MASTER THESIS

A STUDY ON THE POLICY DIRECTION OF COFFEE PRODUCTION IN VIETNAM

GRADUATE SCHOOL

JEJU NATIONAL UNIVERSITY

Department of Agriculture Economics

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2018.08

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A thesis submitted in partial fulfillment of the requirement for the degree of

Master of Agriculture Economics

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ABSTRACT

Vietnam is the second largest coffee producing and exporting country in the world, only after Brazil. Brazil is famous for producing Arabica coffee whereas Vietnam is famous for producing Robusta coffee. Currently, Vietnam mainly produces and exports green coffees which account at 90% of total coffee production and the remaining 10% is processed coffee. This is a big problem of the Vietnam's coffee industry since the value of one unit of processed coffee is threefold higher than one unit of green coffee. The main purpose of this research is to clarify current status of the Vietnamese coffee industry; what problems are existing; from that find out the way to improve the Vietnam's coffee industry. In addition, this research aims to clarify Korean behavior about Vietnamese coffee, understand their tastes and thoughts; and the tendency to consume Vietnamese coffee. There are two main models are applied in this study in order to clarify the two mentioned purpose above. One is AHP model and another one is Logit model. AHP model is used in the decision making of which are the best methods to solve the current problems as well as improve the Vietnamese coffee industry. By contrast, Logit model is used to clarify which factors effect on consumer's decision making when they purchase Vietnamese coffee.

CHAPTER 1

INTRODUCTION

1.1 Research Background

In Vietnamese agriculture, coffee and rice are the two main exported products which contribute significantly to the GDP; rice holds the first position and the second position is coffee. In the world, Vietnam is the second biggest coffee exporter, only after Brazil. Coffee plays an important role for the country's economy. In the crop year 2016/2017, Vietnam exported 1.79 million tons of coffee with a turnover of 3.36 billion USD which accounted for 3% of the total national GDP. In the next period, 2017/2018, the coffee export amount is projected to decrease to 1.4 million tons, which would bring 3.2 billion USD in turnover; a decrease of 19% in total amount of export and 2.7% in turnover when compared with the previous year. In the crop period of 2017/2018, the average export price was about 2,249 USD/ ton, an increase of 20.1% compared to 2016.

Vietnam mainly exports green coffee, where the proportion of green to processed coffee is 9 to 1. And, the price of green coffee is flexible (it changes each hour) and depends on many factors; such weather conditions, fertilizer price and so on, whereas the price of processed coffee is quite stable in the market. Moreover, the value of one unit of processed coffee is threefold higher than the value of 1 unit of green coffee.

According to International Coffee Organization (ICO), the consumption of coffee has increased continuously during the last 40 years with the average increase rate of 1.6% per year and is expected to quickly increase in the future. This is a good opportunity for Vietnam's coffee industry; to have a new production direction when changing from focusing on producing and exporting green coffee to focusing on producing and exporting processed coffee which brings higher return than green coffee. There is one conflict that exists currently; Vietnam is the biggest coffee exporter in the world, but mainly exports green coffee at a low price and then Vietnam imports processed coffee back from other foreign countries but at a higher price. However, with an advantage in cheap, fresh and abundant raw

material inputs – green coffee, Vietnam has a good opportunity to develop its coffee industry in a new production direction – processed coffee

In Vietnam's domestic market, the culture of drinking coffee has increased in recent years and people tend to drink more qualitative coffee and require more from its flavor. Although Vietnam is the second biggest coffee exporting country, the Vietnamese people are still drinking either low quality or expensive, high quality coffee which is imported from some other foreign country. Moreover, Vietnam's domestic brand has not succeeded in building brand loyalty and brand awareness for their customers since many customers believe and trust in foreign brands such as Nescafe rather than domestic brands

In the whole country, there are 97 companies that are processing green coffee but only 10% of it has the TCVN 4193:2005 standard (TCVN standard is a standard use to measure the quality of green coffee export); 160 companies for ground coffee and only 6 companies for processing instant coffee. Besides that, most of the companies are small-scale and have poor techniques in producing and processing coffee products. Until now, there have been a modest number of domestic famous brand such as Trung Nguyen Coffee and Buon Me Thuat Coffee. Trung Nguyen is the biggest brand name in Vietnam's coffee industry – the first time it appeared on the market was in 1999, producing high quality coffee and was well-known in the international market. However, with only Trung Nguyen, Vietnam can only provide for the world market with very tiny amount of coffee products

1.2 Problem Discussion

As mentioned above, Vietnam is the second biggest coffee exporter in the world and in the case of Robusta coffee, Vietnam holds the 1st position. Currently, Vietnam only focuses on export green coffee, where 90% of total harvested coffee is exported and only 10% of harvested coffee is used to produce coffee products for the local market. However, the amount of coffee exported is huge and increases year by year, but the turnover is not high. In some years, although the amount of coffee exported is high, the turnover is lower than the previous year because the turnover depends on the price of coffee as determined by the world coffee market, and that price is always flexible depending

on many factors such as weather conditions. On the other hand, processed coffee brings higher and more stable revenue for Vietnam's coffee industry but is not matter of concern. Focusing on producing processed coffee could contribute more for Vietnam's national GDP (until now, the total revenue of the coffee industry contributes to 3% of the total national GDP).

This is not a good strategy when Vietnam exports green coffee at a lower price and imports processed coffee from other countries at a higher price. Until now, Vietnam does not invest much in its coffee industry, especially in techniques for producing coffee products. Vietnam has a big advantage in fresh raw materials, producing coffee products within the country would help to reduce lots of costs; such as tariffs when exporting green coffee, inventory costs, and transportation costs and so on. However, in the current situation, besides a high-quality product, it still exists a huge amount of low-quality products or even fake coffee. Many companies are using manual methods in producing coffee that lead to low-quality products rather than using technical methods. By the way, setting up high-tech facilities in producing coffee requires a great deal of money which small-scale companies could not apply without government support. Additionally, the reason for producing low-quality coffee also comes from the lack of knowledge of farmers when growing, harvesting and preserving green coffee beans.

The domestic coffee market is expanding day by day since the culture of drinking coffee has increased in recent years. This is a good opportunity to produce and consume coffee in the domestic market. Nowadays, consumers require more and more in the quality of their coffee as well as coffee products; hence producing high-quality coffee is the first priority. Moreover, other industries such as the confectionary industry and milk industry also use coffee in their ingredients.

1.3 Research Objective

This research study aims to clarify the current status of the production in the Vietnamese coffee industry; what problems exist; and ideas for applying new directions in processing coffee in order to increase the turnover for Vietnam's coffee industry

1.4 Delimitation

This research study is limited to the Vietnamese coffee industry, because it is really interesting since people more and more like drinking coffee beverages. My study mainly focuses on coffee production, which is an important step in making a good tasting cup of coffee for drinkers as well as increasing the value of coffee not only in Vietnam's market but also in the international market. More specially, production direction and processed coffee are the main keywords of this study.

1.5 Research Organization

Chapter 1: Introduction

Chapter 1 provides a general view of the research and the reason to conduct the study. This chapter includes research background, problem discussion, research objective and delimitation

Chapter 2: Current Status of Vietna's Coffee Industry

This chapter provides a general view of the status of the international coffee industry and Vietnam's coffee industry in particular. The main purpose of this chapter is to clarify the great achievements as well as the existing problems in Vietnam's coffee industry. This chapter includes two main parts, one is on the international coffee market and the other is on Vietnamese coffee market.

Chapter 3: Literature Review and Methodology

Chapter 3 presents an applied theory relating to the research topic and provides a general look about concepts which are related to coffee production and a new direction for it. This chapter also describes research methodology which is used for this study in order to clarify the hypothesis. In particular, this chapter consists of research methods and methods of data collection, and describes how and where data is collected.

Chapter 4: Data Collection and Analysis

Chapter 4 brings out the data that has been collected through questionnaires and puts the data

collected in relation to a relevant theory in order to clarify the research topic. This is the most important part in this research.

Chapter 5: Conclusion and Recommendation

The final chapter includes the conclusion which has emerged during this thesis and a recommendation which clarifies the limitation of the research as well as propositions on future research.

CHAPTER 2

CURRENT STATUS OF COFFEE INDUSTRY IN VIETNAM

2.1 Brief Introduction about Coffee

History of Coffee

According to a popular legend, the origin of coffee can be traced to the day, maybe a thousand years ago, when an Abyssinian (Ethiopian) goatherd named Kaldi observed his goats prancing and frolicking about. Kaldi had previously found the behavior of his goats to be "irreproachable," so he knew that something unusual was going on. When Kaldi investigated, he saw that the goats were merrily eating the red berries and shiny leaves of an unfamiliar tree. Kaldi decided to try some, and when he did he joined the dancing goats and became "the happiest herder in happy Arabia." From then on, those red berries have become a kind of beverage for humans.

From the 6th century, coffee was not only used by Ethiopians because of its stimulant effects, but also spread outside Ethiopia to different countries like Yemen, some countries in the Middle-Near East and Saudi Arabia

In the 16th century, Venetian merchants imported coffee into Europe. Coffee was introduced into Italy first. Coffee really became popular in Europe in the 17th century and then spread into Asia and Australia

In the early 18th century, the Dutch began growing coffee in Indonesia. Also in the 18th century, people began growing coffee in Brazil. By the early 19th century coffee plantations in Brazil were booming. In the 20th century a vast amount of coffee was grown in Uganda.

Types of Coffee

Arabica and Robusta are the two most common types of coffee beans which we use in making coffee every day. These two beans are used more than any other kind of coffee beans. A third type of

coffee, Liberica coffee, found its place in the localized Liberian coffee, but it generates only a small amount of sales in the global stock market.

- Arabica coffee: it accounts for 60% of the world's coffee production. Its shape is oval and contains less caffeine than Robusta coffee only 1.5%. The ideal altitude to grow Arabica is 1,000 to 1,900 meters above sea level

- Robusta coffee: it accounted for only 40% of the world's coffee production. Its shape is much more circular, the taste is described as burnt tires, or rubbery and contains 2.7% caffeine, nearly double compared with Arabica coffee. The ideal altitude to grow Arabica is 500 to 1,000 meters above sea level

- Liberica coffee was first discovered in 1902 in Ubangui Chari. Because its taste is very strong, Liberica coffee is usually mixed with Arabica coffee in order to create a better smelling coffee.

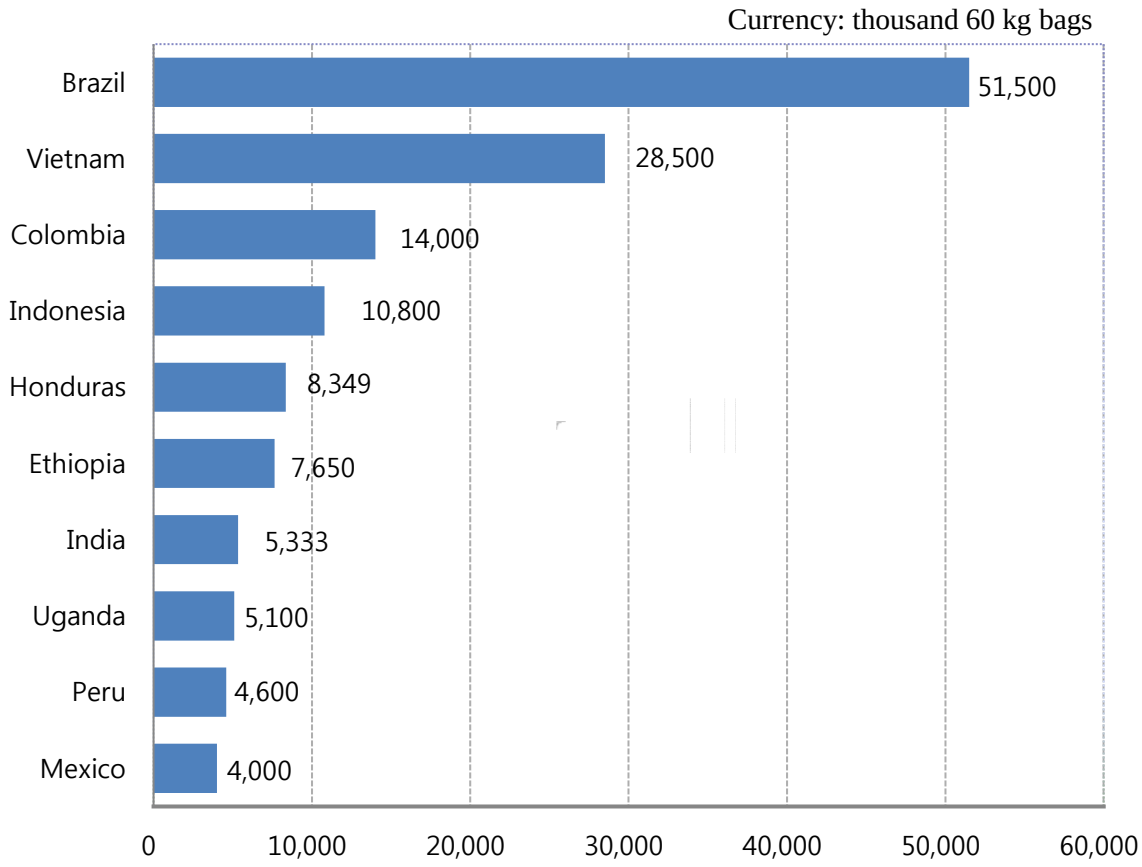
2.2 Current Status of World Coffee

2.2.1 Production and Price

According to data from the International Coffee Organization (ICO), until now, there have been 50 coffee producing countries around the world, focusing mainly on the areas of North, Central and South America, Africa and the Asia Pacific region.

In the coffee producing of year 2016/2017, the world's coffee production was estimated at 157.44 million bags (60 kilograms per bag) and is forecast to increase up to 158.78 million bags in the production year of 2017/2018, an increase of around 0.7% compared to the previous year. Brazil, Vietnam, Colombia and Indonesia are the four major producers in the coffee market.

Figure 1: World's Largest Coffee Producing Countries in 2017



Source: U.S Department of Agriculture (USDA), 2017

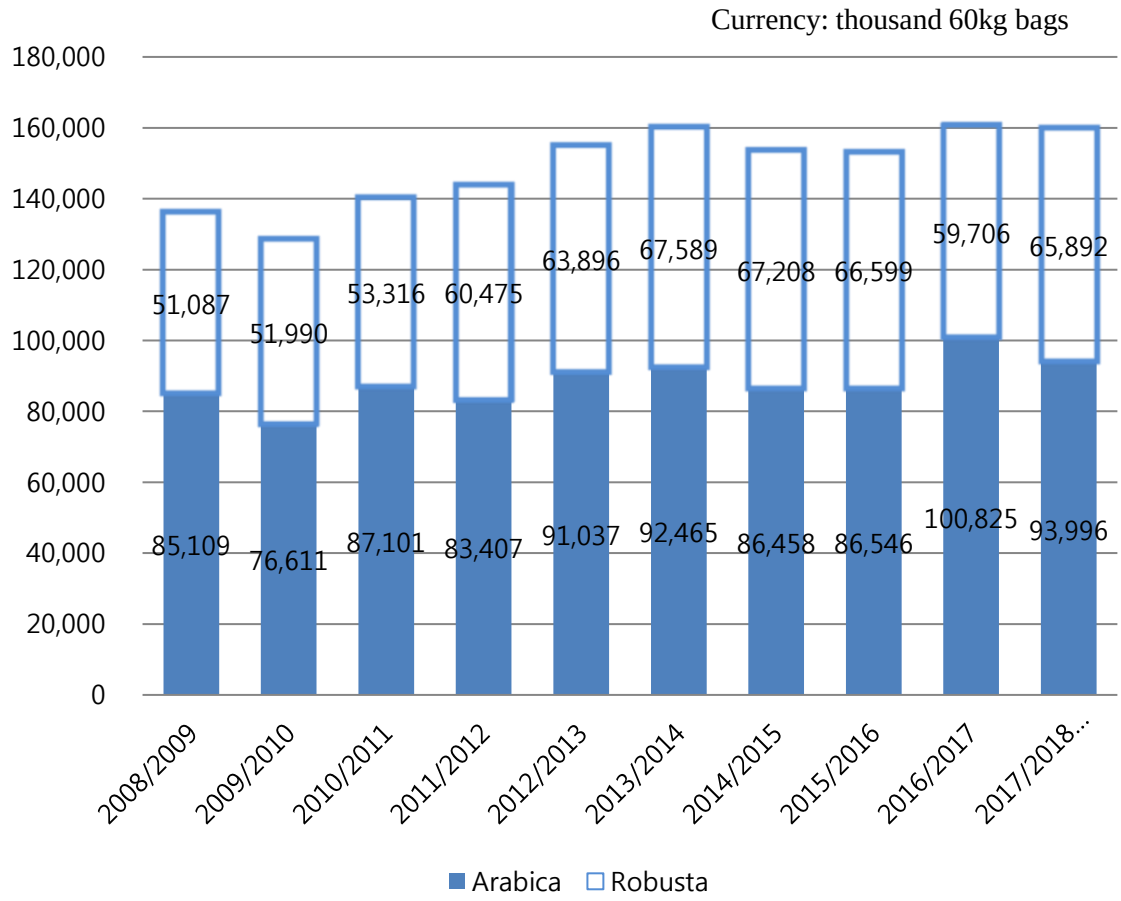
Brazil has been the highest global producer of coffee beans for over 150 years with 27,000 square kilometers growing coffee in the whole country. Its coffee production accounts for 40% of the world's coffee production, mainly producing on Arabica coffee. The majority of coffee plantations are located in Minas Gerais, Sao Paulo and Parama, three southern states where the climate and temperature are ideal for coffee production. After reaching 55 million bags in 2016/2017, Brazil's output is estimated to decline to 51.5 million bags in the crop year of 2017/2018. Compared to the crop year of 2016/2017, Arabica's production decreased by 6.4% and only reached 38.63 million bags. Brazilian coffee exports for the year 2017/2018 are projected to remain stable at 33.03 million bags, the same as the export amount of the previous crop of 2016/2017. Green bean exports are forecast at 29.4 million bags, and 3.6 million bags for soluble coffee exports.

