



WORLD PRODUCTION OF COFFEE IMPORTS AND EXPORTS IN EUROPE, BULGARIA AND USA

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ABSTRACT

Coffee is the world's second most traded and preferred commodity after oil. It's a beloved beverage for a large percentage of the world's population. Due to this fact, it's of interest as a plant culture for research and analysis. The purpose of this article is to analyze the largest world coffee producers, to determine the difficulties in coffee realization and production as well as the world prices of coffee and the dynamics of their change. For the purpose of our research, methods of deduction, reduction, analysis, dynamics of price changes, trend calculation for future market changes in demand and supply of coffee and price dynamics in the world market have been used.

Key words: coffee; purpose; dynamics; demand; supply; production.

INTRODUCTION

Coffee brewing dates back to the fifteenth century. For many years, the Arab province of Yemen has been the only coffee source in the world.

(1) The strong preference and the great demand of this drink make the cultivation of this culture important and significant. An interesting fact is that initially the export of coffee trees out of the country where coffee was initially discovered and grown was not allowed. (3) Despite stringent measures, commercial travelers, en route to the Meccan Highland for the first time, illegally imported coffee trees to their native countries, and soon enough coffee trees take root in India. Coffee gradually reaches Europe through Venice, where large marine fleets trade spices, tea, paints, perfumes and fabrics with Arab merchants along the Silk Road. Many European traders become used to drinking coffee during their travels away from their homeland and bring coffee back with them to

their home countries. The beverage gains worldwide popularity when street vendors started selling coffee everywhere. (2) In the XVII century, the Dutch began to cultivate coffee in its colonies and it spreads to Indonesia.

And nowadays, today, in the XXI century, coffee has become the second most traded commodity in the world. The only thing to surpass coffee is oil – the black gold. (2)

The purpose of this article is to analyze the world's largest coffee producers, stages of its production and processing, and to identify difficulties in the conversion and coffee production and the formation and dynamics of the change in its prices.

Coffee, as a crop, represents the seeds of a fruit resembling a cherry from a tree that grows in the equatorial and subtropical zone to an approximate altitude of 1,800 m. The coffee trees are evergreen and grow up to 20 meters in height. (2) In order to facilitate harvesting, they are usually cut to 2.5 or up to a maximum of 3 meters. It takes more than 4 years for a tree to fruit for the first time (3). Thus its' lifecycle could reach 25 to 40 years. Globally

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there are two varieties grown predominantly. These are the Arabica and Robusta varieties. Global production is divided to approximately 80% in favor of Arabica and around 20% for Robusta (6). Arabica is the more delicate variety of the two and it has a preference for altitude at least 900 meters, and it requires a more precise growing than the Robusta sort. This means that Arabica is grown mainly in mountainous areas, suitable for its cultivation. Arabica grows in the tropical and equatorial lands of America, Africa and Asia, where it's either spring, or a mild and cool summer. The Robusta variety, as its name suggests (Robusta, originating from the word "Robust" – meaning "Rough"), is more resistant to tropical heat and parasites, and is grown at a lower altitude, while having a comparatively lower price.

The coffee fruits should be gathered when fully ripe. In order to get us our favorite drink to us, coffee has to undergo a long stage of processing, which involves the following phases: harvesting coffee beans, cleaning impurities (i.e. small pebbles, leaves and twigs). This is either a mechanical or a manual process. Fruit is removed from the seeds by one of two methods: wet or dry. A longer and more complex method of processing is typical for the wet method and it is principally used for handpicked fruits. Due to the nature of the process, coffee beans treated by this method are sometimes known as "washed coffee" (2). The method consists of the following several steps: Washing, pulping (removal of the red skin of the fruit and the pulpy part (the pulp)). The process is performed using pulping machines, where, under controlled pressure and submerged in water, fruits pass through a sieve with holes big enough to only let coffee beans come through. Thus any accidental non-ripe fruits are removed from the aggregate. They are harder and therefore not crushed by the sieves. Coffee beans spend up to three days in cement tanks, where a series of chemical reactions are induced through natural processes, and this layer is eventually washed away. At the same time, fermentation results in the reinforcement of coffee aroma. This process is followed by the very important step of drying the coffee. This is when the wet grains slowly dry out in the sun. It has to dry from its current 60% humidity to about 10-11%, and in this stage, which lasts about 1 to 2 weeks, grains have to be constantly stirred by hand. Mixing is a very important process, which ensures the uniform drying of all grains. The best quality coffee dries out in the sun, but

