

Impact of covid-19 on the global coffee sector: the demand side

ICO Coffee Break Series

No. 1

8 April 2020

Summary

- The novel coronavirus (covid-19) pandemic is a dramatic public health crisis with significant impacts on economies around the world.
- The spread of covid-19 represents an unprecedented economic shock in an interdependent world, as demand and supply are scaled back around the globe and across sectors.
- The covid-19 pandemic is likely to have a profound impact on the global coffee sector, including production, consumption and international trade.
- This brief provides a preliminary assessment of the demand-side effects of covid-19, specifically the impact of a global recession on coffee consumption.
- The analysis is based on a sample of the top-20 coffee-consuming countries, which represent 71% of global demand, covering the period 1990-2018.
- The results show that a one percentage point drop in GDP growth is associated with a reduction in the growth of global demand for coffee of 0.95 percentage points or 1.6 million 60-kg bags.
- Additional demand-side effects relate to the impact of social distancing measures on out-of-home consumption as large parts of the hospitality industry are under lockdown and workplaces are closed.
- Further analysis, in particular of the supply-side effect of the covid-19 pandemic, is necessary to understand the overall impact on the global coffee sector and all actors along the global value chain. These effects will be assessed in future issues in the ICO Coffee Break series.

The ICO Coffee Break series aims at providing concise accounts of coffee sector issues of topical interest, with a view to facilitating informed debate. The series is based on analyses carried out by the ICO Economics and Statistics sections related to coffee policy and strategic matters.

The issue

Within only a few weeks, the spread of the novel coronavirus (covid-19) developed into a global public health crisis, with more than 180 countries and regions affected. To date, more than 1.3 million people have tested positive for the virus and more than 70,000 deaths have been counted.¹

In addition, the covid-19 pandemic is affecting the everyday lives of people and significantly impacting economies around the world. The covid-19 crisis presents a demand and supply shock that impacts international trade flows and production chains. Although governments are implementing policies to save lives and mitigate the economic damage, a global economic downturn is unfolding. Most international organizations and research institutes predict a steep initial decline in economic growth and rising unemployment, to be followed by a recovery, the extent of which will depend on the effectiveness of actions taken in response to the covid-19 crisis and how quickly confidence returns.²

The spread of covid-19 presents a significant additional challenge to the global coffee sector, which has gone through a prolonged period of low producer prices. Despite steady overall growth in the sector, coffee prices have experienced a continued downward trend since 2016, dropping 30% below the average of the last ten years. Many of the 25 million farmers worldwide, the majority of which are smallholders, struggle to cover their operating costs as input prices continue to rise. Consequently, farm incomes decline and livelihoods are increasingly at risk. Lack of investment in the modernization of farms and in adaptation to the impact of climate change poses a serious risk to the sustainability of the sector and to future coffee supply.³

¹ Estimates of the John Hopkins University [Corona Virus Resource Centre](#) (accessed 7 April 2020).

² For example, OECD: "[Evaluating the initial impact of COVID-19 containment measures on economic activity](#)", 27 March 2020.

³ For a comprehensive assessment of the root causes and impact of the coffee price crisis, please refer to the [ICO Coffee Development Report 2019](#).

How will the spread of covid-19 affect the global coffee sector? The following analysis focuses on demand-side effects of the pandemic.

Analysis and key results

In the short-term, out-of-home consumption⁴ is decreasing significantly as a growing number of countries are adopting a full or partial lockdown. Offices, coffee shops and restaurants remain closed in order to reduce the spread of the virus.

On the other hand, retail- and supermarket-level data suggest that panic buying and stockpiling has led to increased consumer demand in some countries⁵. However, this is unlikely to have a sustained effect on consumption. Following an initial spike in demand, there will be proportionally less demand in the coming weeks and months as consumers draw down stocks kept at home.

A more profound effect on global coffee demand can be expected as the result of a global recession triggered by the direct and indirect effects of the covid-19 pandemic. Reduced household incomes could translate into lower demand for coffee in volume terms. In addition, price-sensitive consumers may substitute higher-value coffee by lower-value blends or brands. However, the income elasticity of coffee demand is likely to be low, especially in high-income countries and traditional markets with high per-capita consumption rates.

