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**Agribusiness Administration Department**  
**Agribusiness Administration Engineering**



**Special Graduation Project**  
**A Study of the Honduran and Colombian Coffee Industry**  
**Competitiveness: A Porter's Diamond Approach**

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### **Abstract**

Coffee is one of the most widely consumed beverages globally, with significant cultural and social significance in many countries. Colombia and Honduras are known as two of the largest coffee-producing countries. This paper aims to describe the factors that have led Colombia to be one of the top three coffee producers in the world, elements that will serve as a benchmark for developing the Honduran coffee sector. The paper examines the competitiveness of the coffee industries in Honduras and Colombia using Porter's Diamond Model. This model revealed the comparative advantage index of both countries to measure their comparative advantage in the coffee sector in the global market. The study results showed that Honduras has a higher comparative advantage in the international market than Colombia. However, both countries have areas for improvement. The study determined that both countries have favorable production factor conditions (land and labor). However, in terms of infrastructure, Honduras has better port infrastructure than Colombia. It was found that Colombia has a larger market due to its larger population, more robust marketing, better logistics infrastructure, and lower levels of corruption. Both countries have supporting solid industries and well-established institutions supporting the R&D. Based on the findings, some recommendations for the Honduran coffee industry are to improve its productivity, yield, and working conditions. Also, it is necessary to invest in advanced tracking and tracing technologies. Overall this paper provides valuable insights into both countries' coffee sectors, which can be used by policymakers, industry stakeholders, and coffee producers to make informed decisions.

*Keywords:* coffee, infrastructure, productivity, benchmark, production, demand, marketing.

## Resumen

El café es una de las bebidas más consumidas a nivel mundial, con un rico significado cultural y social en muchos países. Colombia y Honduras son bien conocidos por ser dos de las naciones productoras de café más grandes. Este artículo tiene como objetivo describir los factores que llevan a Colombia a estar entre los tres primeros productores de café del mundo, factores que servirán como referencia para Honduras. El documento examina la competitividad utilizando datos secundarios de las industrias del café en Honduras y Colombia utilizando el Modelo de Diamante de Porter y el índice de ventaja comparativa revelada para medir la ventaja comparativa del sector cafetalero de cada país en el mercado global. Los resultados del estudio mostraron que Honduras tiene una mayor ventaja comparativa en el mercado internacional en comparación con Colombia. Sin embargo, ambos países tienen áreas de mejora. El estudio determinó que ambos países tienen condiciones de factor favorables, sin embargo en términos de infraestructura, Honduras tiene mejor infraestructura portuaria que Colombia. Se encontró que Colombia tiene un mercado más grande debido a su mayor población, arduo trabajo en marketing, mejor infraestructura logística y menores niveles de corrupción. Ambos países tienen fuertes industrias de apoyo e instituciones bien establecidas que apoyan la investigación y el desarrollo. Con base en los hallazgos, algunas recomendaciones para la industria cafetera hondureña son mejorar su productividad, rendimiento y condiciones de trabajo. También es necesario invertir en tecnologías avanzadas de seguimiento y rastreo. En general, este documento proporciona información valiosa en el sector cafetalero de ambos países que se puede utilizar by policymakers, industry stakeholders and coffee producers to make informed decisions.

*Palabras claves:* café, infraestructura, productividad, producción, demanda, marketing.

## Introduction

The coffee industry has experienced significant growth and transformation, driven by changing consumer preferences, technological advancements, and a growing awareness of sustainability and ethical practices during the last decades. As a result, the competition among coffee-producing countries and companies has intensified, leading to a dynamic and competitive market. Coffee industry is an integral part of the global economy, with Honduras and Colombia among the largest coffee-producing nations. Both countries have a long tradition of coffee production and have made significant contributions to the worldwide market. They are known for their unique and high-quality coffee Arabica beans.

Coffee production began in Honduras in the middle of the nineteenth century (probably for medicinal purposes). However, coffee farming only occupied about 3,486 ha in 1914, and production was destined mainly for the domestic market (Ruben et al., 2018). For Honduran growers, the road to large-scale coffee production has been paved with several obstacles in the twentieth century. The Honduran coffee industry faced several challenges, including political instability, civil wars, and natural disasters like Hurricane Mitch. Despite these challenges, the industry continued to grow and has everything it needs to become a premier specialty coffee producer.

In Honduras, coffee is the main agricultural export product, contributing close to 4.0 percent to the national gross domestic product (GDP) and around 30.0 percent to the agricultural GDP (Instituto Nacional de Estadísticas [INE], 2021). It is produced in 15 of the 18 departments and 221 of the 298 municipalities nationwide (Instituto Hondureño del Café [IHCAFE], 2021). Honduran coffee accounts for approximately 3.1 percent of the world's coffee production and is the largest agricultural export of Honduras, followed by bananas and plantains (Herrell et al., 2017). On the Honduran Coffee Institute (IHCAFE) report, there are approximately 120,000 coffee farmers in Honduras, of which 95 percent are classified as smallholder producers. Also, according to the IHCAFE, Honduras continues to

be the first place in coffee production in Central America, third in Latin America, and sixth worldwide, through the contribution of thousands of families dedicated to this productive activity.

In Colombia, coffee appeared in the early eighteenth century when the Jesuits introduced the first seeds to the country (Cárdenas, 1993). Coffee production began in the early nineteenth century, and by the early twentieth century, it had become a crucial part of the country's economy. Coffee is the national crop par excellence located in the Colombian mountain geography (Federación Nacional de Cafeteros de Colombia [FNC], 2014). The coffee industry is crucial in creating rural employment since it employs more than 785,000 people, or 26 percent of all agricultural sector jobs (FNC, 2014).

Colombia has been one of the most important protagonists of the global market, and coffee production is the leader in the country's agrarian sector, given its contribution to the GDP. Annual shipments of coffee were 6.61 percent of the country's total exports in 2017 (Saenz et al., 2021), and in 2020 it accounted for 0.9 percent of the total GDP (11 percent of the total agricultural GDP) (Suárez et al., 2022). As well as in Honduras, coffee is the most exported product.