Vietnam is the second largest coffee producing nation in the world but is the highest global producer of Robusta. Vietnam's rapid expansion in coffee production, which was only 6,000 tons in 1975 and now is almost 2 million, has moved them to second place. Vietnam's coffee industry has had an average growth rate of 1.4% per year. In the crop of 2017/2018, the cultivated area is 662,200 ha; similar with the previous years and over 95% of total output is Robusta. Production in Vietnam was revised down to 25.54 million bags in 2016/17 due to being overly hot, and dry and output in the current crop year of 2017/2018 is provisionally estimated to increase to 28.5 million bags, 11.6% higher than in the previous year (Coffee market report December, 2017, ICO)

Colombia is the third country in producing coffee, only after Brazil and Vietnam, but is the second highest global producer of Arabica coffee, only after Brazil. After having increased over the past five crop years, Colombia's production is provisionally estimated to decrease by 4.3% to 14 million bags as heavy rains caused damage during the flowering period. Total production in 2016/17 was provisionally estimated at 14.5 million bags, and is forecasted to increase in the crop of 2017/2018 to 14.6 million bags as production recovery stabilizes and weather patterns remain normal.

Though they may not be as internationally known as a top producer, the nation of Indonesia produced 10.6 million bags of coffee beans in the coffee year of 2016/2017 and is forecast to increase by 0.3 million bags to 10.9 million in the crop year of 2017/2018. Approximately 85 percent of Indonesia's coffee production is made up by Robusta bean production, while the remaining 15% is Arabica beans. Robusta bean production is concentrated in southern Sumatra, while the majority of Arabica production is located in northern Sumatra.

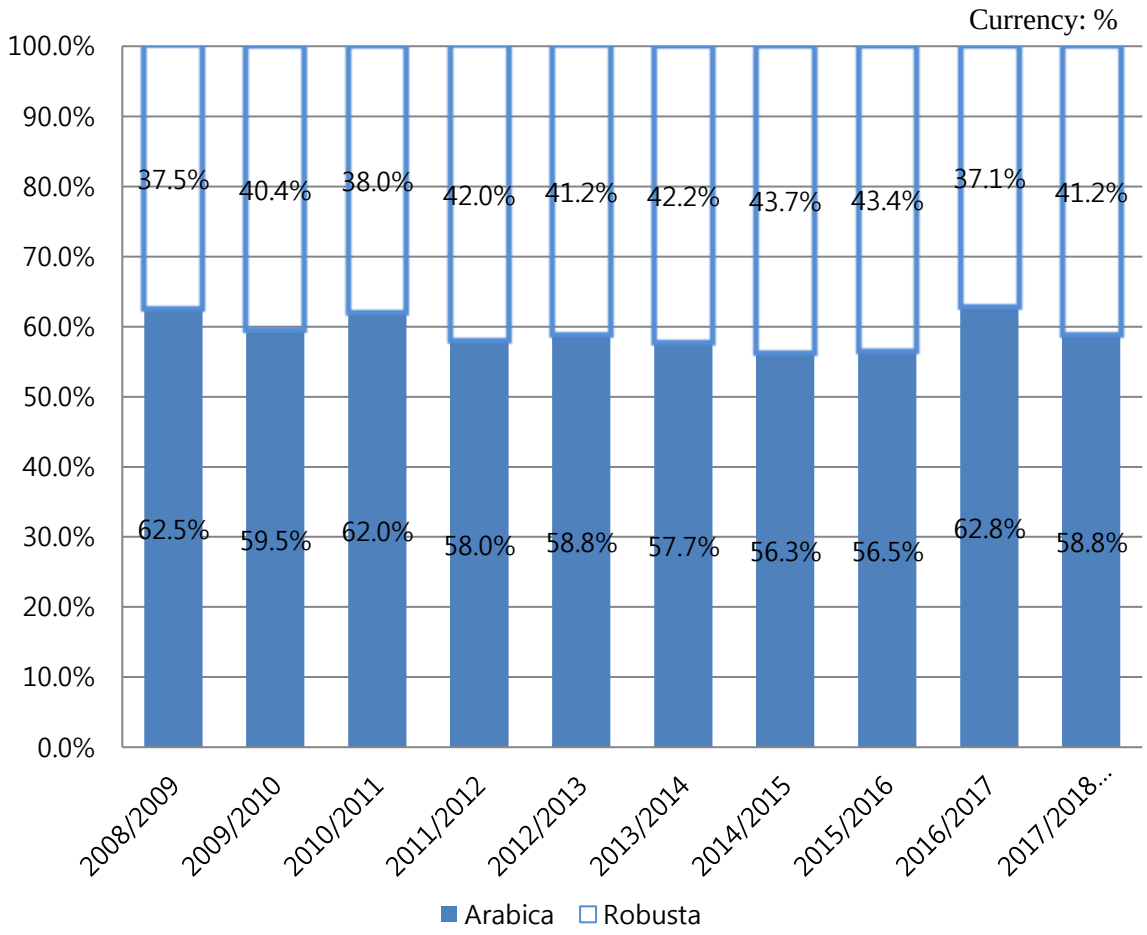
Figure 2: World Coffee Production



Source: U.S Department of Agriculture (USDA), 2017

During the period of 2008-2018, nearly 60% of the total coffee production has been Arabica and the remaining 40% has been Robusta. Total production of Arabica decreased from 100,825,000 bags in the crop year of 2016/2017 to 93,996,000 bags in the production year of 2017/2018. On the other hand, the total production of Robusta coffee tended to increase from 59,760,000 bags up to 65,892,000 bags. However, the total production amount between these two periods had a very tiny change. In the crop year of 2016/2017, Robusta coffee only reached 59,706,000 bags – the lowest amount since the crop of 2010/2011 and only accounted for 37.1% - the lowest percentage from the last ten years.

Figure 3: Arabica and Robusta Production in Percentage



Source: U.S Department of Agriculture (USDA), 2017

In general, the price of coffee fluctuated extremely during the last 10 years. In the last 10 years, from the crop of 2008/2009 to 2017/2018, the price of coffee reached its highest point in April, 2011 at over 250 US cents/lbs and reached the lowest point in November, 2013 around 100 US cents/lbs. In 2011, the production output reduced sharply, especially Arabica coffee, because of the effect of bad weather, whereas the demand for coffee on the world market grew constantly since coffee beverages have been becoming increasingly popular in all markets, especially from the manufacturing countries such as Brazil. In 2013, the reason why the price of coffee fell to its lowest point since 2007 is that the coffee market was also affected by developments in the broader global economic environment. Firstly, weaker-than-expected economic data from China at the beginning of the month suggested a slowdown in demand growth for commodities. In addition, signs of an end to the quantitative easing program in

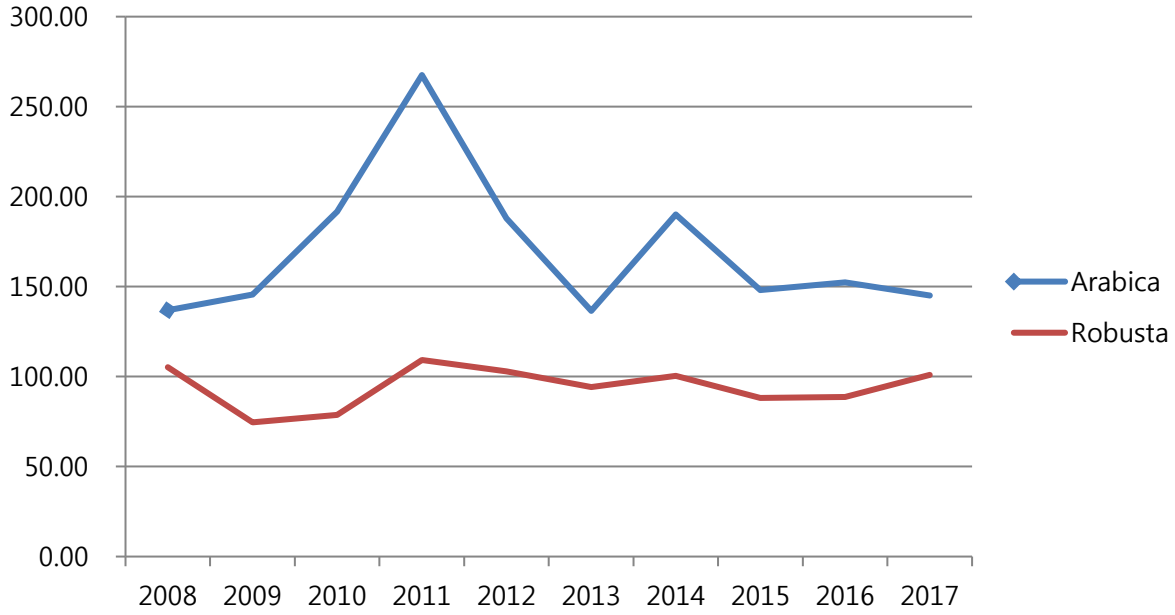
the United States resulted in a widespread decline in commodity markets. These two factors exacerbated the weakness in the coffee market and contributed towards further price decreases.

Figure 4: Monthly Coffee Price from March 2007 to March 2017

Source: Trading Economics, 2017

In more detail, the price of Arabica was higher than the price of Robusta, around 1.5 times, because Arabica coffee is shade grown in the mountains at over 600 meters above the sea level in temperate climates and is therefore more difficult to cultivate and harvest than plantation grown Robusta. And, Robusta is more disease and insect resistant than Arabica because Robusta plants produce as much as three times the amount of caffeine as Arabica plants. Additionally, consumers prefer to drink Arabica coffee rather than Robusta because the flavor is better, not strong like Robusta. The price of Arabica coffee has been controlled by the coffee market since the variation of the price of Arabica and general coffee prices are almost the same. On the other hand, in the period of 2008-2017, Robusta's price did not change too much.

Figure 5: Price Fluctuation of Arabica and Robusta in the World

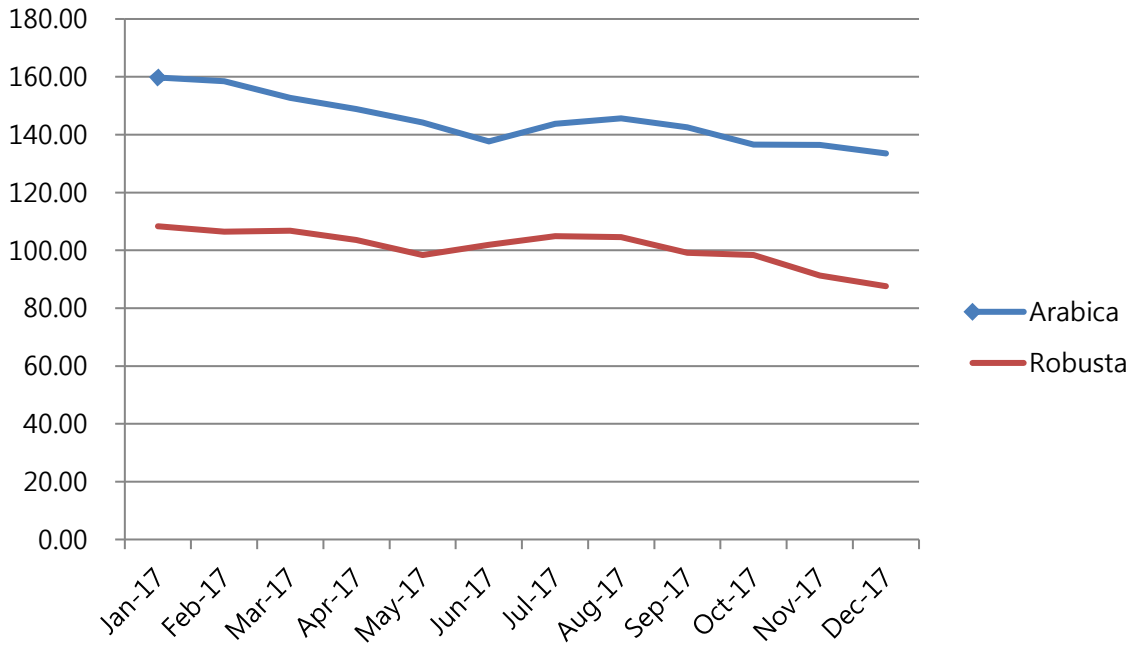


Source: International Coffee Organization (ICO), 2017

In the graph, we can see that the price of Arabica coffee reached its highest point in the year 2011 at 267.51 US cents/lb, and then it dropped rapidly until it reached the bottom at 136.54 US cents/lb. After that, the price increased a little bit and then has continued to decrease steadily, achieving 145.01 US cents/lb. On the other hand, the price of Robusta coffee was steadier than Arabica's price; in recent years, when the price of Arabica had a trend to decrease, the price of Robusta had a trend to increase that led to the gap between these two coffee types becoming closer.

In 2017, according to the Coffee Market Report of International Coffee Organization, the price of both Robusta and Arabica decreased continuously from the beginning to the ending of the year, from 159.76 US cents/lb to 133.50 US cents/lb in case of Arabica and from 108.32 US cents/lb to 87.59 in case of Robusta. However, in general, the gap between Arabica and Robusta still remained the same. The price is forecasted to continue to decrease due to the increase in coffee output of the main exporting country.

Figure 6: Price Fluctuation of Arabica and Robusta in the World in 2017

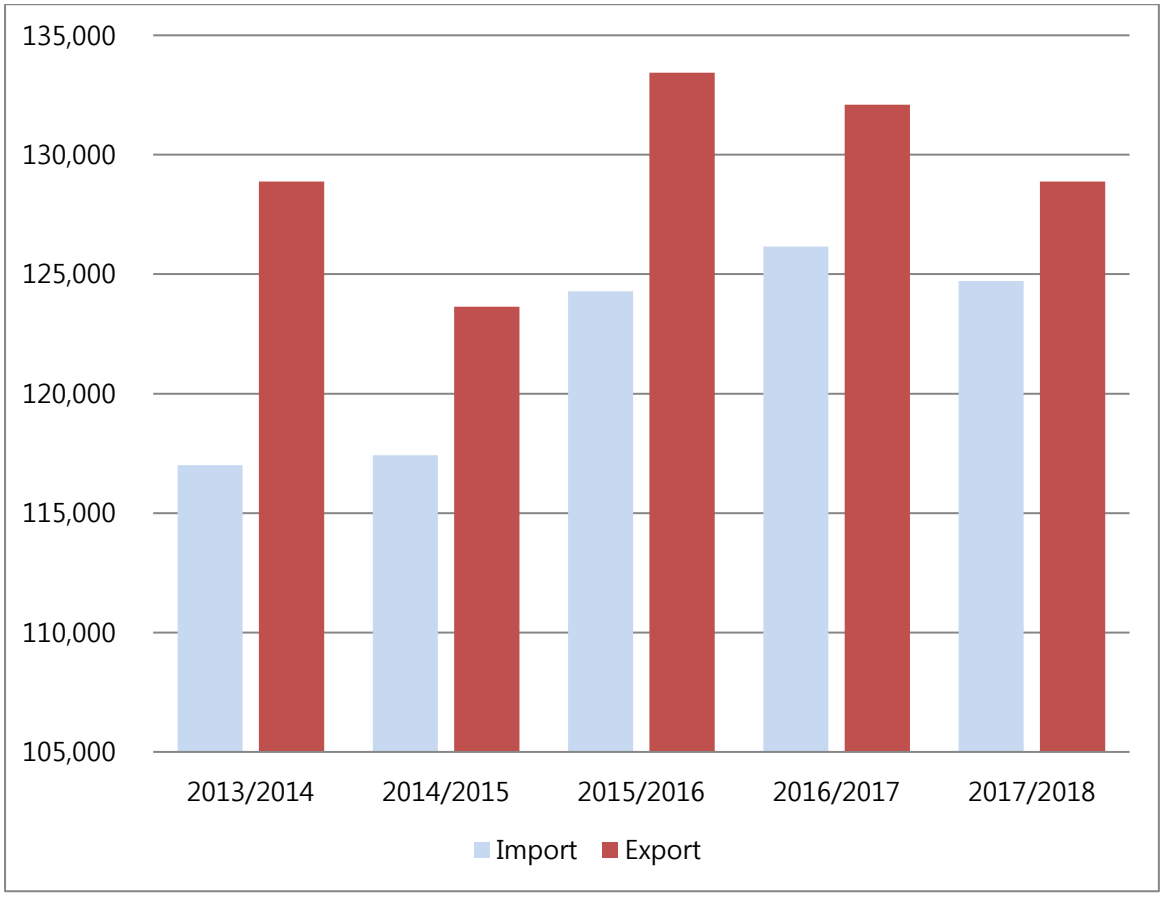


Source: ICO, 2017

2.2.2 Export and Import

In general, from the crop of 2013/2014 until now, total imports have increased steadily until the crop of 2016/2017 and after that had a little bit of a decrease in the period of 2017/2018. On the other hand, the amount of exported coffee fluctuated strongly which is shown in the Figure 7 below. In more detail, in the crop of 2016/2017 total export was 132,091,000 bags and is expected to decrease 2.43% in the crop of 2017/2018 to 128,879,000 bags. Total import also had a decrease (1.15%) to 124,710,000 bags between the production years 2016/2017 and 2017/2018

Figure 7: World Coffee Import and Export (in thousand bags)



Source: USDA, 2017

The International Coffee Organization (ICO) has 80 member countries in total in which more than 40 countries are coffee exporting countries. These countries can either grow and export coffee or only export coffee. However, the major coffee producing countries in the world are the countries that produce and export. Typically, countries such as Brazil, Colombia, Vietnam, Uganda, Ivory Coast, Ethiopia, India, etc. in which Brazil and Colombia are the countries producing and exporting mainly Arabica coffee in the world and Vietnam is the biggest country producing Robusta coffee in the world. At the end of the 2017/2018 period, as shown in the table below, Brazil was the biggest producing country and also the biggest exporting country with 30.43 million bags and followed by Vietnam with 28.15 million bags. Other biggest country exporters in the top 10 coffee exporting countries included: Colombia, Indonesia, Honduras, India, Uganda, Peru, Ethiopia and Guatemala (ranking from high to low based on export quantity). Coffee exports of the 10 leading countries accounted for 83.6% of

world coffee exports in the 2016/17 season, in which the three markets Brazil, Vietnam and Colombia accounted for 56.3%. In the production year 2017/2018, the top 10 exporting countries are expected to account for 83.1% in which the biggest three countries are projected to account for 56.0%. From that, we can see that in the crop year of 2017/2018, the exporting amount tended to reduce from the largest countries.

