Impacts of COVID-19 on customer behavior along green logistics operations: A conceptual framework

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Abstract: Numerous studies evaluated how customer behavior has changed during the COVID-19 pandemic. There have been no studies on the impacts of the Covid-19 pandemic on green logistics operations in the Vietnam context, this study aims to fulfill this gap by exploring the reasons for fundamental change. The main results of this research are a) a literature review in microeconomics and green logistics operations are examined; b) a conceptual framework and its hypotheses to survey the impacts of covid-19 on consumer behavior along with green logistics operations to strengthen the Vietnam economy during and after the pandemic, are developed. The future research agenda is outlined to use structural equation modeling to evaluate and validate the proposed hypotheses of the model.

Keywords: consumer behavior, covid-19, logistics, microeconomics, structural equation modeling
JEL Classification: C12, C83, D00, D01, L80

1 Introduction

Due to the extensive economic integration, the Vietnamese economy was heavily affected by the COVID-19 pandemic but also exhibited considerable resilience. What makes the difference in Vietnam?

The context of Covid-19 and anti-epidemic efforts have formed resilient Vietnamese consumers who are optimistic about the economy. Although, the GDP growth for 2020 at 2.91%, the lowest outturn in at least two decades and far below the 6.76% average during 2015 - 2019, despite the unpredictability of the global economic and political situation, which harms the socioeconomic development of the majority of nations, Vietnam's socioeconomic position in the first half of 2022 still showed rather encouraging results in a variety of disciplines. In comparison to other nations in the region and throughout the world, the economy's growth rate of 6.42% is impressive. Other positive economic indicators include macroeconomic stability and inflation which are kept under control. Essential goods supply and demand were ensured[2].

However, the socio-economic situation in Vietnam still has a lot of problems, notwithstanding the successes. Although the Covid-19 epidemic has been controlled in Vietnam, with new variants, there may be complicated developments in the world. In addition, the global economy grew less quickly due to supply chain disruptions, high costs for essential goods, rising global inflation, the energy crisis, etc. As a result of its extensive openness, the Vietnamese economy nevertheless faces many challenges and is impacted in a variety of ways by the complex and unpredictable global political environment.

Different from the stability of macroeconomics, this study surveys the impact of covid-19 on the changes in microeconomy factors such as consumer preferences or behavior. Evaluating how customer satisfaction has changed during the COVID-19 pandemic is one of the most interesting topics on COVID-19. Numerous studies addressed this problem (Addo et al., 2020; Baicu et al., 2020; Ahmed et al., 2021; Bae and Chang, 2021; Brandtner et al., 2021; Prasetyo et al., 2021). For example, Brandtner et al. (2021) focused on understanding the impact of COVID-19 on the customer end of retail supply chains in Austria. Prasetyo et al. (2021) determined factors influencing customer satisfaction and loyalty during the new normal of the COVID-19 pandemic in Indonesia. Baicu et al. (2020) deployed research on the impact of the COVID-19 crisis on consumer behavior in Romania. Ahmed et al. (2021) investigated the context of the COVID-19 pandemic, and its consequences for employee unproductive behavior at work were examined. Bae and Chang, (2021) highlighted “untact” tourism as a health-protective behavior stemming from individuals’ perceptions of COVID-19 risk.

The research gap is that has no studies on the impacts of the Covid-19 pandemic on green logistics (GL) operations in the Vietnam context, this study fulfills this gap and develops a conceptual framework to survey the impacts of covid-

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[2] *https://www.gso.gov.vn/en/data-and-statistics/2022/07/press-conference-to-announce-the-socio-economic-situation-in-the-2nd-quarter-and-6-months-of-2022/*

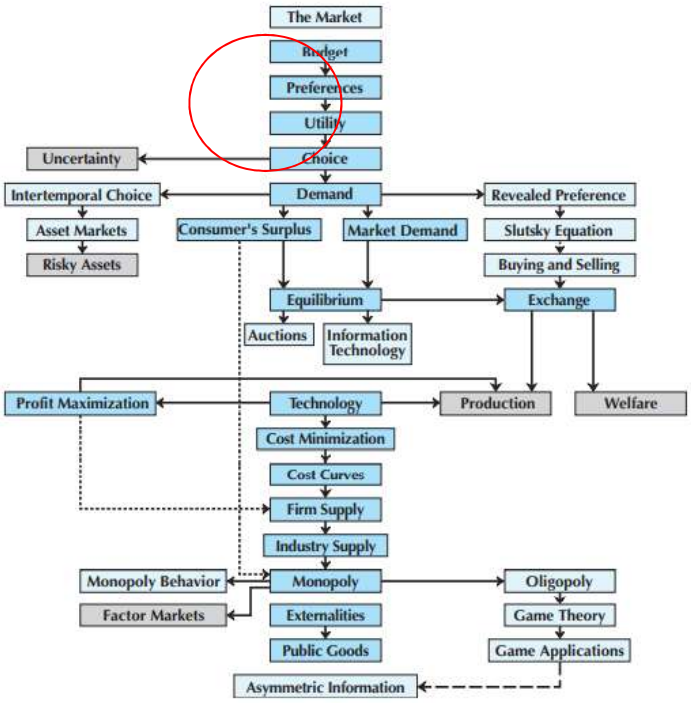
19 on the consumer preferences and behavior along green logistics operations to strengthen the Vietnam economy both micro- and macro-metrics.