Its level of production is so high that it involves 590 municipalities and the Andean departments of the country and defines important areas considered coffee for its production (Salazar, 2021). According to Gomez Posada, 2019, Colombia is the third largest coffee producer. It has an area available for cultivation of close to 3.6 million hectares and is cultivated in approximately 970 thousand hectares, employing the families that own the coffee farms and thousands of coffee pickers, who make up the bulk of direct and indirect workers, a situation that determines that this continues to be an emblematic activity of the Colombian economy; around 96 percent of the farmers are smallholders and have 1,3 Ha in average.

There is an evident gap in production between Colombia and Honduras due to Colombia's available land to grow coffee. According to the management report of the FNC for the 2015-2022 period, Colombia's average production is 13.6 billion of 60 kg bags and a productivity of 18.6 bags per hectare. Moreover, despite a growth of 8 percent, coffee production in Honduras reached 7.9 billion



of 60 kg bags, with an average productivity of 15 bags of 60 kg per hectare. The productivity gap is striking, underscoring the need for Honduras to invest in its productivity to enhance and advance its coffee production in the coming years. Consequently, this paper explores the factors that set both countries apart and shows some areas that could be useful as sector solutions for Honduras.

A nation's goal in a competitive setting is to increase its national revenue. A natural strategy for doing this is to increase market share by lowering costs by relying on increased productivity or by producing and implementing industry solutions. Therefore, acknowledging the gap between Honduras and Colombia's coffee industry, the objective of this research is to present a cross-country analysis based on Porter Diamond Model competitiveness variables comparing Colombia and Honduras, two of the world major's coffee producers countries, and analyze the factors that made Colombia successful in being one of the biggest coffee producers and whether it can become a benchmark that serves as industry solutions for the Honduran coffee industry.

## Methods

This research aimed to conduct a comparative analysis of the competitiveness of the Honduran and Colombian coffee industries using Porter's Diamond framework and the revealed comparative advantage index. The research employed a combination of secondary data from various sources, including literature, annual reports, journals, and databases such as Food Agricultural Organization (FAOSTAT), International Coffee Organization (ICO), World Bank Indicators (WDI), IHCAFE, FEDECAFE, and USDA annual reports, and data from the United Nations Conference on Trade and Development (UNCTAD) for measuring the Revealed Comparative Advantage (RCA) level of both countries.

## Theory

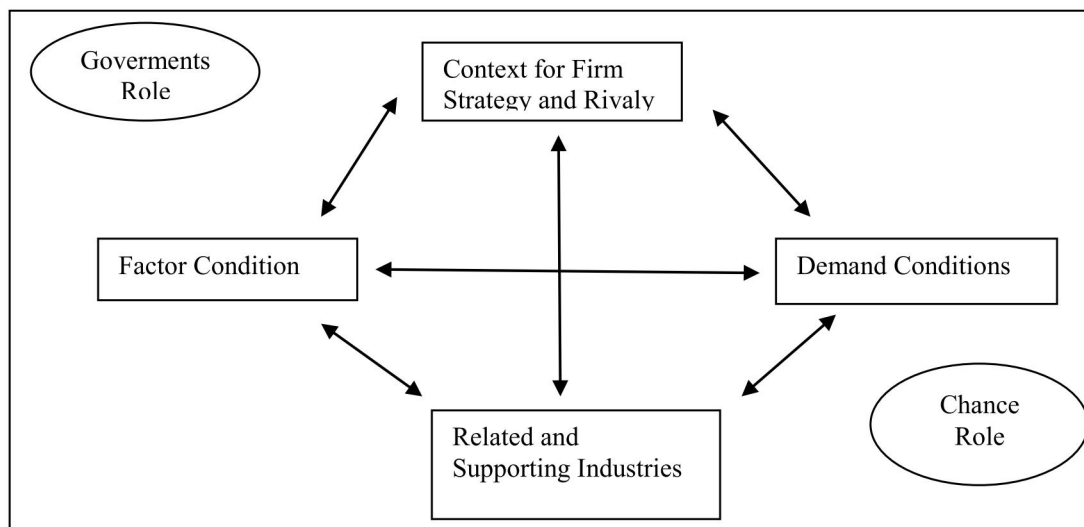
The Report of the President's Commission on Competitiveness, prepared in 1984 for the Reagan Administration, contains the most popular definition of national competitiveness: A nation's competitiveness is the degree to which it can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously expanding the real incomes of its citizens. Competitiveness at the national level is based on superior product performance (Cho & Moon, 2005). Krugman, in turn, argues that "competitiveness" would be a funny way of saying "productivity" and would have nothing to do with international competition (Krugman, 1994). Along the same line Porter (1990) stated that the only meaningful concept of competitiveness at the national level is *productivity*. The principal goal of a nation is to produce a high and rising standard of living for its citizens.

This research approach is consistent with what Porter pointed out by using the "Competition Diamond Model". In this model, Porter models four factors that affect companies' competitive advantage development (Esen & Uyar, 2012). The four components of the diamond are "factor conditions", "demand conditions", "context for firm strategy and rivalry" and "related and supporting industries". Also "luck" and "the government" factors are included in the system. These factors are

described as factors affecting competitiveness as support of the four factors (Bakan & Doğan, 2012). According to Porter, these determinants create the national environment in which businesses are created and learn how to compete.

**Figure 1**

*Porter's Diamond Model*



National competitiveness is determined by how these elements interact with each other. These four components work together to influence the availability of resources and skills, the information that shapes opportunities, the goals of companies, and the pressures on companies to invest and innovate. This model is the basis for the analysis conducted in this study for both countries.

### **Data Collection**

Secondary data sources were extensively reviewed to gather relevant information about the coffee industries in Honduras and Colombia. The literature review encompassed academic publications, research papers, industry reports, and relevant articles focusing on coffee industry competitiveness, Porter's Diamond framework, and related concepts. Annual reports from IHCAFE, FEDECAFE, and USDA were also examined to gain insights into industry performance, trends, and strategies.

