Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Bachelor Thesis

Consumption of Durable and Non-durable Goods in Vietnam

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Thi Hao Nguyen

Economics and Management

Thesis title

Consumption of Durable and Non-durable Goods in Vietnam

Objectives of thesis

The aim of the bachelor thesis is to determine and to evaluate consumption of durable and non-durable as well as consumers behaviour in Vietnam.
The aim will be fulfilled based on the partial aims. Then, several hypotheses will be defined and verified. Based on the results of empirical analysis the final conclusions will be introduced.

Methodology

The bachelor thesis will cover both, theoretical and empirical part. Theoretical part will contain theoretical background of the selected topic as well as the methodological framework. Scientific literature will be used to prepare the literature overview. Based on the empirical analysis the results will be presented and some recommendations will be suggested.

To fulfill the aim of the thesis the selected methods will be employed as following:

– index analysis (base index, chain index)

– regression analysis (trend function)

– survey of consumers' behavior based on own questionnaire

The proposed extent of the thesis

40 – 50 pages

Keywords

Consumption, consumers behaviour, durable goods, non-durable goods, survey, Vietnam.

Recommended information sources

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Declaration

I declare that I have worked on my bachelor thesis titled "Consumption of durable and non-durable goods in Vietnam " by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 7.3.2023. 

Thi Hao Nguyen

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I would like to thank and express my sincere gratitude to my supervisor Ing. Lenka Rumánková, Ph.D for her guidance and advice on my thesis.

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Consumption of Durable and Non-durable Goods in Vietnam

Abstract

Goods are tangible items that humans manufacture, trade, and consume. Durable goods and non-durable goods are the two primary categories of products. From fundamental requirements like food, clothing, and shelter to luxuries like jewelry, cars, and computer devices, they may be anything. In order to meet human needs, promote economic progress, foster social interaction, and improve quality of life, products are essential. It also contributes significantly to the development of the country, especially in Vietnam. The purpose of the study is to determine the factors affecting the consumption of goods in terms of macro on the entire population of the country and micro with a group of 162 people who participated in the survey. Besides, it also finds out the attitude of consumers towards the goods they consume. The study applies a quantitative approach with statistical analysis to find out the relationship between factors and test hypotheses with SAS studio software. The results of the tests have indicated that the GDP and total value of products consumed have a substantial link and that age also significantly affects the frequency of purchases.

Keywords: Consumption, customer behavior, durable goods, non-durable goods, survey, Vietnam.

Spotřeba trvanlivého a nepotravinářského zboží ve Vietnamu.

Abstrakt

Zboží je hmotným předmětem, které je lidmi vyráběno, obchodováno a konzumováno. Trvanlivé a nepotravinářské zboží jsou dvě hlavní kategorie, na které se produkty dělí. Produkty mohou být představovány čímkoli, ať už základními potřebami, jako jsou potraviny, oblečení a přístřeší, anebo luxusnmi výrobky jako šperky, auta a počítačová technika. Produkty jsou nezbytné pro uspokojení lidských potřeb, podporu ekonomického rozvoje, podporu společenské interakce a zlepšení kvality života. Zároveň významně přispívají k rozvoji země, zejména ve Vietnamu. Cílem studie je zjistit faktory ovlivňující spotřebu zboží z hlediska makra na celé populaci země a mikra s 162 respondenty, kteří se zúčastnili průzkumu. Kromě toho studie zjišťuje postoj spotřebitelů k zboží, které konzumují. Studie využívá kvantitativní přístup s statistickou analýzou ke zjištění vztahu mezi jednotlivými faktory shora uvedenými, testování hypotéz pomocí softwaru SAS studio. Výsledky testů ukázaly, že HDP (hrubý domácí produkt) a celková hodnota spotřebovaného zboží mají významný vztah a že věk významně ovlivňuje frekvenci nákupů.

Klíčová slova: Spotřeba, chování zákazníků, trvanlivé zboží, nepotravinářské zboží, průzkum, Vietnam.

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List of abbreviations

CDA: Categorical Data Analysis
EVFTA: European Union–Vietnam Free Trade Agreement
GDP: Gross Domestic Product
GSO: General Statistics Office
KOC: Key Opinion Consumer
KOL: Key Opinion Leader
OLS: Ordinary Least Squares
QOF: Quality Of Forecast
REF: Relative Error of the Forecast
SAS: Statistical Analysis System
SNA: System of National Accounts
USD: United States Dollar
VCG: Vietnamese Communist Government
VND: Vietnamese Dong
WTO: World Trade Organization

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1 Introduction

Consumption of commodities is a vital component of economic activity and a major factor in the expansion of the world economy. Consumption of products tends to be higher in developed economies due to higher levels of disposable income and a wider selection of consumer goods. A highly developed consumer market, with consumers who are more educated and discerning in their choices, is another characteristic of these economies. In industrialized economies, variables including quality, convenience, and brand recognition frequently influence the consumption of goods. Since goods are the tangible items that are purchased and sold in markets, they are essential to economic activity. Production and consumption of goods are major forces behind economic development and progress, generating employment opportunities and increasing GDP.

The act of using things to fulfill one's needs and desires is referred to as consumption of goods. Our daily lives depend on it because we use products and services to satisfy both our leisure and entertainment requirements as well as our basic needs for food, clothing, and shelter. Consuming habits vary greatly based on things like money, culture, and personal preferences. Understanding economic behavior and market trends requires an understanding of consumption since it offers information on consumer demand, preferences, and purchasing choices. Consumption has emerged as a fundamental engine of economic growth in today's worldwide economy, with companies racing to manufacture and offer goods and services that satisfy customer expectations.

Throughout the past few decades, Vietnam has experienced substantial economic growth, changing spending habits and creating a burgeoning middle class. Vietnam's consumer culture is dynamic and fast changing, impacted by a variety of socioeconomic, cultural, and political issues as well as shifting consumer tastes and ideals. Vietnamese consumers, in general, are value- and price-conscious, looking for goods and services that provide high quality at affordable prices. Vietnamese consumers also have a propensity to place a high importance on social connections and relationships, as well as family and community values.

2 Objectives and Methodology

2.1 Objectives

The aim of thesis focuses on the Vietnamese market with the consumption of non-durable goods, durable goods, and based on theories of consumer behavior, it investigates further the consumer behaviors of goods that are influenced by many circumstances. It also analyzes the factors that affect consumption, such as GDP, unemployment rate, inflation rate, age, gender, occupation, educational level, and income. The results of this study add to our understanding of this widespread phenomenon by giving us a multifaceted look at the variables that influence Vietnamese consumers' behavioral responses.There are two main analyzed parts in the practical part. Consumption of non-durable goods and durable goods (dependent variable) will be affected based on independent variables based on GSO data on the entire population of the country in Vietnam from 2004-2020. Hypotheses are:

- GDP and the total value consumption of durable and non-durable goods is a significant relationship.
- Inflation rate and the total value consumption of durable and non-durable goods is a significant relationship.
- Unemployment rate and the total value consumption of durable and non-durable goods is a significant relationship.

Questionnaires with a sample size were created by the author. From there, we can analyze indicators such as age, gender,occupation,educational level, and income using the categorical analysis's method. Hypotheses are:

- Age and consumption of durable, non-durable goods is a significant relationship.
- Gender and consumption of durable, non-durable goods is a significant relationship.
- Occupation and consumption of durable, non-durable goods is a significant relationship.
- Educational level and consumption of durable, non-durable goods is a significant relationship.
- Income and consumption of durable, non-durable goods is a significant relationship.

2.2 Methodology

This study is applied quantitative approach with deduction method as the main methodology.

First of all, it goes with the scientific theories about background consumption of durable and non-durable goods in Vietnam, customer behavior when people and all factors such as GDP, inflation rate, unemployment rate, age, demographic and geographic factors affect to each other. Secondly, statical methods are applied to demonstrate hypotheses were built. The purpose is going from general to specific approaches when testing in all population based on data in GSO then with smaller sample size with a group of people who participated to survey in other to have subjective perspective about this study. And the last part is the conclusion, giving evaluations and comments based on the achieved results and discussing the current status and future trends in the shopping behavior of customers.

2.2.1 Index analysis

Index numbers are used to experess the relative change in some aspects in the period of time. Index numbers or indices are the statistical devices designed to measure the relatice changes in the level of a certain phenomenon (Allen, 1949).They are the specialized averages or rates or ratios or percentages which indicate the general level of magnitude of a statistical group of variables. A number that compares the level of a particular occurrence at a specific date to the level of the same phenomenon at a reference date is known as an index number (Caves , et al., 1982). In addition to being helpful in the corporate world, index numbers are also helpful in the governance, employment, and agricultural sectors. They simplify the complicated measurement method to just numbers. Index numbers are becoming more and more significant as a result of the frequent use that economists, government agencies, and skilled businesspeople make of them (Koves, 1978).

A base index in statistics is a way to compare the values of a group of variables over time by multiplying by 100 after dividing the values of the variables in a given year by the values of the same variables in the base year. Through this process, an index value is generated, which offers a consistent approach to compare the variables over time and across various geographic or demographic groups.

$$k_t = \frac{y_t}{y_0} \qquad (1)$$

$y_{t.}$: Value in the given year

y_0: Value in the base year (Hlavsa & Pacáková, 2020)

In other hands, a chain index is a particular kind of time series index used in statistics that modifies a set of data over time to account for changes in the underlying variables. A chain index employs a number of basis years that are updated over time, as opposed to a basic base index, which uses a single base year.

$$k_t = \frac{y_t}{y_{t-1}} \qquad (2)$$

k_t :Chain index value

y_t: Value in the given year

y_{t-1}: Value in the previous year (Hlavsa & Pacáková, 2020)

2.2.2 Descriptive analysis

Descriptive statistics form a major component of all quantitative data analysis when coupled with several graphics' analysis (Sharma, 2019). It is used mainly to identify the behavior of given samples and present quantitative analysis of the given set of data. Measures of location numerically describes the typical data value of a variable.

Mean: or is called the average which is the sum of all added values divided by the total numbers of value. It is sensitive to extreme value (Sharma, 2019).

$$\bar{x} = \frac{x_1+x_2+x_3+x_4+\cdots+x_n}{n} = \frac{\sum_{i=1}^{n} x_i}{n} \qquad (3)$$

n_i: the total number of values

x_i: data values (Sharma, 2019)

Median: is the middle value in the order of growing size magnitude.

Mode is the most frequency value in the set of data.

Measures of variation spreads of the observations about the mean.

Variance is a dispersion measurement that considers the spread of each data point in a data set.

$$s^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1} \quad (2)$$

x_i: data values

n_i: the total number of values

$\bar{x}$: the value of mean (Kaur, et al., 2018)

Standard deviation is the degree of data dispersion from the mean is indicated . A low standard deviation implies that the data are grouped around the mean, whereas a large standard deviation shows that the data are more dispersed.

set

$$\text{s} = \sqrt{s^2} = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} \quad (3)$$

Coefficient of variation expresses the standard deviation as a percentage of the mean

$$\text{v} = \frac{s}{\bar{x}} \quad (4)$$

s: the value of standard deviation

$\bar{x}$: the value of mean (Hlavsa & Pacáková, 2020)

2.2.3 Multiple regression

Multiple regression analysis techniques allow the estimation of the parameters of a hypothesized, usually linear, relationship between a single dependent variable and several independent variables (Jonathan & Goldlerg, 1988). The dependent variable in this context is the total value consumption of goods, while the independent variables describe the GDP, the inflation rate, and the unemployment rate. The link between two or more variables is frequently the foundation for managerial choices.

In this study, testing is applied to demonstrate the significant relationships between dependent variable and independent variables such as gathered based on GSO. Data can be collected, a statistical technique called regression analysis can be utilized to create an equation outlining

the relationship between the variables**.** The variable being predicted is referred to as the dependent variable in regression terminology. Independent variables are the variables being used to forecast the value of the dependent variable.