2 Literature Review

2.1 Microeconomics background

There are many paths to economic enlightenment (Variant, 2014). A good grasp of microeconomics is vital for decision-making. Microeconomics deals with the behavior of individual economic units including consumers, workers, investors, and enterprises. It reveals how industries and markets operate and evolve, why they differ from one another, and how they are affected by government policies and global economic conditions. By contrast, macroeconomics deals with aggregate economic quantities, such as GDP, unemployment, and inflation. This study focuses on the core of microeconomics - the behavior of consumers, including customer preferences, budget constraints, and customer choices (see Figure 1), that is the basis for the analysis of green logistics operations in Vietnam's economy.

Figure 1 The core modular structure of microeconomics



Source: Varian, R. H. Intermediate Microeconomics a Modern Approach. 9th revised edition, 2014

2.1.1 Customer preferences

It is a practical way to describe the reasons people might prefer one goods to another. To understand the preferences, we try to answer some questions.

How can a consumer with a limited income decide which goods and services to buy? How a consumer might compare different groups of items, namely, the market basket, available for purchase? Will one basket be preferred to another basket, or will the consumer be indifferent between the two baskets?

Moreover, how does one customer’s demand also depends on the demands of other people? It would be improved if we incorporated more realistic and detailed assumptions regarding human behavior. It is the objective of the new field of behavioral economics (Variant, 2014).

2.1.2 Budget constraints

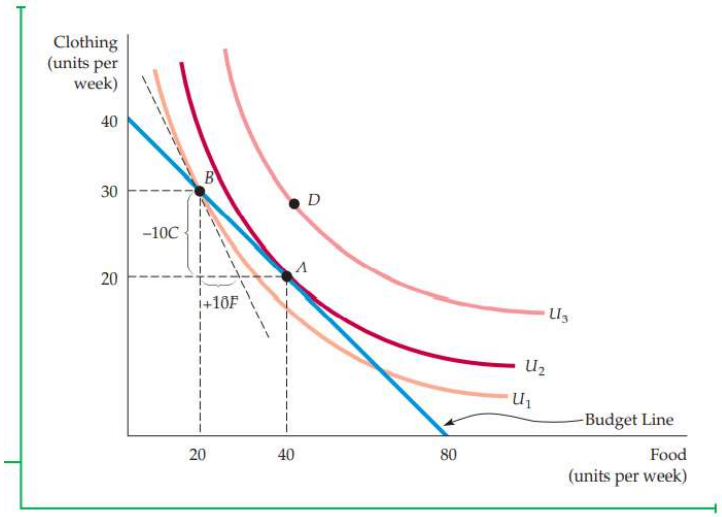
The next concern is the budget. Consumers also consider prices due to limited incomes which restrict the number of goods they can buy. What does a consumer do in this situation? Answering this question by putting consumer preferences and budget constraints together in subsection 2.1.3.

2.1.3 Customer choices

Given their preferences and limited income, consumers choose to buy combinations of goods that maximize their satisfaction. These combinations will depend on the prices of various goods. Thus, understanding consumer choice will help us understand the demand on how the quantity of a good that consumers choose to purchase depends on its price.

To understand, for example, a consumer has an income of $80 and considers a market basket of food and clothing with unit prices of $1 and $2, respectively. The number of clothing and food in baskets *A*, *B*, and *D* is (40; 20), (20; 30), and (42; 28) correspondingly. Figure 2 illustrates the solution to the consumer's choice.