The collected data were analyzed using qualitative and quantitative techniques. In a comparison of the competitiveness of the Honduran and Colombian coffee industry, the comparative advantage of both countries is collected for reference. In contrast, competitive advantage is examined using Porter's Diamond Model. The comparative analysis was conducted to identify similarities and differences in the coffee industries of the two countries using the "Revealed Comparative Advantage Index".

The RCA level, obtained from UNCTAD data, was used to measure the comparative advantage of each country's coffee sector in the global market. The revealed comparative advantage (RCA) concept is based on Ricardian trade theory, which posits that relative productivity differences between nations drive trade patterns. In empirical trade research, comparative advantage can be measured by "Revealed Comparative Advantage" (RCA) indices, which uncover the underlying comparative advantage from observable trade patterns (Yu et al., 2009). The RCA index from Balassa was chosen for this research based on countries' relative shares of world exports. According to Balassa (1965), a country is supposed to have comparative advantages for a given product if the percentage of that product in the country's exports is more significant than the share at the trade area level under consideration (Stellian & Danna-Buitrago, 2022).

### ***RCA Metrics***

When a country's A exports of product  $i$  as a percentage of its overall exports of all goods exceed the same percentage for the world as a whole, it is said to have a disclosed comparative advantage in that product  $i$ . That is,

$$RCA_{Ai} = \frac{\frac{X_{Ai}}{\sum_{j \in P} X_{Aj}}}{\frac{X_{wi}}{\sum_{j \in P} X_{wj}}} \geq 1 \quad [1]$$

Where:

$P$  is the set of all products (with  $i \in P$ ),  $X_{Ai}$  is the country A's exports of product  $i$ ,  $X_{wi}$  is the world's exports of product  $i$ ,  $\sum_{j \in P} X_{Aj}$  is the country A's total exports (of all products  $j$  in  $P$ ), and  $\sum_{j \in P} X_{wj}$  is

the world's total exports (of all products  $j$  in  $P$ ). The value of a commodity's competitiveness index in the RCA index has two options: if RCA is higher than one, it can infer that country A has a comparative advantage in commodity  $i$  and is highly competitive. On the other hand, if the RCA is below, it indicates a comparative disadvantage in commodity  $i$ , which translates into weak competitiveness.

## **Result and Discussion**

### **Global Coffee Industry Overview**

Commercially classified as an agricultural commodity, coffee is one of the most outstanding commodities in international transactions and domestic supply in quantity and value (Vegro & Almeida, 2020). In the last decade, coffee consumption and production were constantly growing until the beginning of the COVID-19 pandemic. According to the International Coffee Organization the World coffee consumption increased by 4.2% to 175.6 million bags in coffee year 2021/22 (Fiallos, 2023). As stated by the USDA, coffee consumption is expected to grow to 178.5 million bags.

Arabica and Robusta are coffee varieties that are predominantly grown for commercial purposes. In comparison, Robusta is significantly more efficient than Arabica, as it can be harvested twice in the same year. Additionally, the upkeep of robust plants is less expensive than arabica plants. Consequently, robusta coffee costs only half that of arabica coffee. At the same time, Arabica is highly regarded as a premium and specialty coffee owing to its complex aroma and taste. According to the ICO, Arabica coffee holds the most significant portion of global coffee production, representing 59.2 percent. On the other hand, Robusta coffee accounts for 40.8 percent of global coffee production. This difference in quality and quantity is reflected in its price. In January 2022, the arbitrage between Arabica and Robusta coffees climbed by 3.9 percent to 135.07 US cents/lb, as assessed on the New York and London futures markets (Siahaan & Aji Affandi, 2022).

Coffee is crucial in driving economic growth and contributing to export earnings for both Honduras and Colombia. Despite the production gap between the two countries, they share certain similarities. For example, robusta is not produced in either of them. And this has meant no problem for them. According to the (International Coffee Organization [ICO], 2021), Honduras is the fourth biggest producer of arabica coffee globally, followed by its neighbor Guatemala in fifth. On the other hand, the highland regions of Colombia are recognized worldwide for producing mild Arabica coffees

(Campuzano-Duque & Blair, 2022). Colombia is best known for being the world's second-biggest producer of arabica, despite having a 5.0 percent fall in the 2020/21 coffee year.

### **The Comparative Advantage of Honduran and Colombian Coffee in The International Market**

To flourish in an increasingly competitive global landscape, nations need to possess competitive commodities that can hold their ground. Each country must be fully cognizant of the degree of competitiveness their exports have in international markets. By understanding their products' competitive edge, countries can strategically position themselves to thrive and succeed in the face of growing competition. Measuring an industry's competitiveness enables the identification of optimal strategies for competing effectively in the global market. Porter pointed out that the competitive advantage of countries can be further analyzed by assessing the resources and conditions in the national industrial environment (Da Huo et al., 2020). This research offers an assessment of the competitiveness level of the Honduran coffee industry compared to Colombia; it examines strategies for improving the Honduran coffee competitiveness in the international market.

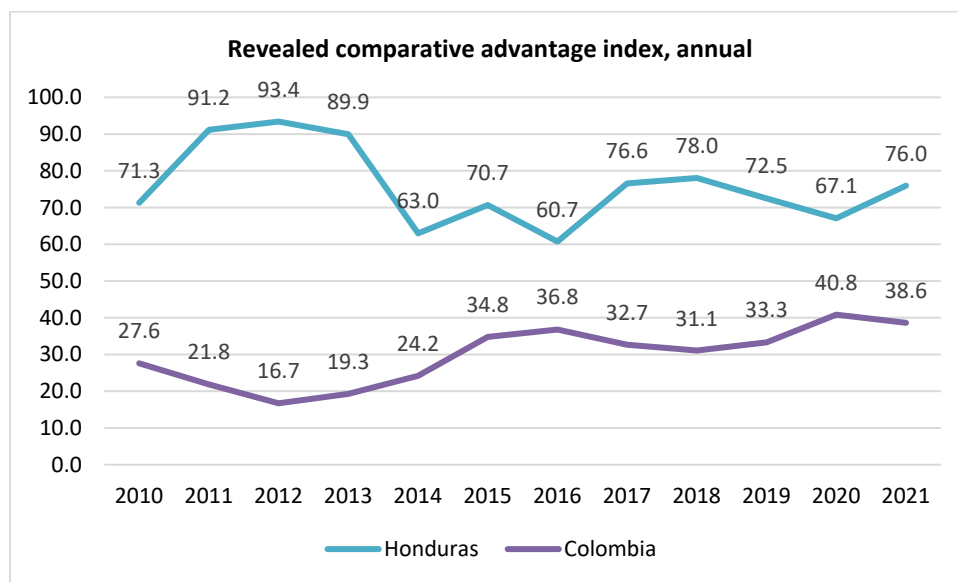
There are several ways to measure an industry's competitiveness; one of them is the RCA index (RCA), known as the Ricardian comparative advantage. In particular, Ricardian comparative advantage has long been perceived as a useful pedagogical tool: a country should produce, and therefore export, comparatively more in the industries in which it is relatively more productive (Leromain & Orefice, 2014). This concept fits very well with what Porter pointed out in the comparative advantage of the nations; a nation's competitiveness depends on the capacity of its industry to innovate and upgrade (Porter, 1990).

