

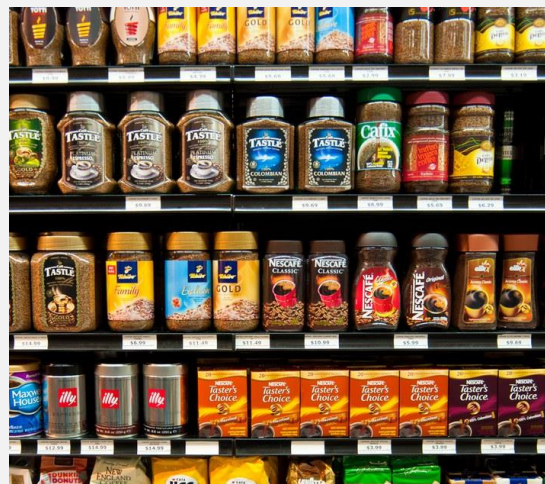
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# WORLD COFFEE ANALYTICS

## CHAPTER ONE: INTRODUCTION

October 2018

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A MOON ISLAND PROJECT – DON'T FORGET TO LOOK UP

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# INTRODUCTION

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We are excited to introduce the World Coffee Analytics project. Our interest is in exploring the global coffee industry all the way through the value chain, from the growers to the consumers. We do this because the coffee industry has many characteristics that make it unique:

## **Coffee is Global**

Coffee is a key global crop and the second most valuable commodity exported by developing countries. The green coffee industry is worth around US\$20 billion annually, while global category sales total \$200 billion. Worldwide, around 2.25 billion cups of coffee are consumed each day.

## **Coffee has Rich History**

Coffee has been enjoyed all over the world since the 17<sup>th</sup> century, and our societies have evolved drastically since humans took their first sips. In a time where we have little in common with our ancestors, even those from a generation ago, coffee is one of few industries that can connect us with our past. With so much history, coffee is a proven staple of human culture, and one that is not likely to disappear.

## **Coffee is Changing Rapidly**

Threats like coffee rust and climate change are challenging growers all over the world. Small specialty coffee roasters are competing more intensely with major bulk roasters and distributors, and the industry has responded with increased M&A activity. Keurig and other convenient brewing equipment companies are changing the way millions of people enjoy their cup of coffee every day. The coffee industry is much different now than it was even a decade ago.

## **Coffee is a Frontier for Social Justice**

Coffee is an agricultural commodity that belongs to a broader category of “tropical commodities” which, because of their ecology, are grown in the global south and exported to the global north. As a result, the coffee industry, and other tropical commodities, are of particular interest to development economists and social activists.

## **Chapter 1: Introduction**

For the first official World Coffee Analytics report, we wanted to give a brief introduction to important concepts in the coffee industry. We intend to then dive deeper into specific topics of interest in subsequent chapters. This introduction gives a definition of what coffee is, discusses the history of coffee and introduces modern processes and trends in coffee production, processing and consumption. Please enjoy this edition of World Coffee Analytics.

# WHAT IS COFFEE?

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## Coffee is a Fruit

The coffee that we drink is actually the seed of a fruit called a coffee cherry. The coffee tree grows best in rich soil, with mild temperatures, frequent rain and shaded sun. These conditions are typically found between latitudes 25 degrees North and 30 degrees South. The regions of Latin America, Africa and Asia that are located within that latitude range are commonly referred to as the bean belt.



## Coffee is a Drug

Coffee is one of the most common sources of caffeine in the world. Caffeine is a drug that stimulates the brain and central nervous system, helping users avoid the feeling of tiredness. That's why, today, coffee is most commonly consumed in the morning and during situations that require focus. However, decaffeinated coffee has been growing in popularity among users who "just like the taste."



## Coffee is an Art

The coffee shop has historically been a place for creative thinking. Great philosophers like Voltaire would often frequent coffee shops in the 17<sup>th</sup> and 18<sup>th</sup> centuries. However, the opening of the first Starbucks in 1971 marked a transition in the industry towards transparency about the coffee process. This led to things like the **Third Wave** of coffee, where consumers treat coffee more like fine wine than a traditional commodity.



# COFFEE HISTORY

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*Coffee was discovered in the Kaffa region of Ethiopia in 850 AD.*



*Café Procope in Paris was the first literary coffee shop. Patrons included Voltaire and Napoleon Bonaparte.*



*The world's first Starbucks opened in Seattle in 1971.*

**850**

An Ethiopian herdsman named Kaldi discovers coffee while observing his goats interact with the fruits of a coffee tree.

**1475**

The first coffee shops open in Constantinople. They become hotspots for lively discussions and political debates.

**17<sup>th</sup> Century**

A smuggler brings coffee seeds from Mecca to India. The first coffee houses are opened in Europe.

**1727**

Brazil sends Colonel Francisco de Melo Palheta to secretly obtain coffee seeds from French Guiana. Brazilian coffee is born.

**1800**

Brazil becomes the world's largest coffee producer, a title it still holds today.

**1920**

Coffee sales in the US explode after congress enacts the Prohibition.

**1971**

Starbucks opens its first store in Seattle Washington. They would go on to revolutionize the coffee consumer experience.

# MODERN SUPPLY CHAIN

The coffee supply chain can be described in 9 general steps.