Table 1. Top 10 Coffee Exporting Countries

Currency: thousand bags

No.	Country	2013/14	2014/15	2015/16	2016/17	Jun 2017/18	Dec 2017/18
1	Brazil	34,146	36,573	35,543	33,081	33,030	30,430
2	Vietnam	28,289	21,530	29,500	27,550	26,650	28,150
3	Colombia	11,040	12,420	12,390	13,740	13,190	13,600
4	Indonesia	10,380	8,720	9,896	8,157	8,200	8,310
5	Honduras	3,940	4,760	5,000	7,180	6,300	7,100
6	India	5,013	4,894	5,693	6,088	5,550	5,550
7	Uganda	3,600	3,400	3,500	4,000	4,000	4,000
8	Peru	4,100	2,750	3,300	4,025	4,300	3,600
9	Ethiopia	3,285	3,500	3,405	3,300	3,310	3,310
10	Guatemala	3,175	3,070	3,044	3,310	2,810	3,110
	World	128,877	123,640	133,441	132,091	130,326	128,879

Source: USDA, 2017

Coffee imports of the 10 leading countries accounted for 84.9% of total imports of coffee in the 2015/16 season. The three leading markets are the European Union, US and Japan accounting for 63.6% of imports of coffee in the world. In which, the EU was the biggest area imported coffee, since the import amount reached 46.19 million bags in the crop year of 2016/2017 which accounted for 36.6% of worldwide imports, and followed by the United Stated with 26.06 million bags in 2015/2016. The

other biggest coffee importing countries are in table below.

Table 2. Top 10 Coffee Importing Countries

Currency: thousand bags

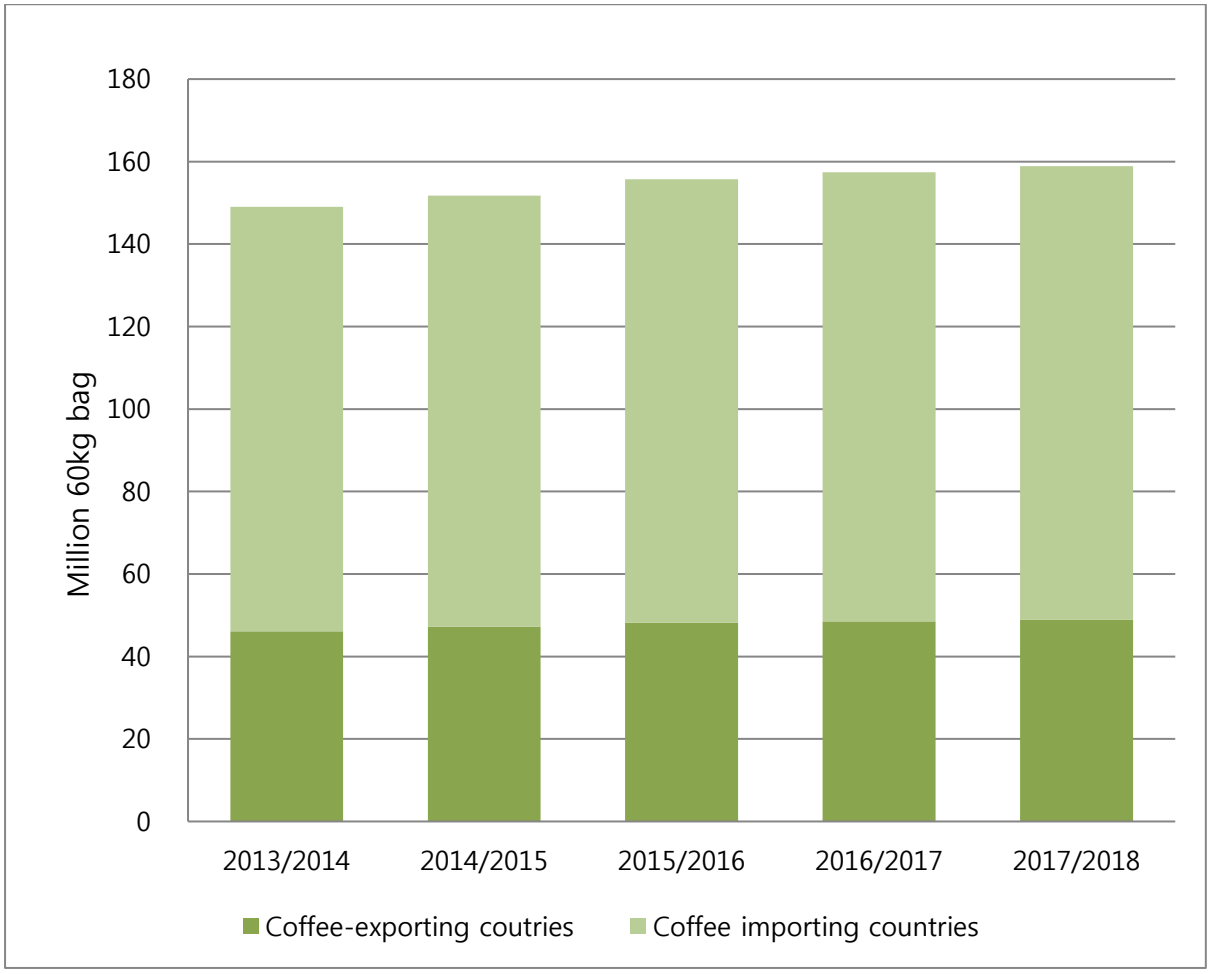
No	Country	2013/14	2014/15	2015/16	2016/17	Jun 2017/18	Dec 2017/18
1	EU	44,650	45,140	45,900	46,190	46,500	46,000
2	United States	24,915	24,005	25,210	26,060	26,300	25,300
3	Japan	7,870	8,110	8,195	7,990	8,520	8,020
4	Philippines	3,145	3,755	6,185	6,450	6,500	5,500
5	Canada	4,605	4,495	4,545	4,780	4,775	4,875
6	Russia	4,230	4,050	4,395	4,615	4,650	4,750
7	China	1,682	1,889	2,938	3,534	3,100	3,700
8	Korea South	2,160	2,305	2,465	2,690	2,700	2,700
9	Switzerland	2,300	2,420	2,460	2,600	2,700	2,700
10	Algeria	2,300	2,195	2,320	2,160	2,365	2,240
	World	117,011	117,414	124,287	126,161	127,525	124,710

Source: USDA, 2017

2.2.3 Consumption

According to coffee trade statistics reported by ICO (international Coffee Organization) which was published in February 2018, total world coffee consumption has been increasing steadily year by year and is estimated at 158.9 million bags in the coffee year of 2017/18, an increase of 1.5 million bags compared to the 2016/2017 crop, and 3.13 million bags compare to the 2015/2016 crop.

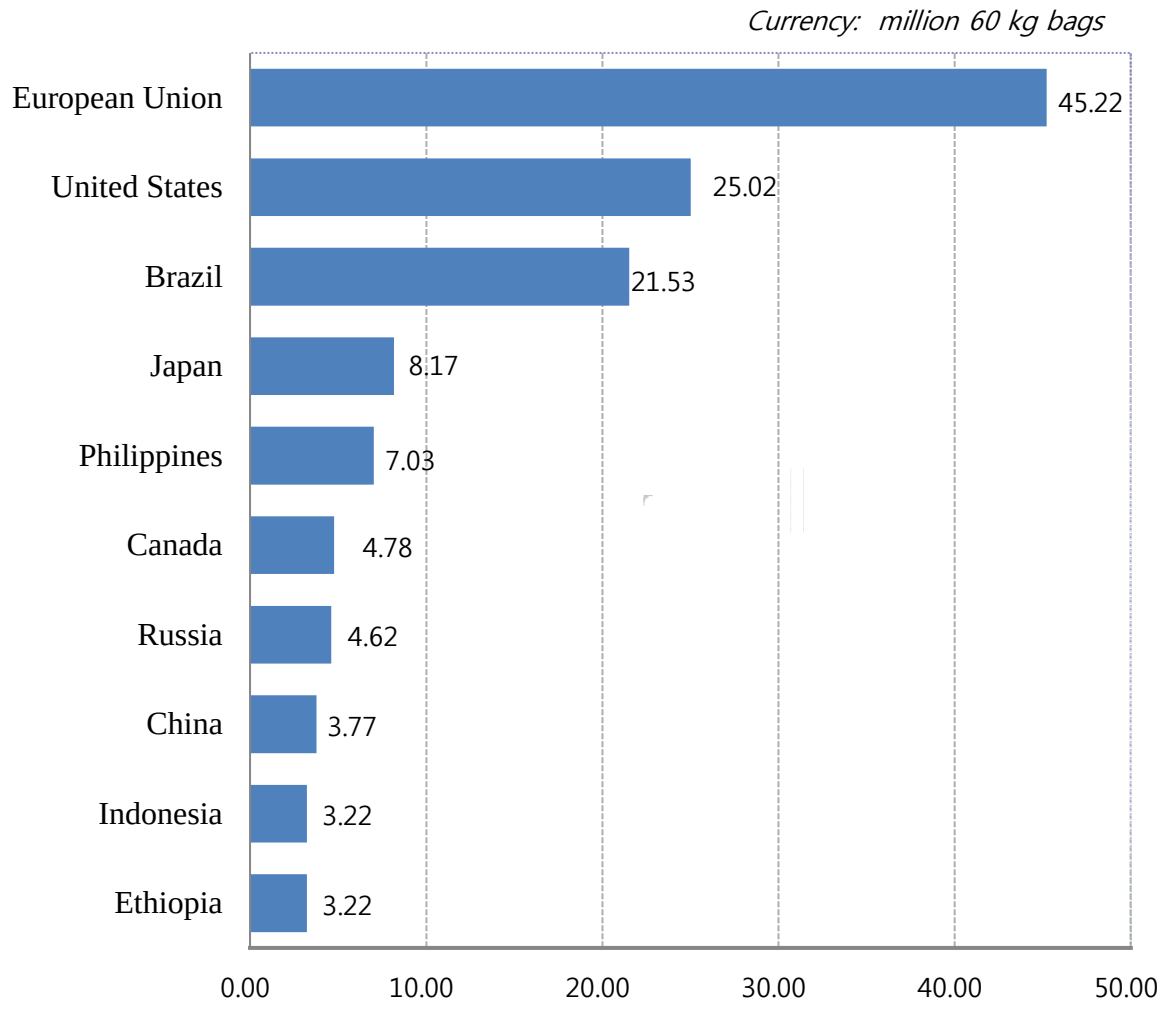
Figure 8: Consumption in Importing Countries and Exporting Countries



Source: ICO, 2018

Consumption in coffee-importing countries was twofold higher than consumption in exporting country. Furthermore, the consumption has increased steadily in both these types of countries and the consumption of coffee in the world is expected to increase without any interruption and will reach 158.9 million bags in 2017/2018. According to the ICO, the consumption of coffee has increased continuously during the last 40 years with the average annual growth rate in global coffee consumption at 1.3% since the coffee year 2012/2013, and the demand for coffee beverage increase by nearly 25% over the coming five years. By 2020, coffee demand is slated to rise to 175.8 million bags. Some of the biggest consumption countries in the world are showed in the graph below.

Figure 9: Top 10 Coffee Consuming Countries in 2016/2017



Source: USDA, 2017

2.3 Current Status of Vietnamese Coffee

2.3.1 Production and Price

During the 2000-2005 period, the coffee price had fallen in the world. Because of debt and lack of investment in coffee production, farmers are cutting down coffee trees and the area of planting coffee trees gradually being decreased. According to data from the General Statistic Office of Vietnam, during a five year period from 2000 to 2005, Vietnam's coffee planted coffee area reduced by 70,000 hectares. As the planted area decreased, coffee output also decreased by 35,000 tons over five years.

After joining the WTO (1st November, 2007), although managers expected an increase in coffee

production based on the opportunity of expanding exports, not only the quantity of the output of coffee reduced, but also the quality of coffee was not good. At that time, Vietnam's coffee price depended on the world price. In 2008, the world market continued to fluctuate due to the global economic crisis. Although the price of fertilizer and production costs increased continuously, the selling price of coffee went up and down without any regularity. Especially, the anomalous climatic environment was a factor of production output reduction. There were not any polices to support producers in order to maintain the relationship of buyers and sellers, and no support for technology applied in production. Therefore, Vietnamese coffee was still faced with the problems of excess production and anomalous price fluctuation. 90% of coffee trees were owned by ranch owners, garden owners and private family businesses. It is difficult to transfer technology and information to over 500,000 people who were planting coffee trees. In 2009, coffee production had faced many difficult things.

In the crop year of 2008/2009, Vietnamese coffee production reached 1,080,000 tons. The average production was 2.16 ton/ha. The government strived to increase the cultivation area from 500,000 to 525,000 hectares as well as focus on investments to improve crop area productivity. In recent years, many farmers expanded their cultivation area by 2000 hectares/year. In 2009, the cultivation area of Arabica coffee was 35,000 hectares, accounting for 6% of the total coffee planting area in Vietnam. Until 2010, Vietnamese coffee production was the second largest in the world, accounting for 14% of the world's production. Vietnamese coffee is grown mainly in five provinces in Tay Nguyen (Dak Lak, Dak Nong, Gia Lai, Kon Tum, and Lam Dong) which accounts for more than 80% of Vietnam's coffee cultivation area.

The cultivation area of coffee trees has continuously grown in the main region. According to data from Vietnam's Ministry of Agriculture and Rural Development (MARD), in 2016/2017 the total coffee tree cultivation area was 662,200 ha, which was 50 ha less compared with the cultivation area in the previous year 2015/2016. The cultivation area in the next crop of 2017/2018 is predicted to be same as the previous crop year. Dak Lak, Lam Dong, Dak Nong and Gia Lai provinces accounted for 86% of total coffee tree cultivation area, mainly planting Robusta coffee. On the other hand, Arabica

coffee is mainly planted in 3 provinces, including Lam Dong, Quang Tri and Dien Bien in which Lam Dong is the largest area with 16,000 ha of Arabica coffee. Arabica coffee cultivation area accounts for 10% of the total cultivation area in the whole country whereas Robusta coffee accounts for 90% of the total cultivation area.

Table 3: Estimate of Vietnam's Coffee Areas by Province

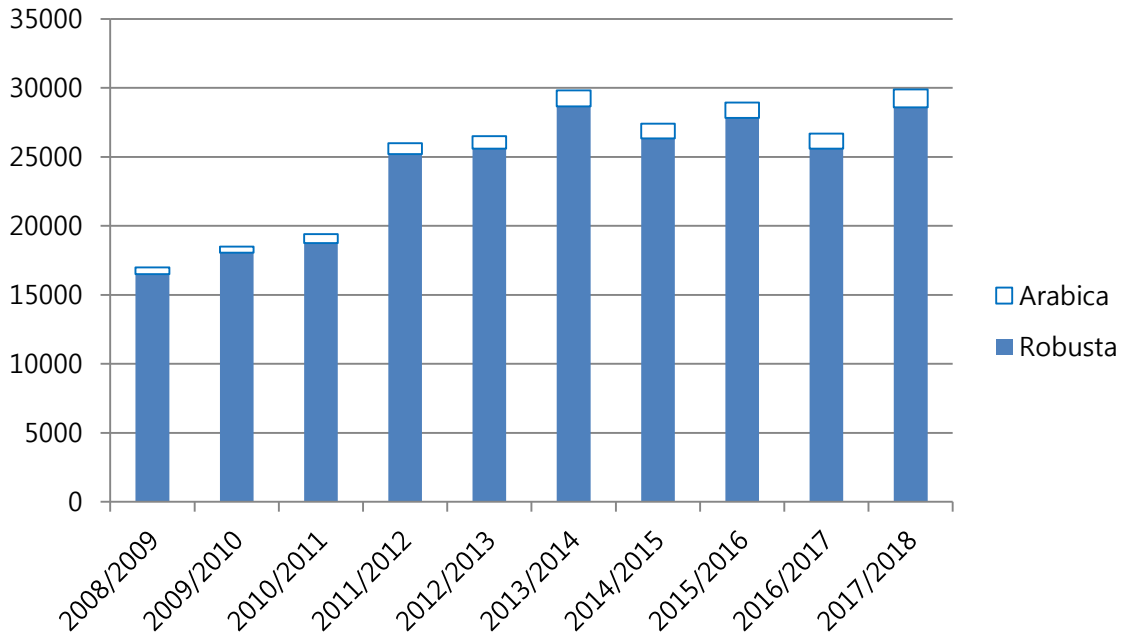
Province	Approximate Coffee Area in MY 2014/2015	Approximate Coffee Area in MY 2015/2016	Approximate Coffee Area in MY 2016/2017	Approximate Coffee Area in MY 2017/2018
Dak Lak	209,760	209,000	190,000	190,000
Lam Dong	151,565	154,000	162,000	162,000
Dak Nong	131,859	126,000	135,000	135,000
Gia Lai	83,168	80,000	82,500	82,500
Dong Nai	20,800	21,000	21,000	21,000
Binh Phuoc	15,646	16,000	16,000	16,000
Kontum	12,390	14,000	13,500	13,500
Son La	10,650	12,000	12,000	12,000
Ba Ria–Vung Tau	15,000	15,000	15,000	15,000
Quang Tri	5,050	5,050	5,000	5,000
Dien Bien	3,385	4,500	4,500	4,500
Others	5,700	5,700	5,700	5,700
Total	**665,009**	**662,250**	**662,200**	**662,200**

Source: USDA, 2017

Vietnam coffee production increased continuously from 2008/2009 until it reached its highest point at 29.8 million bags in 2013/2014. After that it has fluctuated continuously. In the crop year of 2016/2017, Vietnam's coffee production only achieved 26.7 million bags – the lowest amount during the last 5 years due to unfavorable weather conditions (El Nino and La Nina).. However, in the crop

of 2017/2018, the production is projected to reach 29.9 million bags – the highest amount during the past 10 years, an increase of 12% compared with the previous year crop. (El Nino phenomenon: very hot weather, little rain, high temperatures and low humidity. La Nina phenomenon: lots of rain, high humidity)

Figure 10: Arabica and Robusta Production in Vietnam Coffee Industry



Source: USDA, 2018

Vietnam is one of the main countries in planting and producing Robusta coffee, hence the production of Robusta coffee is far higher than Arabica each year. In the crop of 2016/2017, with 26.7 million bags of coffee, 25.6 million bags were Robusta, which accounted for 96% of total production, Arabica accounting for only 4% of total production. In the next crop of 2017/2018, this proportion is predicted to remain unchanged and both Arabica production and Robusta production is expected to increase.