in reality for the most part, major industrial production organizes it artificially in specialized drying rooms. The next very important stage is peeling and polishing. What's typical of this stage is the removal of the main parchment layer and the flake on the coffee seeds, using peeling and scraping machines. Then follows the final processing of the coffee and its storage for export. At this last stage, the grains are sorted by size and color. Grains of poor quality, immature or damaged grains and dirt and impurities in the coffee are removed using this method. This process is completed manually. About 100 grams are taken out from each batch as a sample for roasting and tasting. No qualitative indicators are assigned to coffee for the purpose of classification prior to the evaluation of the roasted sample. After classification and grading, they are filled into 60 kg bags and stored for export.

The largest coffee producing countries for the period from 2014 to 2018 are presented in figure one below. It is very notable that the leader in coffee production for the entire five-year period is Brazil, with Brazil being the leader prior to 2014, as well as for 2019 (4). Its production levels exceed fifty million, in 60 kg. bags, with the highest record yields for the analyzed period in the 2016 and 2017 business years being more than 56 million. Average annual production for the analyzed period of Brazil is 51 million bags. This country is the exclusive grower of diverse coffee varieties. These range from the most common types, mainly marketed to the largest consumers to the most elegant coffee varieties, selected specifically for making espresso. 41 800 000 kg from the Arabica variety and 12 700 000kg of the Robusta variety are grown in the country. Brazil uses four different methods of coffee processing. It may often be observed different methods being applied simultaneously for the same farm and even the same crop. Coffee was first introduced to Brazil as an import from French Guiana back in 1727, and nowadays the country produces one third of the world's stock of coffee. Around 80% of coffee beans grown in Brazil are a variety of Arabica. Brazil is famous with her very special kinds of coffees, which are: Bourbon, Tipica, Katura, Mundo Novo and other selected varieties. The country is the largest coffee producer in the world and this is observed long before the period subject to analysis herein. With the sole exception being the natural calamity of 1975, which seriously

damaged and frosted coffee crops and killed more than half of coffee crops in the country. (3) Naturally, this is the only period when

other countries producing coffee are able to take over Brazil for the position of leadership.

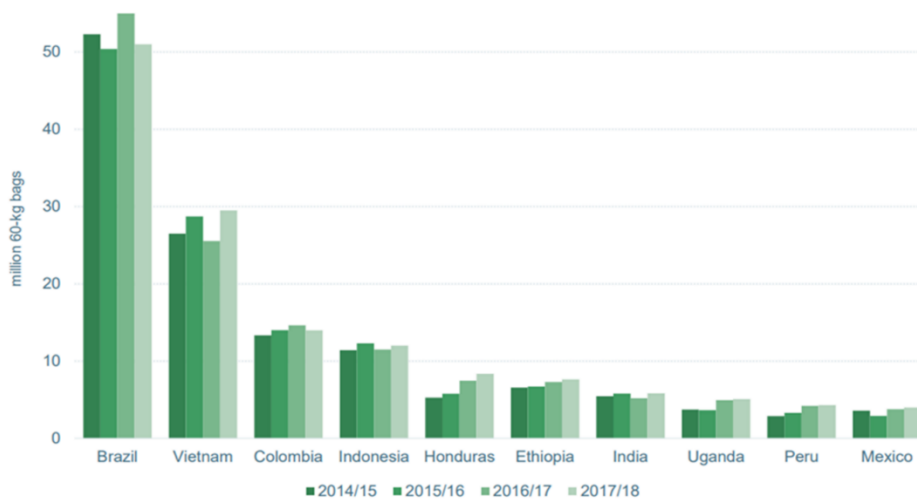


Figure 1. Major coffee production countries in the world for the period between years 2014-2018