Multiple regression model describes how the dependent variable A is related to the independent variable X1, X2,… Xn and an error term

$$Y = \alpha + \beta_1 * x_1 + \beta_2 * x_2 + \cdots + \beta_p * x_p + \varepsilon \quad (7)$$

$\alpha, \beta_1, \beta_2, \beta_p$ are referred to as the parameters of the model and ε is a random variable referred to as the error term. (Olive, 2017)

Estimated multiple regression equation

$$y_i' = \alpha + b_1 * x_1 + b_2 * x_2 + \cdots + b_p * x_p$$

y_i' : estimated value of the dependent variable

$\alpha, \beta_1, \beta_2, \beta_p$ estimated parameters of the model (Hlavsa & Pacáková, 2020)

The OLS method (Ordinary least squares method) is applied to estimate regression equation the best approximated the straight-line relationship between the dependent and independent variables (Olive, 2017).

Multiple coefficients of determination can be understood as the percentage of the dependent variable's variability that the estimated multiple regression equation can account for. Thus, when multiplied by 100, it can be seen as the proportion of the variability in Y that the calculated regression equation can account for (Hlavsa & Pacáková, 2020).

$$R^2 = \frac{SSR}{SSE+SSR} = \frac{SSR}{SST}$$

SSR : sum of squares due to regression

SSE: sum of squares due to error

SST: sum of squares due to regression (Hlavsa & Pacáková, 2020)

In this study, SAS software will be used to analyze data and the relationship between the variables (consumption, GDP, inflation rate and unemployment rate) to figure out which variables affect consumption. α is 0,05.

P-value < α =0,05: a significant relationship

P-value > α =0,05: insignificant relationship

ANOVA test is also used to find out the relationship between variables. If there are significant relationships, we will use the T-Test to look at each pair of variables to find out where and how the variable affects consumption. And finally, the variables that do not affect the dependent variable will be removed, and a new model with higher accuracy will be built (Olive, 2017).

2.2.4 Time series

A "Time Series" is a collection of numerical data that has been collected over a period of time. It is a history of how certain variables have changed over time. The observations in this series are organized chronologically (Chatfield, 2016). Utilizing statistical methods, time series are analyzed to identify the variables that influence the types of series. A time series will result from a variable that depends on the passage of time (Cowpertwait & Metcalfe, 2009).

There are two ways in order to measure time series : static (arithmetric or chronological mean) and dynamic (fix base index, chain base index, growth rate)

Component

$$Y = T + P + \varepsilon \qquad (8)$$

T : Trend (Long term tendancy, graphical, trend fuction, moving average)

P : Periodicity

ε : Error (Difference between model and real data) (Hlavsa & Pacáková, 2020)

In this study, the time series is used without fluctuation, therefore the single linear regression model with OLS will be applied (Olive, 2017)

First of all, building the original model with all observations.

Secondly, building the model with fewer 1 observation than original model.

Testing the quality of model

QOF: QOF (Quality of forecast) is a test to measure the accuracy of model.

REF: (Relative error of forecast) is a test to measure forecast accuracy; the difference between the actual and forecast for a given period is tested.

$$\left|\frac{predicted\ value - actual\ value}{actual\ value}\right| * 100$$

If the model is less than 10% means the model is accepted to apply for forecasting. (Hlavsa & Pacáková, 2020)

2.2.5 Categorical data analysis (CDA)

A categorical variable has a measurement scale consisting of a set of categories (Agresti, 2002). There are 2 types of categorical variables: nominal variable (such as gender which uses to name variable without providing any numerical value) and ordinal (such as education level, grade which are sets of data in order or scale it) (Nishisato, 1980). Contingency table is divided into 2 type of tables: 2*2 (2 rows and 2 columns) and classical (with at least 2*3 or 3*2) (Hlavsa & Pacáková, 2020). Testing in two-way contingency table (2*2).

There are 2 methods to apply for analysis: X^2 -test (Chi-square test) and Fisher's factorial test.

- X^2-test: if sample size n > 40

  $20 \leq$ n ≤ 40 and all expected frequencies are > 5 => X^2-test
- FFT will be used when sample size n < 20 FFT will be used

  $20 \leq$ n ≤ 40 and all expected frequencies are < 5 => FFT (Hlavsa & Pacáková, 2020)

Test of independence

Var A\ Var B	B_1	B_2	$\sum$
A_1	a	b	a+b
A_2	c	d	c+d
$\sum$	a+c	b+d	n

Table 1:Observed frequency

Var A\ Var B	B_1	B_2	$\sum$
A_1	$\frac{(a+b)*(a+c)}{n}$	$\frac{(a+b)*(b+d)}{n}$	a+b
A_2	$\frac{(c+d)*(a+c)}{n}$	$\frac{(c+d)*(b+d)}{n}$	c+d
$\sum$	a+c	b+d	n

Table 2:Expected frequency

$$X^2 = \sum\sum \frac{n_{ij}-e_{ij}}{e_{ij}}$$

where

n_{ij} = observed frequency for contingency table category in row *i* and column *j*.

e_{ij} = expected frequency for contingency table category in row *i* and column *j*.

$$X_\alpha^2 [(r-1) *(c-1)]$$

r: number of rows

c: number of columns (Simonoff, 2003)

for 2*2 table X_α^2 (1) = 3,84

- X^2- Test (Chi-square test)

H0: Build null hypothesis: there are no relationship between variables.

H1: There is relationship between variables.

Decision:

$X^2 > X_\alpha^2$ Or P < P_α = 0,05 Hypothesis is rejected

$X^2 < X_\alpha^2$ or P > P_α = 0,05 Hypothesis is accepted

- FFT (Fisher's factorial test)

  - Finding cell with the lowest value.
  - Reducing the value by 1 (final value is 0); all marginal frequencies are the same.
  - Computation of probablility for each table.

$$P_i = \frac{(a+b)!\,(c+d)!\,(a+c)!\,(b+d)!}{n!\,a!\,b!\,c!\,d!} \qquad (9)$$

Decision:

$\sum p_i$ >0,05 => Hypothesis is accepted

$\sum p_i$ <0,05 => Hypothesis is rejected (Hlavsa & Pacáková, 2020)

3 Literature review.

3.1 Non-durable goods definition.

Non-durable goods are things that consumers buy with the intention of using them for a little time. Additionally, it is known as consumables. There are three categories of non-durable items. They could be eaten and drunk together, literally. They can also be used up till they are gone, like dish soap, toothpaste, or deodorant. The third category of non-durable commodities includes items like socks, paper plates, and light bulbs that have been used but are no longer required were only meant for one use, or were simply damaged by regular use. Non-durable commodities include things like food, medicine, or electronics that are meant to be replaced quickly. Because it is essential to life, it goes hand in hand with economic development (Campus, 2019). Consumers prefer to acquire non-durable things more frequently than durable goods, which are made to last for several years because they wear out more quickly. Because of this high rate of consumption, the non-durable goods market is generally stable, and these products are frequently regarded as reliable indicators of consumer confidence and spending habits. In general, non-durable goods are crucial to the economy because they stimulate consumer spending and provide jobs for those who work in the sectors that make them (Campus, 2019). Since the economy's share of non-durable items is consistent, they are not seen as a key economic indicator. So, rather than an economic issue, changes in the purchasing of non-durable products are typically impacted by changes in population and demographics. Nonetheless, because demand for durable goods tends to increase during economic expansion and decline during a recession, they are seen as a trustworthy economic indicator.

Consumer non-durable items are necessary because they influence customer behavior in a positive way (Ermini, 1992). They specifically encourage individuals to spend money in the economy, which keeps the financial wheels of the economy turning constantly. More generally, non-durable items are crucial to the overall economy for three main reasons: They make up a large component of the gross domestic product (GDP) of a nation. A nation's productivity and profitability tend to increase with its GDP. As non-durable commodities, like groceries, are frequently necessities, their economic value is steady. Contrary to durable items, which are frequently luxuries, consumers must always buy non-durable goods. Non-durable items are therefore less impacted by normal business cycles than durable goods. Economic indicators don't include non-durable products (Erceg & Levin, 2002). Little pricing or purchase changes for non-durable products aren't thought to be a sign of financial health or wealth but instead because of their stability. Yet, they can still provide some insight into the general consumer

psyche for economists. The bottom line is that non-durable consumer items are necessary; thus pursuing a career in this sector can be a smart move.

In comparison to durable products like electronics, furniture, and appliances, non-durable goods frequently cost less. This indicates that, despite the fact that consumers might buy non-durable goods more frequently, the overall cost is typically lower than buying durable goods.

In general, non-durable products are important to the economy since they account for a substantial amount of consumer spending and are necessities that households must frequently buy. (Ermini, 1992)

3.2 Durable goods definition.

A durable good is a consumption good that can " deliver useful services to a consumer through repeated use over an extended period of time" (Diewert, 2011).Durable goods are goods that consumers use many times over a long period, unlike goods that are used only once or consumed immediately, such as food and food. Consumer durables are similar to investments in that they create a stream of services over their lifetime rather than providing service once in a while. Durable goods are specific goods that are often used a lot—for example, machinery, clothing, motorcycles, etc. Durable goods often require more direct sales and services, are more profitable, and require more guarantees from the seller.

The primary attribute of a durable good is that it is productive for two or more periods, similar to capital goods, rather than its physical durability, a trait shared by many other consumption commodities. The distinction is made based on whether the goods can be used repeatedly or continuously or if they can only be used once for purposes of production or consumption, according to the System of National Accounts (SNA), the internationally recognized set of recommendations on how to compile measures of economic activity (European commission, 2009). For instance, coal can only be burned once while having high physical durability. A durable good is one that, assuming a typical or average rate of physical use, may be used repeatedly or continuously for a period of more than a year. A product is considered consumer durable if it can be used frequently or continuously for consumption over the course of a year or longer.

Four welfare consequences of durable items include: bettering household stability, encouraging the creation or acquisition of other assets, boosting social influence, and improving the welfare of offspring (Sherraden, et al., 1991). Durable items can be utilized to produce revenue or to avert economic disasters in order to increase household stability. For instance, in some nations,

durable commodities are used as collateral for minor loans (McCants, 2007). Similar to this, durable products like computers, vehicles, videogame consoles, and washing machines have been employed as revenue sources. For instance, in Colombia, some individuals utilize personal vehicles or motorcycles to provide transportation services in places where public transportation is inconvenient or unavailable (Medina, 2019) .In many developing nations, video games, computers, and mobile phones have also acquired popularity as lucrative commercial endeavors. In classical and consumer economics, durable goods have been conceptualized as things that are utilized to increase the effectiveness of the domestic activity. The improvement of quality of life, particularly in industrialized nations, has been significantly attributed to durable commodities (Amendola, 2014) (Figal, 2019) People now have easier access to knowledge thanks to durable commodities like radios and televisions, for instance (Figal, 2019) (Kafle, 2018). Televisions and radios have increased their range of applications by being utilized for education in several poor nations (Marinelli, 2020)

Similarly to that, personal computers (PCs) and access to the Internet have made it possible for everyone to benefit from the knowledge economy as well as participate in it (Figal, 2019). People now find it simpler to access chances for education and work thanks to the use of Computers and the Internet, whether used independently or together. For instance, in the area of education, PCs and the Internet have made it easier to complete secondary and postsecondary education, helping to create human capital. Computers and the Internet have emerged as essential tools for connecting people with career prospects and business endeavors. Participate in the knowledge economy while simultaneously benefiting from it (Figal, 2019)

3.3 Customer and customer behavior

3.3.1 Definition of customer

C. Glenn Walters defined to term “customer” by stating that “A consumer is an individual who purchases, has the capacity to purchase, goods and services offered for sale by marketing institutions in order to satisfy personal or household needs, wants, or desires." (Walters, 1974). Consumer theory focuses on how people make shopping decisions based on income and budget. Understanding how consumers work makes it easier for suppliers to predict which products will sell more and allows economists to grasp the overall economy’s shape better. There are two distinct categories of consumers: personal consumers and organizational consumers. Personal consumers buy goods and services for their own consumption, for use in the home, or as gifts for other people. Therefore, personal consumers buy for eventual

consumption. Organizational consumers, on the other hand, include both lucrative and non-profit organizations, government organizations, and institutions. They buy goods and services to operate an organization (Schiffman & Kanuk, 1997) . The individual, personal consumer who buys goods or services for their own use or the use of their family will be the main focus of this chapter and this study.