Although Vietnam is the second biggest coffee producing country in the world, lots of limitations existing in Vietnam's coffee industry

1. Limitations in production stage

The area of farms with old, stunted coffee plants has increased in the Central Highlands, resulting in a decrease in output. Now, the area of farms which have coffee trees that are more than 20 years old is 86,000 ha, account for 13.8% of the total coffee cultivation area. In addition, over 40,000 ha of coffee trees that are have not grown well, branches that developed with little, many branches do not have coffee fruit, the average productivity is low which under 1.5ton/ha, low-quality fruit, and so producers do not receive any profit. According to reports from Agriculture Departments in the Central Highland provinces, the region needs to replant around 200,000ha by 2020, due to the area having old and stunted coffee trees. Dak Lak needs to replace 85,000ha; Lam Dong 59,000ha; Gia Lai 27,000ha; and Dak Nong 24,000ha.

Small-scale farm and dispersion. Small-scale farms are common. The number of households that own an area of 2 to 5 hectares only account for 9.75%, whereas household owning less than 1 ha account for 63%. The coffee cultivation area of small households accounts for 84.8-87.9% of the entire coffee industry. Households have a small-scale production, so it is difficult for them to get loan capital which is used for production development, re-cultivation, and research in new coffee varieties; and applying technical advances is limited. That is the reason why the productivity is not as high as expected.

Fertilizers abusing. When the price increases, in order to achieve maximum productivity, farmers use lots of chemical fertilizers, higher than the standard of 10-30%. Coffee cultivation areas which use organic fertilizers account for only 50%

Water-saving irrigation technology is applied slowly. Coffee cultivation areas which are irrigated by surface water account for 18%, by underground water account for 69.6%, and coffee growing areas which are irrigated by rain-water account for 12.4% of the total coffee cultivation area. In general, irrigation techniques have not improved, almost all coffee growers waters their coffee crops based on their experience and amount of water used is higher than the standard 600-700 m^3/ha/crop (the standard is 2000-2005 m^3/ha/crop) which causes a waste of water.

Harvesting unripe fruits. Coffee harvesting with unripe fruit is the biggest limitation of coffee production in Vietnam, due to the fact that management of coffee in the crop is still limited. In detail, in Tay Nguyen (Dak Lak, Dak Nong, Lam Dong, Gia Lai) show that 15.5 of household farmers harvest coffee one time during a crop, 64.5% two times and 20% three times. The proportion of ripe coffee cherries after harvest is 45.7%. The number of households that have ripe coffee cherries rate lower than 50%; 41.8 of households have the rate from 50-70%, and only 12.5% of households have a rate over 70%. Because of that, it is really difficult to apply the wet processing method (which is more efficient than the dry method) so green and brown bean have a high percentage in coffee production

Some coffee areas developed out of the plan. Coffee areas which were developed out of the plan have faced many risks, especially the lack of irrigation water when droughts occur, evidenced by the drought in 2013.

2. Limitations in the preliminary treating, processing and preserving of coffee

The conditions of preliminary treatment, preservation and storage of coffee of households are inadequate. Coffee cultivation areas which are owned by household farmers account for 90% of the entire industry, in which many ethnic minority households are in remote areas, lacking drying yards, storage facilities and technical requirements. In 4 provinces, namely Gia Lai, Dak Lak, Dak Nong and Lam Dong we can see that cement drying yards accounts for 61.5%, drying on tarpaulin accounts for 13.5% and drying on the ground accounts for 25% of the total area of drying yards

Because of not having enough yards for drying, 71% of the output of coffee is dried from fresh coffee cherries, 20.8% has the skin removed before drying and only 8.2% is sold as fresh coffee cherries to processing factories which have enough facilities to dry coffee. That is one reason why the rate of black, brown and moldy seed is high. In addition, inventory for the temporary storage of coffee has not reached technical standards; hence coffee fruits and seeds after storage time will have increased in humidity, resulting in a change of their original color which will have an effect on the quality of coffee

Until now, in Vietnam, there have been a total of 97 small factories that are processing coffee beans, 160 small factories that are processing coffee powder, and only 5 small factories for instant coffee. Vietnam is a country that mainly exports green coffee rather than processed coffee, exporting 90% green coffee, and only the remaining 10% of green coffee is used to produce processed products; such as coffee powder, roasted coffee, instant coffee and so on. Furthermore, Vietnamese processed coffee is short of famous brands, until now there have only been 3 famous brands including: Trung Nguyen Coffee, Buon Ma Thuat Coffee, and Vinacafe but only Trung Nguyen Coffee is well-known in the world market.

2.3.2 Export and Import

Vietnam's coffee export, if compared with other agricultural products, has progressed more quickly. According to the statistics from the ICO, in the world, from the year 2000, most of the major coffee producers have made an increase in production. Brazil holds the first position in the international coffee market with an output of 35.5 million bags, following by Vietnam – the second biggest coffee exporter, with an output of 29.5 million bags in the crop of 2015/2016. The other main coffee exporters include Colombia, Indonesia and so on.

Table 4: Vietnamese Coffee Import Quantity and its Percentage

Currency: thousand 60 kg bags

Crop Year	Vietnam Export	World Export	% Vietnam coffee Export
2008/2009	15,565	102,931	15.12%
2009/2010	18,670	104,813	17.81%
2010/2011	18,640	115,319	16.16%
2011/2012	24,495	116,402	21.04%
2012/2013	24,643	119,074	20.70%
2013/2014	28,289	128,877	21.95%
2014/2015	21,530	123,640	17.41%
2015/2016	29,500	133,441	22.11%
2016/2017	27,550	132,091	20.85%
2017/2018	28,150	128,879	21.84%

Source: USDA, 2017

Vietnamese coffee export amount increased continuously during the period of 2008/09~2013/14, especially soared from the crop 2011/12. However, until reaching the highest point in 2013/14 with 28.3 million bags, the amount of export fell to the lowest point in the crop 2014/15 at only 21.5 million bags. After that, Vietnamese coffee export amounts have gradually recovered and grown again. In recent years, Vietnamese coffee export quantity has accounted for over 20% of the total exporting coffee in the world (except the crop of 2014/15) and maintained the second biggest position in coffee exporting.

In more detail, according to the statistics from General Department of Vietnam Customs, in the crop of 2016/17, Vietnam exported about 25 million bags of green coffee, increased 1.95 million bags compared with in the previous 2015/16. In the crop 2017/18, exporting amount of green coffee is predicted to increase to 25.5 million bags due to an advantage in harvesting. Together with green

coffee export, Vietnam also exports roast coffee and instant coffee. In the crop of 2016/17, Vietnam exported 550,000 bags of roast coffee and 2 million bags of instant coffee. In the crop year of 2017/18 export turn-over is predicted to be equivalent with the current crop. In the present, Vietnam mainly exports green coffee rather than processed coffee (roast coffee, instants coffee.) with the percentage of green coffee export is 90% and only 10% of processed coffee.

Table 5: 10 Main Countries Vietnam Exports Coffee to

Currency: ton

No.	Countries	2015	2016	2017 (First 8 months)
1	Germany	191,644	275,679	157,601
2	America	157,117	237,195	139,559
3	Italia	105,578	136,223	89,720
4	Spain	117,600	115,466	70,755
5	Japan	84,169	104,450	64,956
6	Belgium	61,491	86,747	48,688
7	Algieri	46,164	59,812	38,667
8	Russia	36,793	64,050	29,982
9	Philippine	31,644	59,025	34,114
10	India	27,398	45,790	29,549
	Total	1,341,839	1,781,642	1,024,518

Source: USDA, 2017

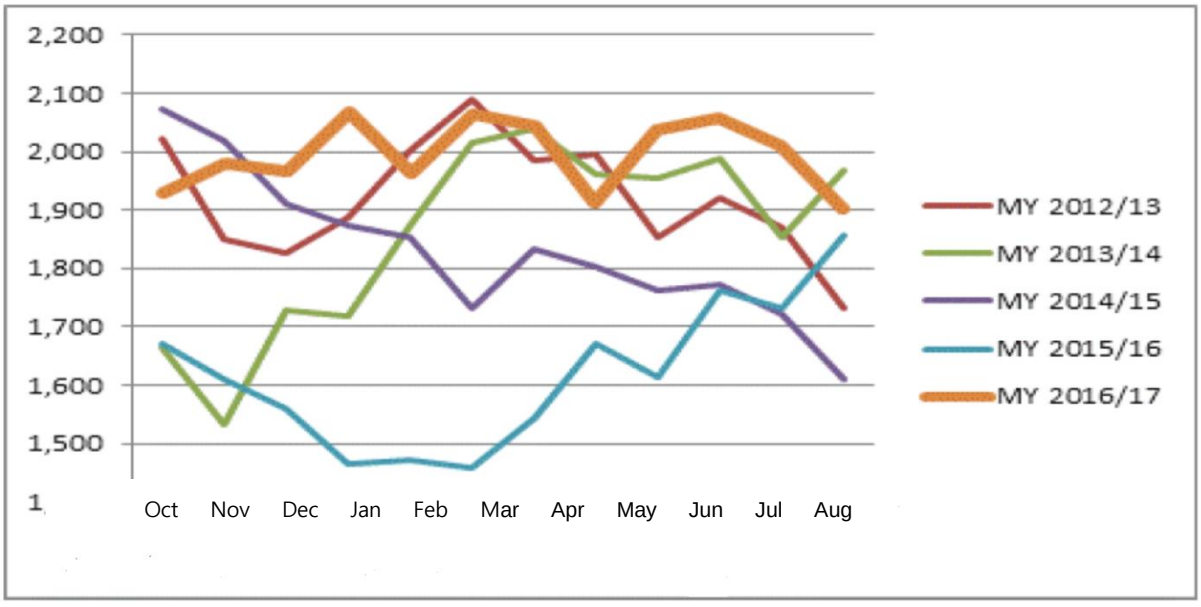
In the crop year of 2015/16, especially from Jan to Feb 2016, the monthly export price of green Robusta coffee (FOB price in Ho Chi Minh City) fell to the lowest point within the last 4 seasons. The export price from March to June 2016 recovered due to bad weather condition which had negative effects on coffee production in both countries Vietnam and Brazil.

At Lam Dong, Robusta green coffee bean reached the lowest price at 32,000 VND/kg (around 1.5USD) in January 2016, compared to 39,600 VND/kg (around 1.8 USD) in the same month of the previous year. The export price touched bottom in February and March, 2016; however, it recovered steadily to increase from April to September due to a poor crop in Brazil and drought in some provinces of Vietnam

However, in the crop year of 2016/2017, the price of coffee increased again after one year price dropping and was higher than the average price during the last 5 years, and the price was always over $1,900. The reason come from a decrease in production and inventory in both markets Vietnam and Brazil.

Figure 11: Average Export Price for Green Coffee in Vietnam

Currency: in USD



Source: Ministry of Industry and Trade, 2017

Although Vietnam is the second biggest coffee exporter in there world, Vietnam still imports some processed coffee; include roasted, brewed and instant coffee. Vietnam also imports a small amount of coffee beans, roasted coffee and instant coffee from Lao, Indonesia, Brazil, Cote d'Ivoire and America. The imported amount of roasted and ground coffee have been increasing in recent years due to the expansion of the retail sectors in Vietnam's domestic market with some famous brands like Starbucks,

McCafé và Dunkin Donuts...

In the crop of 2015/2016, Vietnam imported 630,000 bags of coffee in which 160,000 bags were instant coffee; 450,000 bags were green coffee and 20,000 bags were roast coffee. Total coffee imports in the production year of 2016/2017 were expected to be up from 640,000 to 1 million bags of Green Bean Equivalent (GBE), due to the rapid expansion of coffee shops in Vietnam. In which, 160,000 bags were soluble coffee, 340,000 bags were roast and ground coffee, and 500,000 bags were green bean. Experts forecast that total imported coffee will be 1.06 million bags in the year of 2017/2018

Table 6: Quantity of Vietnam's Coffee Import from 2008 - 2018

Currency: thousand bags

Year	Quantity
2008/09	95
2009/10	75
2010/11	350
2011/12	450
2012/13	824
2013/14	648
2014/15	590
2015/16	630
2016/17	1,000
2017/18	1,060

Source: USDA, 2017

2.3.3 Consumption

Although Vietnam is the second biggest coffee exporters in the world, domestic consumption is quite low, only reaching 1.15kg/person/year, whereas Brazil ranks at the first position on the list of top coffee drinkers. With the highest per capita coffee consumption rate of 4.8kg per year, Brazilians drink an average of 1.32 cups of coffee per day. However, domestic consumption has increased

continuously during the last ten years and is expected to increase quickly in the future. In the crop of 2016/17, in the whole country, the Vietnamese consumed total 2.87 million bags of coffee and is expected to increase to up to 2.93 million bags in the year 2017/2018 due to the continuing growth of coffee shops. Moreover, domestic consumption is predicted to increase based on an increase in GDP as well as in population. In the period of 2005-2015, the coffee consumption in Vietnam increased surprisingly from 0.43kg per capita to 1,38kg per capita – the highest growth rate among the world's coffee exporters. This figure is expected to increase up 2.6kg per capita by 2021. Vietnam Ministry of Agriculture and Rural Development expect that domestic coffee consumption will increase by about 10 -15% in the crop year of 2017/2018. Vietnamese coffee drinkers prefer roasted and ground coffee because of its full-bodied and original flavors.

In recent years, in Vietnam, there have been many violations in coffee production, especially using roasted corn pulp, soybeans and chemicals to make fake coffee and then launch it into the market through small shops, kiosks and retail coffee shops. Therefore, in order to regain the trust from consumers, many coffee shops grind and brew coffee in front of customers. But, "dirty" coffee – coffee which contains many other materials – is mainly sold to low-income people or people who live in remote areas. Coffee culture in Vietnam has brought a wide range of products and many different levels of prices for consumers. Consumers can easily find coffee shops selling black coffee at just 10,000 VND (~0.5 USD) or up to 70,000 VND (~3.5 USD) per cup. In general, the coffee shops in Vietnam are highly appreciated for their variety of forms, services and products.

According to Euromonitor, the prominent presence of specialist coffee chains allows consumers to have easy access to high-quality, freshly brewed coffee at affordable prices. Consumers can also easily prepare instant coffee for consumption at their offices or homes. Domestic consumption is forecast to continue to grow, reflecting the expansion of retail coffee shops and the robust growth of other retail food service subsectors serving coffee in Vietnam. The expanding coffee retail sector will contribute to stronger consumption for the foreseeable future.

According to Euromonitor, coffee shop chains are the fastest growing type of business, with an

annual sales increase of 32%. The high growth is due to the expansion of branches of current coffee brand shops and the entry of new brands. In 2017, Starbucks increased the numbers of stores up to 29. McCafe opened 9 stores since it entered in Vietnam in 2014. The store chains such as Coffee Bean and Tea Leaf, Gloria Jeans, Coffee Concept and Highland have continuously increased their branches. The booming growth of these coffee shop chains clarifies an increase in demand of customers in coffee as well as its quality and services.

Moreover, there are a large number of smaller coffee shop chains, with the idea of serving both traditional coffee which is good for health and foreign style coffee (ice blending, latte, fruit smoothies) with more competitive prices than foreign brands. The large and small coffee shop chains in the country such as Trung Nguyen Coffee, Passio Coffee, Phuc Long, Thuc Coffee, Effoc Coffee, Takeaway Coffee, Napoli and Milano have developed and influenced domestic consumption.

In Vietnam, coffee shops are a model which mainly brings revenue for the coffee drinking industry. Besides that, the model of takeout coffee is being developed more broadly and is suitable for busy people who live in big cities. Takeout coffee is becoming more and more popular over the traditional style of drinking coffee (street coffee). Now, many brands have used the type of takeout coffee and hoe delivery to extend the number of customers.

In case of instant coffee, according to the Vietnam Coffee and Cocoa Association, Vietnam's total targeted production for instant coffee was about 2.67 million bags in the crop of 2015/16. However, the actual production only achieved 50% of this goal. Given the strong demand for instant coffee products domestically and a growing demand for export, the USDA estimates that instant coffee consumption was at 350,000 bags in 2015/16 and 370,000 bags in 2016/17 and is projected to rise to 380,000 bags in the year 2017/2018.