Figure 2 Consumer satisfaction optimization

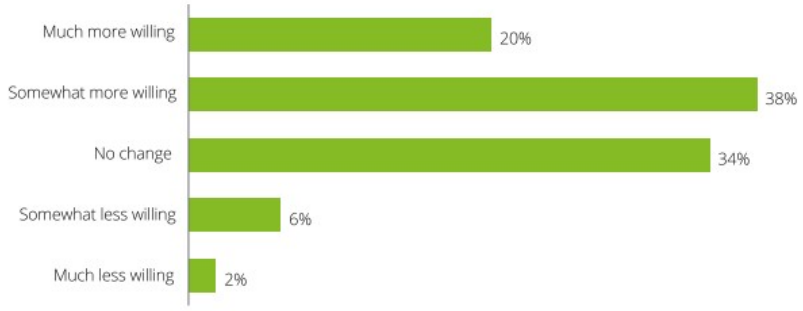


Source: Pindyck S. Robert, Rubinfeld L. Daniel. Microeconomics. 9th edition, USA, 2013

Here, the blue line describes the budget. And three indifference curves (u_1, u_2, and u_3) describe a consumer's preferences for food and clothing of *B*, *A*, and *D* baskets, respectively. It is easy to define that point *B* is not the most preferred choice because a reallocation of income in which more is spent on food and less on clothing can increase the consumer's satisfaction. At point *A*, its basket located on u_2 that is on the right and above the u_1, the consumer spends the same amount of money and achieves the increased level of satisfaction associated. In addition, basket *D* in u_3 achieves a higher level of satisfaction but cannot be purchased because it is out of budget. Therefore, the customer chooses basket *A* for maximizing satisfaction (Pindyck & Rubinfeld, 2013).

On the other hand, Meng & Oka, (2021) surveyed the impact of the Covid-19 pandemic on Vietnam's consumer behavior. It is evident that with increasing customer preferences for green information technology such as e-commerce or online channels, the results show clearer signs of a shift from traditional commerce to online channels (see Figure 3).

Figure 3 Willingness to make online purchases of necessities and fresh products as a result of COVID-19



Source: Deloitte's Vietnam Consumer Survey (2020)

The survey also showed that there are still many barriers to the adoption of e-commerce and digital payments regarding the green information infrastructure. There is not only the infrastructure including green IT but also the factors related to green transportation in delivery time and cost, and reverse logistics. Another aspect, Vietnamese consumers are generally optimistic about the economy, despite the ongoing Covid-19 pandemic. This optimism can be observed even among low-income consumers. This may be the result of confidence in Vietnam's consistent economic growth in both micro and macro-economies.

2.2 Green Logistics Operations

In today's global economy, manufacturing and logistics are revolutionized by providing the opportunity to utilize advanced technologies. According to Sean Galea-Pace (2020), the supply chain is in a significant transformation with the help of technologies, the three biggest trends in 2020 are AI & Machine Learning, Green Logistics, and Big Data Analytics. Green logistics is a key factor in the global economy's sustainable development in both developed and developing countries. There are many studies on the relationship between G, circular economy, and sustainability (Seroka-Stolka and Ociepa-Kubicka, 2019; Islam et al., 2021; Luu, 2021a).

Recently, Islam et al. (2021) integrated reverse logistics, closed-loop logistics, green logistics, and environmental logistics in a review and presents a generic conceptual model for understanding the implementation process of environmental practices in logistics. Kumar, Singh, and Kumar, (2021) through literature reviews and expert opinion, identified key criteria and barriers that have been solved to meet sustainable goals. Zijm et al. (2015) stated that sustainable logistics and supply chain is growing in terms of system status; cultural change; technological innovation; and new business model development. To sum up, Luu, (2021b) investigated GL operations, in which a typical supply chain consists of suppliers, producers/sellers, distributors, collectors, and customers. After receiving the customer order, sellers will arrange third-party logistics (3PLs) providers to deliver goods to customers. The process includes the eight key green logistics operations such as green information (green IT), green procurement, green manufacturing, green transportation, green packaging, green storage, green consumption, and reverse logistics.

3 Methods

3.1 Research design procedure

The study is designed as a mixed approach consisting of qualitative and quantitative methods. The first phase of the study explores a literacy understanding of the customer preferences and behavior in the microeconomic background, and green logistics operations. In the second phase, a conceptual framework of the impacts of covid-19 on customer behavior along with green logistics operations and its hypotheses are proposed. In the third phase, the research outlines a future agenda to deploy quantitative methods using partial least structural equation modeling through statistical software such as SPSS and SmartPLS-SEM to evaluate and validate the research hypotheses of the proposed framework.