The concept of consumer and customer is often used with a connotation of a person who buys a product or service in the marketplace. But the reality here is different and needs to be distinguished to understand the definition of consumer. The customer is the person who buys the product or service from the company itself. They can either buy for the sake of using the product or give it to someone else or resell it to another person. But on the other hand, the consumer is the person who uses the product. It is possible that the product was purchased for their own personal preference or may also have been given as a gift from another person. So we can also say a customer can be a consumer, but a consumer is not necessarily a customer. And in many cases, a person can be both a customer and a consumer.

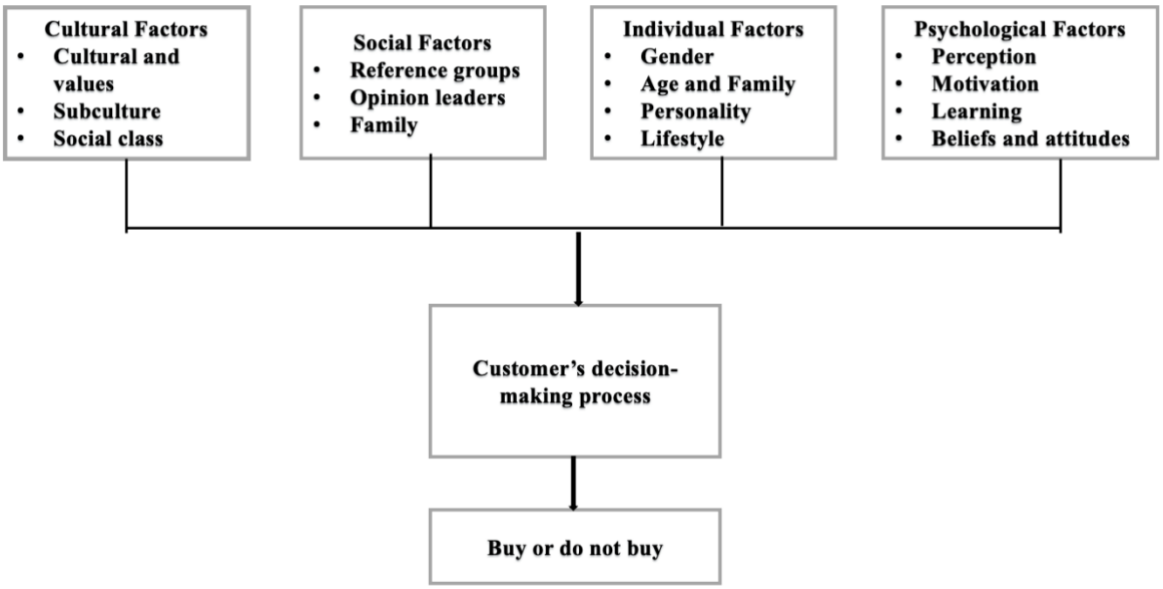
3.3.2 Customer behavior

Consumer buyer behavior is considered to be an inseparable part of marketing. Cite the definition of consumer buying behavior as the study of how people acquire and dispose of products, services, ideas, and experiences to meet their needs and desires. (Kotler & Keller, 2012). But according to Ben M Enis, it is a process that "leads to the satisfaction of requirements and wants through the utilization of inputs and their use through process and actions" is what is meant by the definition of buyer behavior. Numerous aspects that make up consumer buying behavior are thought to influence customers' purchasing decisions in one way or another (Enis, 1974). An alternative term for this is consumer buying behavior, which "refers to the purchasing behavior of ultimate consumers, including people and households, who purchase goods and services for personal consumption" (Kumar , 2010). The reasons behind consumers' purchases, specific elements impacting the patterns of customers' purchases, an analysis of factors evolving within society, and other issues are specific aspects of consumer behavior that, from the perspective of marketers, need to be examined. Consumer buying behavior is itself a complicated, dynamic topic that is difficult to characterize simply and often, according to (Blackwell, et al., 2006). As a result, different scholars have defined the concept of consumer buying behavior in different ways. Despite the diversity of the definitions provided above, they all point to the same conclusion: consumer buying behavior is the act of

choosing, purchasing, and discarding goods and services in accordance with consumers' requirements and wants.

3.3.3 Factors that affect customer buying

According to (Charler, et al., 2011) there are four major elements that affect consumers' purchasing decisions:



Source: is created by the author based on (Charler, et al., 2011)

Figure 1: Factors that affect customer buying

- Cultural factors include the values, subcultures, and social classes of the consumers. Basic values, perceptions, needs, and behaviors are shaped by culture and are influenced by the consumer's family, friends, and society. When customers choose to buy things, cultural influences from other countries have a significant effect. Consequently, consumer purchasing behavior varies noticeably between cities (Aaker, 1996). There are subcultural groups or entities inside a culture that adhere to the same traditions, beliefs, and social mores. (Aaker, 1991) Nationalities, religious affiliations, geographical locations, and racial groups are all categories of subcultures.
- Social factors which also include friends, family, colleagues, and peer groups, are the second factor. This component is crucial since social class structures exist in every society. People are continually interacting with one another. Hence these elements have a significant impact on consumer behavior, according to I.E.Bigne (Bigne, et al., 2001). Additionally, in order to save time and effort on product research and evaluation,

consumers are more prone to seek out the advice of others. These social elements have an effect on consumers' purchasing attitudes and behavior both directly and indirectly.

- Individual factors The individual factor is the third factor. Age, gender, family life cycle stage, lifestyle, self-concept, and other characteristics are just a few of the many differences between people. These unique qualities influence one's motivation, perception, and choice (Kotler & Keller, 2012) (Brassington & Pettitt, 2013; Macdonald, 2000). Individuals consume a variety of goods and services throughout their lifetimes, which is only natural. Children, teenagers, adults, and senior citizens all have different likes in things like clothing, cuisine, furnishings, refreshment goods, and services. According to Esterby-Smith (Smith, et al., 2012), a person's personality is viewed as a self-concept and self-perception that influences his decision to buy a certain object. Their interests, activities, and opinions are determined by their attitudes, perceptions, beliefs, and self-evaluation.
- The psychological component, which includes perception, motivation, learning, attitudes, and beliefs, is the final ingredient. This element is thought of as a tool for consumers to engage with society. Firms and marketers can take action to satisfy the consumer's high wants by acknowledging their feelings, carefully examining the material, and clearly conveying their views and opinions. According to Lamb et al (Charles, et al., 2004), consumers' learning process, which influences their experience and practices with products or services, is the source of changes in consumer behaviors. According to Kotler et al. (Kotler, et al., 2005), many learning theorists believe that customers learn via interacting with inputs, drives, cues, reinforcement, and reactions. As a result, individuals act on their beliefs and attitudes

3.3.4 Customer decision-making process

The five steps of the consumer decision-making process include need identification, information search, alternative evaluation, purchase, and post-purchase behavior. As it has been more thoroughly covered below, marketing managers try to affect consumer behavior at each of these stages**.**

The source is created by the author is based on (Charles, et al., 2004)

Figure 2: Customer decision-making process

- Need recognition

  The first step in the decision-making process for consumers is need recognition, which is defined as "the outcome of an imbalance between actual and desired needs." (Charles, et al., 2004). It has been determined that this is the initial step in the decision-making process. It is the point where a customer encounters the discrepancy between perception and the actual level of satisfaction (Solomon, et al., 2006) . The writers emphasize that when a person's unmet needs are identified, the consumer buying decision process will start. Functional demands and psychological needs might be further separated from these unmet needs. While the first pertains to how the product or service performs, the second is focused on how customers feel about the goods or services they buy.

- Information research

  According to Moorthy et al. ((Moorthy, 1997) , influencing factors for consumer choice include personality, income, social class, the magnitude of purchase, prior brand perception, prior experiences, and customer happiness. The customer looks for information both inside and externally during this second stage. At this point of the decision-making process, customers are heavily impacted by retailers' marketing techniques. Retailers specifically disseminate brand information using a variety of channels, which may include any combination of advertising, direct marketing, public relations and publicity, personal selling, events and experiences, and sales promotion (Kotler & Keller, 2012).

- Evaluation of alternative

  The third stage focuses on the assessment of potential solutions. According to Kolter et al. (Kotler, et al., 2005), buyers evaluate various items and brands during the pre-purchase evaluation phase before making a purchasing decision. They typically base their decisions on characteristics that are pertinent to their needs. According to Kotler et al. (Kotler, et al., 2005), a customer's decision to purchase something is therefore influenced by a number of factors, including size, quantity, quality, and price. (Porter, 2004) Porter emphasized that a company creates value by providing cheaper costs in addition to having a unique personality to compete with its rivals.

- Purchase decision

  The fourth step of the consumer decision-making process is when the customer actually makes the purchase. The degree of satisfaction from prior shopping experiences, the

product return policy, the atmosphere of the store, and the degree of time pressure associated with the purchase are all important factors that play a significant role in the decision of which retailer to make a purchase from at this stage.

- Post-purchase

  The consumer-decision process model's final stage can be broken down into three parts. Customers must consume the goods and services as a first step. Customers will assess their consumption in the second stage, and it may be seen here that customer satisfaction levels can differ from how customers view their performance and vice versa (Aaker, 1996); (Blackwell, et al., 2006). Diversification occurs in the final step. Consumers will probably recycle or discard the item at this stage. This is the point that most businesses are now focused on. As a result, they are now concerned with being environmentally friendly because they believe that practically all customers would likely make repeat purchases if they are happy with the reinforcement stage (Jeffrey F. Rayport, 2004).