The prominent presence of specialist coffee chains allows consumers to have easy access to high-quality, freshly brewed coffee at affordable prices. Consumers can also easily prepare instant coffee for consumption at their offices or homes. Domestic consumption is forecasted to continue to grow, reflecting the expanding retail coffee shops and robust growth of other retail food service subsectors

serving coffee in Vietnam. The expanding coffee retail sector will contribute to stronger consumption for the foreseeable future.

Table 7: Vietnam's Domestic Consumption by Specific Types

Currency: in thousand 60kg bags

	2015/2016	2016/2017	2017/2018
Domestic consumption – Roasted coffee	2,280	2,500	2,550
Domestic consumption – Instant coffee	350	370	380
Total domestic consumption	2,630	2,870	2,930

Source: USDA, GTA, Ministry of Industry and Trade of the Socialist Republic of Vietnam

SWOT Analysis of Vietnam Coffee Industry

Besides statistic information about the Vietnamese coffee industry which is shown in the previous parts, SWOT analysis is also analyzed in order to understand deeply about the Vietnam's coffee industry. The main contains of SWOT are the analysis of Vietnamese coffee's Strengths, Weaknesses, Opportunities and Threats.

STRENGTHS	**WEAKNESSES**
- Vietnam is a coffee exporting country with a huge amount of production quantity and low prices - Plentiful low-cost labor force - Maintain the second position in the market world in term of producing and exporting green bean coffee - Land condition is good	- Still not producing coffee with high value - Cultivation area of coffee is old that lead to a reduction in production output - Irrationality of type of coffee production - Have a little amount of coffee brand names

OPPORTUNITIES	THREATS
- Value and brand enhancement - Coffee consumption increase - High-tech development - Foreign Direct Investment (FDI) - Government policy support	- Climate change effect - Not enough capital to re-cultivate old cultivation areas - Self-development, lack of planning, small-scale production - Unstable coffee prices, input material price increase. - Foreign Direct Investment (FDI)

Strengths

First of all, Vietnam is a coffee exporting country with huge amount of production quantity and low prices. In 2015/2016, Vietnam held the second position in the world market in exporting coffee and its production output achieved 29.3 million bags. In the present, some large countries focus mainly on producing Arabica coffee with high quality and the prices are also high. However, the price of coffee exported from Vietnam is very low, about 1,500~2,000 USD/ton; hence Vietnam can attract importing companies because it could help those company save on the cost of raw materials which would bring more revenue for them.

Secondly, Vietnam has plentiful a low-cost labor force. In 2016, the population of Vietnam was estimated at 92.7 million, ranking 13th in the world in which 47.5 million people are of a working age. With young a labor force, Vietnam has an advantage in young and plentiful labor as well as in low-cost labor. The labor force has been increasing continuously without any decrease and accounts for 51.2% of the country's total population. In the field of coffee, the labor force accounts for 2% of the total national labor force.

Thirdly, Vietnam still maintains the second position in the market world in term of producing and exporting green bean coffee. According to this strength, Vietnam can create an opportunity in

investment from foreign countries in capital and technology support. Coffee is one of the main exported agriculture products of the country; hence coffee management companies as well as farmers receive many concerns from the government for support, encouragement and investment policies.

Fourthly, Vietnam's land condition is good. The soil from the central plateau to the southeast area of Vietnam has basaltic soil which brings high economic value. This advantage in land helps Vietnam produce coffee with high quantity as well as creates special natural taste for coffee

Weaknesses

The first weak point is that Vietnam does not produce high value coffee. Vietnam mainly produces Robusta coffee with 85% of the total coffee production rather than Arabica coffee, which only accounts for 15%; hence Vietnam can produce a huge amount of Robusta coffee with a low price in order to supply to the international market. However, the technology lags behind other countries, which effects negatively in producing high quality Robusta coffee. Although Vietnam has had many development policies and investments in order to improve facilities for producing coffee, the industry is still considered to be lacking in professionalism and technology compared to developed countries or producing countries with a long history in the production of coffee.

The second point is that the cultivation area of coffee is old, which leads to a reduction in production output. According to the Western Highlands Agro-Forestry Scientific and Technical Institute (WAIS), Vietnam coffee trees in the age of 22 to 25 years old account for 22%, the trees below 12 years old account for 50%. In addition, coffee growing farm do not have enough tools and techniques to propagate good seedlings. In some areas, the trees in the age of 22 to 25 years old account up to 25-30% such as in Dak Lak. Therefore, coffee trees cannot grow up and can easily to be destroyed by pests, which explains why a reduction in productivity.

Thirdly, there is an irrationality of type of coffee production. Vietnam mainly produces and exports Robusta coffee. However, in the world coffee market, Robusta coffee receives less preference than Arabica coffee since the coffee consumption of Arabica coffee is twofold higher than the

consumption of Robusta coffee

Fourthly, Vietnam has only a few coffee brand names. Excepting Buon Me Thuot coffee and Trung Nguyen coffee brand name, Vietnam does not have any other big and strong brand names for coffee which can enter and compete in the world market. Vietnam mainly produces and exports only green bean coffee with low prices; hence it receives a low turnover. Also, Vietnamese coffee exporting companies have a limitation in financial capacity therefore they cannot build a strong trademark. Because the marketing fee for building a strong trademark is very high and many risks may occur during the process; it is very hard to research and make a plan for a new product.

Opportunities

First of all, there is an opportunity for Vietnam's coffee value and brand enhancement. There are some coffee brand names which are famous and well-known in the world market such as Trung Nguyen coffee. Therefore, in order to make current brands become stronger and more well known, Vietnam needs to enhance the trust of their customers by providing quality coffee with a beautiful taste which would be a tool to help protecting the benefits for Vietnam's domestic companies in producing coffee.

Secondly, coffee consumption not only in the Vietnamese domestic market but also in the world market is increasing continuously without any reduction. According to International Coffee Organization (ICO), the demand for coffee consumption will increase 25% within the next 5 years. In detail, coffee consumption will increase up to 175.8 million bags in 2020 compared to 141.6 million bag (60kg/bag) in 2015. According to Hanns R. Neumann Stiftung Corporation's prediction, global coffee consumption will increase 30% to 200 million bags in 2030. In Vietnam's domestic market, the coffee consumption achieved 2.6 million bags in 2015 in and is expected to increase in the coming years.

Thirdly, there is high-tech development. Results of researching coffee variety and advanced technology has been applied in production, the new Robusta varieties such as TR4, TR5, TR6, TR7,

TR8, TR9, TR10, TR11, TR12, TR13 and new Arabica varieties include TN1, TN2, which have a high productivity, have been chosen to create, been recognized and have been transferred to production. Some advanced technology such as multiplication, replanting, improvement grafting, intercropping, and water-saving irrigation are being applied in order to increase the productivity of coffee as well as contribute to reduce the cost of production.

Fourthly, there is Foreign Direct Investment (FDI). FDI projects from foreign countries for processed coffee (coffee powder and instant coffee) with modern technology and equipment, mechanization and automatic systems contribute to increase the quality and diversity of coffee products sold in the domestic market and abroad. According to the Investment Promotion Center, Dak Lak province has attracted 15 investment projects in the coffee sector, with a total capital of nearly 5,400 billion in which 4 investment projects are Foreign Direct Investment (FDI) with the total capital of nearly 1,300 billion.

Fifthly, there is the government policy support. The government increases investment in agriculture and rural areas. Many new government policies have been issued to support farmers and enterprises in order to overcome difficulties, develop the land and encourage the producers and enterprises in term of producing coffee to achieve sustainable efficiency.

Threats

Firstly, there is climate change effect. Temperature and rainfall are two main factors which directly effect on production and quantity of coffee. The effect of climate changes such as droughts and unseasonal rains make it difficult to produce and difficult to deal with, especially in Tay Nguyen area, the coffee area which is not irrigated up to 53.6 thousand ha. In addition, high temperatures create favorable conditions for certain pests and diseases to appear, develop and spread to other areas. Pests will increase when the temperature increases. Consequently, the management and control of pests and diseases in the future will be more complex and expensive.

Secondly, there is not enough capital to re-cultivate old cultivation areas. According to the

Vietnam Coffee-Cacao Organization, coffee trees aged from 20-25 years old in the country cover about 86,000 ha, accounting for 73% of the total coffee growing area. There are about 40,000 ha of coffee trees under 20 years old but they are old and stunted, poor growing, and the quality of cherry fruits is quite low. Thus, the total of old plants need to be replaced and changed is about 140.000-160.000 ha in the next 5-10 years, especially in Tay Nguyen province. According to the calculation of the Agriculture Department, it will cost from 80-150 million VND (~3,500 – 7,000 USD) per ha to replant new coffee trees, which is a lot of money for farmers. Farmers can borrow money from banks with the supported interest rate of about 6.5% per year. But until 31/3/2016, only 9 organizations and 5,923 individuals have been able to borrow money with supported interest rates, the total amount of money lent only reached 758.13 billion VND in order to replant 9,479 ha coffee, while the total money lent with a supported interest rate from the government for replanting coffee was about 12,000-15,000 billion VND in the period of 2014-2020 (an average about 2,500 billion / year). Therefore, many people and businesses have demanded loans for replanting coffee, but still cannot approach the capital with a supported interest rate. It is not capital for replanting coffee trees that leads an increase of the old planting coffee area.

Thirdly, there is self-development, a lack of planning, and small-scale production. Small-scale production limits the security in production and investment as well as reduces the efficiency of application of science and technology that leads to the quality of Vietnamese coffee not being identical, which means each area will produce different levels of quality. In addition, it is difficult to transfer advanced technology to farmers as well as farmers have a hard time to learn cultivation knowledge from experts.

Fourthly, there is unstable coffee price, and input material price increase. The price of coffee depends on many factors, especially climate, which effects much on coffee price. When the weather is in good condition for coffee growth the productivity increases, the price will decrease and vice versa. Other input materials such as fertilizer and pesticides increase continuously year by year.

Fifthly, the Foreign Direct Investment from foreign countries is increasing quickly. FDI

enterprises in Vietnamese coffee are increasing and showing their power. Meanwhile, many domestic companies are in trouble, even facing bankruptcy or closing factories due to a lack of raw materials to process and produce coffee products. According to the Vietnam Coffee-Cacao Association (Vicofa), appearing only after a few years, FDI enterprises have occupied 50% of the total coffee production in Vietnam, an equivalent of 600,000 tons per year.

CHAPTER 3

ANALYTIC METHODOLOGY

3.1 Theoretical Review

3.1.1 Definition

Coffee

Coffee is a dark brown drink made from ground coffee beans and boiled water; including two main types: Arabica coffee and Robusta coffee. Robusta coffee has a bitterer flavor than Arabica coffee; hence the number of people who drink Arabica coffee is much higher than Robusta. However, people who really love coffee, tend to drink Robusta coffee rather than Arabica, since they prefer the bitter flavor in Robusta coffee.

Processed coffee

Processed coffee is coffee which is processed in the factory after having been harvested at the farm; including: roasted coffee, instant coffee (also called soluble coffee) and coffee powder.

Coffee production

Coffee production is the industrial process of converting the raw fruit of the coffee plant into finished coffee which consumers can enjoy as their favorite drink as well as its value of being far higher than green coffee. While all green coffee is processed, the method that is used varies and can have a significant effect on the flavor of roasted and brewed coffee. Coffee production is a major source of income, especially for developing countries where coffee is grown. By adding value and processing the coffee locally, coffee farmers and countries can increase the revenue from coffee.

There are in total three methods of processing coffee: wet processing, dry processing and semi-dry processing. However, dry and wet processing are the two main methods which are mainly used in the production of coffee. Detailed information about these processes will be discussed in the next part of this chapter.

3.1.2 Relevant Theory of This Study

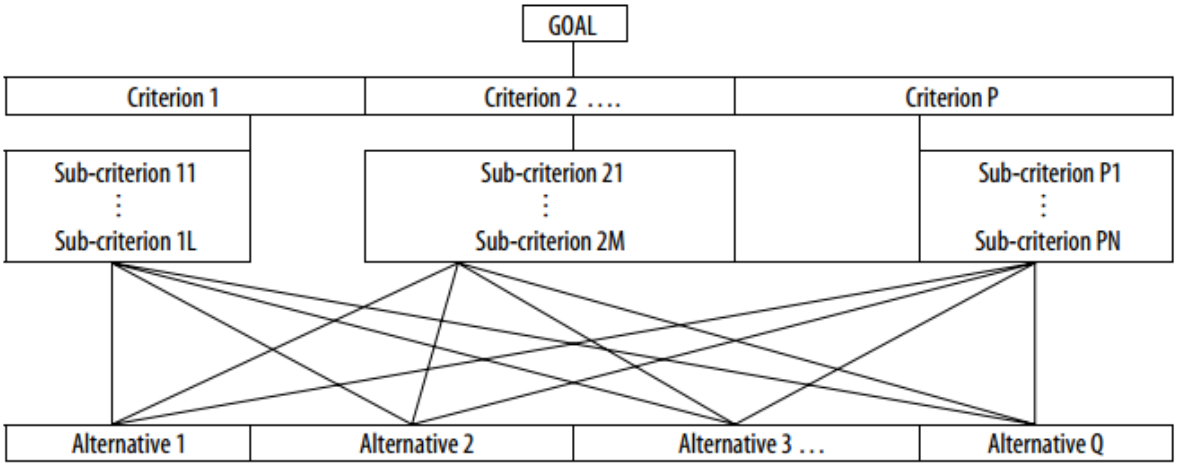
AHP model

The Analytical Hierarchy Process or AHP was first developed by Professor Thomas L. S in the 1970's and has received wide application in a variety of areas since that time. The AHP has found use in business, government, social studies, R&D, defense and other domains involving decisions in which choice, prioritization or forecasting is needed. The AHP is a multi-criteria decision making approach and many researchers use it in order to analysis their hypothesis due to the nice mathematical properties of the method and that the required input data is easy to obtain. The AHP model can be used to solve complex decision problems since it uses a multi-level hierarchical structure which includes: objective, criteria, sub-criteria and alternatives. The data is collected from using a set of pair wise comparisons. Researchers used these comparisons to achieve the weight of importance of the decision criteria and the relative performance measures of the alternatives of each individual decision criterion. If the comparisons are not perfectly consistent, then it provides a mechanism for improving consistency.

Additionally, the AHP model helps structure the decision-maker's thoughts and can help in organizing the problem in a manner which is simple to follow and analyze. Basically, AHP helps in structuring the complexity, measurement and synthesis of rankings. These features make it suitable for a wide variety of applications because of its ease of implementation and understanding. Moreover, it is a methodology capable of producing results that agree with perception and expectations.

The AHP provides a means of decomposing the problem into a hierarchy of sub-problems which can more easily be comprehended and evaluated. The evaluations are converted into numerical values and then processed to rank each criteria and sub-criteria on a numerical scale. The methodology of AHP includes consecutive steps:

Figure 12: Generic Hierarchic Structure



Source: Brunelli, 2015

Step 1: The problem is decomposed into a hierarchy of goal, criteria, sub-criteria and alternatives. This is the most creative and important part of decision-making. This is the first step as well as a fundamental step to process AHP. Hierarchy indicates the relationship between elements of one level with another level below. This relationship percolates down to the lowest level of the hierarchy, and every element is connected to every other one; hence a hierarchy is the same as a network. Saaty suggests that a useful way to structure the hierarchy is to work down from the goal to criteria; criteria to sub-criteria and then work up from the alternatives until the levels of the two processes are linked in such a way as to make comparisons possible. Figure 2.1 shows a generic hierarchical structure. At the top of the hierarchy is the goal or objective of the problem being analyzed. The bottom is the alternatives to be compared. Between these two levels various criteria and sub-criteria are contained. It is important to note that when comparing elements at each level, the decision-maker also has to compare each element with respect to the contribution of the lower-level elements to their corresponding upper-level element

Step 2: Data are collected from experts or decision-makers corresponding to the hierarchy structure. In order to compute the weights for different criteria, creating a pairwise comparison matrix is needed in the AHP model. The matrix **A** is a matrix, where m is the number of evaluation criteria

considered. Each entry a_{jk} of the matrix **A** represents the importance of the j criterion relative to the k criterion. If $a_{jk} > 1$, the j criterion is more important than the k criterion and vice versa. If two criteria have the same importance, then the entry a_{jk} is equal 1. And, the entry a_{jk} and a_{kj} need to achieve this requirement

$$a_{jk} . a_{kj} = 1$$

Additionally, ajj and akk equal 1 for all j or k. the relative importance between two criteria is measured by using a numerical scale between 1 and 9, as shown in Table 1 below, the decision maker's qualitative evaluations of the relative importance between two criteria is translated into nine-point scales that is shown in Table 8

Table 8: Saaty's Ratio Scale for Pair Wise Comparison of Importance of Weights of Criteria/ Alternatives

Intensity of Importance	**Definition**	**Explanation**
1	Equal importance	j and k are equally important
3	Moderate importance of one over another	j is slightly more importance than k
5	Essential or strong importance	j is more important than k
7	Very strong importance	j is strongly more importance than k
9	Extremely importance	j is absolutely more importance than k
2,4,6,8	Intermediate values between two elements	Compromise is needed between two elements
Reciprocals	When j compared to k is assigned one of the above numbers, the activity of j compared to i is assigned its reciprocal	
Rational	Ratio arising from forcing consistency of elements	

Source: Hamid, (2012)

Step 3: The pairwise comparison of various criteria generated at step 2 are organized into a square matrix. The diagonal elements of the matrix are 1. The criterion in the jth row is better than the criterion in the kth column if the value of the elements (j,k) is more than 1 and vice versa. The (j,k) elements of the matrix are the reciprocal of the (k,j) elements.