## Production

### 1. Growing

Coffee is grown at high altitudes near the equator in areas that receive a lot of rainfall. There are two species of coffee plant that supply most of the world's coffee: Arabica and Robusta.

### 2. Harvesting

Coffee plants begin bearing significant quantities of fruit in their 5<sup>th</sup> year after planting. The plants are mostly hand-picked during harvest, except in Brazil, where they are mechanically "strip-picked."

### 3. Processing

In this step, the fruit of the coffee cherry is removed in one of two ways:

1. Dry (Natural) Processing: Beans are sorted and dried in the sun. After several weeks, the fruit can be easily removed from the seed. This is a more labor intensive process, but it produces a more flavorful coffee.
2. Wet (Washed) Processing: Coffee is submerged, fermented and scrubbed so that the pulp falls off the seed. This produces a more consistent coffee with less fruity flavor.

## Midstream

### 4. Roasting

In this step, the green coffee seed is transformed into what we know commercially as the coffee bean. By applying heat, chemical reactions inside the bean turn starches into sugars and acidity weakens. Most coffee is roasted in large commercial roasters, but home roasting is possible with smaller machines. It is a step where the process starts to become segmented based on consumer preferences.

### 5. Packaging

Once the coffee is roasted, it needs to be stored in a cool, dark, dry and airtight container. Most roasters will also add their own branding so that their unique flavor can be distinguished by consumers.

### 6. Shipping

Once packaged, the coffee is shipped quickly, either to restaurants and hotels, or directly to consumers. The coffee should ideally be consumed within a couple weeks of roasting for maximum flavor and freshness.

## Consumption

### 7. Grinding

Grinding is a critical part of the process. Coffee is ground to a very specific size that depends on how it will eventually be brewed. The finer the grind, the more "extraction" per bean can be obtained during brewing. But more extraction is not always better. Pressure methods of brewing will often require the finest grind size, while steeping methods will require the coarsest grind size.

### 8. Brewing

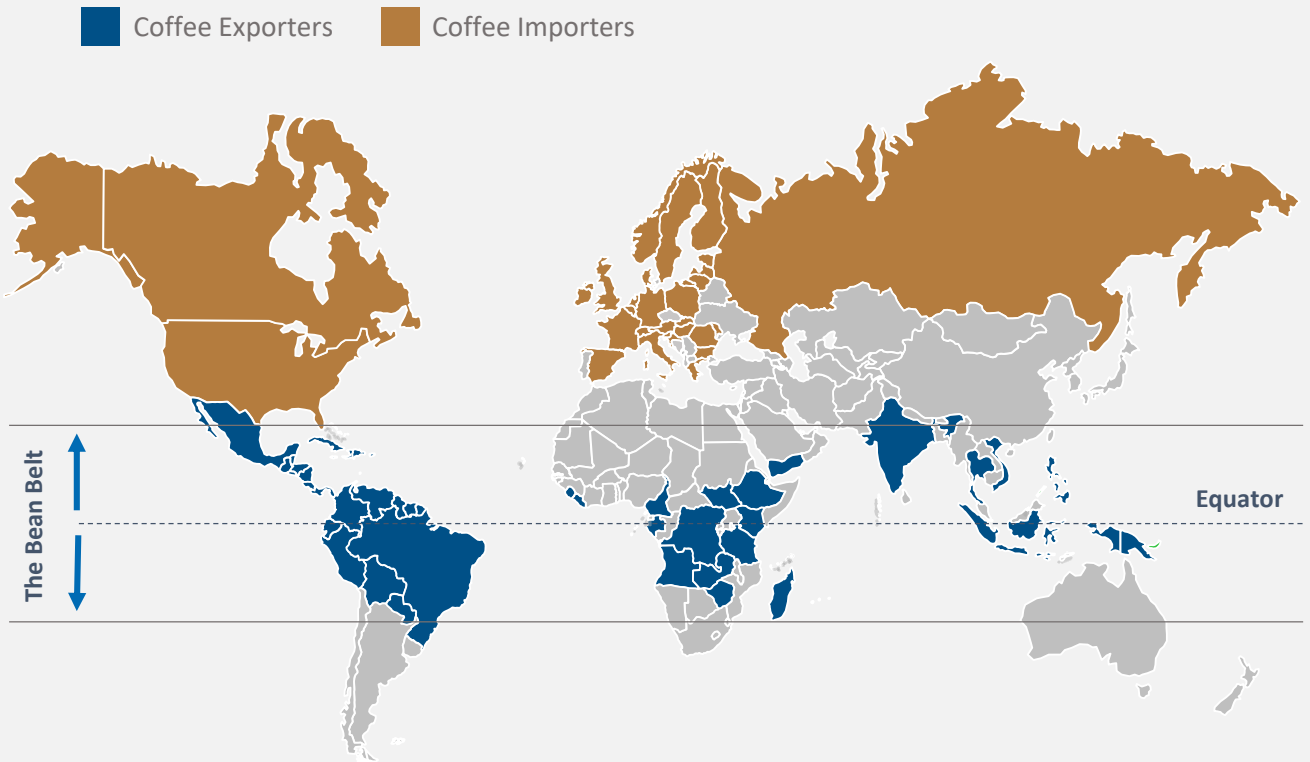
Brewing introduces the most choices into the coffee process. In this step, the ground coffee comes into contact with water for anywhere from 30 seconds to 24 hours depending on the selected method. Popular brewing methods include:

- Pressure Brewing
- Steeping
- Drip Brewing
- Cold Drip Brewing

### 9. Drinking

# THE WORLD OF COFFEE

## World Coffee Map: Production & Consumption



**Brazil** – Brazil is the world's largest producer of coffee at 30% of global production. Large, flat farms have allowed Brazilian coffee farmers to use commercial practices such as strip picking.