Source: Figure is adapted to State of the global coffee market; United Nations Conference of Trade and Development

The next main producer for the period of analysis is Vietnam, which approximately produces half of the coffee Brazil has for the period, i.e. somewhere in the range of 25 to 29 million. For Vietnam, the best economic year benefiting from good climate change is at the end of the period (2017-2018), when production growth has reached 29 million bags. The third-ranked coffee production country in the world for the analyzed period is Colombia, with approximately 14 million tons of produced coffee in bags during the reporting period. The main variety of coffee producing in this country is Arabica. (5) Coffee is introduced to Colombia in the early 19th century. The first registered production with commercial purposes is in 1835 – a total of 2,560 bags of green coffee beans, exported to Cucuta. This is the only South American state with ports in both the Atlantic and the Pacific Ocean – a factor that determines its great commercial focus. The country produces 12% of the world's stock. Colombian coffee brands have a rich flavor, strong aroma, and moderate acidity. Colombian coffee varieties are known mostly for their deep aroma. The location of coffee farms is at the foot of the Andes, which helps impart special flavor properties to the end product due to the specific natural characteristics of the region.

Indonesia is next on the list, with annual output of 10.9 million bags of coffee. The geographic location of the country helps both *growing the coffee* and the coffee market *development*. The

first successful coffee plantations have been developed on the island of Java in the late 17th century. In the late 19th century, the harvest of *Coffea Arabica* is affected by coffee rust – a disease which destroys crops, this being one of the major reasons the country currently ranks far behind in the global ranking of coffee producers. The majority of coffee production in the country is Robusta (7 950 000), which means that special varieties of coffee in the country are grown, but in very small quantities even though small quantities of Arabica, produced in Indonesia, namely Indonesian Arabica, is considered to be one of the world's strongest coffee. An interesting fact is that Indonesia also produces the increasingly popular Kopi Luwak coffee – a coffee that is sold and produced solely due to the Indonesian civet cat.

Indonesia is followed in the coffee production rankings by the countries below: Honduras, Ethiopia, India, Uganda, Peru, and Mexico. It is very notable that India is well behind the ranking of the main producer countries in the five-year period, and this is due to the smaller plantations in the area and the redirection of labor to other sectors of the economy. The last country in the list is Mexico, with an average annual production of around 4 million bags per year, mostly of the Arabica variety. Coffee was introduced to Mexico from the Antilles, late 18th century. Nowadays approximately 100 000 small farms produce most of the production, like most coffee beans being grown in the

southern part of the country. Mexico is the largest importer of coffee for the United States (6). The nice Mexican coffee is similar to the fine white wine – it has delicate taste, it is pleasantly dry and has a slight acidic flavor.

It's not surprising that the biggest exporters are also the largest *coffee* producers in the world. Brazil and Vietnam are at the forefront, and it is typical for Vietnam that it is the largest Asian coffee producer – 29.5 million bags of Robusta. French missionaries imported coffee for the first time in Vietnam in the middle of 1860, but it took to 1990 before production expanded and reached a scale close to the current situation. The problem of Vietnamese farmers is derived from the fact that crops increase too quickly in terms of quantity, and this does not allow such rapid expansion of coffee processing, in turn resulting in issues with quality of the coffee produced. Colombia, Indonesia and India have a smaller share of coffee exports, which among the three countries is almost equal to the share of Vietnam exports. All other coffee *producers* and exporters in the world in terms of exports, amount to approximately coffee export levels in Brazil. This gives us reason to conclude that Brazil is the leading leader in both production and export of coffee for the analyzed period. We can summarize and conclude that the biggest importers in the coffee world are America, Germany, Italy, Belgium and Japan. All other countries have much lower import levels and will not be analyzed. America, Germany and Italy import mainly from Brazil, Vietnam and less from Colombia and other smaller coffee producing countries, which explains the better quality of coffee offered in these countries, sometimes based on special varieties of gourmet coffee.

