between any two constructs is less than the square root of the AVE. As demonstrated in Table 3, discriminant validity is established.

**Table 3** Discriminant Validity through the Square Root of AVE with the Fornell-Larcker Criterion

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | RSK | ATT | SN | CON | INC | ITR | AC | PBC |
| RSK | **0.817** |  |  |  |  |  |  |  |
| ATT | 0.078 | **0.788** |  |  |  |  |  |  |
| SN | 0.228 | 0.428 | **0.771** |  |  |  |  |  |
| CON | 0.267 | 0.411 | 0.612 | **0.757** |  |  |  |  |
| INC | 0.209 | 0.413 | 0.286 | 0.448 | **0.867** |  |  |  |
| ITR | 0.233 | 0.657 | 0.537 | 0.683 | 0.459 | **0.867** |  |  |
| AC | 0.133 | 0.616 | 0.263 | 0.321 | 0.465 | 0.586 | **0.855** |  |
| PBC | 0.242 | 0.526 | 0.606 | 0.753 | 0.392 | 0.732 | 0.491 | **0.774** |

**4.2 Hypothesis Testing Results**

The model fit indices with Relative Chi-Square = 1.959, GFI = 0.900, NFI = 0.931, TLI = 0.954, CFI = 0.965, RMSEA = 0.047, and RMR = 0.080 suggest that the model is an appropriate fit. The path coefficients, t-statistics, and explained variance of the structural equation model are investigated. Figure 2 displays the results of the analysis conducted to evaluate the strength of the proposed model through path significance and hypotheses testing.



**Figure 2**  Results of the Structural Equation Model

Note: The values on the path indicate β coefficients and p values

The model’s predictive ability is a crucial indicator of its quality. [Hair, Sarstedt, Pieper, and Ringle (2012)](#_ENREF_15) stated that when the coefficient of determination (R²) value for behavioural intention is greater than 0.6, it is regarded as having a high predictive ability. In the extended TPB model, the fit index indicated a strong fit with R² = 0.662 for the intention to return EDPs. The strong R² value demonstrated the amount of variance in intention to return could be predicted by attitude, subjective norm, perceived behavioural control, and awareness of consequence as independent constructs. Furthermore, an indirect effect of convenience moderating in perceived behavioural control was observed with an R² = 0.744 for this path. This strongly indicates that convenience can explain variances in perceived behavioural control. Moreover, our findings show that there is an indirect effect of awareness of consequence on intention to return through attitude, with an R² = 0.400 for this path.

Table 4 shows the correlation coefficients. All paths were significant at p < 0.05, except for the path coefficients for convenience (β = 0.204, p > 0.05), incentive (β = 0.013, p > 0.05) and risk perception (β = 0.057, p > 0.05). The test results show that attitude, subjective norm, perceived behavioural control, and awareness of consequence were positively and statistically significant for intention to return (β = 0.252, p < 0.001; β = 0.097, p < 0.05; β = 0.311, p < 0.01; β = 0. 0.200, p < 0.01, respectively). Although convenience did not have an insignificant direct effect on intention, it had an indirect effect via perceived behavioural control (β = 0.863, p < 0.001). In contrast, awareness of consequence had a significant direct effect on behavioural intention, as well as an indirect effect through attitude (β = 0.632, p < 0.001). Thus, hypotheses H1–H4 and H7–H8 were supported, while H5-6, and H9 were not supported based on the test results.

**Table 4** Hypothesis test results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hypothesis | Path | Path coefficients | T Statistics | P Values |
| H1 | ATT 🡪 ITR | 0.252 | 5.347 | 0.000\*\*\* |
| H2 | SN 🡪 ITR | 0.097 | 2.173 | 0.030\* |
| H3 | PBC 🡪 ITR | 0.311 | 3.132 | 0.002\*\* |
| H4 | CON 🡪 PBC | 0.863 | 16.188 | 0.000\*\*\* |
| H5 | CON 🡪 ITR | 0.204 | 1.866 | 0.062 |
| H6 | INC 🡪 ITR | 0.013 | 0.309 | 0.757 |
| H7 | AC 🡪 ATT | 0.632 | 13.752 | 0.000\*\*\* |
| H8 | AC 🡪 ITR | 0.200 | 3.900 | 0.000\*\*\* |
| H9 | RSK 🡪 ITR | 0.057 | 1.625 | 0.104 |

Note: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

1. **Discussions**

Using an enhanced TPB model, this paper investigated the factors that influence the desire to return EPDs for future usage. Even though the express delivery sector has been expanding dramatically and there is a growing need to protect the environment, returning EDPs from the perspective of customers has not been widely adopted in a developing country context, particularly in Thailand. As a result, it presents an excellent opportunity for express delivery firms and the government to develop policies to encourage the return of EDPs for future usage.