The comparative advantage of Honduran and Colombian coffee in the international market demonstrates its competitiveness. Figure 1 shows the revealed comparative advantages index for the last decade (2010 to 2021) for Honduras and Colombia. The figure shows that Honduras has a higher RCA compared to Colombia. The RCA average of Honduras from 2010 to 2021 is 75.9, whereas Colombia has an average of 29.8, which explains that Honduras has a higher comparative advantage

than Colombia. The small RCA value indicates that the Colombian comparative advantage is less than Honduras. However, despite having a higher RCA average, Honduras has work that needs to be done in productivity, and work conditions. The concern about the low productivity of the Honduran coffee industry needs to be examined and solved immediately.

**Figure 2**

*It revealed the comparative advantage index of the Honduran and Colombian Coffee industry from 2010 to 2021.*



### **Porter's Diamond: The Competitive Advantage of Honduras and Colombian Coffee Industry**

#### **Factor Conditions**

According to standard economic theory, factors of production—labor, land, natural resources, capital, and infrastructure—will determine the trade flow (Porter, 1990). These resources constitute the fundamental underpinnings for fostering expansion, achieving financial success, and facilitating productive endeavors. According to Morris (2018), the amount of land available, the availability of coffee seedlings, fertilizers, labor, and the infrastructure needed to turn coffee beans into a finished product or ready-to-drink coffee are all elements that affect productivity in the coffee industry.



Located in the center of Central America and with various mountainous regions across the country, Honduran's geography and climate characteristics in these regions are ideal for coffee plantations. For the coffee year 2021/2022, a total of 321,000 hectares were reported planted, 67% of which were distributed in the departments of El Paraíso, Comayagua, Lempira, Copan, and Santa Barbara, with a productivity average of 15 bags of 60 kg/ha (Asociación de Exportadores de Café de Honduras [ADECAFEH], 2022). About 60 percent of the farms are between 900-1300 m, 30 percent above 1300 m, and 10 percent below 900 m. The coffee is cultivated under an agroforestry system, with 95 percent of the area planted with a shade of different species (Álvarez, 2018). There is a high interest in geographic advantage, a geographical feature like denomination of origin (DO) that provides coffee with its extra quality value, as some places are well known for producing high-quality coffee.

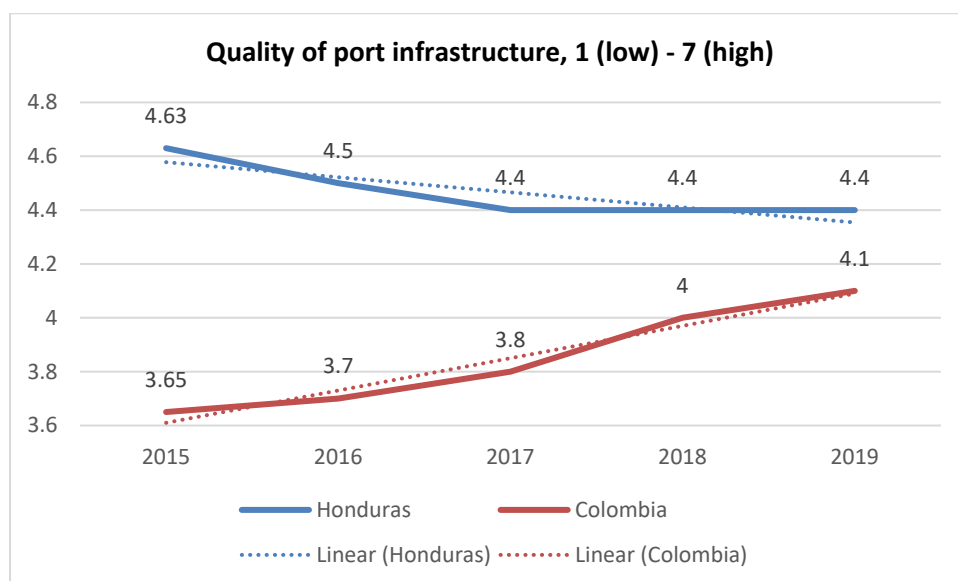
On the other hand, Colombia, located in the northwestern part of South America, with plentiful mountainous terrain that provides the perfect conditions for growing high-quality arabica beans. According to the USDA (2022), approximately 840,000 hectares of coffee are planted in Colombia, of which 689,000 hectares are classified as "technified" crops, meaning planted using modern techniques such as the use of improved seeds. Most Colombian coffee is grown at an altitude of 1,200 to 2,000 meters above sea level. Most of the production occurs in the rural area of Colombia known as the Colombian coffee growing axis or the coffee triangle, which comprehends four departments: Caldas, Quindío, Risaralda, and Tolima. According to FEDECAFE, 2022, since 2015, Colombia has maintained an average production of 13.6 million bags of coffee per year, with an average productivity of 18.6 bags of 60 kg per hectare. And it is estimated to reach an average of 22 bags per hectare with volumes of 14 to 14.5 million bags per year (FNC, 2022). In 2005, the Colombian Coffee DO was protected by the Superintendence of Industry and Commerce (SIC) at the request of the National Federation of Coffee Growers. This was due to the unique natural and environmental factors that contribute to the quality of Colombian coffee.