**Indonesia** – The size of coffee estates in Indonesia are in decline as farmers have shifted their focus to palm oil, rubber and cocoa, all of which generate premium return internationally.

**Ethiopia** – Ethiopia is the birthplace of Arabica coffee. It is grown by over 4 million smallholder farmers and employs 15 percent of the population at different points along the value chain.

**Colombia** – Colombian production was thrashed by coffee rust in recent years. Now, about 80% of coffee area is planted with rust resistant varieties, compared to 35% in 2010.

**Italy** – Italians have long favored consumption of espresso from local independent coffee shops. In 2016 coffee consumers in Italy were estimated at around 87% of the total population.

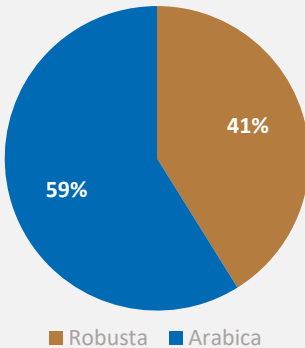
**United States** – The United States is the leading importer of green coffee in the world. Top exporters into the US are Brazil, Colombia, Vietnam and Guatemala.

**Japan** – Japanese coffee consumption has soared during last 40 years. The country is now third in terms of total consumption among importing countries.

**Russia** – The Russian coffee market is still considerably young. One of the reasons is that Russia is traditionally a tea drinking country, but coffee consumption is on the rise.

# MODERN PROCESSES: GROWER

**Coffee Production by Variety**  
(5-year average)



## Varieties

There are two main species of coffee that are produced globally: *Coffea arabica*, known as Arabica coffee (60%), and *Coffea canephora*, known as Robusta coffee (40%). Arabica coffee is used for more premium, specialized coffees. Robusta coffee is a lower grade coffee with a heavy flavor and a stronger caffeine content. Robusta coffee beans are also grown at lower altitudes (between sea level and 2,000 feet) and are more resistant to disease and weather, while Arabica coffee beans are commonly grown at higher altitudes and are less robust, meaning they mature more slowly. Robusta coffee production is heavily concentrated in Brazil and Vietnam, while Arabica coffee production is concentrated in Latin America and Africa. The Arabica species is made up of many varieties, or cultivars—distinct types that are able to sexually reproduce with one another. World Coffee Research estimates that more than 80% of Arabica coffee production worldwide is derived from Typica and Bourbon-related varieties. These varieties are associated with standard or high cup quality, but are susceptible to the major coffee diseases.

## Coffee Processing



### Dry (Natural) Process

Beans are sorted and dried naturally in the sun until the fruit falls off. Dry processing is more labor intensive but produces a more flavorful coffee.



### Wet (Washed) Process

Coffee is submerged, fermented and scrubbed so that the pulp falls off the seed. This produces a more consistent but less flavorful coffee.

## Harvesting & Crop Year

Most of the world's coffee is harvested by hand in up to seven harvesting cycles, since not all coffee cherries ripen at the same time. In countries with flatter land and larger farms, the coffee cherries can be harvested mechanically (called strip picking), but the resulting coffee is lower quality. The International Coffee Organization organizes coffee producing countries by their **crop year**. A crop year is a period of 12 months commencing on the first day of the month in which the harvesting of the crop begins. The crop years currently used by the organization commence on April 1st, July 1st and October 1st.

## Coffee Cooperatives

Despite huge advancements in the coffee industry, most of the 25+ million coffee farmers work on small farms of less than 6 hectares (1 hectare equals 2.47 acres). With billions of coffee drinkers and only a handful of large companies controlling the market, these small coffee producers are left with very little bargaining power. To mitigate competitive pressures in the industry, growers in large production regions have come together to form cooperatives. In cooperatives, growers share information and other resources with their fellow members to advance production practices and improve grower bargaining power by consolidating the marketing and shipping of product.



# MODERN PROCESSES: MIDSTREAM

## Coffee Trading

- A. **Grading:** Green coffee is graded and classified for export so that buyers who are looking for a differentiated bean can pay premium prices to get it. However, there is no universal grading and classification system. Each producing country has its own, which it may also use to set (minimum) standards for export. Grading and classification are usually based on some of the following criteria: altitude and/or region; variety; process type; bean size; defects; roast appearance and cup quality; bean density.
- B. **Transporting:** Coffee importers and traders assist the flow of coffee from the exporting country to the roaster. Traders and dealers take responsibility for discharging the coffee from the incoming vessel and make all the necessary arrangements to have the coffee delivered to the roaster.

## Coffee Roasting

Coffee roasters transform the seed of a coffee cherry, known as green coffee, into the brown coffee beans we are used to seeing in stores. Large roasters use specialized machines that function like convection ovens to bring the green beans to just above 400 degrees Fahrenheit, at which point sugars in the beans start to caramelize. Beyond 400 degrees, roasters carefully balance sweetness and acidity with bitterness and body. This is a segment of the coffee value chain that is dominated by big players (the top 10 roasters account for 35% of volume). However, there has been a trend towards smaller, specialty roasters in the last decade. This trend has sparked a period of excited merger and acquisition activity, where large companies like Nestle buy out specialty roasters like Blue Cottle Coffee.