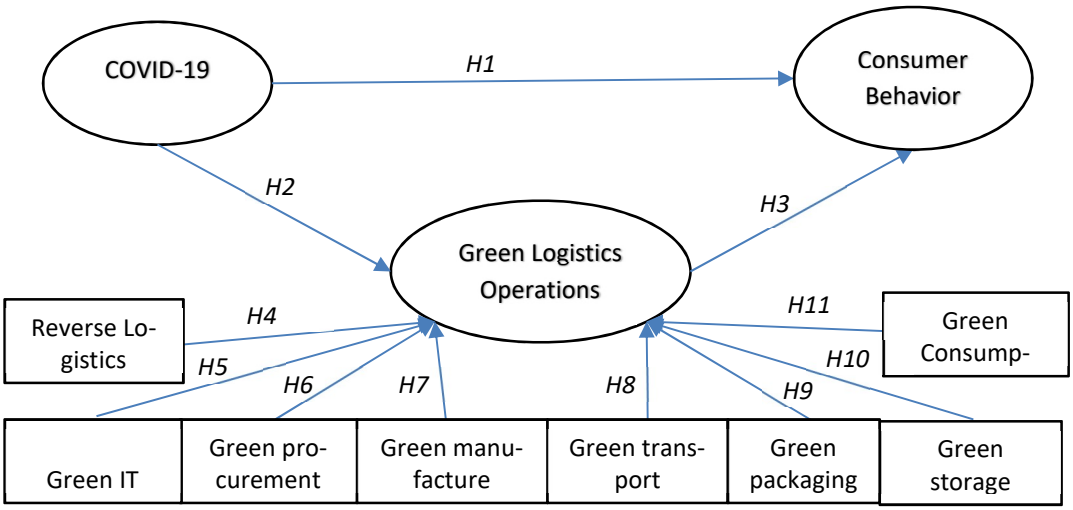
In the future research agenda, a research design procedure will be developed in detail and includes three main steps: focus group, pilot test, and main test. In which the sampling and sample size of the research is defined in the focus group. The questionnaire technique is used to collect sufficient observations. The pilot test assesses a reflective measurement model that involves indicators and constructs' reliability through the outer loading and Cronbach's alpha; convergent validity by the average variance extracted (AVE); and discriminant validity by HTMT (Hair et al., 2017). Finally, the main test analyzes the inner structural model, it test whether the theoretical structural relationships between the constructs are fit and significant. In this step, the coefficients of Pearson's determination (R^2), the cross-validated redundancy (Q^2), the standardized root mean square residual (SRMR), the *t*-value, and the *p*-value are used ((Henseler, Ringle, and Sinkovics, 2009).

4 Research Results

4.1 Proposed research framework

As a result of the above discussion, the study focuses on eight green logistics operations related to the microeconomic factor of customer behavior influenced by the covid-19 pandemic. The study uses a simple path model that defines outer and inner models; exogenous and endogenous constructs; and observed variables. In detail, the reflective research model includes 3 constructs of the Covid-19, consumer behavior, and green logistics operations with its 8 independent factors including green information (green IT), green procurement, green manufacturing, green transportation, green packaging, green storage, green consumption, and reverse logistics. The research framework is proposed in Figure 4.

Figure 4 The theoretical research framework



Source: own processing

4.2 Research hypotheses

Hypotheses based on what has been stated thus far:

- *H1. COVID-19 is harming Vietnam's consumer behavior.*
- *H2. COVID-19 is harming Vietnam's green logistics operations.*
- *H3. Green logistics operations have high effects on Vietnam consumer behavior.*
- *H4. Reverse logistics positively affect Vietnam's green logistics operations.*
- *H5. Green IT positively affects Vietnam's green logistics operations.*
- *H6. Green procurement positively affects Vietnam's green logistics operations.*
- *H7. Green manufacturing positively affects Vietnam's green logistics operations.*
- *H8. Green transportation positively affects Vietnam's green logistics operations.*
- *H9. Green packaging positively affects Vietnam's green logistics operations.*
- *H10. Green storage positively affects Vietnam's green logistics operations.*
- *H11. Green consumption positively affects Vietnam's green logistics operations.*

Based on the presented hypotheses the process will be examined in detail in the coming months. The focus of the research will be on confirming /refuting the results concerning customer behavior changes in the field of green logistics projects. The research results will be important for the development of flexible design and management methodology for company projects for effective future activities.

5 Conclusion

The main result of the study is to propose a conceptual framework and its hypotheses to examine the impacts of Covid-19 on consumer behavior in the green logistics operations in the Vietnam context. The key eight logistics activities examined in the framework include green information (green IT), green procurement, green packaging, green manufacturing, green transportation, green storage, green consumption, and reverse logistics.

This study focuses on the core of microeconomics - customer behavior, including customer preferences and choices under the impact of covid-19. The finding from the Deloitte survey also illustrates that green logistics services are the top concern for Vietnam consumers, especially in logistics infrastructure including green IT, green transportation, digital payment platform, and reverse logistics.

The study also proposes a future research agenda that develops a quantitative approach using structural equation modeling through statistical analysis software such as SPSS and SmartPLS-SEM to evaluate and validate the hypotheses

of the proposed model to make a better understanding of Vietnam's customer behavior under covid-19 impact along green logistics operations.

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