According to “Eurostat” we can confirm that nearly 3 million bags of coffee have been imported in 2017 to the European Union (EU), which is a 5% increase compared to 2007 levels. Import of coffee in the EU is estimated at 8.8 billion euros (\$10.18 billion). Bulgaria is the 34th largest importer of coffee in the world, according to the World Stop Exports consulting firm, which also owns a specialized website for global trade. In our country, a total of 131.4 million dollars worth of *coffee has been imported*, and this indicator takes about 0.4% of the market share in foreign imports. According to Eurostat, the main quantities of coffee in the EU originate from two countries outside the Union: Brazil (imported into the

EU 840 thousand tones or 29% of total coffee imports to the EU) and Vietnam (627 thousand tons, 23%). Followed by Honduras (211,000 tons, 7%), Colombia (188,000 tons, 6%), Uganda (149,000 tons, 5%), India (148,000 tons, 5%) and Peru (119 thousand tones, 4%). In 2018, global purchases of imported coffee amounted to 32.9 billion dollars. From 2016 to 2018, imported coffee has increased with 9.4%. From a continental point of view, European countries reported the highest imports of coffee in 2018, with purchases worth \$ 18.5 billion, or 56.4% of the total amount. On the second place are ranked the North American importers with 23.5%, while 14.5% of world coffee imports are delivered to Asia. Lower percentages of coffee imports are reported in Africa at around 2.3%, Oceania - around 1.8%, led by Australia and New Zealand, then followed by Latin America, except Mexico but including the Caribbean (1.2%). According to the International Coffee Organization, we can summarize that total coffee exports have been increasing every year since 2010, with a new peak reached in 2018 at 121.86 million bags, or 2 percent growth, compared to 2017. (7) During the twelve months ending in September 2018, exports of green Arabica amount to 70.95 million bags compared to 70.51 million bags last year, considering that the exports of green Robusta amounted to 39.24 million bags compared to 38.87 million bags. Total shipments of all coffee varieties are increase significantly in four of the ten largest exporters of coffee in 2018, of course, including and the two largest producers and exporters in the world- Brazil and Vietnam. **Table 1** shows the first ten largest exporting countries for the end of the analyzed period. A strong impression is that coffee-producing countries also have countries that are not direct producers but have their own coffee- producing colonies or trade with coffee-producing countries. These countries also export and rank among the top ten largest exporters in the world. This is the case with Germany, Switzerland, Italy, Belgium and France.

The top ranked largest coffee exporting countries are the top ranked production countries – Brazil and Vietnam, with the biggest change to the percentage growth for the analyzed period marked by Brazil, with 14.1%, approximately seven times higher than tenth in the list export country Belgium. These facts are extremely logical, due to the fact that

Brazil has permanently retained its production potential.

Table 1. The main exporters by countries for the period 2017-2018 year and change of percentage growth against the previous economic year 2016-2017

N	Exporting country	Billion dollars	Percentage growth against the total coffee exports
1.	Brazil	4,60	14,1%
2.	Vietnam	3,50	10,7%
3.	Germany	2,64	8,1%
4.	Colombia	2,58	7,9%
5.	Switzerland	2,20	6,9%
6.	Italy	1,60	5,0%
7.	Indonesia	1,19	3,6%
8.	Honduras	1,16	3,6%
9.	France	1,07	3,3%
10.	Belgium	0,94	2,9%
12.	Ethiopia	0,93	2,9%
13.	Usa	0,87	2,7%
14.	Holand	0,75	2,3%
15.	Guatemala	0,74	2,3%