Step 4: the principal eigenvalue and the corresponding normalized right eigenvector of the comparison matrix give the relative importance of the various criteria being compared. The elements of the normalized eigenvector are termed weights with respect to the criteria or sub criteria and ratings with respect to the alternatives

Once the matrix **A** is built, it is possible to derive from A the normalized pairwise comparison matrix, called A_{norm}, by making equal to 1 the sum of the entries on each column, each entry $\bar{a}_{jk}$ of the matrix A_{norm} is computed as:

$$\bar{a}_{jk} = \frac{a_{jk}}{\sum_{l=1}^{m} a_{lk}}.$$

And then, the criteria weight vector w (that is an m-dimensional column vector) is built by averaging the entries on each row of A_{norm}.

$$w_j = \frac{\sum_{l=1}^{m} \bar{a}_{jl}}{m}.$$

Step 5: Calculate the consistency of the matrix. When many pairwise comparisons are performed, some inconsistencies may exist. For example, assume that three criteria are considered, and the decision maker evaluates that the first criterion is *slightly* more important than the second criterion, while the second criterion is *slightly* more important than the third criterion. An evident inconsistency in this example is that the decision maker evaluate by mistake that the third criterion is equally or more important than the first criterion. On the other hand, in this example, the decision maker evaluates the first criterion to be also *slightly* more important than the third criterion. A consistent

factor is that the first criterion is *absolutely* more important than the third criterion

The AHP model incorporates an effective technique for checking the consistency of the evaluations made by the decision maker. The technique relies on the computation of a consistency index. The Consistency Index, CI, is calculated as below

$$\mathrm{CI} = (\lambda_{\max} - n)/(n - 1)$$

where λ_{max} is the maximum eigenvalue of the matrix and n is the number of elements. And then, the consistency ratio is calculated by using the formula CR = CI/RI, where RI is known as the random consistency index which is obtained from a large number of simulation runs and varies depending upon the other elements of the matrix

RI is the Random Index, the consistency index when the entries of **A** are completely random. The value of RI for small problems ($m \leq 10$) are shown in Table 9

Table 9: Average Random Index (RI) Based on the Matrix Size (Adapted from Saaty, 2000)

Size of matrix (n)	Random consistency index (RI)
1	0
2	0
3	0.52
4	0.89
5	1.11
6	1.25
7	1.35
8	1.40
9	1.45
10	1.49

Source: Riama, 2010

The perfect consistency should always obtain CI=0, but small values are accepted. The value of the Consistency Index should be less than 0.1. If the consistency index fails to reach a required level then the answer for comparisons may be re-examined or rejected. For example,

$$A = \begin{bmatrix} 1 & 3 & 1/3 \\ 1/3 & 1 & 3 \\ 3 & 1/3 & 1 \end{bmatrix}$$ ⇨ CI/RI = 1.150 ⇨ inconsistent

$$A = \begin{bmatrix} 1 & 3 & 3 \\ 1/3 & 1 & 3 \\ 1/3 & 1/3 & 1 \end{bmatrix}$$ ⇨ CI/RI = 0.118 ⇨ slightly inconsistent

$$A = \begin{bmatrix} 1 & 3 & 5 \\ 1/3 & 1 & 3 \\ 1/5 & 1/3 & 1 \end{bmatrix}$$ ⇨ CI/RI = 0.033 ⇨ consistent

Step 6 : If the evaluations of the decision maker is consistent, the option ranking is accomplished by ordering the scores in decreasing order.

Logit Model

In statistics, the logit model is also called logistic regression, or logit regression; it is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary). Like all regression analyses, the logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variable.

Logistic regression was developed by the statistician David Cox in 1958. Logistic regression includes these 3 types binomial logistic regression, ordinal logistic regression and multinomial logistic regression. Binominal or binary regression deals with the situation where the outcome for a dependent variable can have only two types, “0” and “1” (which may present, for example, “yes” vs. “no”or “male vs. “female”. Multinomial logistic regression deals with the situations where the outcome can have more than two types (for example, “disease A” vs. “disease B” vs. “disease C” that are not ordered. On the other hand, ordinal logistic regressions also deal with situations where the outcome has over 2 types, but one different thing is how dependent variables are ordered. This study mainly

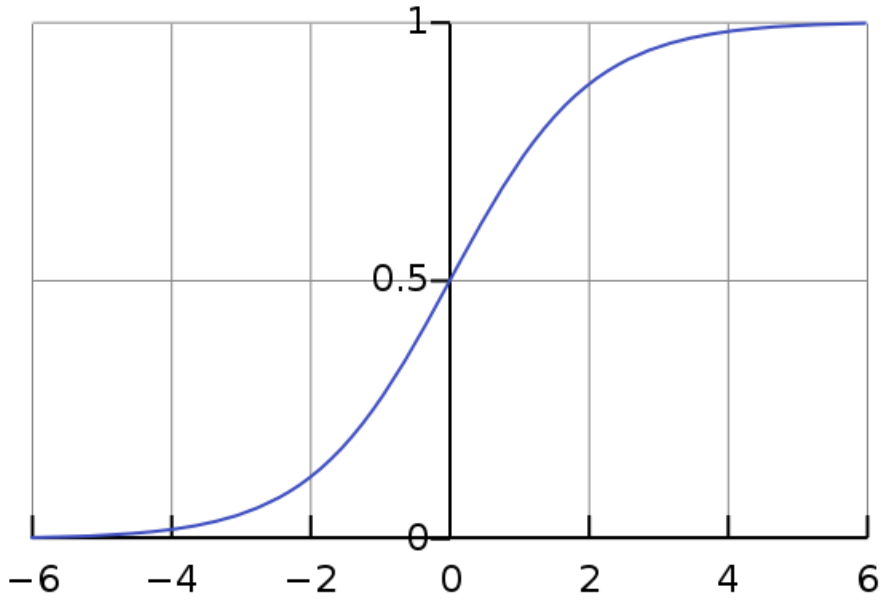
focuses on binary logistic regression and using binary logistic regression for analyzing data.

In binary logistic regression, the outcome is usually coded as “0” or “1” as this leads to the most straightforward interpretation. In particular, if the observed outcome for dependent variables is the noteworthy possible outcome (referred to as a “yes” or a “like”) it is usually coded as “1”. By contrast, the contrary outcome (referred to as a “no” or a “dislike”) is usually coded as “0”. Binary logistic regression is used to predict the odds of being a case based on the values of the independent variables (predictors). The odds are defined as the probability that a particular outcome is a “yes” divided by the probability that is a “no”.

Pi = E[Y=1/Xi] = α + βXi

- If Yi = 1, probability is Pi
- If Yi = 0, probability is 1-Pi.

In the Logit model, we can use cumulative function to show the probability between the two values (0 and 1) of the dependent variables.



$P_i = E[Y=1/Y_i] = \frac{1}{1+e^{-zi}}$ is the cumulative logistic distribution.

Like other forms of regression analysis, logistic regression makes use of one or more predictor variables that may be either continuous or categorical. Unlike ordinary linear regression, however, logistic regression is used for predicting dependent variables that take membership in one of a limited number of categories (treating the dependent variable in the binomial case as the outcome of a Bernoulli trial) rather than a continuous outcome. Given this difference, the assumptions of linear regression are violated. In particular, the residuals cannot be normally distributed. In addition, linear regression may make nonsensical predictions for a binary dependent variable. What is needed is a way to convert a binary variable into a continuous one that can take on any real value (negative or positive). To do that, binomial logistic regression first takes the odds of the event happening for different levels of each independent variable, then takes the ratio of those odds (which is continuous but cannot be negative) and then takes the logarithm of that ratio (this is referred to as logit or log-odds) to create a continuous criterion as a transformed version of the dependent variable. Thus the logit transformation is referred to as the link function in logistic regression—although the dependent variable in logistic regression is binomial, the logit is the continuous criterion upon which linear regression is conducted.

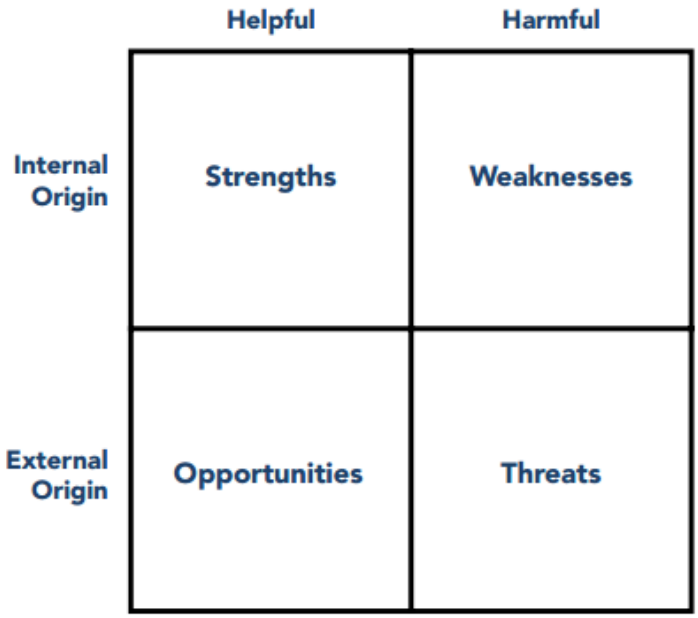
The logit of success is then fitted to the predictors using linear regression analysis. The predicted value of the logit is converted back into predicted odds via the inverse of the natural logarithm, namely the exponential function. Thus, although the observed dependent variable in binary logistic regression is a zero-or-one variable, the logistic regression estimates the odds, as a continuous variable, that the dependent variable is a "yes" (a "like"). In some applications the odds are all that is needed. In others, a specific yes-or-no prediction is needed; this categorical prediction can be based on the computed odds of a "yes", with predicted odds above some chosen cutoff value being translated into a prediction of a "yes".

The inverse of the logistic function

$$Li = \ln\left[\frac{Pi}{1-Pi}\right] = Zi = \alpha + \beta Xi$$

SWOT analysis

SWOT analysis is an acronym for Strengths, Weaknesses, Opportunities and Threats and is a business analysis technique that can perform good things as well as bad things for each of its products, service and markets when deciding on the best way to achieve future growth. Additionally, identification of SWOTs is important because they can inform later steps in planning to achieve the objective. The process involves identifying the strengths and weaknesses of the organization and the opportunities and threats present in the market where it operates in.



The method of SWOT Analysis is to take the information from environmental analysis and separate it into internal (strengths and weaknesses) and external issues (opportunities and threats). When this is completed, SWOT analysis determines what may assist the firm in accomplishing its objectives and what obstacles must be overcome or minimized in order to achieve the desired result. As mentioned before, SWOT analysis is a technique to analysis four main elements: Strengths, Weaknesses, Opportunities and Threats. More detailed explanation is as below

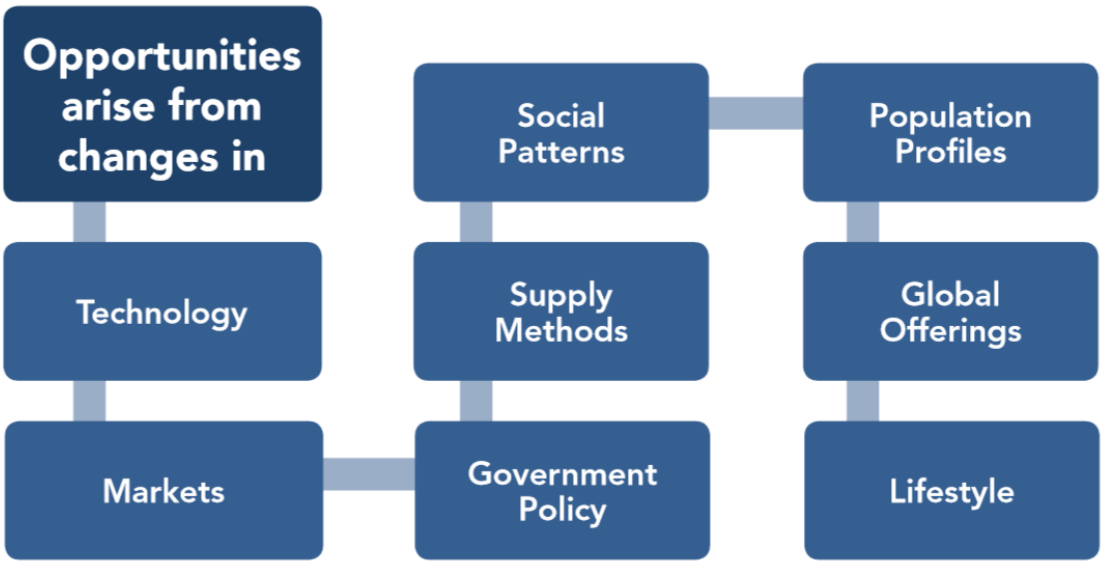
Strength A **'strength**" is something has a positive implication. It adds value, or offers the organization competitive advantages. Strengths include tangible assets such as available capital, equipment, credit, established and loyal customers, existing channels of distribution, copyrighted

materials, patents, information and processing system and other valuable resources

Weaknesses are the characteristics of products or services that are detrimental to growth. Weaknesses are those things that detract from the value of products or services and create disadvantages when compare with other competitors.

The more accurately the weaknesses are identified, the more valuable the SWOT analysis. However, because weaknesses are identified by definition internally there can be lots of resistance to admitting them. Highlighting weaknesses can be understood by drawing a general view to areas of organization which have been badly managed or where poor decisions have been made.

Opportunity is an external factor and is an element in the environment that the business or project could exploit to its advantages. Opportunity may result from changes with the market, customer lifestyle changes, and advances in technology, new product methods, etc.



Source: SWOT Analysis, 2013

Threats

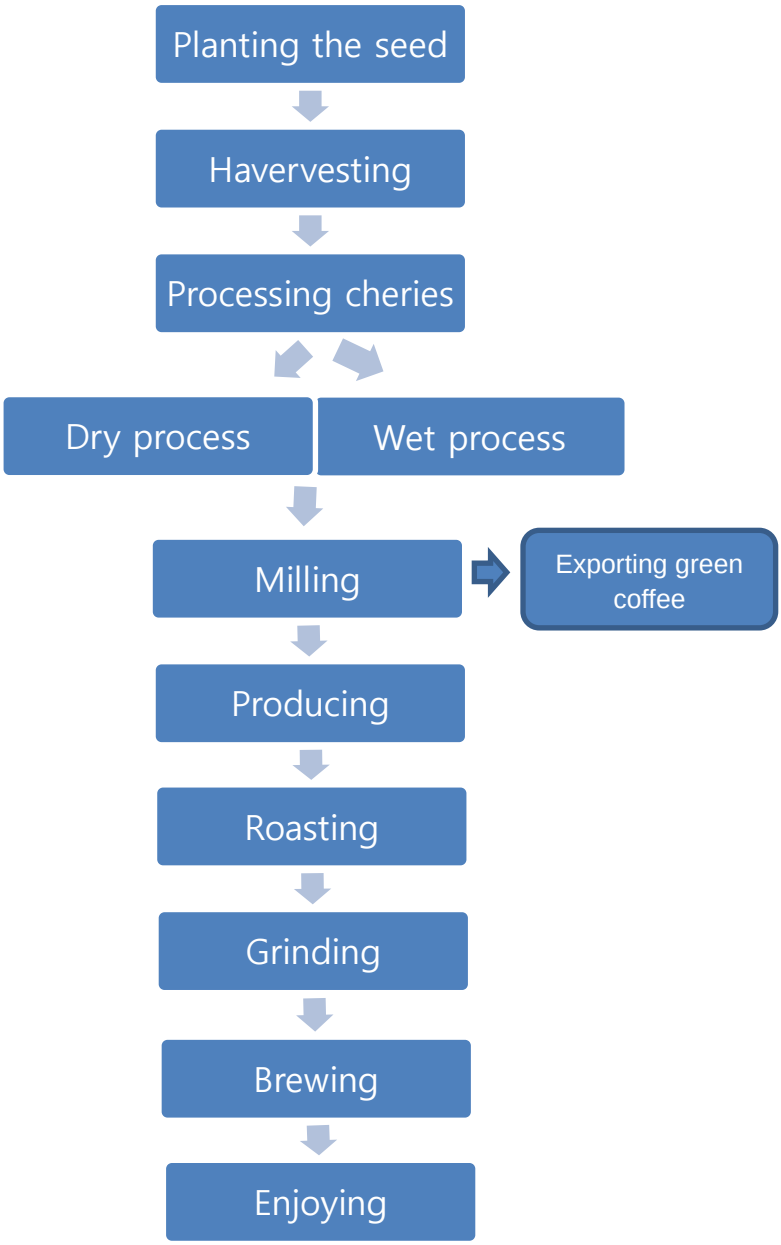
The final part of SWOT process is threats which are external risks the organization has to face with. Threats are elements in the environment that could cause trouble for the business. Although they are external factors which mean that the business has little or no control over them, the organization should consider making contingency plans, no matter how sketchy because it can put problems on the agenda that people may be more comfortable ignoring. The greater ability to identify potential threats, the more proactive the business can deal with problems that may occur. Anticipating and responding to competitors' actions is one of the biggest challenges the organization has to face and clearly indicate. Threats include some elements as below

Source: SWOT Analysis, 2013

A SWOT analysis is a useful method for any kind of strategic planning. It is a quick way to look at one organization's strengths, weaknesses, opportunities and threats. The overall aim of the SWOT method is to examine the internal factors as well as external factors that help the organization archive their objective.