3.4 Brief information about Vietnamese's economic growth

Since Vietnam's transition to a market economy in the 1990s, the country's retail sector has undergone significant development. The Vietnamese Communist Government (VCG) established the Doi Moi reform initiative in 1986 in response to the inadequacy of the Soviet-type central planning of the country's economic structure (renovation). This program created new market regulations that liberated the business environment, opened the market to foreign firms, privatized domestic firms, and allowed foreign goods and cultural products (such as movies and music) to enter the Vietnamese market (Clifford J. Shultz, 1994). Doi Moi, the economic and political reforms that turned Vietnam from one of the world's lowest markets into a lower middle-income market, took place more than 30 years ago. Vietnamese consumers' consumption habits changed as a result of this development (Toulouse, et al., 2018). By the politics of consumption, the government maintains control over Vietnamese consumers' purchase habits and so exerts significant influence on how Vietnamese consumers, particularly young consumers, live their everyday lives. These modifications have also significantly affected how Vietnamese consumers view themselves and their interpersonal interactions (Toulouse, et al., 2018). Progressive industrialization and modernization, along with peoples' more prosperous lives and the rise in residents' living standards, have collectively led to a significant increase in average household expenditure, which has in turn contributed to the

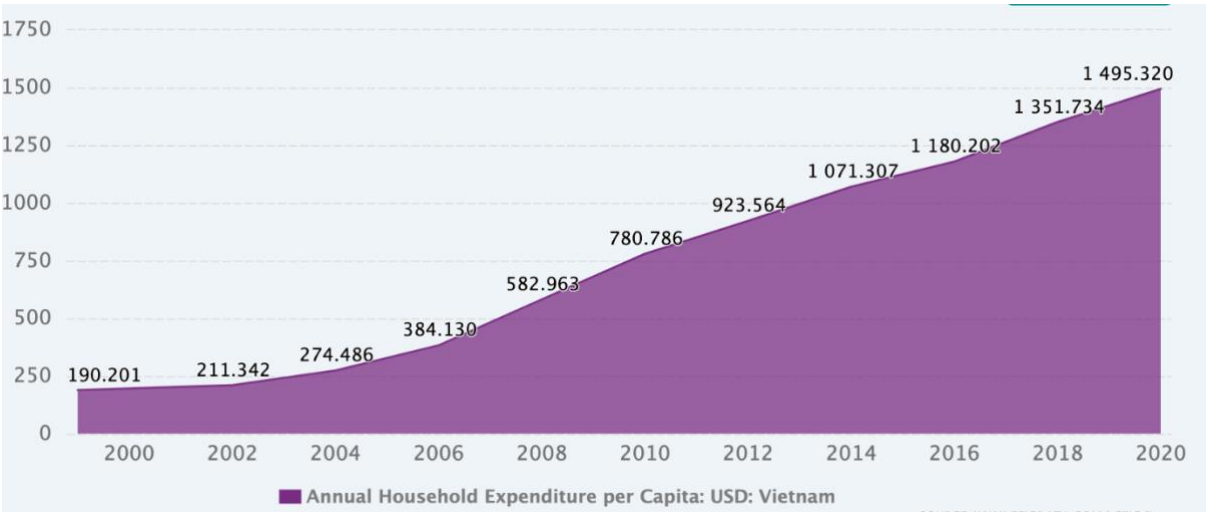
spike in retail market sales. The urbanization also exposes the retail sector to the need for hassle-free environments, clean dairy and food items, and trendy, eye-catching, and high-tech goods, among other things. Vietnam's classes is expanding, particularly in metropolitan areas, as a result of the country's rapid economic growth, industrialization, rising income, and young, expanding population according to GSO (GSO, 2012). 25 years ago, the nation was among the poorest; today, it is a lower-middle-income nation (World Bank, 2012). Together with China, India, and Indonesia, Vietnam is regarded as Asia's fourth-largest economy (OECD, 2010), shifting the region's economic center of gravity to the east.

3.5 Vietnam's consumption spending on goods

In 2010, about a quarter of the population in Vietnam was under the age of 14 (GSO, 2012). This young workforce will help Vietnam's middle class grow. In 2012, more than 30% of the workforce (or 65% of the total population) was between the ages of 15 and 30, while another 25% was between the ages of 30 and 40 (GSO, 2012). The percentage of adults who are literate is 93,1%, and educational levels are rapidly increasing (GSO, 2012).

Rising living standards are driving an increase in consumer durable demand. Vietnam's rapidly urbanizing population, expanding middle class, rising living standards, and young population all contribute to the country's increased demand for durable consumer goods.

Businesses' profits are anticipated to stay consistent, and growth prospects for 2016 are still favorable. However, lingering issues with transportation and distribution networks may continue to cap the potential for expansion. The level of competition is already high and is expected to increase as more major foreign companies, such as those from France, South Korea, and the US, enter the market.



Source: CEIC Data based on General Statistics Office of Vietnam (USD)

Figure 3: Annual Household Expenditure per Capita

Compared to the previous update *figure 3* of 1351$ per capita in December 2018, Vietnam's annual household expenditure per capita increased to 1494$ per capita in December 2020.
Data on Vietnam's Annual Household Expenditure per Capita, which ranges from December 1999 to December 2020, is updated monthly and has an average value of 781$ per capita.
The statistics peaked at USD 1494$ per capita in December 2020 and hit a record low of USD 190$ per capita in December 1999.
Although many local retailers of consumer goods are heavily geared, banks are typically eager to extend loans. The industry's current standard payment period is from 30 to 60 days. In this industry, there is some evidence of slower payment, although typically not to the point where it results in non-payment. In the upcoming months, no increase in non-payments is anticipated. Our underwriting posture for the sector is typically open, and we base our choices mostly on financial reports and our experience in the market.
Vietnam demonstrates that more individuals are purchasing automobiles, consuming meat, and having air conditioning (AC). Urban families were more likely to own motorbikes (56.7-88.6%) or refrigerators (33.7-74.7%), phones (32.5-91.4%), or washing machines between 2002 and 2012. (Obert Pimhidzai, 2018) The AC is the leading electricity consumer in urban households, and ownership rates increased from 4.5 to 24.1 percent. Another survey focusing on the urban middle class revealed that 62% owned an air conditioner.

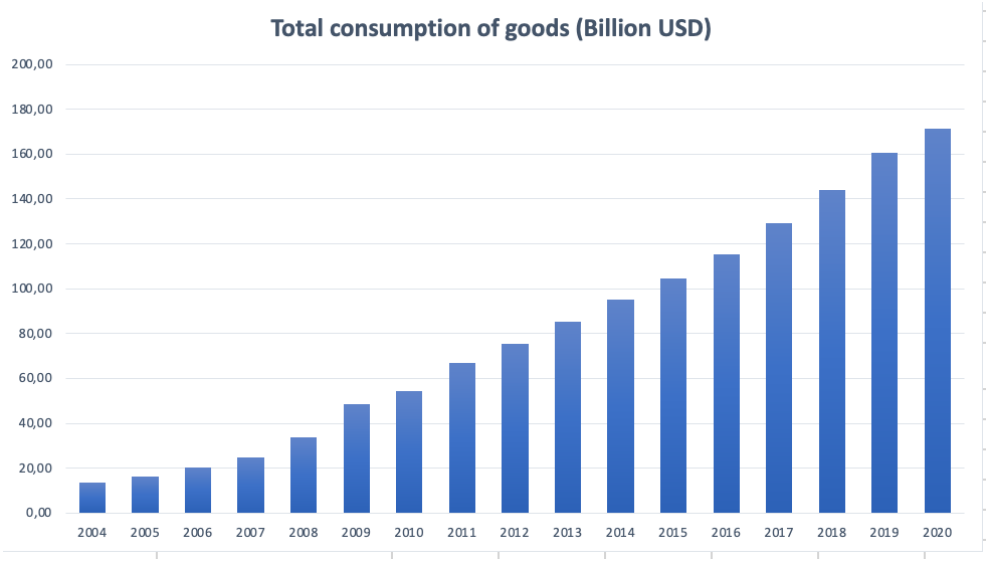
4 Practical Part

The practical section is divided into two main parts; the first part includes data analysis on the total value of goods consumed across the population of Vietnam from 2004-2020. The second part is to go into the analysis of survey data collected from 162 participants.

4.1 Analysis of the whole population according to GSO

The promotion and economic growth of the country are significantly influenced by consumption. As the larger Vietnamese economy recovers and growth figures resume a more stable and medium-term trend, consumer spending will increase. Based on the statistics of the General Statistical Office, *figure 4* shows a rapid growth in the total value of consumptions from 2004 (13,68 billion USD) to 2020 (171,52 billion USD), which increased by 12,54 times. This change is thanks to the rapid growth of GDP after the international integration period of Vietnam, and the government has found the right policy. The growth in income also

makes people want to buy more. In the years after the 2000s, a person's salary was only enough for the minimum needs. But as income increases, they gradually spend more on consuming.



Source: is created by the author based on data from GSO

Figure 4: Total consumption of goods (Billion USD)

4.1.1 Descriptive and index analysis

Year	Total consumption of goods (Billion USD)	Base Index	Chain Index
2004	13,68	1,00	-
2005	16,26	1,19	1,19
2006	20,14	1,47	1,24
2007	24,99	1,83	1,24
2008	34,00	2,49	1,36
2009	48,54	3,55	1,43
2010	54,53	3,99	1,12
2011	66,77	4,88	1,22
2012	75,67	5,53	1,13
2013	85,42	6,24	1,13
2014	95,19	6,96	1,11
2015	104,51	7,64	1,10
2016	115,17	8,42	1,10
2017	129,02	9,43	1,12
2018	143,83	10,51	1,11
2019	160,63	11,74	1,12
2020	171,52	12,54	1,07
Descriptive Analysis			
Mean	79,99		
Median	75,67		
Mode	#N/A		
Standard Deviation	51,52		
Minimum	13,68		
Maximum	171,52		
Coefficient of variation	0,64		

Source: is created by the author in Excel

Table 3: Descriptive table for the total value of consumptions

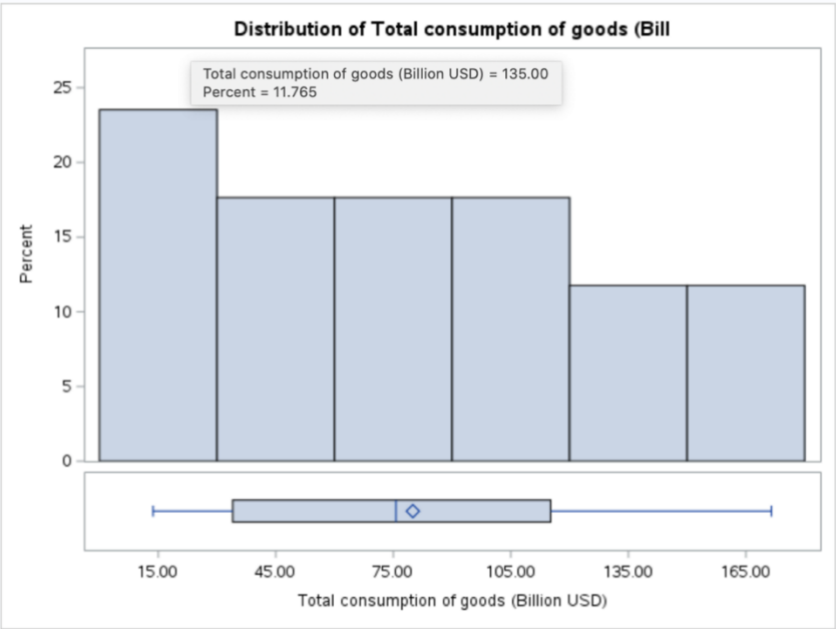
Based on the above data *table 3*, the first column is the period collected from 2004-2020. The second column is the total consumption of durable goods and nondurable goods based on GSO data from a billion Vietnamese dong converted to USD by the author by the exchange rate of 23000 VND = 1 USD. The third column is the base index calculated by the formula. In order to compare the change in value, whether increase or decrease in the following years compared to the base year (2004). And the last column is the chain index, to show the change in the years compared to the previous year.

Overall, the value has grown steadily and rapidly since 2004. Many articles have assessed this as "solid growth" and are expected to continue to grow in the coming years. Until the economy is gradually returning to recovery after the Covid pandemic.

Based on the chain index - a table that compares the values of the years to the previous year, since 2007 has increased by 24% compared to 2006, 2008 increased by 36% compared to 2007. The indexes have shown the fastest growth in the period 2008-2009, with 43%. This is considered a period of strong development of consumer demand. One of the reasons for this growth is that Vietnam has joined the WTO (Word Trade Organization). Joining the organization has contributed to expanding and promoting Vietnam's economy to develop and integrate with the world in general, especially stimulating the shopping needs of consumers.

After the period of 2010, it can be seen that the growth is not as fast as in previous years, but at an average rate of 10-12% annually compared to previous years. This can see a period of more sustainable and stable development in consumer demand. And set the lowest value when it only increased by 7% in 2020 compared to 2019. The reason for this is due to the impact of the Covid pandemic starting in 2019. It has had an impact on many different economies around the world. The most challenging time was at the start of the epidemic when quarantine and isolation orders in every nation nearly brought the entire world's economy to a standstill. Although the government of Vietnam has taken every precaution to contain the pandemic, the severe effects they bring are unavoidable.