Source: The table is adapted to World Stop Exports: Official site for the export of world-class goods

To the entire analyzed period before it. The listed 15 countries in Table first are transferred over three quarters (78.2%) of global coffee exports for 2017 in value indicator (8). The fastest-growing leading exporters of coffee for Europe are also listed in table one and these are: Germany, Italy, Switzerland, Belgium, France and the Netherlands. Europe, thanks to these six countries, reported for the highest value of coffee exports in 2017, with total deliveries of 11.5 billion dollars or 35.1% of the world's coffee exports. On the second place is ranked Latin America (except Mexico) and the Caribbean – 33.2% (7).

The smaller percentages belong to Asian exporters – 18.3% and Africa - 6.9%. North America with 5.9% of Oceania only at 0.6%, led by Papua New Guinea and Australia.

One of the biggest importers of coffee in the world is America. The main countries from which North American coffee is imported are listed in the following figure. An interesting fact is that Columbian coffee for the end of the analyzed period outpaces the Brazilian by import value with 200 million tons. America's global purchases of imported coffee amounted to \$ 6.3 billion in 2018. **Figure 3** below outlines the 15 largest coffee providers from which the US imported coffee in 2018 in billions of dollars.

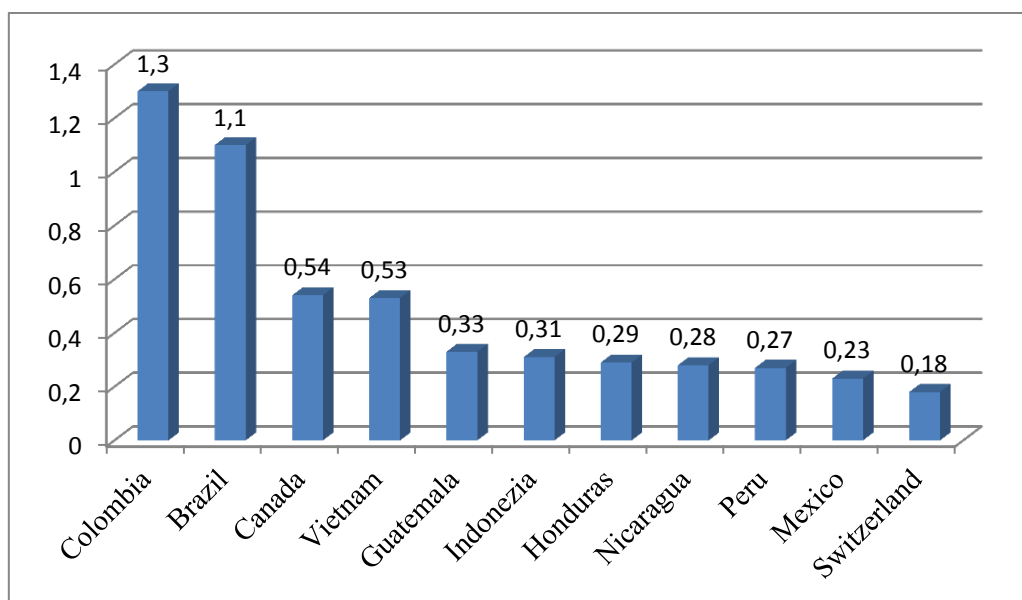


Figure 2. Main coffee import countries in North America

Source: Figure is adapted to World Stop Exports: Official site for the export of world-class goods

Table 2 presents the average selling coffee prices in years for the period 2010 to 2019. From table can be seen, that changes in rates for 2010 and 2014 are the largest, and in some years the

change is negative. Despite the close values in the change in average selling prices, the amount of realized kilograms of coffee produced is a determinant of the volume of sales revenue earned.