## Coffee Roasts Guide

-  **Green Coffee:** Purchased by roasters and stored until roasting
-  **Yellowing Phase:** At just under 400° F, the beans begin to yellow
-  **Light Roast:** Light brown color and fruity acidic flavor
-  **Cinnamon Roast:** Cinnamon color with low body and light acidity
-  **Medium Roast:** Proclaimed as the most preferred roast in the US
-  **High Roast:** Balanced bitterness and acidity
-  **City Roast:** Varietal character of the bean can be clearly tasted
-  **Full City Roast:** Heavy body and bitterness
-  **French Roast:** Good for espresso drinks
-  **Italian Roast:** Good for espresso drinks

## Popular Brands



# MODERN PROCESSES: CONSUMER

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## Pressure Brewing



**Time:** 20-30 seconds  
**Grind Size:** Fine  
**Skill Required:** Commercial machines require extensive training  
**Resulting Brew:** Strong and flavorful

## Drip Brewing



**Time:** 5 minutes  
**Grind Size:** Medium  
**Skill Required:** Easy to medium depending on level of control desired  
**Resulting Brew:** Rich flavor with no bitterness

## Steeping



**Time:** 4 minutes  
**Grind Size:** Coarse  
**Skill Required:** Low to moderate skill required for basic brewing  
**Resulting Brew:** Aromatic and flavorful

## Cold Drip Brewing



**Time:** 10-24 hours  
**Grind Size:** Coarse  
**Skill Required:** Once cold dripper is set up, little skill is required  
**Resulting Brew:** Intense flavor, smooth aftertaste

## The Three Waves of Coffee

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### First Wave of Coffee

The **First Wave** made coffee easily accessible at home to the average consumer with innovations like instant coffee. New coffee-making methods and wider availability of coffee meant more Americans were drinking coffee than ever before. However, little attention was paid to coffee quality, so the coffee being produced and sold during the first wave didn't taste good.

### Second Wave of Coffee

In 1966, Peet's Coffee and Tea opened its first store in Berkeley, California. Starbucks followed with its first store in Seattle, Washington in 1971. Those stores and others like them promoted dark-roasted coffee made from high-quality beans and were more transparent about their supply chain. These practices quickly caught on with consumers and would go on to define the **Second Wave** of coffee.

### Third Wave of Coffee

Coffee connoisseurs began adopting the mindset of wine and craft beer enthusiasts in defining and describing the unique qualities of specific coffee beans, and the factors that affect those qualities. These include the climate of a coffee-growing region, the altitude at which the coffee is grown, and the method used to process the beans. Roasters also began to highlight flavor notes that could be detected in roasts.

# PRODUCTION TRENDS

## Total Production from Major Exporting Countries (in 000s of 60kg bags)

	2014	2015	2016	2017	5-Yr Growth	10-Yr Growth	20-Yr Growth
<b>April group</b>	<b>68,790</b>	<b>70,857</b>	<b>75,457</b>	<b>68,598</b>	<b>-9.6%</b>	<b>29.4%</b>	<b>73.8%</b>
Brazil	52,299	52,426	56,764	51,000	-8.0%	30.9%	95.0%
Indonesia	10,862	12,535	11,491	10,902	-16.6%	40.2%	43.1%
Peru	2,883	3,304	4,223	4,280	-3.8%	39.7%	121.7%
<b>July group</b>	<b>1,793</b>	<b>1,986</b>	<b>1,933</b>	<b>1,805</b>	<b>-20.2%</b>	<b>-19.9%</b>	<b>-44.9%</b>
Tanzania	753	930	846	750	-34.8%	-7.4%	20.2%
Dominican Republic	397	400	412	400	-18.1%	-14.0%	-57.5%
Haiti	343	341	342	340	-2.8%	-5.4%	-21.3%
<b>October group</b>	<b>77,976</b>	<b>80,718</b>	<b>81,657</b>	<b>88,157</b>	<b>20.6%</b>	<b>32.2%</b>	<b>54.8%</b>
Vietnam	26,500	28,737	25,540	29,500	26.1%	79.8%	322.7%
Colombia	13,339	14,009	14,634	14,000	41.0%	11.9%	14.6%
Honduras	5,268	5,786	7,457	8,349	78.2%	129.4%	225.6%
Ethiopia	6,575	6,714	7,297	7,650	22.7%	28.2%	150.3%
India	5,450	5,800	5,200	5,840	10.1%	33.7%	53.5%
<b>Total</b>	<b>148,559</b>	<b>153,561</b>	<b>159,047</b>	<b>158,560</b>	<b>4.8%</b>	<b>30.1%</b>	<b>59.1%</b>

© International Coffee Organization

Since the 1990s, global coffee production has increased by an average annual rate of 2.1%. Much of the growth has come from Brazil and Vietnam.

**Brazil:** The Agricultural Trade Office in Sao Paulo (ATO) projects Brazilian 2018/2019 crop to set a record 60.2 million bags thanks to an on-year of the biennial production cycle, favorable weather and generally improving crop management techniques. The additional supply will fuel a sharp rebound in exports and boost global ending stocks.