Infrastructure is essential to the coffee business and for the distribution of one of the most consumed beverages in the world—strong infrastructure guarantees effective transportation of coffee beans from farmers to processing plants and eventually to customers globally. According to Martí et al. (2014), the ease of transporting commodities across nations significantly influences the quality of logistical services and infrastructure. Inefficient logistics, on the other hand, leads to increased time and financial expenditures, negatively impacting nations and businesses. They estimate that poor infrastructure accounts for 40% of predicted transport costs for coastal countries and up to 60% for landlocked countries (Francois & Manchin, 2007).

A useful indicator to measure the competitiveness of countries is the Quality of port Infrastructure provided by the World Economic Forum. Quality of port infrastructure measures business executives' perceptions of their country's port facilities. The rating ranges from 1 to 7, with a higher score indicating better development of port infrastructure (World Bank, 2023). The figure below shows the quality of port infrastructure for Honduras and Colombia in five years, from 2015 to 2019. This figure reveals that Honduras has a higher value than Colombia during this period. These values allow us to identify that Honduran executives perceive the country's port facilities better. However, the trendline shows a downward trend starting from 4.63 to 4.4. On the other hand, Colombia shows an upward trend starting from 3.65 and ending relatively close to Honduras at 4.1. As a matter of fact, it is worth noting that in the WEF 2012 Competitiveness report, Honduras ranked in the 97th position, higher than Colombia located in 108th.

**Figure 3**

*Quality of port infrastructure of Honduras and Colombia*



### ***Demand Conditions***

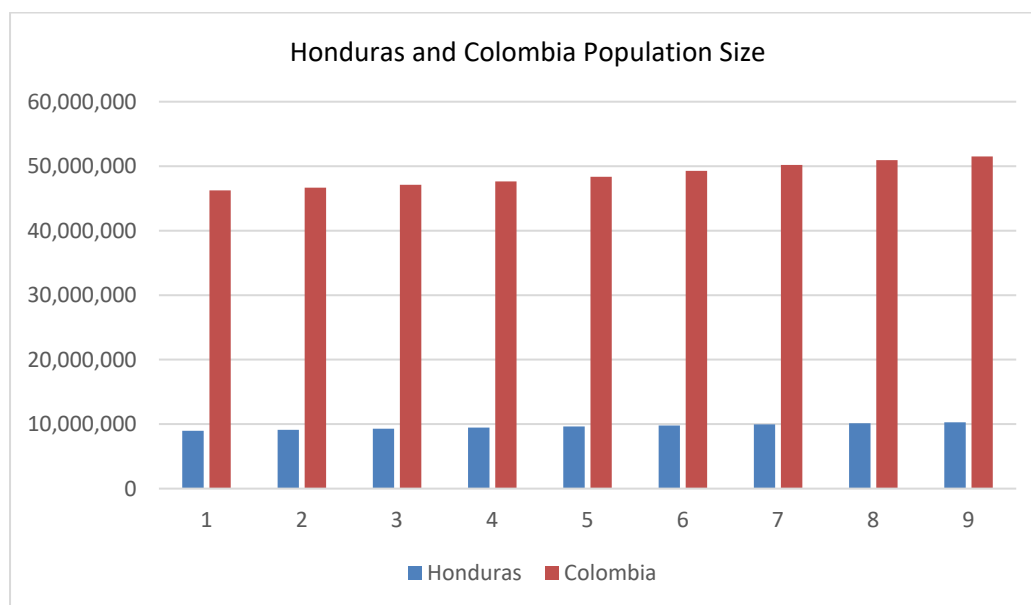
The second element of the diamond model centers on the demand conditions prevailing within a nation. According to Porter (1990), the demand conditions refer to the nature of home market demand for the industry's product or service. Nations gain competitive advantage in industries where domestic demand helps firms understand developing consumer needs more clearly or sooner and where affluent consumers push businesses to innovate more quickly and attain more sophisticated competitive advantages than their international rivals. Home-demand conditions help build a competitive advantage when a particular industry segment is more extensive or more visible in the domestic market than in foreign markets (Porter, 1990).

According to the world development indicators of the World Bank database, for 2021, the total population of Honduras surpasses 10.2 million people, with a growth rate of 1.5 percent. Of the total population, 58.9 percent are considered urban. Urbanization of the country is the right indicator of development, and it is the economy's growth engine (Pawar & Veer, 2014). On the other hand, Colombia has five times the population of Honduras, with 51,5 million inhabitants and a growth rate

of 1.1 percent. Of the total population, 81.7 percent live in urban areas. Hence, local demand and consumption are expected to be higher than in Honduras.