Table 2. Rate of average conversion prices per years for the period 2010-2019 in kilograms

YEAR	Average Closing Price	Year Open	Year High	Year Low	Year Close	Annual % Change
2010	1.6416\$	1.4185\$	2.4050\$	1.2880\$	2.4005\$	76.90%
2011	2.5338\$	2.3495\$	3.0615\$	2.1510\$	2.2685\$	-5.68%
2012	1.7528\$	2.2720\$	2.3490\$	1.3990\$	1.4380\$	-36.61%
2013	1.2625\$	1.4940\$	1.5630\$	1.0150\$	1.1070\$	-23.02%
2014	1.7840\$	1.1140\$	2.2190\$	1.1140\$	1.6660\$	50.50%
2015	1.3315\$	1.6105\$	1.8005\$	1.1215\$	1.2670\$	-23.95%
2016	1.3683\$	1.2390\$	1.7435\$	1.1160\$	1.3705\$	8.17%
2017	1.3346\$	1.3740\$	1.5540\$	1.1345\$	1.2620\$	-7.92%
2018	1.1360\$	1.3020\$	1.3020\$	0.9585\$	1.0185\$	-19.29%
2019	1.0071\$	0.9950\$	1.0680\$	0.9485\$	0.9665\$	-5.11%

Source: The table is adapted to Macrotrends: Macro-economic information site for research of global trade markets and the main products traded on them

To make coffee a favorite beverage throughout all over the world, one of the most important steps is to roast it. There are certain subtleties that the good coffee makers are familiar with and they relate to the following facts: special coffee brands are usually roasted in small batches. The two most commonly used methods are in a special drum unit or in hot air equipment. When roasted in a drum unit, coffee beans rotate in a drum that is heated by gas or other energy. When the desired level is reached, the grains are poured into a cooling hopper, which prevents them from burning. The scheme of operation in the hot-air equipment is as follows: coffee beans pass through a constant stream of hot air. Most coffees are roasted at about 220°C. The baking causes coffee beans to swell and expand their size by about 50-60%, while reducing their weight. During coffee roasting, sugars and other carbohydrates in the beans are caramelized to form a substance known as coffee butter. Technically, this is not exactly butter, because it is soluble in water, but it just gives the coffee its unique taste and aroma. The amount of coffee butter on the grain surface increases in proportion to the duration of the roasting, while the acidity and the caffeine content decrease. The final stage of baking is cooling. This is usually done by spraying cold water or cold air. Water cooling is a cheaper method, in which there is a risk of rewetting the roasted coffee, while cooling with cold air keeps the aromatic characteristics achieved during baking. Lightly roasted beans vary in color from cinnamon to chocolate milk. They are not usually used in espresso blend, as they are sourer and have sharp taste. Heavily roasted dark coffees (popular as French or Italian Roast, Italian Roast) have a more dense

and characteristic sweet sour taste (9). Dark roasted coffees acquire a color of chocolate brown with a satin gloss to almost black with a very high fat content. The strongest roasted coffee has a typical smoky taste and is more suitable for Turkish or Schwarz coffee than for espresso. In the baking process (starting from the lightest to the most roasted), the following names have been established: "Light", "Cinnamon", "Medium", "High", "City", "Full City", "French Roast", "Dark French roast", "Italian roast" (9).

After cooling as a process follows the packing of the coffee. Coffee should be packed in packs to prevent any contact with oxygen. Oxygen is the worst enemy of baked coffee. Exposed to air, it will lose 40% of its fragrance only after eight hours. On the other hand, freshly baked coffees exude hundreds of chemical substances in the form of different steams. It takes about a day or two to complete the process and the coffee to get its true aromatic characteristics (9). Most of the good brands pack coffee in special packages that allow these gases to leave the packet, but do not allow the inversion of oxygen. If not packaged in this way, it means that the coffee has been stayed before packing and has already lost some of its flavor or that the package is not hermetically sealed, which is even worse.