**Vietnam:** Vietnam is projected to produce another record crop in 2018 with 29.9 million bags. Vietnam's coffee crop is heavily oriented towards Robusta coffee, accounting for nearly 95 percent of total output. Four seasons ago, farmers started switching from coffee to other cash crops, such as black pepper, avocado, and passion fruit, in order to generate higher income. However, with alternative commodity prices at recent lows, there is a movement back to coffee.

**Colombia:** In the last decade, yields have increased about 30 percent due largely to a renovation program that replaced trees suffering from coffee rust with disease-resistant varieties (see page 16). The program also reduced the average age of coffee trees from 15 to 7 years, further boosting yields.

**Indonesia:** Robusta output is expected to reach 9.7 million bags on favorable growing conditions in the lowland areas of Southern Sumatra and Java, where approximately 75 percent of Robusta is grown. Arabica production, which is more concentrated in the Northern Sumatra Region, is estimated at 1.4 million bags, which is up slightly from last year.

**Ethiopia:** While coffee production has increased over the last decade, there are a number of constraints still holding the sector back, including poor tree management practices, low-yielding older trees, worsening soil conditions, rising temperatures, and increasingly erratic weather conditions.

# MIDSTREAM TRENDS

## Transition to Specialty Continues

There continues to be a movement in the industry away from a roast and ground model that isn't concerned with the where how and why of its beans, towards a whole bean model that tells a very clear story about its coffee. Even some of the largest coffee roasters, like Nestle and Lavazza, have launched premium brands and supply chain initiatives, like the Nespresso AAA Sustainable Quality Initiative.

## Top 10 Coffee Roasters by Volume (2014-2018)

2014			2018		
1.	Nestle	(860,000 MT)	→	1.	Nestle (870,000 MT)
2.	Mondelez**	(500,000 MT)	→	2.	JDE** (710,000 MT)
3.	DEMB 1753**	(360,000 MT)	→	3.	Smuckers (350,000 MT)
4.	Smuckers	(300,000 MT)	→	4.	Starbucks (290,000 MT)
5.	Strauss	(230,000 MT)	→	5.	Strauss (285,000 MT)
6.	Starbucks	(180,000 MT)	→	6.	Lavazza (200,000 MT)
7.	Tchibo	(180,000 MT)	→	7.	UCC (190,000 MT)
8.	UCC	(150,000 MT)	→	8.	Tchibo (180,000 MT)
9.	Lavazza	(150,000 MT)	→	9.	MZ (145,000 MT)
10.	KGM	(98,000 MT)	→	10.	KGM (90,000 MT)

\*\* Mondelez and DE Master Blenders merged in 2015 to form Jacobs Douwe Egberts (JDE).

## High Merger & Acquisition Activity

Like any industry, as growth stagnates among larger players, they acquire smaller companies to boost sales. With specialty roasters slightly disrupting the growth of more established companies in recent years, M&A activity has picked up considerably. JAB Holding Company has been the most active in the M&A world, acquiring Peet's Coffee and Tea, Caribou Coffee, Mighty Leaf Tea, Stumptown Roasters, Intelligentsia and, perhaps most importantly, Keurig Green Mountain, all between 2012 and today. Nestle has also been busy with specialty acquisitions like Blue Bottle Coffee and Chameleon Cold Brew. Finally, Coca Cola made waves in the coffee world when it acquired Costa Coffee this summer.

## Major Coffee Acquisitions Between 2012 and 2018

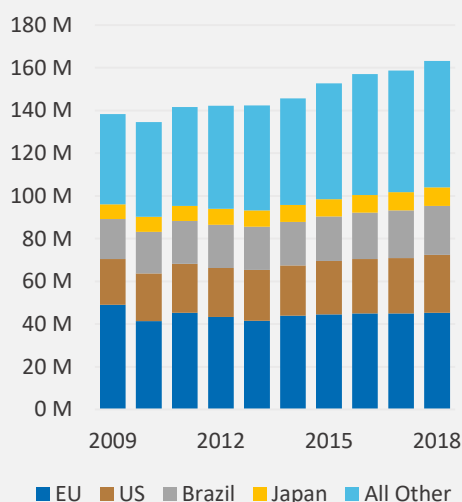
Target Company	Acquiring Entity	Transaction Value (mm)	Transaction Year
Keurig Green Mountain	JAB Holding	\$13,900	2016
DE Master Blenders	JAB Holding	\$9,800	2013
Panera Bread	JAB Holding	\$7,500	2018
Starbucks License Agreement	Nestle	\$7,150	2018
Costa Coffee	Coca Cola	\$5,100	2018
Pret A Manger	JAB Holding	\$1,900	2018
Krispy Kreme Doughnuts	JAB Holding	\$1,350	2016
Peet's Coffee	JAB Holding	\$1,000	2012