Coffee Production Process: Wet Process and Dried process

Figure 13: Coffee Processing Steps



Coffee seeds are generally planted in large beds in shaded nurseries. Then, baby coffee trees are planted and farmers need to wait 3-5 years for their flowers to blossom. Robusta coffee is grown in a subtropical climate at the height of 1,800~3,600 feet above sea level, and the ideal altitude for Arabica coffee is a tropical climate at the height of 3,600-6,300 feet. After its flowers blossom, the fruits

(cherries) will ripe and turn from green to red and occasionally yellow, and farmers will harvest the deep red cherries. The cherries are picked by hand – workers pulling fruit from trees as a traditional method or by machine. Machine-picking is more efficient, required less labor and has other significant advantages over manual harvesting. But for the young trees (which can't stand the strain of heavy machines) or the very oldest (which aren't planted in rows widely enough to accommodate the), hand-picking is the best way to harvest. Farmers selectively choose the ripe coffee cherries and leave the unripe cherries for later harvesting. The next step is processing the cherries. Coffee cherries are processed in one of two ways: dry or wet processing. In the dry process, coffee is dried in the sun and on raised bamboo bed and is ranked to prevent spoilage. Beans are dried until the cherries moisture level reaches 11%. In the wet process, beans are separated from pulp and then sorted by ripeness and size; ripe beans will sink under water and unripe beans will float on the surface of water; then beans are moved into fermentation tanks in order to remove the mucilage. After that beans are rinsed and dried until the cherries moisture level reaches 11%. The next step is milling in which beans are put into a machine in order to remove the parchment layer or husk; grading and sorting are also needed in this step in order to remove defective beans. Good-quality green bean coffee is loaded into bags which are loaded into containers which are loaded into ships to export to other countries.

Good- green bean coffees go to the next process in order to make a cup of coffee. The first step in making a cup of coffee is roasting, roasting transforms green coffee into the aromatic brown beans we know and love; beans are removed when the internal temperature reaches 400 degrees at which point oil locked inside the bean emerges. Then, coffee is ground by machine into coarse or fine grinds; the desirability of coarse or fine grinds depends on the brewing method. Coarse or fine grinds are brewed by hand or coffee machine in order to make a perfect cup of coffee, brewing is the last step of this process.

Alternatively, some companies will purchase green bean coffee in order to produce processed coffee like coffee power, instant coffee or used as an auxiliary ingredient for other industries such as the confectionary industry, cosmetic industry and so on.

3.2 Analysis Procedure

3.2.1 Research Process

There are two types of research methods, including Qualitative Research and Quantitative Research. According to Saunders, Levis and Thornhill (2009, Ch.5), the Qualitative Research method is a synonym for any data collection technique that creates or uses non-numerical data. In other words, the Qualitative Research method is a type of scientific research, collecting and analyzing information, data activities are based on people's ideas, opinions, emotions, beliefs and behaviors. The kinds of qualitative research are various, including the three most common methods: respondent observation, in-depth individual interview or focus group. The nature of qualitative research method is explored by using open-ended questions and gives respondents opportunities to respond in their own words and thoughts rather than requiring them to choose fixed responses, as quantitative research methods do. In contrast, the Quantitative Research method is defined as a synonym with any data collection technique that creates or uses numerical data (Saunders, 2009) and is a type of empirical investigation. In other words, Quantitative Research is more logical and data-led, a method which is used to measure a customer's thinking from statistical and numerical point of view. This method is used to gather data from a large amount of respondents because it is easy for organizing and processing data in report analysis

Quantitative Method

Regarding the purpose of this study, the empirical data will be collected by applying a quantitative research method which is used to gather essential information as well as clarify the research topic. The reason why the quantitative research method is the most applicable to with this study is that it provides a precise and reliable result through actual numerical data. Moreover, quantitative research is useful when it can gather data from a bigger number of respondents and is easier to process data. Additionally, the method provides the result as an objective perspective that leads to a more precise and liable result for the research. Nowadays, thanks to the development of the technical industry, we can easily collect information on the Internet, but if different research applies to the same data within

the same period it will lead to the same result as well as the fact that data on the Internet is not usually updated, therefore it may be not suitable for the current research. The AHP model is applied to collect data from respondents, as the Quantitative Research method

3.2.2 Method of Collecting Data

3.2.2.1 Secondary Data

The secondary data have been collected mainly from journals and books within the coffee industry. According to the MSG, secondary data is the data that have been already collected by and readily available from other sources (MSG, n.d). And therefore it has often been collected for various research topics rather than for a specific research topic. In addition, secondary data is usually out of date; it means that it was collected a long time ago; hence when researchers use secondary data for analysis maybe they can be faced with the risk of no longer suitable data. However, using the secondary data provides researchers a general perspective for a specific research topic as well as the current status of it.

The secondary data also contains one more risk that needs to be considered – the origin of the source, because on the Internet there are many unreliable sources which provide information as their thinking without prof. In order to reduce the risk of secondary data, researchers should only use published scientific articles and books written by acknowledged authors as well as checking sources against each other in an attempt to verify their accuracy. Therefore, in this research study, data is mainly collected from some big and reliable organizations, including from the FOA (Food and Agriculture of the United Nations), the USDA (United States Department of Agriculture), the VICOFA (Vietnam Coffee-Cocoa Association), the Ministry of Agriculture and Rural Development of Vietnam and General Statistic Office of Vietnam.

3.2.2.2 Primary Data – AHP Model

In this research, the quantitative research method is chosen to apply for the purpose of the data collecting process. According to Donald Currie, the primary data can be collected by using three main

methods: survey, interview and observations. Among the many advantages related with collecting primary data are that the information which has been collected, will be used for in-depth analysis of the market. This information collected is current and relevant since it is collected from the opinion of experts in the coffee industry; in other words, it is updated information which is more accurate during the period of research. However, collecting primary data can be very time consuming.

The primary data will be collected through questionnaire in the AHP processing model which involves self-completion; it means that respondents will answer all questions in the questionnaire by themselves. The questionnaire includes 5 main questions with the purpose of analysis as to what experts in the coffee industry think about the way to improve coffee production in both quantity and quality. Self-completion questionnaires include many forms, but in this study an online questionnaire was used to achieve data collection

In order to collect quantitative data, the questionnaire was created and sent to experts who have a wide knowledge about the coffee industry by email. Online questionnaires can approach larger amounts of respondents which help to reduce time and money compared with interviewing, and it also eliminates the influences of interviewers on respondents. All data will be collected, arranged and analyzed with Excel.

The Questionnaire

The purpose of research questions is used to examine experts thinking on what way they believe is more important to apply in order to improve and develop the current Vietnamese coffee industry. This is also a good way to see which method needs to be prioritized to apply first under the eyes of experts in coffee production.

When deciding on questionnaires, there are several things which need to be considered, especially good content, logic structure and useful collected result. According to Wai-Ching Leung, there are two main objectives of questionnaire design, the first is to maximize the response rate and the second is to obtain accurate relevant information (Wal-Ching, n.d.). Therefore, questionnaires are designed in such

a way to achieve two main objectives and clearly explain for each question in the questionnaire in order to limit misunderstanding.

The two main parts of the questionnaire were designed. All questions in the questionnaire are designed by using a numerical scale of relative importance from 1 to 9, the importance level will increase from 1 to 9, 1 is the least important and 9 is the most important. In the first part, it includes only one question about the first level of the strategy. There are a total of 4 criteria which create 6 pairwise comparisons which experts need to compare the important levels between each pair.

THE IMPORTANCE OF A PLAN FOR THE DEVELOPMENT OF COFFEE INDUSTRY EVALUATION																	
Characteristic A	A AI		A DI		A SI		A WI		EI		B WI		B SI		B DI		B AI	Characteristic B
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
	←								•								→	
Replanting Program																		Farmers' Knowledge Improvement
Replanting Program																		Government Support and Institutionalization
Replanting Program																		Business Efficiency
Farmers' Knowledge Improvement																		Government Support and Institutionalization
Farmers' Knowledge Improvement																		Business Efficiency.
Government Support and Institutionalization																		Business Efficiency

The second part includes 4 main questions which are of the same type with the first part of the questionnaire; these 4 questions are about level 2 of this strategy. Each criteria in level 1 include some sub-criteria in the level 2 which is clarified more specifically. These four main questions also compare the important level between each pair of sub-criteria in each criteria.

CHAPTER 4

CONSUMER PREFERENCE OF VIETNAMESE COFFEE IN SOUTH KOREA

4.1 Questionnaire Design

The questionnaire was designed with the purpose of determining customer behavior about Vietnamese coffee. This questionnaire includes three main parts. The first part includes 5 general questions about age, gender, occupation, region and income. The second part includes 7 questions related to coffee drinking and how customers think about coffee. And, the third part includes 10 questions, in this part the questionnaire was designer in order to understand customer thinking and behavior about Vietnamese coffee. In total, there are 22 questions which each respondent needs to complete

In total, there are 90 people who participated and answered all questions in the questionnaire in which 68 people said that they really like coffee and another 22 people said that they don't. Within 68 people, there are 45 people who said that they know about Vietnamese coffee in which 35 respondents tried to drink Vietnamese coffee before.

4.2 Independent and Dependent Variables

The main goal of this questionnaire is to discover customer thinking by applying the Logit Model. There are three main dependent variables which need to be verified in this research which is shown in table below:

Dependent Variable	Independent Variable
1. People like to drink coffee	1. Age 2. Gender 3. Income 4. Occupation 5. Religion

2. Customer continues to consume Vietnamese coffee in the future	1. Age 2. Gender 3. Income 4. Occupation 5. Religion 6. Money spending for coffee 7. Abroad brand 8. Have you ever drank coffee 9. Vietnamese coffee price
3. Even the price increase 5 to 10%, consumer still continues to consume Vietnamese coffee	1. Age 2. Gender 3. Income 4. Occupation 5. Religion 6. Money spending for coffee 7. Abroad brand 8. Have you ever drank coffee 9. Vietnamese coffee price

4.3 Analysis Results

After analyzing the collected data by using the software Eview, the result is as below:

+ Dependent variable: people like to drink coffee (presented by LIKECOFFEE). The purpose of this one is clarify what factors affect people in reference to coffee.

Dependent Variable: LIKECOFFEE

Method: ML - Binary Logit

Date: 03/08/18 Time: 16:54

Sample: 11 90

Included observations: 80

Convergence achieved after 6 iterations

Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-2.876939	1.233670	-2.332016	0.0197
GENDER	1.258690	0.767301	1.640412	0.1009
AGE	1.137372	0.521186	2.182274	0.0291
COSTFORCOFFEE	2.465119	0.796603	3.094538	0.0020

Mean dependent var	0.775000	S.D. dependent var	0.420217
S.E. of regression	0.332333	Akaike info criterion	0.786097
Sum squared resid	8.393851	Schwarz criterion	0.905199
Log likelihood	-27.44389	Hannan-Quinn criter.	0.833848
Restr. log likelihood	-42.65311	Avg. log likelihood	-0.343049
LR statistic (3 df)	30.41844	McFadden R-squared	0.356579
Probability(LR stat)	1.13E-06		

Obs with Dep=0	18	Total obs	80
Obs with Dep=1	62		

LIKECOFFEE = 1-@LOGIT(-(1.258689782*GENDER + 1.13737167*AGE +

2.465118552*COSTFORCOFFEE - 2.876938998))

In which

LIKECOFFEE: respondents are asked whether they like coffee or not

GENDER: respondent's gender (male or female)

AGE: respondent's age

COSTFORCOFFEE: the amount of money respondent spends for coffee

After receiving the result from respondents, all answers are coded under "number", the detailed explanation is as below:

- For the "LIKECOFFEE" dependent variable, a person who likes coffee is coded as "1" and a person who does not like coffee is coded as "0".
- For the GENDER independent variable, male is coded as "1" and female is coded as "0".
- For the AGE independent variable, "0" represents a respondent's age from 10 to 19 years old, "1" represents a respondent's age from 20 to 29 years old, "2" represents a respondent's age from 30 to 39 years old, "3 represents a respondent's age from 40 to 49 years old, "4" represents a respondent's age over 50 years old
- For the COSTFORCOFFEE independent variable, a respondent who spends less than 10,000 won per week to drink coffee is represented as "1", from 10,000 to 20,000 won/week is represented as "2", from 20,000 to 30,000 won/week is represented as "3", from 30,000 to 40,000 won/week is represented as "4" and someone who spends over 50,000 won/week is represented as "5".

Based on the analysis of the first dependent variable (LIKECOFFEE), we can see that the preference for drinking coffee depends on 3 factors which are gender, age and the amount of money people used for coffee. As the result, male intends to drink coffee more than female; people whose age is higher tend to drink more coffee than young people, and people who spend more money on coffee tend to like coffee more than people who spend less on coffee

+ Dependent variable: Customer continues to consume Vietnamese coffee in the future (represented as BUYORNOT)

After executing the same method with the first dependent variable (LIKECOFFEE), we receive the result as below:

Dependent Variable: BUYORNOT

Method: ML - Binary Logit

Date: 03/08/18 Time: 16:29

Sample: 11 87

Included observations: 34

Excluded observations: 43

Convergence achieved after 4 iterations

Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-5.373219	2.137461	-2.513833	0.0119
GENDER	2.303025	0.969533	2.375396	0.0175
DRINKCOFFEE	2.614793	1.398189	1.870129	0.0615
LIKECOFFEE	2.309333	1.155125	1.999206	0.0456

Mean dependent var	0.558824	S.D. dependent var	0.503995
S.E. of regression	0.446831	Akaike info criterion	1.286000
Sum squared resid	5.989734	Schwarz criterion	1.465572
Log likelihood	-17.86201	Hannan-Quinn criter.	1.347240
Restr. log likelihood	-23.33116	Avg. log likelihood	-0.525353
LR statistic (3 df)	10.93832	McFadden R-squared	0.234414
Probability(LR stat)	0.012064		

Obs with Dep=0	15	Total obs	34
Obs with Dep=1	19		

BUYORNOT = 1-@LOGIT(-(2.303024968*GENDER + 2.614793291*DRINKCOFFEE + 2.309333158*LIKECOFFEE - 5.373218891))

In which

BUYORNOT: customers intend to buy Vietnamese coffee in the future or not

LIKECOFFEE: respondents are asked whatever they like coffee or not

GENDER: respondent's gender (male or female)

DRINKCOFFEE: respondent who has drunk Vietnamese coffee or not

After receiving the results from respondents, all answers are coded under "number", the detailed explanation is as below:

- For the BUYORNOT dependent variable , a person who answers yes is represented as "1" and a person who answers no is represented as "0"
- For the "LIKECOFFEE" dependent variable, a person who likes coffee is coded as "1" and a person who does not like coffee is coded as "0".
- For the GENDER independent variable, male is coded as "1" and female is coded as "0".
- For the DRINKCOFFEE, a person who has drunk Vietnamese coffee is represented as "1" and one who has not drunk Vietnamese coffee is represented as "0"

In case of the question about the decision of buying Vietnamese coffee or not (dependent variable BUYORNOT), that depends on three factors: gender, people who have tried Vietnamese coffee, and people who like to drink coffee. As the result, male intends to buy Vietnamese coffee more than female, and people who have drunk Vietnamese coffee tend to buy Vietnamese coffee more than

people who have not tried it. Furthermore, people who like coffee tend to buy Vietnamese coffee more people who do not like coffee.

+ Dependent variable: Even if the price is higher by 5 to 10% compared with domestic coffee, consumers still continue to consume Vietnamese coffee (presented by BUYORNOT2)

Dependent Variable: BUYORNOT2

Method: ML - Binary Logit

Date: 03/08/18 Time: 17:07

Sample(adjusted): 7 81

Included observations: 32

Excluded observations: 43 after adjusting endpoints

Convergence achieved after 5 iterations

Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	2.676310	1.353463	1.977379	0.0480
REGION	-2.165626	0.986237	-2.195847	0.0281
ABROADBRAND	4.591860	2.046225	2.244064	0.0248
COSTFORCOFFEE	1.353953	0.687581	1.969154	0.0489

Mean dependent var	0.406250	S.D. dependent var	0.498991
S.E. of regression	0.404766	Akaike info criterion	1.134345
Sum squared resid	4.587391	Schwarz criterion	1.317562
Log likelihood	-14.14952	Hannan-Quinn criter.	1.195076
Restr. log likelihood	-21.61487	Avg. log likelihood	-0.442172
LR statistic (3 df)	14.93070	McFadden R-squared	0.345380
Probability(LR stat)	0.001877		

Obs with Dep=0	19	Total obs	32
Obs with Dep=1	13		

BUYORNOT2 = 1-@LOGIT(-(-2.165625553*REGION + 4.591859999*ABROADBRAND - 1.353953402*COSTFORCOFFEE + 2.676310009))

In which:

BUYORNOT2: Even if the price increase 5~10%, a customer intends to buy Vietnamese coffee in the future or not

REGION: the place where respondent lives

ABROADBRAND: people prefer to drink an abroad brand or not

COSTFORCOFFEE: the amount of money a respondent spends for coffee

After receiving the result from respondents, all answers are coded under "number", the detailed explanation is as below

- For the BUYORNOT2 dependent variable, respondents who intend to buy Vietnamese coffee even if the price is higher 5~10% than the current domestic coffee price is represented as "1" and for those who do not intend to buy, is represented as "0"
- For the RELIGION independent variable, "0" represents a person who lives in Jeju and "1" represents a person who does not live in Jeju.
- For the AROADBRAND independent variable, a respondent who prefers to consume coffee of an abroad brand is represented as "1" and for one who does not refer an abroad brand is represented as "0"
- For the COSTFORCOFFEE independent variable, a respondent who spends less than 10,000 won per week to drink coffee is represented as "1", from 10,000 to 20,000 won/week is

represented as “2”, from 20,000 to 30,000 won/week is represented as “3”, from 30,000 to 40,000 won/week is represented as “4” and someone who spends over 50,000 won/week is represented as “5”.

However, with the question about purchase intension when the price of Vietnamese coffee is a little bit higher (5~10%) than the current coffee in the market (dependent variable BUYORNOT2), the result is that people who live in the mainland tend to purchase more than people who live in the Jeju area. People who like abroad brands tend to buy Vietnamese coffee even when the price is higher than other coffee, and people who spend more money on coffee also tend to buy Vietnamese coffee even when the price is higher.