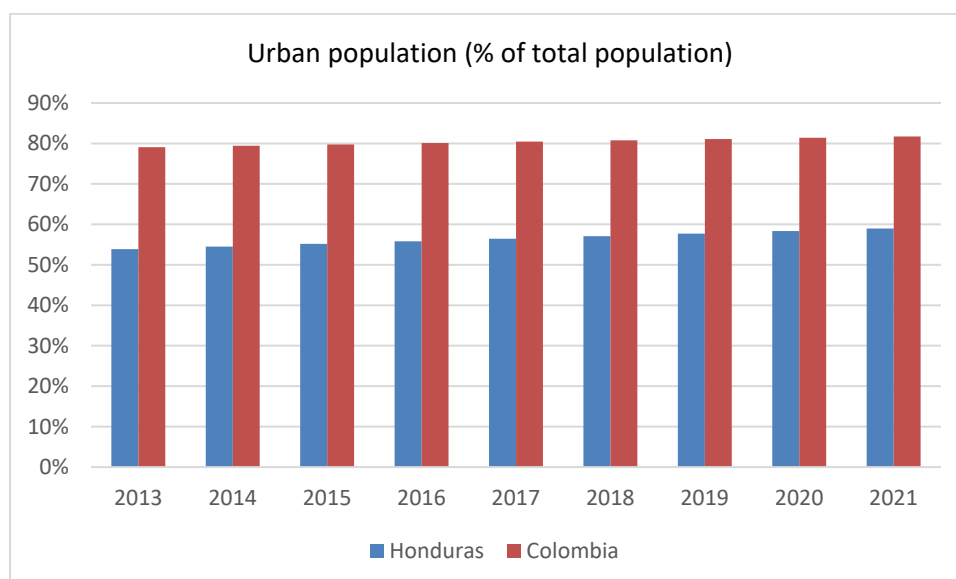
**Figure 4**

*Honduras and Colombia Population Size*



**Figure 5**

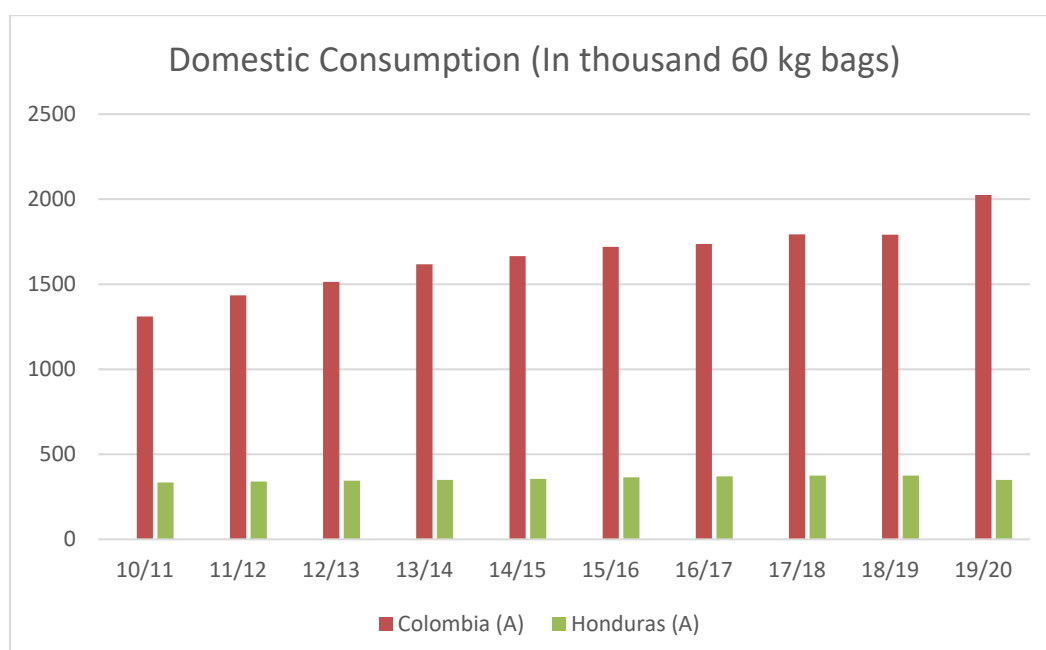
*Urban population (% of the total population)*



An important indicator of competitive advantage within countries is the local demand for consumption. According to the international coffee organization (ICO), per capita consumption places Honduras in the middle apparent consumption group in the region with Panama, Mexico, and Guatemala. The figure below shows the domestic consumption since the coffee year 2010/11 to 2019/20, where it can be seen that Colombia has a higher domestic consumption than Honduras, which its population size might explain. However, in Honduras, annual consumption is estimated at 2.39 kilograms per capita (Fiallos, 2022). While in the Andean country, according to Fedecafe, Colombia's coffee per capita consumption is estimated at 2.2 kilograms (4.6 pounds) (FAS Bogota Staff, 2021). In 2022, Fedecafe launched a new campaign to promote Colombian coffee consumption. This campaign, called "Look for the Colombian Coffee Quality Triangle," aims to help consumers identify 100% Colombian coffee products stimulating the local consumption.