# CONSUMPTION TRENDS

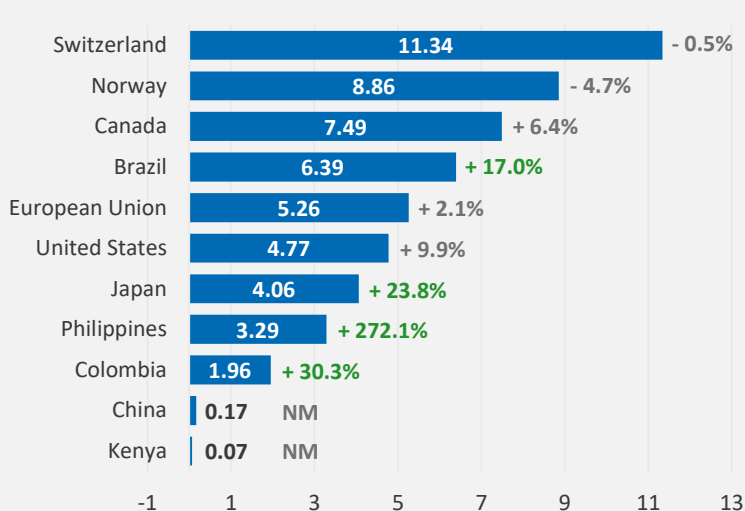
## Growing Consumption in Exporting Countries

Global coffee consumption has grown by an average of around 2.2% per year since the early 2000s. Some of the most impressive growth has come from coffee producing countries, like Brazil, Ethiopia, Vietnam and Colombia. As incomes rise, consumers are switching from cheaper beverages like tea. They also are demanding higher-quality beans, often the same varieties used by big roasters in the U.S. and Europe. In fact, U.S. importers of Brazilian beans say they are paying higher prices for premium coffees because they must compete with new buyers in Brazil.

**Domestic Coffee Consumption**  
(60 kg bags)



**Per Capita Coffee Consumption**  
(kg per capita and 10-yr growth)



## Key Findings from the 2018 NCA National Coffee Drinking Trends Report

- The number of people drinking coffee within the past day is 64 percent, the highest level since 2012. This follows growth from 57 percent in 2016 to 62 percent in 2017.
- In the last six years, past-day soft drink consumption has dipped 15 points to 35 percent.
- Past-day consumption of espresso-based, gourmet and non-gourmet beverages held steady at 24 percent, 16 percent and 31 percent respectively.
- Past-day consumption of non-espresso-based beverages was 7 percent.
- Past-week consumption of nitro coffee moved up one point to 4 percent.
- 79 percent of people drinking coffee within the past day brewed coffee at home, compared to 75 percent in 2017 and 84 percent in 2012.

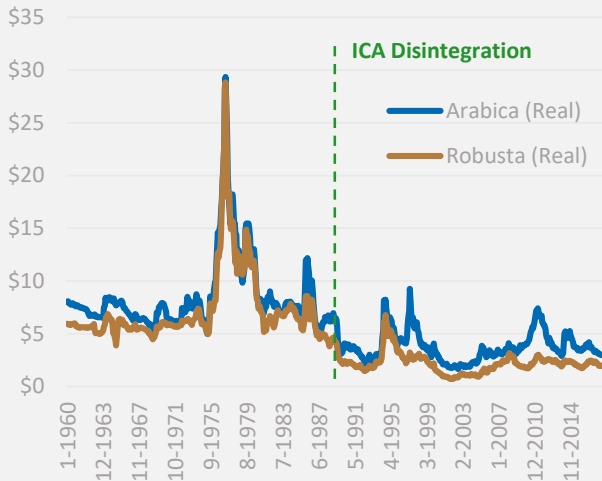
“Tracking U.S. coffee consumption for over 60 years, the National Coffee Drinking Trends study first logged more than 75 percent of Americans aged 18+ drinking coffee on any given day. These numbers slowly declined until the mid-1990s, when the percentage of Americans aged 18+ drinking coffee on any given day dipped below 50 percent. Since then, the numbers have rebounded and slightly retracted.”

# COFFEE TRADE

## Coffee Trade & Futures Contracts

The world price of coffee is set according to the New York “C” Contract Market for Arabica and the London International Financial Futures and Options Exchange (LIFFE) contract for Robusta. Futures contracts are an agreement between buyers and sellers of commodities to transact at some point in the future (between 1 month and 18 months from today) at a price set today. Futures markets benefit both buyers and sellers of commodities by eliminating concern that the market will move in a direction that will adversely affect their bottom line. Producers will prefer to lock in a price set today to mitigate the risk that coffee prices have fallen when the coffee is eventually sold, while buyers, such as Nestle or Starbucks, will prefer to lock in a price set today to mitigate the risk that coffee prices have risen by the time the coffee is eventually needed. Speculative traders will also buy and sell futures contracts to capitalize on market movements in commodities and other goods sold on futures markets.

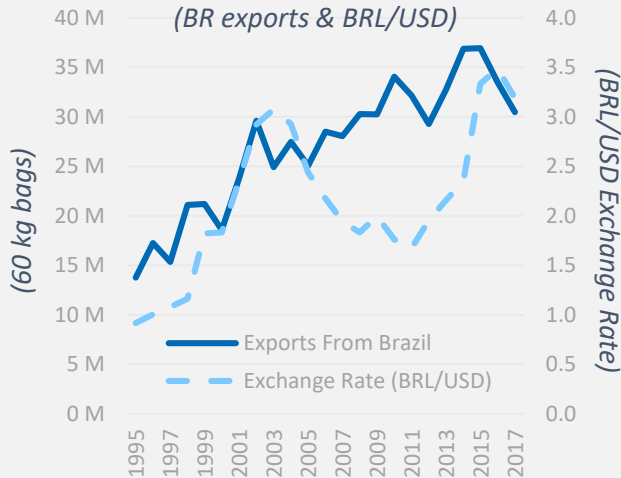
**Real Monthly Coffee Prices: 1960-2018**  
(Real USD/kg)