The findings show that attitude has a significant impact on return intention, which is consistent with earlier research on behavioral intention (Cattapan *et al*., 2023; Kumar, 2019; Tsai & Tiwasing, 2021; Q. Wang *et al*., 2021). However, not everyone with a positive mindset will have a strong desire to return. In this case, the findings show that persons who are more aware of environmental issues are more likely to engage in return activities. As a result, awareness of consequences predicts both attitude and return intention ([Khan *et al*., 2019](#_ENREF_18); [Wan *et al*., 2012](#_ENREF_36); [Z. Wang *et al*., 2016](#_ENREF_39)). The evidence suggests that people are more likely to participate in the provided activities when they are aware of the environmental consequences.

The subjective norm influences return intention positively. This means that people are more likely to get involved in return actions if they receive support and encouragement from those who are significant to them. This findling is consistent with previous studies ([Kumar, 2019](#_ENREF_21); [Mokkhamakkul, 2022](#_ENREF_26)).

Perceived behavioural control has a considerable positive impact on the intention to return. Perceived behavioural control essentially represents customers’ perceptions of the ease of performing particular behaviours and their ability to manage them. This aligns with prior findings ([Kumar, 2019](#_ENREF_21); [Mokkhamakkul, 2022](#_ENREF_26); [Q. Wang *et al.*, 2021](#_ENREF_38)). The difficulties of implementing a certain activity will impact a person’s final decision. This data shows that convenience is a significant contributor to the perceived behavioural control results.

Furthermore, despite its non-significant direct effect, convenience was found to have an indirect effect on return intention via perceived behavioural control. Environmental concerns and sustainability attitudes are the main drivers of consumers' intentions to return EDPs. While convenience may not be directly associated with environmental considerations, it can indirectly influence intention through perceived behavioural control. When consumers perceive convenient return options as facilitating their environmental goals, it enhances their perceived control over the return process, ultimately strengthening their intention to return. As perceived behavioural control mediates individuals' perception of their ability to perform the behaviour, considering factors such as self-efficacy, available resources, and the perceived ease or difficulty of the return process. Convenience can influence these mediating factors, subsequently shaping the intention to return EDPs. Moreover, previous studies (Kumar, 2019) revealed that consumers' limited information about the available return options or the simplicity of the return process can overshadow the influence of convenience, resulting in reduced significance in shaping return intentions. As a result, the direct impact of convenience alone on the intention to return EDPs might be relatively modest. However, when consumers become knowledgeable about convenient return methods, their perception of control over the return process may enhance, subsequently positively influencing their intention to return.

In contrast, incentive and risk were found to be insignificant predictors of return intention. This is certainly intriguing in a developing country. Many studies have shown that an individual’s incentives and risks directly affect their initial choice. However, the study proposes an opposite view on whether financial incentives can be considered effective motivators. This research found that incentives are not a very cost-effective tool for stimulating behavioural change, which means that the lack of incentives would not discourage individuals from returning their EDPs if they intended to do so. This result is consistent with [Voorberg *et al*. (2017)](#_ENREF_35). While, [some](#_ENREF_13) papers did not find that the financial incentive influences the significance of other motivations that people may have for engaging in the behaviour, this suggests that the incentive did not cause people to recognise other reasons for doing certain actions more in the long run ([Gneezy *et al*., 2011](#_ENREF_13); [Zeiske *et al*., 2021](#_ENREF_40)). Particularly for the behavior of returning their EDPs, when the intention to return is generally motivated by environmental awareness rather than monetary incentives, the stimulant of personal cash rewards is less essential.

Furthermore, this paper investigates the possibility that the perception of risk resulting from the COVID-19 epidemic influences the intention to return. During the pandemic, individuals have been highly concerned about the risk of infection, leading to increased tension, anxiety, and fear in society. However, in the post-COVID-19 pandemic period, these impacts on risk perception did not affect the willingness of returning EDPs. This finding is not consistent with [Li *et al*. (2022)](#_ENREF_24). Several factors could contribute to this outcome, as listed following. The Thai government's official vaccination programme marks an important milestone for the country in bringing new cases and deaths down, which has given residents some confidence in their activity. Coupled with the current situation, Thailand classifies COVID-19 as an infectious disease under surveillance, meaning that COVID-19 is treated similarly to a seasonal flu virus and mask wearing is a voluntary practise. Thus, the effect is insignificant. Another reason for this result could be that individuals' risk perception may be reduced if they believe they have adequate control. Control perception acts as a moderator, influencing the desire to return EDPs. As a result, the direct effect of risk perception on intention may be negligible ([Gao & Chen, 2022](#_ENREF_12); Jaengprajak & Chaipoopirutana, 2022; Sriram, Phouzder, Mathew & Hungund, 2019).

**5.1 Theoretical Contribution**

Although the TPB model was initiated by [Icek Ajzen (1991)](#_ENREF_4), the findings of this study enrich the existing literature and provide a new theoretical insight to predict behavioural intentions in returning EDPs across a developing country. The awareness of consequences variable in the TPB model affects both the attitude variable and the intention variable. The study's findings reveal specific behaviors that significantly impact the intention to return EDPs in a developing country. Additionally, the convenience variable, while its direct impact on the intention variable is uncertain, influences perceived behavioral control, which subsequently affects the intention variable. It, therefore, contributed to a better understanding of reverse logistics for EDPs from the customer's standpoint, and it is advantageous for enterprises to offer theoretical suggestions when recycling EDPs.