According to descriptive analysis, the minimum value is 13.68 billion USD in 2004, and the maximum value is 117.52 billion USD in 2020, the range is 157.84. The average value from 2004 to 2020 is 79.99 billion USD, a median of 75.67 billion USD in 2012.



Source: is created by the author with SAS Studio based on the data of GSO

Figure 5: Distribution of total consumption of goods (Billion USD)

The statistics *figure 5* shows that the mean value is greater than the median value, which means that the distribution of the data is skewed to the right, or positively skewed is generated by the values of consumption increase over time to the right. The standard deviation is 51.52 billion USD which is a measurement of how far apart from the mean value a set of data points are from one another. The coefficient of variation is 0.64 (64%). This shows that the large variation of the standard deviation is relatively high compared to the mean, and the increase in total consumption is widely distributed and increases rapidly compared to previous years.

4.1.2 Multiple linear regression models between dependent and independent variables

The question is, what factors will affect the total value of consumption? There are 3 factors mentioned that are GDP, inflation rate, and unemployment rate. The data was collected at GSO and analyzed by the author. The hypotheses are made:

- H0: There is no relationship between total consumption of goods, GDP, inflation rate, and an unemployment rate

  H1: There is at least one significant relationship among them.
- H0: There is no relationship between the total consumption of goods and the GDP.

  H1: There is a significant relationship between the total consumption of goods and the GDP.
- H0: There is no relationship between the total consumption of goods and the inflation rate.

  H1: There is a significant relationship between the total consumption of goods and the inflation rate.
- H0: There is no relationship between the total consumption of goods and the unemployment rate.

  H1: There is a significant relationship between the total consumption of goods and the unemployment rate.

Testing the hypotheses process with $\alpha = 0.05$

y' : Total consumption of goods in billion USD

x_1 : The GDP in billion USD

x_2: The inflation rate (%)

x_3 : the unemployment rate (%)

Step 1: Testing multicollinearity (presenting the high correlation among explanatory variables x_1, x_2, x_3)

Pearson Correlation Coefficients, N = 17			
	GDP (Billion USD)	Inflation rate (%)	Unemployment rate (%)
GDP (Billion USD) GDP (Billion USD)	1.00000	-0.51776	0.32923
Inflation rate (%) Inflation rate (%)	-0.51776	1.00000	-0.22385
Unemployment rate (%) Unemployment rate (%)	0.32923	-0.22385	1.00000

Source: is created by the author with SAS Studio based on the data of GSO

Table 4: Correlation coefficients of independent variables

Based on *table 4*

$|r_{x1*x2}| = |-0.52| < 0.75$

$|r_{x1*x3}| = |0.32| < 0.75$

$|r_{x2*x3}| = |-0.22| < 0.75$

There is no multicollinearity among independent variables.

Step 2: Building the models and testing relationships

Using the OLS method with SAS Studio according to *table 5*

$$y' = - 0.42 + 0.51x_1 - 0.46x_2 - 4.55x_3$$

The coefficient of determination $r^2 = 0.9871$ means 99% of the variation in " total consumption of goods" which is explained by this model, and 1% residual. This is a good model from a statistical perspective.

Model: MODEL1
Dependent Variable: Total consumption of goods (Bill Total consumption of goods (Billion USD)

Number of Observations Read	17
Number of Observations Used	17

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	41923	13974	331.46	<.0001
Error	13	548.07476	42.15960		
Corrected Total	16	42471			

Root MSE	6.49304	R-Square	0.9871
Dependent Mean	79.99235	Adj R-Sq	0.9841
Coeff Var	8.11708		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-0.42432	15.13882	-0.03	0.9781
GDP (Billion USD)	GDP (Billion USD)	1	0.50948	0.01995	25.54	<.0001
Inflation rate (%)	Inflation rate (%)	1	-0.45994	0.33002	-1.39	0.1868
Unemployment rate (%)	Unemployment rate (%)	1	-4.55293	6.82995	-0.67	0.5167

Source: is created by the author with SAS Studio based on the data of GSO

Table 5: Testing hypotheses of variables in SAS Studio

- ANOVA Test

Null hypothesis H0: There is no relationship between total consumption of goods, GDP, inflation rate, and an unemployment rate

H1: There is at least one significant relationship among them

F-value = 331.46, P-value = 0.0001 < P_α = 0.05 according to *table 5*

Decision: the hypothesis is rejected and conclusion: there is at least one significant relationship among variables

- T-Test
    - Total consumptions and GDP

Null hypothesis H0: There is no relationship between the total consumption of goods and the GDP.

H1: There is a significant relationship between the total consumption of goods and the GDP.

t-value = 25.5, P-value = 0.0001 < P_α = 0.05

Decision: the hypothesis is rejected; conclusion: there is a significant relationship between the total consumption of goods and the GDP.

- Total consumption and inflation rate

Null hypothesis H0: There is no relationship between the total consumption of goods and the inflation rate.

H1: There is a significant relationship between the total consumption of goods and the inflation rate.

t-value = -1.39, P-value = 0.19 > P_α = 0.05

Decision: the hypothesis is accepted and the conclusion: there is no significant relationship between the total consumption of goods and the inflation rate.

- Total consumption and unemployment rate

Null hypothesis H0: There is no relationship between the total consumption of goods and the unemployment rate.

H1: There is a significant relationship between the total consumption of goods and the unemployment rate

t-value = -0.67, P-value = 0.52 > P_α = 0.05

Decision: the hypothesis is accepted and the conclusion: there is no significant relationship between the total consumption of goods and the unemployment rate.

Step 3: Building a new model with the significant factor.

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-15.61091	3.45053	-4.52	0.0004
GDP (Billion USD)	GDP (Billion USD)	1	0.51959	0.01665	31.21	<.0001

Source: is created by the author with SAS Studio based on the data of GSO

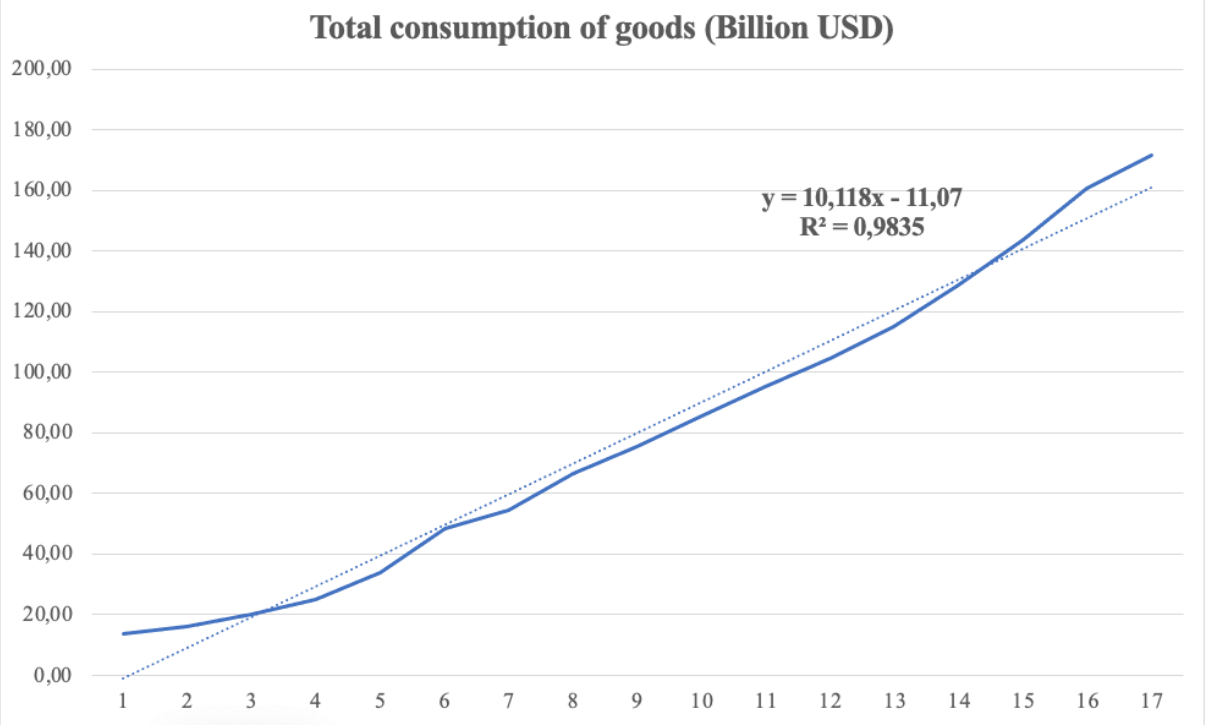
Table 6:Parameter estimates of GDP (Billion USD)

$$y' = - 15.61 + 0.52x_1$$

This *table 6* shows the relationship between the total consumption of goods and GDP (when GDP increases by 1 billion USD, total consumption of goods also increases by 0.52 billion USD).

4.1.3 Trend function of total consumption.

Trend function is created with the dependent variable "total consumption of goods." The parameters are estimated using a time series of 17 observations in the period 2004-2020.



Source: is created by the author in Excel based on the data of GSO

Figure 6 : Trend line of the total consumption of goods (Billion USD)

According to the generated *figure 6*, the slope of the trend function is represented by time, and the slope parameter is 10.12. It increases long-term tendencies because it is a positive number with no periodicity. Using the OLS method with linear regression and SAS studio software built the original model where t (time) = 1,2,3,4…n corresponding to the year 2004,2005,… 2020 with n (number of observations are 17)

$$y' = -11.07 + 10.12\,t$$

Step 1: Testing model quality.

- QOF (Quality of forecast) with The coefficient of determination r^2 = 0.98 which means 98% of the variation in " total consumption of goods" which is explained by this model, and 2 % residual. The model is good for prediction from a statistical point of view.

Building a new model with fewer than 1 observation (n = 16)

Root MSE	6.31951	R-Square	0.9833
Dependent Mean	74.27188	Adj R-Sq	0.9822
Coeff Var	8.50862		

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-9.48250	3.31398	-2.86	0.0126
T	T	1	9.85346	0.34272	28.75	<.0001

Source: is created by the author with SAS Studio on the data of GSO

Table 7: Parameter estimated of time with less than 1 observation.

New model: $y' = -9.48 + 9.85\ t$.

The predicted value $y'_{17} = 157.97$, The actual value y_{17} = 171.52

REF = $\left|\frac{157.97-171.52}{171.52}\right|$ *100 = 8 %, REF is good based on a statistical perspective

Step 2: Apply the original model to predict.

y'= $-11.07 + 10.12\ t$

Root MSE	6.84064	R-Square	0.9835
Dependent Mean	79.99235	Adj R-Sq	0.9824
Coeff Var	8.55162		

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-11.07000	3.47026	-3.19	0.0061
T	T	1	10.11804	0.33866	29.88	<.0001

Source: is created by the author with SAS Studio on the data of GSO

Table 8: Parameter estimated of time

Based on *table 8*, considering p-value = 0.0001 < P_α = 0.05, which is significant.

- When x = 18 (the year 2021)

  $y_{18} = -11.07 + 10.12 * 18 = 171.09$ (billion USD)

There is still no specific report on the total consumption of goods officially from the GSO public from 2021 and 2022. But on the other hand, monthly reports are updated regularly.