CHAPTER 5

DEVELOPMENT STRATEGY FOR VIETNAMESE COFFEE INDUSTRY

5.1 AHP Model Contents

The AHP is a multi-criteria decision making approach AHP model and can be used to solve complex decision problems since it uses a multi-level hierarchical structure. Additionally, the AHP model helps structure the decision-makers' thoughts and can help in organizing the problem in a manner which is simple to follow and analyze. In this research, the AHP model is a system examined by Vietnamese coffee experts in order to determine what kind of method would be best for Vietnamese coffee industry development

This Hierarchy includes 3 levels: the first level is called Goal which is presented by Coffee Industry Development. The second level is called Criteria which involves 4 methods: Replanting Program, Farmer's Knowledge Improvement, Government Support & Institutionalization and Business Efficiency. The third level is presented as Subcriteria. Below each Criteria there are many Sub criteria, which in my study means that for each big method, it contains some detailed methods. Firstly, Replanting program includes: Bud Grafting Technique, Land Reclamation Technique, Seed Improvement Technique and Disease and Insect Management technique. Secondly, the Farmer's Knowledge Improvement method contains three smaller detailed methods: Experts directly teach on the farm, Lesson and experiences sharing through social media and Training Center Establishment. Thirdly, the Government Support and Institutionalization method includes Capital support program expansion, Calling for FDI (Foreign Direct Investment) and establishing a coffee research institute. Finally, the Business Efficiency method involves the Coffee wet processing technique, a Focus on producing processed coffee, Domestic market development, and High quality produced coffee factory expansion.

There are 5 pairwise comparison matrices in all: One for the criteria with respect to the goal

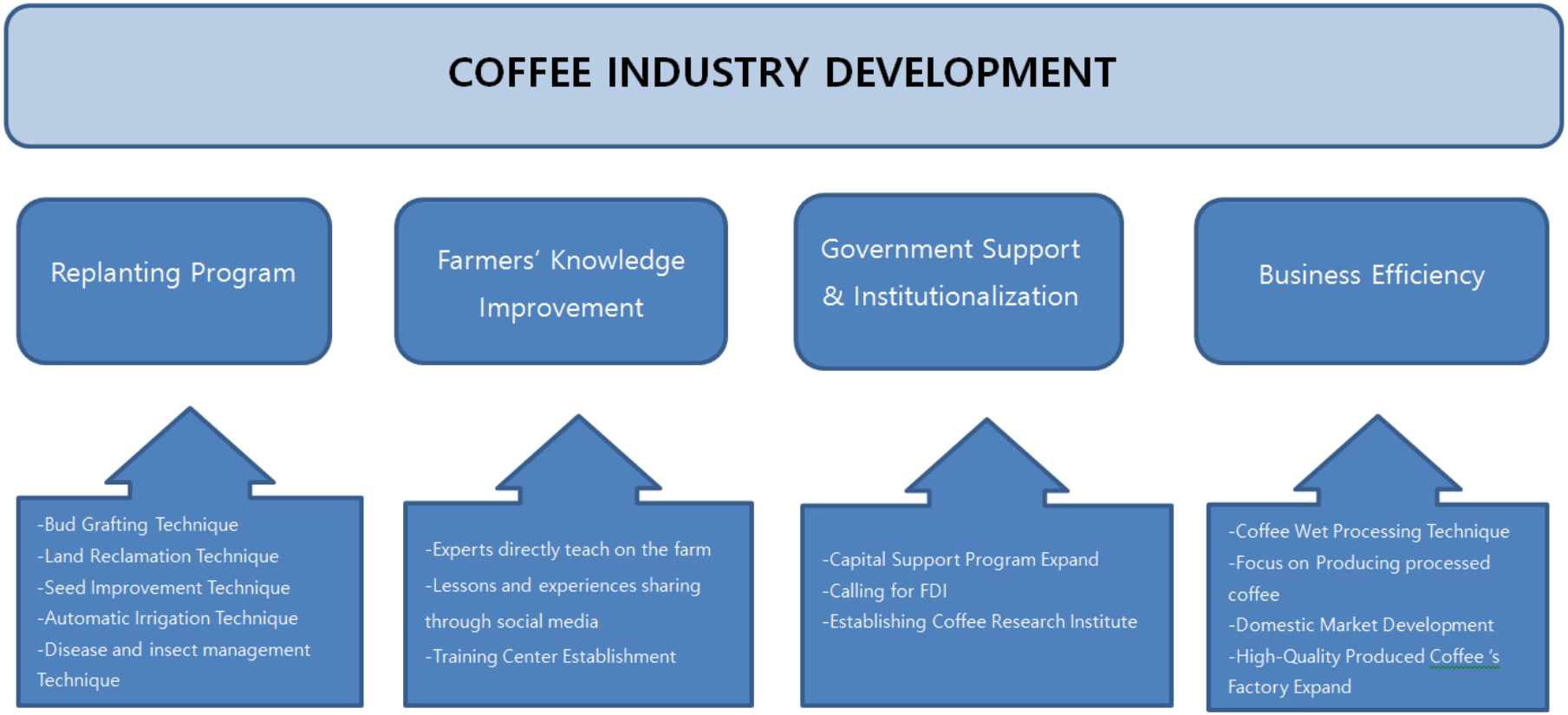
(Coffee Industry Development) which is shown here in Table 10, four for the subcriteria, the first one for the subcriteria under the Replanting Program that is given in Table 11; the second one is for the subcriteria under Famers' Knowledge Improvement that is shown in Table 12; the third one is for the subcriteria under Government Support and Institutionalization that can be seen in Table 13 and another one for the subcriteria under Business Efficiency that is given in Table 14

❖ Analysis Result of Criterion

Table 10: The Main Contents and Evaluation Items of Criterion for the Development of the Vietnamese Coffee Industry

Criterion	Main Contents
a) Replanting Program	- Bud Grafting Technique - Land Reclamation Technique - Seed Improvement Technique - Automatic Irrigation Technique - Disease and Insect Management Technique
b) Farmers' Knowledge Improvement	- Experts Directly Teach on the Farm - Lessons and Experiences Sharing through Social Media - Training Center Establishment
c) Government Support & Institutionalization	- Capital Support Program Expansion - Establishing Coffee Research Institute - Calling for FDI
d) Business Efficiency	- Coffee Wet Processing Technique - Focus on Producing Processed Coffee - Domestic Market Development - High-quality Produced Coffee's Factory Expand

Figure 14: AHP Model for Developing Vietnamese Coffee Industry



5.2 AHP Model Results and Analysis

First of all, according to the result in Table 11, it is clear to see that the Replanting Program is the most important method whose priority weight is 0.3, followed by Business Efficiency (0.27). The Farmers' Knowledge Improvement and Government Support and Institutionalization have an approximate weight, respectively 0.22 and 0.21, in which Government Support and Institutionalization has a minimum weight. It also means that in order to develop the Vietnamese Coffee Industry, the most important method that should be applied is the Replanting Program rather than the other 3 methods, although other 3 methods are also important. The second priority method is Farmer's Knowledge Improvement, following by Government Support and Institutionalization and Business Efficiency

Table 11: Result of expert's survey

Priority	Items	Weight
1st	Replanting Program	0.30
2nd	Business Efficiency	0.27
3rd	Farmers' Knowledge Improvement	0.22
4th	Government Support & Institutionalization	0.21

❖ Analysis Result of Sub-Criterion (Replanting Program)

However in each big method, there are many detailed methods inside. Table 12 shows us the result of pair comparisons of the Replanting Program and the Disease and Insect Management Technique. The first priority by weight is 0.29; holding the second position is the Seed Improvement Technique with a weight of 0.23 and the Automatic Irrigation Technique accounts for 0.22, approximate weight

with the Seed Improvement Technique. The two final positions in this ranking table are the Land Reclamation Technique (0.17) and the Bud Grafting Technique (0.09). The Disease and Insect Management Technique is the most important thing that needs to improve because nowadays due to climate change and the development of insects and diseases, productivity has been reduced which effects on farmer's income. According to the survey result from the Western Highlands Agriculture & Forestry Science Institute (WASI), 50% of total coffee trees are infected – a very high rate which effects much on coffee's production. Moreover, disease and insect management is based only on farmer's experience rather than applying techniques on it. Seed improvement technique is the second most important thing, a good quality seed can resist insects as well as growing well with less disease, from that the productivity can be improved from 1.5 to 2 times. Watering is also an important step to create high productivity and quality for coffee. When applying the Automatic Irrigation Technique, the amount of water will reduce 30% compared with the traditional watering method (the traditional watering method uses 570 liters/tree/year and the saving watering method which is also called the Automatic Irrigation Technique only uses 400 liters/tree/year).

Table 12: Evaluation Result of Replanting Program

Priority	Items	Weight
1st	Disease and Insect Management Technique	0.29
2nd	Seed Improvement Technique	0.23
3rd	Automatic Irrigation Technique	0.22
4th	Land Reclamation Technique	0.17
5th	Bud Grafting Technique	0.09

❖ Analysis Result of Sub-Criterion (Farmers' Knowledge Improvement)

As the Evaluation Result of Farmer's Knowledge Improvement which is shown in Table 13, it is clear that having experts directly teach about farming method is the most important method since it holds for 0.51 and another half is shared by Lessons and Experience sharing through social media (0.27) and Training Center Establishment (0.21). Actually, the farmers lack of knowledge about growing coffee, which we can see through the figure of 53% of total farmers not having participated in training lessons about preventing insects and diseases. Therefore, the Expert teach directly on the farm method is the most important one. This method helps farmers discover, compare and select the technique which is appropriate with their condition as well as local soil. This training method also helps farmers speak freely, raise the sense of initiative, no longer being timid, or shy like when they study in normal classes before. Although this method is effective, it takes lots of time and human resources; therefore, Lessons and Experience sharing through social media is also a good method that can replace for the method of Expert directly teach on the farm since the development of the Internet can help farmers to approach useful information quickly and easily

Table 13: Evaluation Result of Farmers' Knowledge Improvement

Priority	Items	Weight
1st	Experts directly teach on the farm	0.51
2nd	Lessons and experiences sharing through social media	0.27
3rd	Training Center Establishment	0.21

❖ Analysis Result of Sub-Criterion (Government Support & Institutionalization)

Table 14 shows the Evaluation Result of Government Support and Institutionalization, the highest weight is about Capital Support Program Expansion which accounts for more than 50% of the total

weight and the remaining 44% is shared equally for Establishing Coffee Research Institute and Calling for FDI with the same amount at 22%. During the period of producing coffee, capital is a necessary condition for farmers to produce coffee, but currently, it is very difficult for farmers to approach supported capital from the government. According to Mr Trinh Tien Bo, Director of Cultivation Department, Agriculture and Rural Development Department, said that the investment for growing coffee is from 100-150 million VND/ha, but based on the current capital support program, the bank only lends up to 80% while the remaining capital is the actual capital of the farmers that lead to the situation of farmers not having enough money to grow and produce coffee. Besides that, the government should establish a Coffee Research Institute which would be separate from the Western Highlands Agro-Forestry Scientific & Technical Institute.

Table 14: Evaluation Result of Government Support & Institutionalization

Priority	Items	Weight
1st	Capital Support Program Expansion	0.56
2nd	Establishing Coffee Research Institute	0.22
3rd	Calling for FDI	0.22

❖ Analysis Result of Sub-Criterion (Business Efficiency)

Finally, Table 15 shows us the Evaluation Result of Business Efficiency. The first position is the coffee wet processing technique whose weight is 0.39, following by Focus on producing processed coffee with 0.25. The third and fourth position is respectively Domestic Market Development (0.22) and High-quality produced coffee's factories expansion (0.14). After harvesting, there are two kinds of methods to process coffee: coffee dry processing (traditional method) and coffee wet processing (advanced method). If using the coffee dry processing method, coffee beans need to be dried under sunshine for 10 days and if it rains, the coffee beans will get moldy. With the wet processing method,

it only takes 3 days to dry coffee under sunshine and 5 to 6 days if drying in a greenhouse. The wet processing method also increases the quality of coffee beans that lead to an increase in the price of the coffee beans. Besides that, nowadays, Vietnam's coffee industry also needs to focus on producing processed coffee rather than focusing on producing and exporting green bean coffee since the value of processed coffee is three times higher than the value of green bean coffee.

Table 15: Evaluation Result of Business Efficiency

Priority	Items	Weight
1st	Coffee Wet Processing Technique	0.39
2nd	Focus on Producing Processed Coffee	0.25
3rd	Domestic Market Development	0.22
4th	High-quality Produced Coffee's Factory Expand	0.14

5.3 Conclusion

Through the analyzed figure above, we can see that in order to develop the Vietnamese coffee industry, 4 elements should be implemented: (1) Replanting Program, (2) Farmers' Knowledge Improvement, (3) Government Support and Institutionalization and (4) Business Efficiency. However, the Replanting Program is the highest priority method that farmers and experts should focus on. Also, in the Replanting Program there are five detailed methods which we need to concern; in which Disease and Insect Management Technique is the most important thing that supports to produce high quality as well as high quantity products. The second priority which is equally important with the Replanting Program is Business Efficiency; in it, the Coffee Wet Processing Technique is the most important thing. Knowledge is also an important element that helps to improve the quantity and quality of coffee products and Expert directly teach on the farm is the most important thing in this

method. Besides that, farmers and experts also need supports from the Government and Institutionalization in which Capital Support Expand is the highest priority thing we need to do.

In another way, we can say that with the purpose of improving the Vietnamese coffee industry, farmers and experts should improve based on the priority. First of all, we need to focus on the Replanting Program since Vietnamese coffee trees become old which mean that they have little defense against diseases and insects, so farmers should focus on the Management Technique to fight this problem. Besides that, researchers should improve the quality of seeds by examine good seeds which farmer use to grow coffee trees, land reclamation techniques and bud grafting techniques are also necessary. Secondly, the government should increase Business Efficiency by focusing and investing more in the Technique for Coffee Wet Processing since it will help to produce green coffee faster than the traditional method. Besides that, we also need to focus on producing extracted coffee, because coffee products have three times the value higher than green coffee; the Domestic market Expansion factor and high-quality produced coffee factory expansion are also two important things in this section. Thirdly, the government should have some policies to improve farmers' knowledge; the highest priority thing is that experts should come to the farm and share experiences with farmers about planting methods, how to prevent insects and diseases in order to improve the knowledge for farmers, sharing lessons and experiences through social media as well as establishing training centers are also necessary things that the government should do. Finally, concerning Government Support and Institutionalization, sometimes farmers want to expand their farms or invest in techniques for producing coffee but they do not have enough money to do that, which is why they need support from the Government, so the Government should create and expand the Capital Support Program, such as by lending money at a low interest rate to help farmers feel secure with their investments. Besides that, the Government should establish a Coffee Research Institute as well as call for Foreign Direct Investment in order to get more of a budget.

CHAPTER 6

SUMMARY AND POLICY IMPLICATIONS

As mentioned above, Vietnam is the second biggest country in the world regarding the production and export of coffee. Vietnam mainly produces and exports green bean coffee rather than processed coffee where the proportion is 90% green bean to only 10% processed. In general, the amount of production and export of green bean coffee is increasing year by year. Even though the value of one unit of processed coffee is three times higher than the value of one unit of green coffee; but Vietnam now only focus on producing green bean coffee and that is the biggest problem of the Vietnamese coffee industry. Besides the continuing increase in the production amount of coffee, the world coffee consumption also has increased continuously during the last 40 years with the average increase rate of 1.6% per year and it is expected to increase quickly in the future. This is a good opportunity for the Vietnamese coffee industry when changing from a focus on producing and exporting green coffee to concentrating on producing and exporting processed coffee which would bring a higher return. Vietnam has lots of advantages in developing the coffee industry in a new production direction – processed coffee. In Vietnam, there are a small number of coffee processing companies, only 97 factories for green coffee, 160 companies for ground coffee and only 6 companies for instant coffee; but only 10% of it applied the TCVN 4193:2005 standard. Besides that, small-scale model business is also an issue which needs to be solved.

In this study, SWOT analysis is used to clarify Strength, Weakness, Opportunity and Threat of the current Vietnamese coffee industry. From that we have an overview about Vietnamese coffee, such as which aspects need to be improved, which aspects need to be eliminated, which problems Vietnamese coffee may be faced with and which opportunities for the Vietnamese coffee industry in the world market. Also, the AHP model and Logit model have been applied to analyze data collected from experts and customers. There are many solutions and methods which can be applied to develop the Vietnamese coffee industry; in order to decide which method needs to be enacted first and which method needs to be enacted later, I applied the AHP model. And in the view of consumers, I used the

Logit model to clarify which factors effect on decision making when purchasing Vietnamese coffee. From that, through this research, the viewer can understand well about Vietnam's coffee industry as well as the way to improve current problems existing in this coffee industry from both points of view: experts and consumers. Based on the results of AHP model, we can conclude that in order to develop the Vietnamese coffee industry, the first priority is the Replanting Program in which Disease and Insect Management is the most important one. The government also needs to increase business efficiency, farmer's knowledge as well as support regarding capital for farmer. On the other hand, by applying the Logit model to analyze, we can know what people think about Vietnamese coffees, who are the target customers and so one.

In the next few years, the Vietnamese coffee industry will develop more and more, not only becoming famous for green bean coffee but also famous for processed coffee, such as instant coffee, ground coffee and so on. Vietnamese coffee is improving about quantity and quality day by day by applying more technology in production rather than the current manual method. In Korea, Vietnamese coffee brands have gradually become familiar to Korean and they appear to have a tendency to buy Vietnamese coffee in the future with the evidence of 50% of respondents said that they know about Vietnamese coffee and more than 55% of them said that they will buy and consume Vietnamese coffee. In the near future, with higher qualitative coffee bean, Vietnamese coffee will export more to the Korean market.

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