## The International Coffee Agreement

In 1962, 66 countries created the International Coffee Agreement under the authority of the United Nations. According to the agreement, coffee producers were given export quotas based on their historical export volume and coffee inventories, resulting in an increase in and stabilization of coffee prices. However, in 1989, the ICA disintegrated and large foreign buyers began to purchase coffee directly from farmers. With no supply controls, the industry saw a large production boom. The rapid increase in production caused global prices to crash. As a result, many countries that relied heavily on coffee exports implemented agricultural policies that subsidized high-cost producers.

**Exports and Exchange Rates**  
(BR exports & BRL/USD)

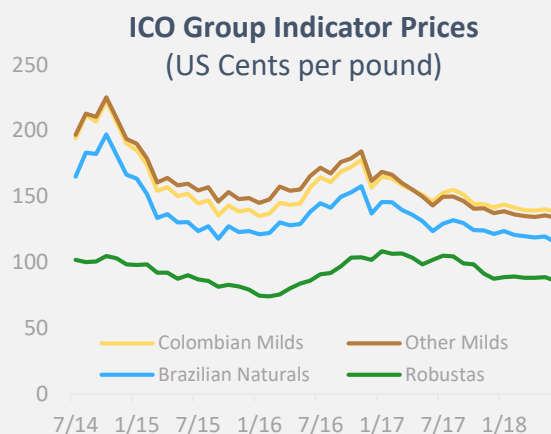
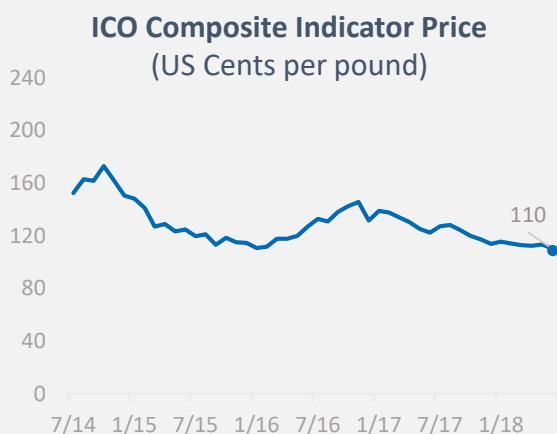


## Impact of Exchange Rates

Exchange rates between currencies in exporting countries and the US dollar (the currency that coffee is priced in on international markets) affect the relative value paid by buyers and received by sellers. For example, a strong dollar relative to the Brazilian real means Brazilian sellers of coffee are able to convert the US dollars they receive as payment into more of their home currency. In a this way, a stronger dollar, all else equal, raises the price of coffee experienced by Brazilian sellers. As a result, Brazilian coffee producers are more inclined to sell their coffee on international markets as opposed to the domestic market, and Brazilian coffee exports rise.

# COFFEE PRICES

There is no single price for 'coffee' because coffee, being a product of nature, is not a homogeneous product. However, broadly speaking, international coffee-pricing can be divided up as follows: physicals – prices for physical coffee; indicators – prices that track broad groups of physical coffee; futures – prices that are locked in for a later date based on specified qualities; differentials - a system linking physical prices to futures prices.



## 4 Important Drivers of Global Coffee Prices

### Weather / Crop Size

Weather affects the size of the growing crop. Together, the growing crop and global beginning stocks make up annual coffee supplies. If weather limits the size of the crop, supplies will be lower than originally anticipated and prices will move upward. Weather in Brazil (the world's largest producer) is one of the most important drivers of price volatility in any given season.

### Geo-Political Factors

With the major coffee-producing nations being emerging markets, the supply of coffee can be easily impacted by the unstable political situations that often characterize those nations. The International Coffee Agreements, which regulated the supply of coffee until the late 1980s, are a good example of how geopolitical events can affect coffee prices.

### Speculator Effect

As previously mentioned, traders will buy and sell futures contracts for a given commodity based on speculation that the market will move in their favor. Many researchers hold the view that commodity speculators make futures markets more volatile than they should theoretically be based on supply/demand models. However, the findings are mixed about the actual size of this effect.

### Enterprise Buying

The top 10 coffee roasters in the world account for roughly 35% of the total volume. Thus, if these huge buyers follow trends together, they have the capability to significantly move prices. For example, improvements in roasting technology have allowed roasters to remove some of the harsh flavors from low quality Robusta beans, resulting in increased demand for Robusta and decreased demand for Arabica.