The General Statistical Office of Vietnam reports that despite the COVID-19 pandemic's effects, overall retail sales of consumer goods and services in Vietnam in the first half of 2021 increased of 11.8% from the same period in 2020. This implies that despite difficult conditions, Vietnam's consumption spending has remained resilient (GSO, 2012). In addition, the Vietnamese government has taken a number of actions to encourage local consumption, including lowering taxes and fees, adopting stimulus plans, and boosting domestic tourism. These actions have aided Vietnam's economic expansion by increasing consumer spending.

- When x=19 (the year 2022)

  $y_{19} = -11.07 + 10.12 * 19 = 180.58$ (billion USD)

Vietnam's economy has been expanding steadily in recent years, helped along by a young population and a burgeoning middle class. Consumer spending has risen as a result throughout the nation. While the Vietnamese government is anticipated to put policies into place to further encourage domestic consumption and economic growth, it is likely that this trend will continue in 2022. Also, Vietnam has ratified a number of free trade agreements with other nations, which are anticipated to increase consumer spending through promoting trade and investment. The EU-Vietnam Free Trade Agreement (EVFTA), which went into force in August 2020, is anticipated to significantly improve consumer spending and the economy in Vietnam.

- When x = 20 (the year 2023)

  $y_{20} = -11.07 + 10.12 * 20 = 191.53$ (billion USD)

In the year 2023, the predicted value of the total consumption of goods in Vietnam is 191.53 billion USD.

- When x = 21 (the year 2024)

  $y_{21} = -11.07 + 10.12 * 21 = 201.45$ (billion USD)

In the year 2024, the predicted value of the total consumption of goods in Vietnam is 201.45 billion USD.

4.2 Questionnaire Evaluation

In this study, the author conducted the questionnaire through a google form. It included multiple choices and open-text questions in order to gather data from all classes and all groups

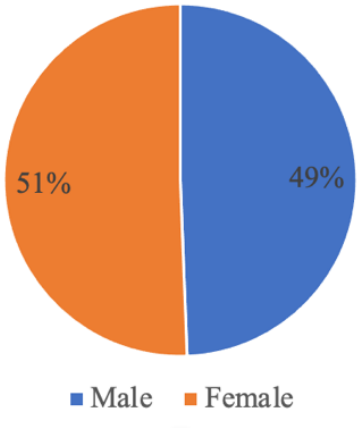
of people's ages. The survey was conducted and received 162 respondents as a sample size to test all factors, such as gender, age, occupation, income, and educational level, which directly affect consumer behavior. There are 17 questions, including 15 questions with one answer, 1 question with more than one answer, and 1 open question where the respondent can share their point of view about the personal experience of consuming and the trend of it in the few recent years. There are no restrictions on age, region, gender, etc. everyone can participate in the survey. It is filled in by 162 random people. The survey was published on social networking platforms such as Instagram, Facebook, and WhatsApp to collect information objectively.

Besides the analysis of the general population in Vietnam with macro-factors to prove that there is any significant relationship among them, in this part, the author would like to test deeper the specific group of people to have a comprehensive perspective. The first part will go into exploiting personal information based on age, gender, income, and education level to better understand the survey participants. The second part will analyze the characteristics, frequency, and key factors that motivate them to buy and what types of goods they buy more often and spend more money. The last part will examine the hypotheses made based on the survey.

- Dependency between age and durable, non-durable goods
- Dependency between gender and durable, non-durable goods
- Dependency between occupation and durable, non-durable goods
- Dependency between educational level and durable, non-durable goods
- Dependency between income and durable, non-durable goods

4.2.1 Evaluation of personal questions

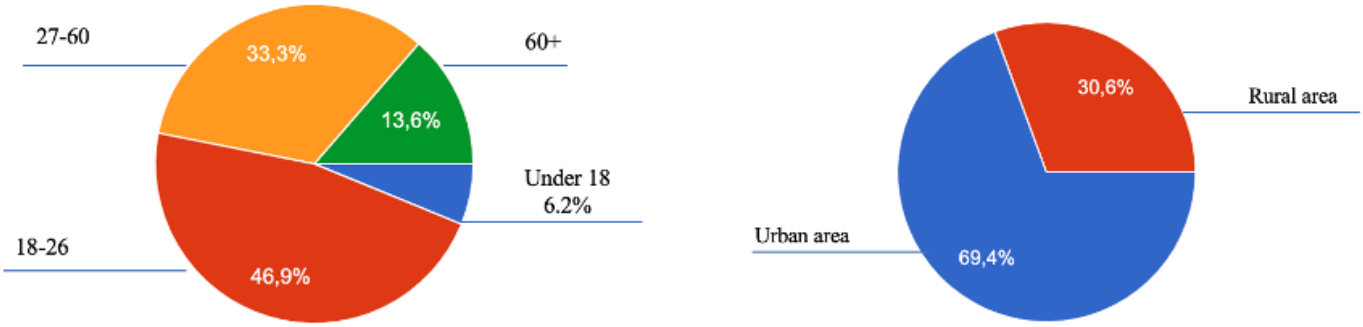
From the survey, 80 responses were received from males representing 49%, and 82 responses from females representing 51% of all those who participated in the interview. This is a fairly balanced and objective result when the opinions recorded from males and females are quite correlated, and there is little difference.



Source: is created by the author in Excel based on the survey

Figure 7: Gender

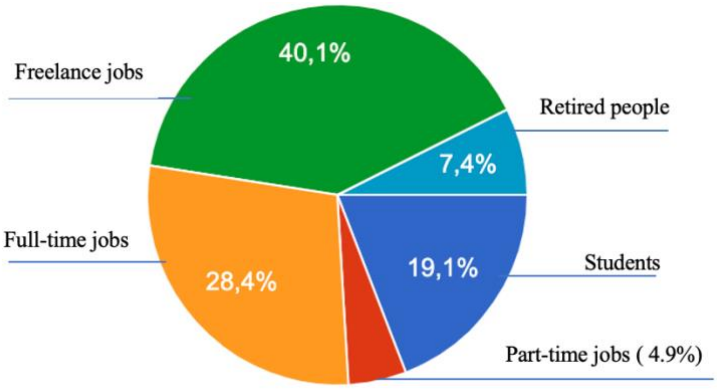
The *figure 8* points out that the majority of survey respondents are between the ages of 18-26 at 46.9%, followed by 27-60 with 33.3% of working age. 13.6% were over 60 years old, and finally, 6.2% of the participants were under 18 years old. Regarding region, 30,6% of participants come from a rural area, and 69,4% come from an urban area.



Source: is created by the author in Excel based on the survey

Figure 8: Age and region

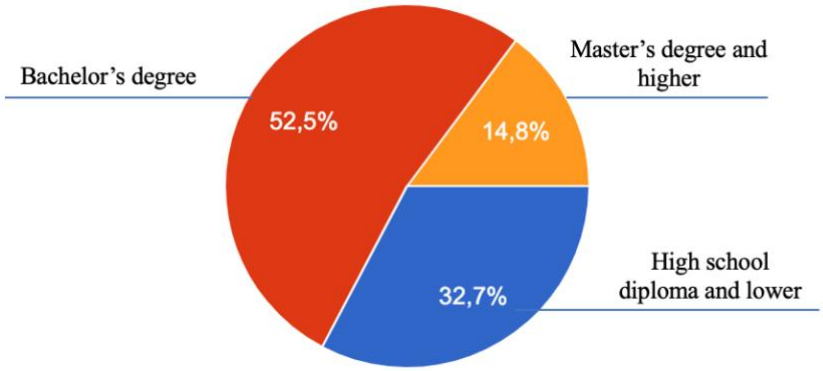
In *figure 9,* 40.1% of respondents said that they are doing freelance work. Another 28.4% are working full-time, 19.1% are students, 7.4% are of retirement age, and 4.9% are working part-time. The majority of that survey are full-time workers, and freelancers make up 68.5% of the total. This is also a positive sign that they have a stable source of income for spending.



Source: is created by the author in Excel based on the survey

Figure 9: Occupation category

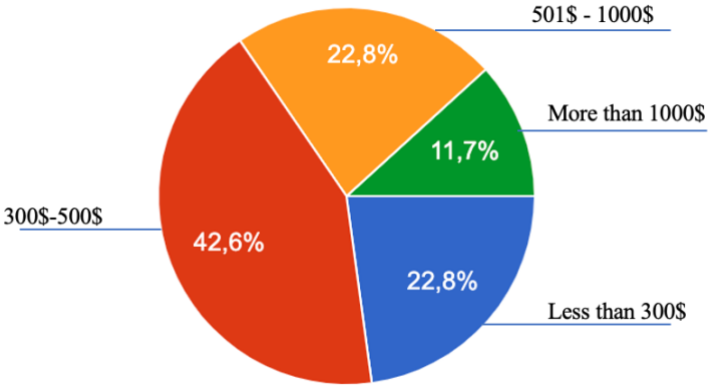
Follow-up survey questions were asked to know more about the participants' educational levels. Based on the *figure 10* , we can see that 52.5% of the interviewees said they have a bachelor's degree, followed by 32.7% who said they have a secondary school degree and below. The rest, accounting for 14.8%, said they have a master's degree or higher.



Source: is created by the author in Excel based on the survey

Figure 10: Educational Level

According to World Data in Vietnam, in the *figure 11* the average income per capita is $3712 per capita per year. So the survey took the $300 mark as the starting point to calculate the income of 1 person a month. The majority accounted for 42.6% of participants who said their income ranged from $300-500 a month, which is higher than the minimum. Followed by 22.8% of people who said that their income is between $501-1000 a month, Under $ 300 a month income accounts for 22.8%, and only 11.7% of people have an income of more than $1000 a month.

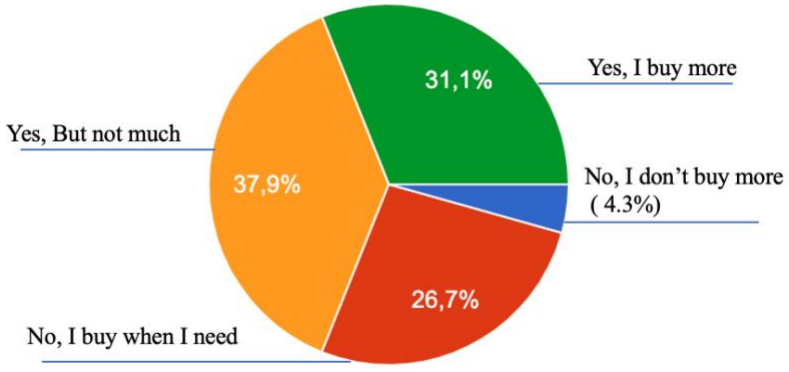


Source: is created by the author in Excel based on the survey

Figure 11: Monthly income

4.2.2 Evaluation of consuming durable and non-durable goods

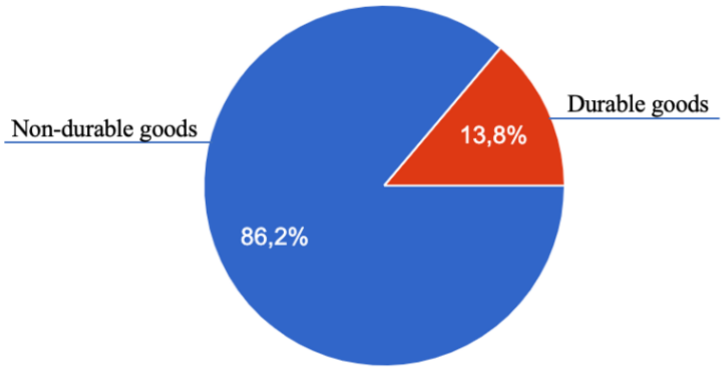
The question was asked when increasing income, what will the consumption trends of the survey participants be? Based on the *figure 12* shows that 37.9% of people tend to buy more but not much, and 31.1% are buying more clearly. More than 30% of the rest think that they don't buy more; they only buy when they really need it and have no need to change their consumption behavior.