Coffee is one of the most popular beverages on the planet and is also one of the most traded goods in the world. Some bean coffees can travel more than 600,000 km from their country to consumer markets before they reach us as consumers. Coffee is widely grown in the tropical zones and is an important export crop for many developing countries. Furthermore, coffee production and trade is significant from

an economic and social point of view, and it significantly contributes to the livelihood of local farmers. Brazil and Vietnam increase most of the world's total production while the European Union is the largest total importer, followed by the United States.

CONCLUSION

Coffee, which is produced in more than 50 developing countries, is one of the most traded goods in the world. It has an important contribution to socio-economic development and the reduction of poverty in the producing countries of this specific culture. Its great economic importance is based on exports, which represent more than half of the income of the people involved in its conversion. Moreover cup of coffee in the highly developed countries of North America and the European Union could reach a price of 3.60 \$, but for that same cup, coffee farmers in the Andes and in South America or Southeast Asia only get 24 cents, or 7 percent of its selling price, which, of course, does not even cover production costs or basic needs of manufacturers. These are the most direct consequences of the crisis over the past two years, which leads to poverty of over 2 million and half coffee producers. Coffee trade by four multinational companies - Nestle, Kraft Foods, Procter & Gamble and Sara Lee has limited their economic growth in the last two years, once again because of the crisis situation related to adverse climate change, which also affect the production processes of the world's best-selling crop.

Another adverse reason for the occurrence of a crisis situation in recent years are the existing adverse circumstances in the global industry for the production of coffee related with finding cheap labor and rising costs for labor in coffee producing countries. Low prices that coffee farmers receive not only endanger the livelihood of people and communities in these countries, but also substantially increase global inequality and its correlation with financial and political consequences. From the economic point of view, the crisis also reveals the failures of the export-oriented models, where large financial resources are dedicated to the coffee-processing countries, not the coffee-producing countries for this specific type of crop. This is what developing countries are losing on, and the developed countries are earning a significantly share. Examples of this are countries like North America, Italy, Germany, Switzerland and France, who create world-famous coffee brands based on

Brazilian, Colombian and Vietnamese coffee. The increased export of coffee from the side of the producing countries leads from one side to the social, the other to the economic benefit for them. The social benefit is expressed in creating jobs and employment. This is also a major problem in coffee production, because most of the processes in underdeveloped countries are performed manually and economic aspects are associated with revenues from main production activity in these countries. The economic aspects of coffee importing and processing countries are associated primarily with the addition of value to the original resource, which creates the conditions for greater financial profits and greater satisfaction of processors, on the one hand, and their workers and consumers, consuming coffee as an end product on the other hand. If producing countries start processing coffee and do not export it, but instead process it until they get to a complete product, the global implications shall be oversupply of goods and a decline in sell prices.

This can be explained by a reduction in transport costs and on the other hand reduction in labor costs, because labor costs are often lower in developing countries compared to labor costs in developed countries. The truth is that contemporary economic and social stage, the life of small farmers producing coffee is highly vulnerable, depending on the imposed conditions. This is done on the basis of the companies that dominate commodity markets and in all cases are structured in a way that concentrates the power in a small number of international corporations, which process and market coffee.

What can be done in modern conditions, as an impact in the sector we think it is: the creation of a Global Organization to support coffee producers all over the world. The organization will protect at the same time and support the members of its structures. Another good alternative is the possibility of participation in programs designed to reduce the effects of price shocks as the farmers and any programs that the European Union has developed very successfully. As an example, we can mention a Rural Development Program and a measure of support for young farmers in rural areas. It is also necessary to support the capacity of local associations processing and producing coffee in order to obtain a fair price for the main coffee producers, not the coffee merchants. Our last proposal is associated with improved

quality in the world market of coffee and promote to diversified activities, relating for example to the production of cocoa and other relevant for the region cultures with purpose to reduce the risk of bad Coffee business year, based on adverse weather or a number of pests on the coffee crops.

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