**Figure 6**

*Domestic Consumption in thousand 60 kg bags*



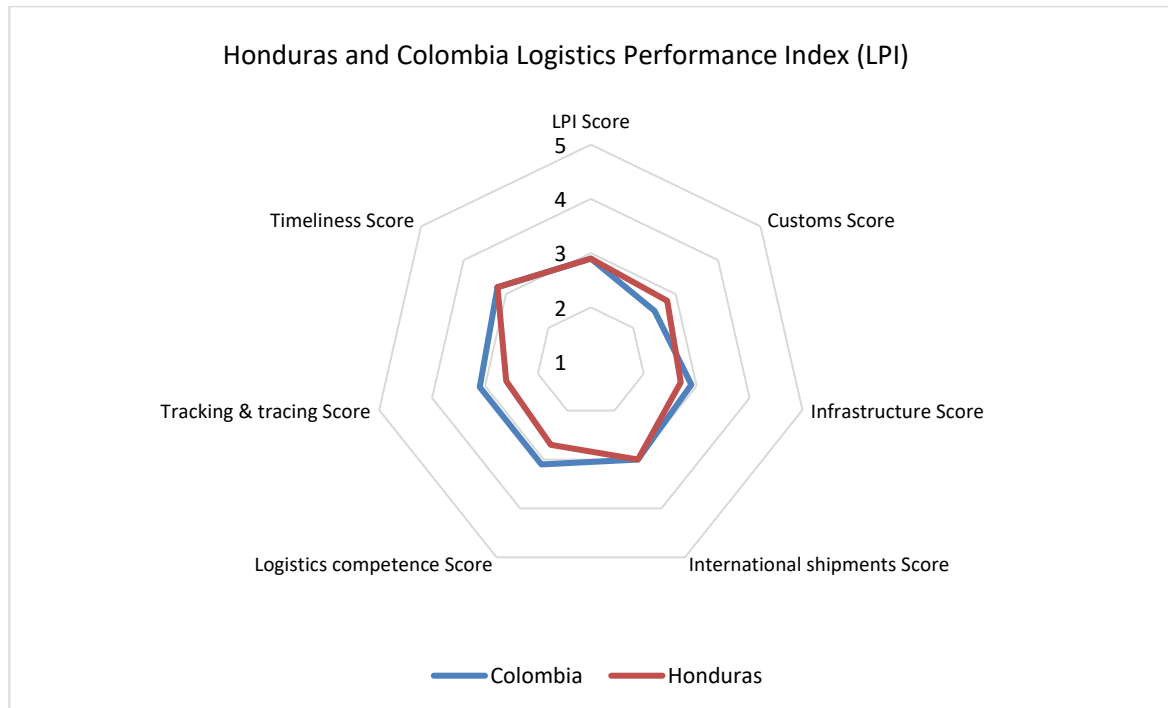
***Related and Supporting Industries***

The third element of the Diamond model critical to the competitive advantage of an industry is the presence in the nation of related supporting industries that are internationally competitive. Porter argues the importance of internationally competitive home-based suppliers, but it goes further than that. Far more significant than mere access to components and machinery, however, is the advantage that home-based related and supporting industries provide in innovation and upgrading—an advantage based on close working relationships (Porter, 1990).

The Logistics Performance Index (LPI) is a fundamental indicator that can be used to measure an industry's competitive advantage by measuring the supply chain's efficiency. Trade and logistics involve a number of policies that are critical to a country's business competitiveness. LPI is a crucial instrument that explains the relationship between trade and transport facilitation (Martí et al., 2014). According to the 2022 LPI report of the World Bank, Honduras, and Colombia ranked in the 66<sup>th</sup> position with an LPI score of 2.9. However, figure 2 shows a comparison between Honduras and Colombia LPI's values in each of its categories. It can be seen that Colombia has higher values on infrastructure (2.9 against 2.7), logistics competence (3.1 against 2.7), and tracking and tracing (3.1 against 2.6). Regarding the three missing categories, Honduras has a higher score in customs (2.8 against 2.5), but they're tied in international shipments (3) and timeliness (3.2).

**Figure 7**

*Honduras and Colombia's Logistics Performance Index (LPI).*



An essential factor to consider when measuring industry competitiveness is the industry's research and development (R&D) level. In the coffee industry, there are several paths on which R&D can be achieved, either through public or private channels. In a study conducted by the Escuela Agricola El Zamorano with the Bern University of Applied Sciences of Switzerland, they analyzed innovation of the Honduran coffee industry through local buyers, international buyers or exporters, input suppliers, government and development cooperation, farmer initiatives, and financing institutions. This study highlights the role of the Honduran Coffee Institute (Instituto Hondureño del Café or IHCAFE), which has a public mandate to strengthen the coffee industry. There are six regional centers, 35 extension offices, and six R&D and training centers (Fromm et al., 2010). Besides R&D, the IHCAFE offers the development of new coffee varieties, extension and training, soil analysis, plants, water, quality analysis, enterprise development, and market intelligence.

On the other hand, the National Federation of Coffee Growers (NFC) is the leading organization in Colombia's coffee sector. It is a private finance company with shared goals to guarantee the growers' representation and safety. The NFC also oversees various organizations supporting coffee farmers' work, including the National Coffee Research Centre (Cenicafé). Cenicafé coordinates all R&D related to coffee, from genetic studies to produce new varieties to the study of the harvest in terms of yield and quality, all aimed at benefiting the growers (Roldán et al., 2009). The role that the NFC plays in the Colombian coffee industry goes beyond research; it also assists its farmers, such as social programs, loans, advice on new technology, education, and incentives – in the form of certification – to improve the quality of the coffee (Roldán et al., 2009).

On the side of the input suppliers, in Honduras, a wide range of importing companies sell fertilizers, agrochemicals, biological goods, and agricultural equipment to stores and other establishments for later distribution to farmers. These companies, alongside agents with close relationships with coffee growers, frequently invite farmers from specific regions to training and demonstration sessions. The large input supplier companies also maintain a research and development (R&D) department with a limited number of agents that test products, sometimes on farmers' fields, develop recommendations from best practices and applications, and diffuse the information to farmers (Fromm et al., 2010). Conversely, among the institutions created for Colombian coffee development, there is Agrocafé. This is an agency and support company in commercializing fertilizers and agricultural inputs. It is committed to providing quality products, technical advisory services, and financing to coffee growers' cooperatives and departmental committees.

### ***Firm, Structure, and Rivalry***

This fourth component of the diamond model addresses the environment in which companies are created and organized and includes the domestic rivalry structure. According to Porter, competitiveness in a specific industry result from the convergence of the management practices and

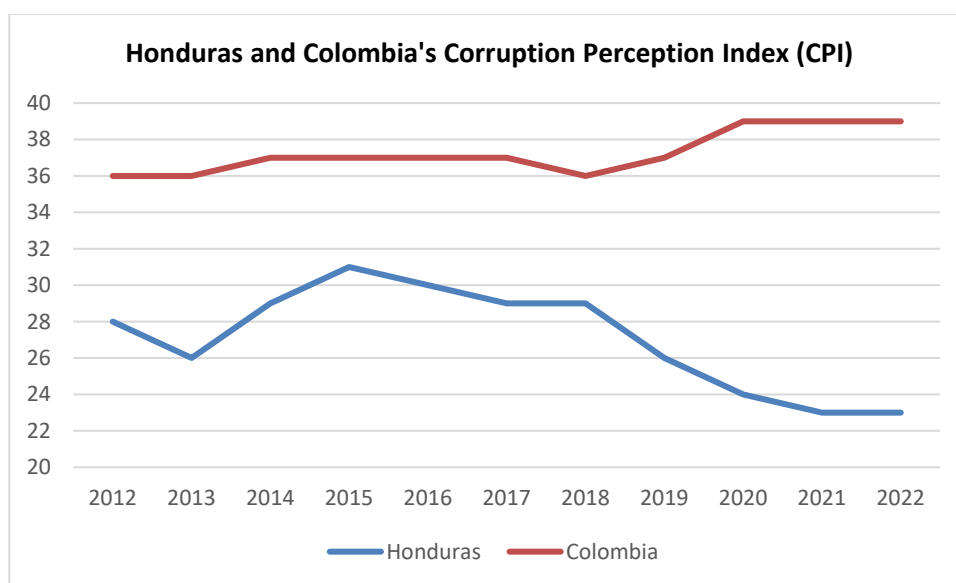


organizational modes favored in the country and the sources of competitive advantage in the industry (Porter, 1990). Several indicators can measure an industry's competitiveness in this component.