Source: is created by the author in Excel based on the survey

Figure 12: Behavior of consuming when income increases

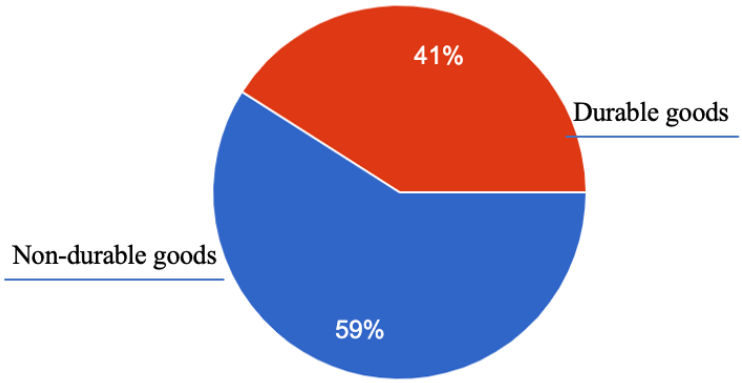
In *figure 13*, 86.2% of people surveyed said they buy non-durable goods more often, and only 13.8% said they buy durable goods more often. Based on the literature review, the definition and role of these two goods were defined. This is quite consistent with the user's psychology when they tend to buy the right thing.



Source: is created by the author in Excel based on the survey

Figure 13: Frequent purchases

While in the previous question, most people answered that they buy non-durable items more often, but based on the *figure 14*, it shows that the difference is not too big when consumers spend a lot of money on shopping. 59% say they spend more money on non-durable goods because they buy them more often. Besides, 41% said that they spend more money when buying durable goods because their value is often greater than non-durable goods.

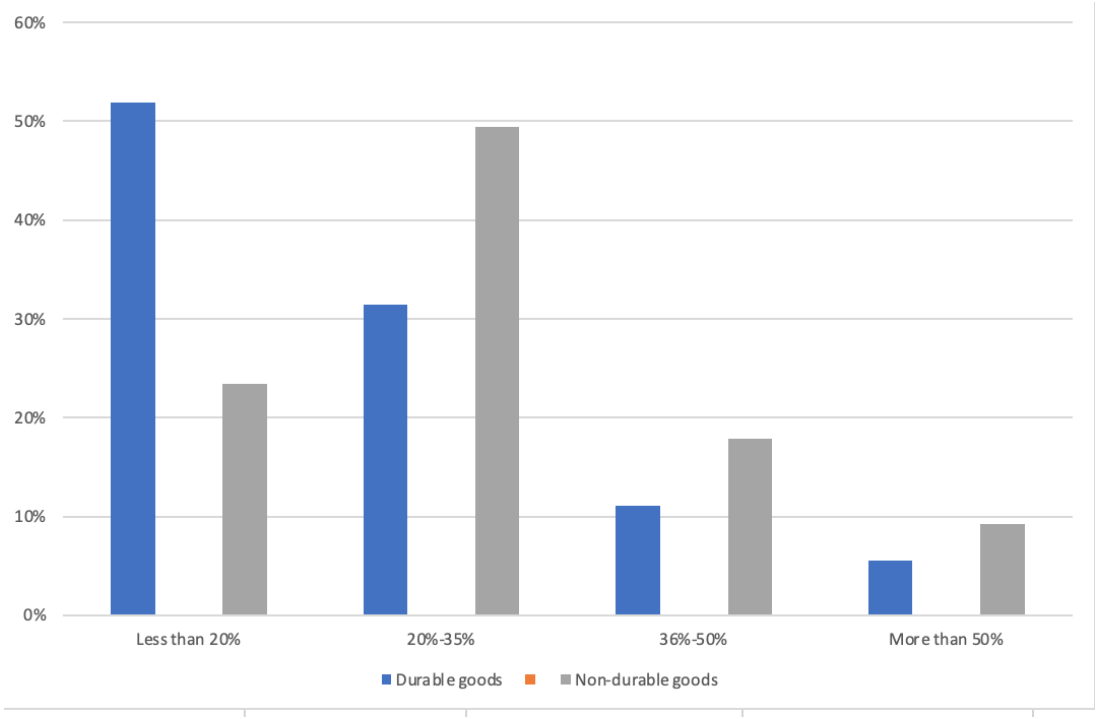


Source: is created by the author in Excel based on the survey

Figure 14: Spending on purchases

The *figure 15* depicts the percentage-based monthly income that participants spend on monthly purchases of both durable and nondurable consumer goods. Total spend on durable goods is 100%, and total spend on non-durables is 100%. At less than 20% of monthly income, 52% of respondents spent on durable goods and 23% spent on non-durables. At 20-30% of income,

31% of people spend more money on durable goods, and 49% of participants choose non-durable goods. At 36-50% from income, 11% from durable goods, and 18% from non-durable goods. At the bottom end, with more than 50% of income, 6% of people spend on durable goods and 9% spend on non-durable goods. Although the sample size is only 162 people, it cannot be representative of the entire population. However, through the survey, it can be seen that objectively the behavior of random participants is that they are still spending most of their income. their income for non-durable goods such as food, dairy drinks, etc.



Source: is created by the author in Excel based on the survey

Figure 15: Percentage of spending based on income for consumption

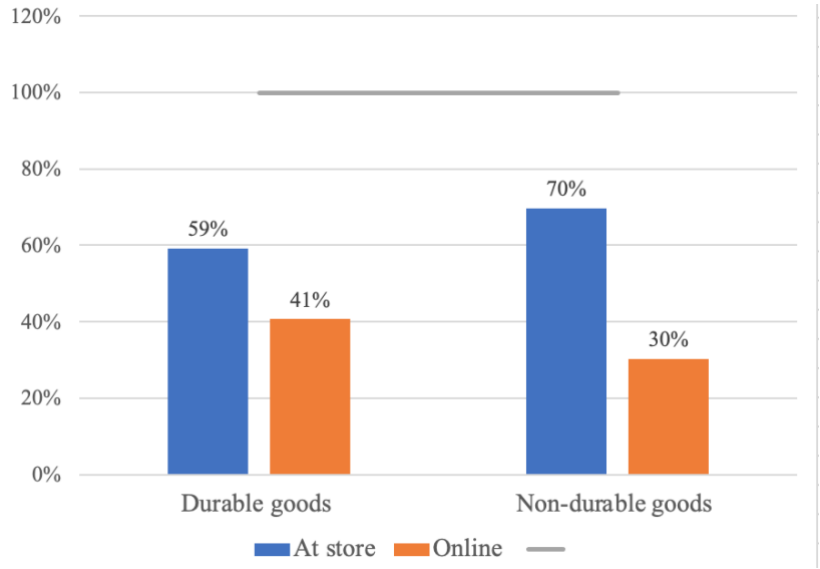
The *table 9* is a collection of participants' data on the factors they consider about a product before making a purchase decision. On a scale of 1-5, 5 is the highest score, and 1 is the lowest score. About the price of the product, the average is 3.68 out of 5 . Along with 3.68 is the necessity of goods. Next is the quality of the product which is also noticed by consumers with 3.67 out of 5. then the popularity of that product in the market and finally the brand of the product. This also indicates that it is unlikely that famous branded appliances have attracted the needs of customers because some famous brands sell products at very high prices, but the quality is not as expected. Feedback from people who have purchased and used the product is 4.05 out of 5, which shows that they are very satisfied with the product they have purchased. More than 90% of the interviewees said that they would repurchase the product they have tried.

	Max	Min	Mean	Median	Mode	Standard Deviation
Price of goods	5	1	3,68	4,00	5,00	1,43
Neccesary of buyers	5	1	3,68	4,00	4,00	1,35
Brand's name of goods	5	1	3,31	4,00	4,00	1,29
Quality of goods	5	1	3,67	4,00	4,00	1,31
Well-known goods	5	1	3,48	4,00	4,00	1,28
Feedback of used goods	5	1	4,05	4,00	4,00	0,90

Source: is created by the author in Excel based on the survey

Table 9: Descriptive table about all factors that affect the decision-making process

The question in the survey is that they often buy online, on e-commerce sites, on websites, or in stores. In the *figure 6*, for durable goods, 59% say they shop more often in stores than 41% buy online. The difference is not too big. While it can be seen at non-durable stores, 70% choose to buy in-store, while only 30% buy online. This is understandable because goods are not durable; people need to use them daily and often, so they tend to buy readily available, convenient, and with less waiting time.

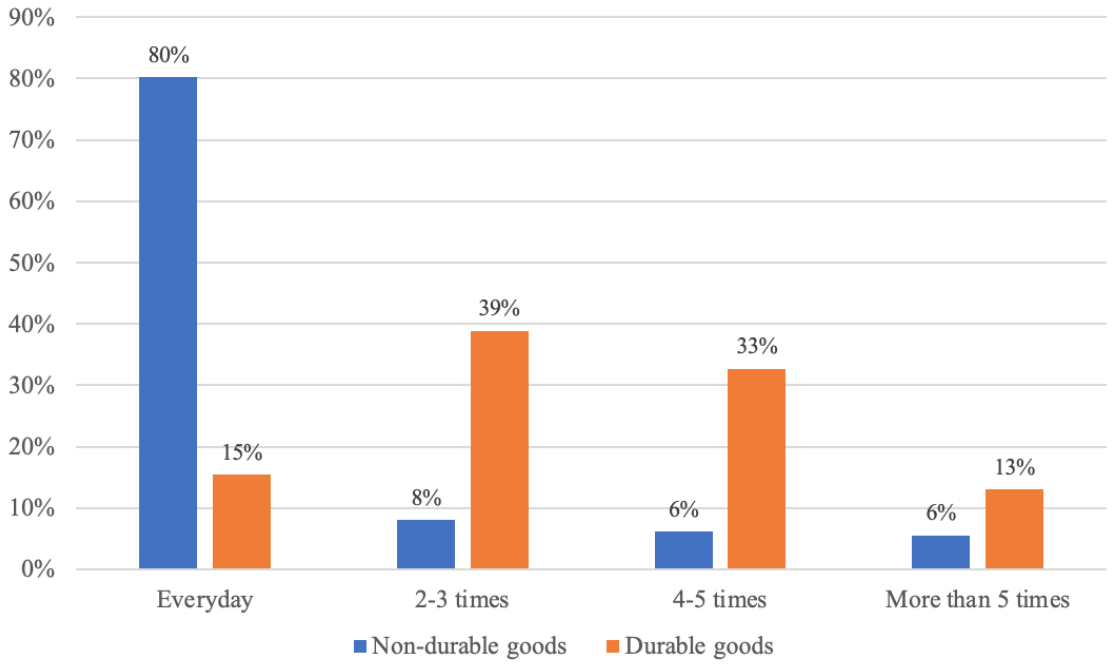


Source: is created by the author in Excel based on the survey

Figure 16: Percentage of purchase method

Purchase frequency is referred to in the *figure 17*. For non-durable goods, it can be seen that 80% of respondents said that they buy them regularly. Only a few remaining are 2-3 times a

month, 4-5 times, or more than five times a month. But for durable goods, most of them answered that they buy 2-3 times or 4-5 times a month, accounting for mainly in the survey group. As necesary, people tend to buy non-durable goods often.



Source: is created by the author in Excel based on the survey

Figure 18: Percentage of consuming frequency

4.2.3 Hypothesis testing

The question is, what kind of goods do they consume more often? Hypotheses are made to determine which factors will have a significant relationship to the purchase of goods, and below is the process of testing the hypotheses.

- Analysis of dependency between age and consumption of durable, non-durable goods.

H0: There is no dependency between age and consumption of durable, non-durable goods.

H1: There is a dependency between age and consumption of durable, non-durable goods.