* 1. **Practical Implications**

Although developing countries are one of the key drivers of the growth of e-commerce, few studies have investigated the behavioural intention of customers to return EDPs. This research provides five takeaways for policymakers in the government and the express delivery companies operating. However, it is important to consider these practical implications in conjunction with other contextual factors and industry-specific considerations.

First, companies should consider educating and training their customers on the importance and social acceptability of returning EDPs. This can be done through various channels, such as instructional videos, online tutorials, or informative brochures that highlight the environmental benefits and social responsibility associated with package returns. By promoting a sense of collective responsibility and normative influence, companies can encourage customers to prioritise and engage in return behaviours.

Second, incorporating sustainability messaging in marketing campaigns and packaging materials, such as reducing waste and carbon emissions, can help raise customers’ awareness and foster a sense of social responsibility among customers, further strengthening their intention to return. In particular, celebrity support for returning initiatives can be used as a marketing tactic to encourage more people to return. Furthermore, celebrities might serve as role models for better recycling practises.

Third, companies should aim to provide hassle-free and convenient return options, such as prepaid return labels, drop-off locations, or pickup services. By simplifying the return process and providing clear instructions, companies can indirectly influence customers' intentions to return packages by improving their perceived control. Companies can also leverage technology to provide tracking and status updates, allowing customers to stay informed and maintain a sense of control throughout the return journey.

Fourth, to optimise the effectiveness of strategies aimed at increasing return intention, companies should regularly collect feedback and evaluate the return process. Soliciting customer opinions and experiences can provide valuable insights for identifying areas for improvement. Monitoring customer satisfaction, addressing concerns promptly, and refining return policies and procedures accordingly can enhance the overall experience and reinforce customers' intentions to return packages.

Last but not least, the government should revise their educational policies to incorporate environmental responsibility teaching and activities. Additionally, to incentivize businesses engaged in EDPs utilization or production to adopt reverse logistics policies, the government should offer benefits or incentives, such as tax reductions, for the implementation of these initiatives.

1. **CONCLUSIONS**

The study highlights the significance of consumer return behaviour in enhancing waste management initiatives, which align with the principles of green development and the circular economy. However, existing literature on reverse supply chain management has overlooked this area. To address this gap, the study presents an extended TPB model that identifies the key factors that impact consumer intentions to return EDPs for next use rather than dispose of them.

According to the findings, the positively influential factors determining intention to return EDPs in a developing country are attitude, subjective norm, perceived behavioral control (moderated by convenience), and awareness of consequence, whereas incentive and risk perception constructs are insignificant.

This research also provides insights to the government and express delivery operators with practical implications for the take-back campaigns. The government should increase publicity and education in order to raise customer knowledge and foster a positive social environment.

The study presented several limitations that could be addressed in future research. This paper represents the first attempt to comprehend the first link in RL, but to fully understand the structural and operational mechanisms of waste reverse supply chains, it is necessary to explore additional activities, such as network configurations, value production, and financial and information flows. Additionally, this study only examined four factors: convenience, incentive, risk perception, and awareness of consequence and it was limited to a specific industry (e-commerce ). Other aspects should be considered in future studies to fully understand the intentions to return EDPs, as well as the applicability of the extended TPB model in other sectors. Finally, because this study was conducted in a developing country, the findings may not be applicable to developed countries with distinct waste management systems and cultural values. Future study might compare these findings to those of studies conducted in developed nations to better understand cross-national variations.

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**Appendix A**

**Table A1** Distribution of valid respondents (n = 426)

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | Demographic | Frequency | Percent (%) |
| Gender | Male | 127 | 29.81 |
|  | Female | 290 | 68.08 |
|  | Others | 9 | 2.11 |
| Age | Below 21 | 54 | 12.68 |
|  | 21-30 | 225 | 52.82 |
|  | 31-40 | 54 | 12.68 |
|  | 41-50 | 44 | 10.33 |
|  | 51-60 | 7 | 1.64 |
|  | Above 60 | 42 | 9.86 |
| Educational level | High school and below | 30 | 7.04 |
|  | Bachelor | 274 | 64.32 |
|  | Master and Doctorate | 122 | 28.64 |
| Average monthly income (THB) | Less than 20,000 | 199 | 46.71 |
| 20,001-40,000 | 114 | 26.76 |
| 40,000-60,000 | 47 | 11.03 |
| More than 60,000 | 66 | 15.49 |
| Occupation | Personnel of public | 60 | 14.08 |
|  | Enterprise personnel | 100 | 23.47 |
|  | Business | 38 | 8.92 |
|  | Retired person/housewife | 39 | 9.15 |
|  | Student | 169 | 39.67 |
|  | Others | 20 | 4.69 |
| Monthly average number of express delivery packages | 0-5 | 233 | 54.69 |
| 6-10 | 149 | 34.98 |
| 11-15 | 26 | 6.10 |
| More than 15 | 18 | 4.23 |
| Condition of express delivery packages | Excellent | 63 | 14.79 |
| Good | 333 | 78.17 |
| Quite bad | 27 | 6.34 |
| Bad | 3 | 0.70 |