The first indicator is the Corruption Perceptions Index (CPI). This index has been published annually since 1995 by Transparency International. The CPI ranks 180 countries using a scale from zero (highly corrupt) to a hundred (very clean). In 2022, Honduras remained at the same score (23) and position (157) as the CPI 2021 report, which means that Honduras has a high incidence of corruption that could affect the industry's competitiveness. Meanwhile, Colombia ranks 91 with a CPI value of 39. It is essential to mention that both countries are relatively close. However, corruption levels are higher in Honduras.

**Figure 8**

*Honduras and Colombia's Corruption Perceptions Index (CPI)*



Another useful indicator of an industry's competitiveness is the ease of doing business. This indicator measures the favorability of the business environment in a country to run a firm. The ease of doing business score serves as the basis for ranking economies on their business environment: the ranking is obtained by sorting the economies by their scores (World Bank, 2020). According to the

Doing Business 2020 report of the World Bank Group, Honduras ranks 133 with a doing business score of 56.3. Meanwhile, Colombia ranks in the 67th position with a doing business score of 70.1, with a difference of 13.8 points. According to this ranking the regulatory environment of Colombia is more conducive to business operation resulting in a healthier environment.

### **Government**

Concerning the government's role in creating competitive advantage, Porter (1990) argues that governments are not responsible for creating competitive industries; only companies have the power to do so. Porter considers the government's role as inherently partial, which succeeds only when working in tandem with favorable underlying conditions in the diamond (Porter, 1990). Except for nations still in the early stages of development, successful government policies foster an environment in which businesses can gain a competitive advantage.

To create and sustain national advantages, government policy's main goal should be to deploy a nation's resources with high and rising productivity, which requires continually upgrading and innovating in existing and new industries (van Berkum et al., 2016). The NFCG implements regulatory policy for what has been called the most regulated sector in Colombia, according to the decisions of the National Coffee Committee. This public-private body acts as the managing board of the National Coffee Fund (Giovannucci et al., 2002). In Colombia, most policies aim to stabilize coffee prices through a floor price mechanism for farmers from the Fondo Nacional de Café (National Coffee Fund, FNC). In 2019, the Colombian government allocated 155.5 billion pesos (about \$50 million) to coffee growers to protect farmers' income through direct payments (Rau & Gomez, 2019).

In contrast to Colombia, Honduras has also implemented various policies and initiatives to support the coffee sector. The Honduran government, through executive decree 352-2022, the National Congress of Honduras, has ratified the exclusion of the payment of 12% sales tax on the production of coffee (Fiallos, 2022). This initiative aims to lower production costs and improve the coffee industry's competitiveness. Also, it is worth noting that after one and a half years of

socialization, the Gender Inclusion Policy was approved and published in La Gaceta on April 17<sup>th</sup>, 2021, by decree CONACAFE No. 191-2021. The policy focuses on promoting equal opportunities for women in the coffee sub-sector (Fiallos, 2022). The Coffee Bonus Program also provides incentives, the Law of Financial Reactivation assists producers, and the National Coffee Fund supports infrastructure development.

### ***Chance***

Several factors, including luck-related variables, heavily influence the coffee industry in Honduras and Colombia. The climatic conditions play a crucial role in coffee growing in both countries. Unpredictable changes in temperature, rainfall patterns, and seasonal variability can significantly impact yields and coffee quality. Furthermore, the presence of pests and diseases poses a constant threat to coffee plantations. Additionally, the fluctuations in market demand and international coffee prices create an element of luck for the industry. Changes in consumer preferences and global economic events can affect profitability.

## **Conclusions**

This study used the revealed comparative advantage index and the diamond model to analyze the competitive priorities of the Honduran and Colombian coffee sector.

According to this study, it can be determined that Honduras has a higher comparative advantage in the international coffee market than Colombia, as evidenced by its RCA index. However, concerns about productivity, and work conditions in Honduras still need to be addressed to improve the country's competitive advantage.

With respect to the diamond model system, in the factor conditions it was determined that both countries have favorable natural resources for coffee production. However, Colombia has turned its coffee sector into a cluster by establishing relationships between the stake holders and thanks to the origin denomination in several departments of the country.

On the demand conditions, Colombia has a largest local consumption and despite having a lower per capita consumption, there are efforts to increase through programmes driven by the government from which Honduras can learn to keep increasing the local consumption.

In the related and supporting industries, Colombia has a better infrastructure, logistics, tracking and tracing. This shows that Honduras needs to work in enhance these three key components to increase its competitiveness. Also, CENICAFE'S work in Colombia boosts the productivity gap between the two countries, leaving behind the work done by IHCAFE in Honduras.

Lastly, the competitiveness of the coffee sector in Honduras is being affected by the high levels of corruption, as well as by the unhealthy environment for doing business in the country, which leaves Colombia with a higher advantage.

By reviewing the results of the study, it is observed that the two main factors affecting the competitiveness of the coffee sector in Honduras are the related and supporting industries, and firms, strategy and rivalry, followed by demand conditions and at last the factor conditions.

### **Recommendations**

Honduras should focus on improving its related and supporting industries. This includes improving the infrastructure, logistics, and tracking and tracing systems for the coffee industry. It also includes working with other industries such as tourism to create a more supportive environment for the coffee sector.

Honduras should work to reduce corruption and improve business environment. This includes strengthening the rule of law and enforcing anticorruption laws. It also includes making it easier to do business in Honduras by reducing bureaucracy.

Honduras should invest in research and development for the coffee sector. This could include developing new varieties of coffee that are more resistant to pests and diseases, or that are better suited to the changing climate.

Honduras should work to build relationships with coffee buyers and exporters. This could help Honduras to secure better prices for its coffee and to reach new markets.

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