P_α = 0.05

The sample size is greater than 20, and all expected frequencies are greater than 5. X^2- Test (Chi-square test) is used for this hypothesis. P- value = 0.001< P_α = 0.05, the null hypothesis is rejected, there is a dependency between age and consumption of durable, non-durable goods.

Table of Age by Goods			
Age(Age)	Goods(Goods)		
	Durable goods	Non-durable goods	Total
18-26	11 16.37	57 51.63	68
27-60	7 11.315	40 35.685	47
60	6 6.0185	19 18.981	25
Under 18	15 5.2963	7 16.704	22
Total	39	123	162

Source: is created by the author with SAS Studio based on the survey

Table 9: Contingency table: Age and durable, non-durable goods

Statistics for Table of Age by Goods			
Statistic	DF	Value	Prob
Chi-Square	3	27.9036	<.0001
Likelihood Ratio Chi-Square	3	23.9982	<.0001
Mantel-Haenszel Chi-Square	1	18.4155	<.0001
Phi Coefficient		0.4150	
Contingency Coefficient		0.3833	
Cramer's V		0.4150	

Sample Size = 162

Table 10: Statistical table: Age and durable, non-durable goods

- Analysis of dependency between gender and consumption of durable, non-durable goods.

H0: There is no dependency between gender and consumption of durable, non-durable goods.

H1: There is a dependency between gender and consumption of durable, non-durable goods.

P_α = 0.05

All expected frequencies are larger than 5, and the sample size is greater than 20. This hypothesis is tested using X^2- Test (Chi-square test). P- value = 0.34> P_α = 0.05

The null hypothesis is accepted because there is no relationship between gender and consumption of durable, non-durable goods.

Table of Gender by Goods			
Gender(Gender)	Goods(Goods)		
	Durable goods	Non-durable goods	Total
Female	10 12.148	72 69.852	82
Male	14 11.852	66 68.148	80
Total	24	138	162

Source: is created by the author with SAS Studio based on the survey

Table 11: Contingency table: Gender and durable, non-durable goods

Statistics for Table of Gender by Goods			
Statistic	DF	Value	Prob
Chi-Square	1	0.9030	0.3420
Likelihood Ratio Chi-Square	1	0.9060	0.3412
Continuity Adj. Chi-Square	1	0.5315	0.4660
Mantel-Haenszel Chi-Square	1	0.8974	0.3435
Phi Coefficient		0.0747	
Contingency Coefficient		0.0745	
Cramer's V		0.0747	

Table 12: Statistical table: Gender and durable, non-durable goods

- Analysis of dependency between occupation and consumption of durable, non-durable goods.

H0: There is no dependency between occupation and consumption of durable, non-durable goods.

H1: There is a dependency between occupation and consumption of durable, non-durable goods.

$P_\alpha = 0.05$

Test with 30% expected frequencies less than 5. Therefore, the Chi-square test cannot be applied to this case. The hypothesis cannot be tested.

Table of Occupation by Goods			
Occupation(Occupation)	Goods(Goods)		
	Durable goods	Non-durable goods	Total
Freelancers	11 9.6296	54 55.37	65
Full-time jobs	8 6.8148	38 39.185	46
Part-time jobs	1 1.1852	7 6.8148	8
Retired people	2 1.7778	10 10.222	12
Student	2 4.5926	29 26.407	31
Total	24	138	162

Source: is created by the author with SAS Studio based on the survey

Table 13: Contingency table: Occupation and durable, non-durable goods

Statistics for Table of Occupation by Goods

Statistic	DF	Value	Prob
Chi-Square	4	2.2556	0.6889
Likelihood Ratio Chi-Square	4	2.6256	0.6223
Mantel-Haenszel Chi-Square	1	1.6471	0.1994
Phi Coefficient		0.1180	
Contingency Coefficient		0.1172	
Cramer's V		0.1180	
WARNING: 30% of the cells have expected counts less than 5. Chi-Square may not be a valid test.			

Sample Size = 162

Table 14:Statistical table: Occupation and durable, non-durable goods

- Analysis of dependency between educational level and consumption of durable, non-durable goods.

H0: There is no dependency between educational level and consumption of durable, non-durable goods.

H1: There is a dependency between educational level and consumption of durable, non-durable goods.

P_α = 0.05

The sample size is greater than 20, and one expected frequency is smaller than 5 but less than 20%. This hypothesis is put to the test using the X^2- Test (Chi-square test). P- value = 0.47 > P_α = 0.05

The null hypothesis is accepted because there is no relationship between an educational level and consumption of durable,non-durable goods.

Table of Educational level by Goods			
	Goods(Goods)		
Educational level(Educational level)	Durable goods	Non-durable goods	Total
Bachelors's degree	12 12.593	73 72.407	85
Highschool diploma and lower	10 7.8519	43 45.148	53
Master's degree and higher	2 3.5556	22 20.444	24
Total	24	138	162

Source: is created by the author with SAS Studio based on the survey

Table 15: Contingency table: Educational level and durable, non-durable goods

Statistics for Table of EduL by Goods

Statistic	DF	Value	Prob
Chi-Square	2	1.5216	0.4673
Likelihood Ratio Chi-Square	2	1.6026	0.4488
Mantel-Haenszel Chi-Square	1	0.0849	0.7708
Phi Coefficient		0.0969	
Contingency Coefficient		0.0965	
Cramer's V		0.0969	

Sample Size = 162

Table 16: Statistical table: educational level and durable, non-durable goods

- Analysis of dependency between income and consumption of durable, non-durable goods

H0: There is no dependency between income and consumption of durable, non-durable goods

H1: There is a dependency between income and consumption of durable, non-durable goods

P_α = 0.05

The expected table with one frequency is smaller than 5 but still less than 20% in total expected frequencies. This hypothesis is put to the test using the X^2- Test (Chi-square test). P- value = 0.67 > P_α = 0.05. The null hypothesis is accepted because there is no relationship between an income and consumption of durable,non-durable goods.

Table of Income by Goods			
Income(Income)	Goods(Goods)		
	Durable goods	Non-durable goods	Total
300-500$	11 10.222	58 58.778	69
501-1000$	6 5.4815	31 31.519	37
Higher than 1000$	1 2.8148	18 16.185	19
Less than 300$	6 5.4815	31 31.519	37
Total	24	138	162

Source: is created by the author with SAS Studio based on the survey

Table 17: Contingency table: Income and durable, non-durable goods

Statistics for Table of Income by Goods

Statistic	DF	Value	Prob
Chi-Square	3	1.5582	0.6689
Likelihood Ratio Chi-Square	3	1.9365	0.5857
Mantel-Haenszel Chi-Square	1	0.5895	0.4426
Phi Coefficient		0.0981	
Contingency Coefficient		0.0976	
Cramer's V		0.0981	

Sample Size = 162

Table 18: Statistical table: Income and durable, non-durable goods

5 Conclusion and discussion

The purpose of this thesis is to examine factors influencing consumer behavior in Vietnam and the consumption of durable and non-durable commodities. Based on the data collected from secondary data (GSO) shows that the rapid increase in total consumption value from 2004 to 2020 equals billions of dollars. This is a sign of the outstanding economic development of Vietnam after the war and the difficult time has passed. Factors are given to see the impact at the macro level, such as GDP, Inflation rate, and employment rate; we can draw the conclusion that GDP has a positive relationship with the total value of consumption while the other two factors have a positive relationship with the total value of consumption. Otherwise, it is an inverse relationship. Because when the unemployment rate is too high or inflation is too high, consumers tend to buy less.

Primary data was collected by the author through a survey on social networking platforms with the participation of 162 people. It can be said that this is a small sample and cannot be representative of everyone, but with the data from all random participants, the author has analyzed and pointed out indicators and trends that lead to behavior consumer purchases. According to the analysis, when people increase their income, they tend to consume more goods for themselves, especially durable goods. Non-durable goods were chosen by the participants, with 86.2% of the participants, and the amount that participants spent more was also on non-durable goods 59%. It is interesting that people with incomes above $1000 tend to spend more money on durable goods, contrary to the majority of participants. There have been many surveys showing that in developed countries, people don't spend too much of their income on food, drink, or disposable goods. They buy more non-durable goods but spend a lot less money on them. Five hypotheses have been proposed to test the relationship of gender, age, occupation, educational level, and income with the consumption of durable and non-durable goods. The results obtained are as follows:

- There is a dependency between age and consumption of durable, non-durable goods.
- There is no dependency between gender consumption of durable, non-durable goods.
- Dependency between occupation and consumption of durable, non-durable goods cannot be tested.
- There is no dependency between educational level and consumption of durable, non-durable goods.
- There is no dependency between income and consumption of durable, non-durable goods.

Based on the above report, the age factor has a significant relationship on the consumer choice of goods. And the rest of the factors may also influence the decision to be more or less, but because the sample set is small, it cannot be investigated.

Participants in the survey were questioned about the elements that contribute to your belief in the product's quality and influence your decision to buy it. Up to 128 persons, or the highest percentage, decided to believe the opinions of those who purchased and tested the goods. It is the most sincere viewpoint and inspires a lot of confidence. Next is referrals from acquaintances, ranked 3rd is through KOL influencers through social networking platforms and finally the brand's website. The final part of the survey is an open-ended question where participants can share their opinions and perspectives on the future market. One of the participants shared that: "The trend of online shopping will be more developed than direct shopping. The approach via KOL and KOC is increasingly popular. I often buy products in this direction because of the ease of use. High reliability, products that approach the trend. Traditional online shoppers can change for convenience and save time." A combination of economic, social, and cultural variables drives the fast-changing consumer behavior of product consumption in Vietnam. Consumer behavior is expected to vary and adapt to new influences and trends as the nation continues to develop.

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7 Appendix

Questionnaire

1. How old are you ?
- Under 18
- 18-26
- 27-60
- 60+
2. What is your gender?
- Male
- Female
- Prefer not to say
3. What is your highest educational level?
- Highschool degree or lower
- Bachelor’s degree
- Master’s degree
- Doctorate and higher
4. What region do you live?
- Urban area
- Rural area
5. What do you do for a living?
- Students
- Part-time jobs
- Full-time jobs
- Freelancers
- Unemployed
- Retired
6. What is your income interval monthly?
- Less than 300$
- 301-500$
- 500-1000

- More than 1000$

7. How often do you consume non-durable and durable goods?

- Durable goods (2-3 times per month, 4-5 times per month, more than 5 times per month, every day)
- Non-durable goods (2-3 times per month, 4-5 times per month, more than 5 times per month, every day)

8. When you decide to consume goods, which factors are desirable?

- Prices of goods (Rate from 1-5)
- Necessary of demand ((Rate from 1-5)
- Brand's name (Rate from 1-5)
- Quality of goods ((Rate from 1-5)
- Well-known on the market (Rate from 1-5)

9. How do you consume goods?

- Durable goods (Online, at the store)
- Non-durable goods (Online, at the store)

10. Do you consume more when your income increases?

- No, I don't consume more
- No, I just buy when I need
- Yes, But not much
- Yes, I consume more

11. What kind of goods do you often buy more ?

- Durable goods
- Non-durable goods

12. What kind of goods do you spend more money on ?

- Durable goods
- Non-durable goods

13. How many percent of your income do you spend on consuming goods?

- Durable goods (Less than 20%, 20-35%, 36-50%, more than 50%)
- Non-durable goods (Less than 20%, 20-35%, 36-50%, more than 50%)

14. What kind of factors affects your making decision?

- Feedback from people who bought those goods
- Introduction from friends
- Introductions from influencers, KOLs

- Websites, social media

15. Rate the quality of goods you have purchased (from 1-5)
16. Do you buy again goods that you purchased?

- Yes
- No

17. If you would like to share your experiences of purchasing goods and the trend of customer behavior in the next few years, please let your comments below.