# HEADLINE INDUSTRY CONCERNS

## Climate Change & Deforestation

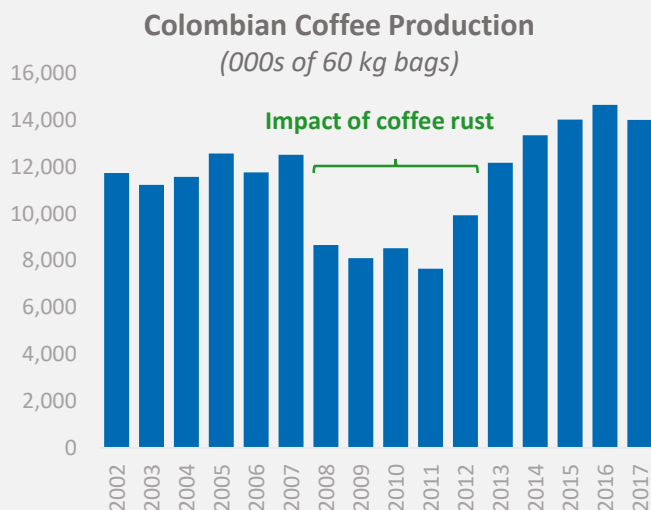
In the equatorial belt where coffee cultivation takes place, climate change is significantly impacting yields and quality. Arabica coffee requires a climate with annual mean temperatures of about 20°C and over 1200 mm of annual rainfall to be economically viable. Temperatures over 30°C for extended periods reduce yields, while frosts lasting a few days damages or even kills the tree. Because Arabica coffee requires such a specific climate within narrow limits, growers could see yield and quality fall as the climate changes. Because of the importance of coffee to the rural economies of so many developing countries, researchers have been trying to quantify the potential impacts of a changing climate.

What they have found is that in the next few decades, we may see coffee production undergo dramatic shifts away from the equator and further up mountains. Some studies have found that rising CO2 levels may boost the growth and vigor of the coffee plant, but there is no guarantee this ‘fertilization effect’ will offset the risks imposed by a more hostile climate. Brazil and Vietnam, the two largest producers, appear set to experience substantial losses. Conversely, the projected climate of 2050 seems to favor the highlands of East Africa, along with Indonesia, Papua New Guinea, and the Andes.

According to several research papers, 60% of the land projected to be suitable for coffee production in 2050 is currently forested. In addition, only 20% of this land is under any formal protection. In nearly all countries where coffee production is expanding, new coffee crop lands are mostly created by deforestation. There is a serious worry that losses of viable coffee area will push up coffee prices and encourage deforestation.

## Coffee Rust

Coffee Rust is a leaf disease caused by the fungus *Hemileia vastatrix*. It is an obligate parasitic fungus that must take energy and nutrients from a host. In the first stage of the disease, a spore lands on a leaf where it can sit until conditions are suitable for germination. At that point, it enters the leaves through the stomata, producing small yellow lesions that appear on the back of the leaf. In the final stages, defoliation occurs and can lead to the death of the branch and even the tree.



Between 2008 and 2012, Colombian coffee production was significantly impacted by a coffee rust outbreak thanks to several climatic and crop management factors that allowed the disease to spread rapidly at the time. Production recovery during the past several years has been largely successful thanks to a replanting program that renovated more than 45 percent of the 940,000 hectares of coffee trees. An estimated 80 percent of coffee area now has rust-resistant varieties, up from just 30 percent before the crisis. The program also reduced the average age of coffee trees from 15 to 7 years, further boosting yields.



# CLOSING THOUGHTS

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This report is the first of several standard reports that will be released as part of the World Coffee Analytics Project. In it, we introduced a number of important aspects of the coffee industry, such as cooperatives, varieties, roasters, and brewing methods. We also reviewed some of the trends that have shaped the industry in past decades. We will continue to develop our understanding of these concepts as we follow up with new reports and explore different verticals in the space. Some of our key findings in this report were:

- The coffee that we drink is actually the seed of a fruit called a coffee cherry.
- Coffee is believed to have been discovered in 850 AD. Since then, there have been three waves that have defined the industry.
- There are two main varieties of coffee: Arabica (60% of global production) and Robusta (40% of global production).
- Brazil is by far the largest producer of coffee in the world, followed by Vietnam, Colombia and Indonesia.
- High volumes of mergers and acquisitions are re-shaping the coffee roasting industry.
- Consumption growth has been highest in producing countries, where new demand for specialty coffee, spurred by rising incomes, has added new competition to markets that are traditionally dominated by the US and Europe.
- Climate change and coffee rust pose new challenges to coffee producers, who are already struggling in a competitive industry. There is a danger that producers looking to expand production will be incentivized to remove forestland, potentially destroying biodiversity.

## Chapter 2: Producers

For the second official World Coffee Analytics report, we will take a closer look at major themes in coffee production. Some important questions that we plan to explore are:

- How profitable are coffee farmers now compared to years past?
- Who are the coffee cooperatives that producers organize themselves into. How effective have cooperatives been in their mission to improve grower return?
- How much of the price that consumers pay for a coffee makes its way back to growers?
- How are new varieties changing producer economics?
- How will coffee producers adjust to the challenges of coffee rust and a changing climate?

We hope you will join us as we search for answers to these questions and more.

Sincerely,

Joey Maginnis  
Chief of Content, Moon Island

# ENDNOTES

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# A MOON ISLAND PROJECT



The World Coffee Analytics program is coordinated by **Moon Island**.

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Our projects segment helps us carry out our mission by contributing the opportunity to thoroughly explore interesting topics, whether an industry, a branch of science, or a category of art. The goal of the projects segment is to support concentrated learning and personal development over long periods of time. That is, our projects will be, for the most part, focused on just one topic and will have a “do it yourself” spirit. But most importantly, our projects will represent our passions!

Have cool project ideas? Email me at [joey@moonisland.com](mailto:joey@moonisland.com).