The following quantitative analysis attempts to identify the relationship between GDP growth and coffee consumption (in volume terms), thereby providing an estimate of the demand-side shock resulting from the covid-19 pandemic.

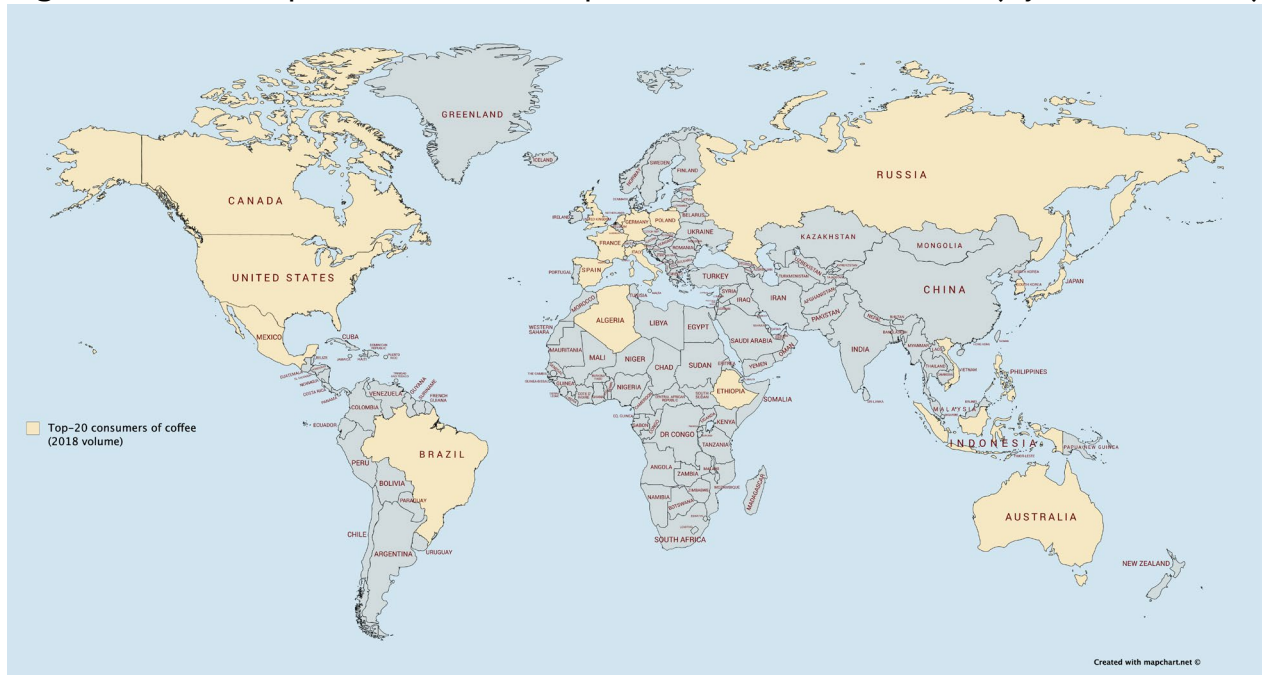
⁴ In 2018, coffee consumed out-of-home represented approximately 26.1% of the total quantity of coffee consumed worldwide according to an [estimate](#) by CoffeeBi, a consultancy.

⁵ Market research institute IRI recorded an increase of demand in the roasted coffee category. In the week ending 15 March consumer spending in Italy and France had increased by 34.6% and 29.5%, respectively, compared to the same period last year. The full report is available [here](#).

Sample & data

The dataset contains annual observations of coffee consumption⁶ obtained from the ICO Global Coffee Database, as well as economic and demographic indicators from the United Nations (UN) and World Bank, for the twenty most important coffee-consuming countries, which represent 71% of global demand (Figure 1). The dataset contains up to 578 annual, country-specific observations for each variable.

Figure 1: The sample includes the top-20 consumers of coffee (by 2018 volume)



Source: ICO

Visual inspection of the data

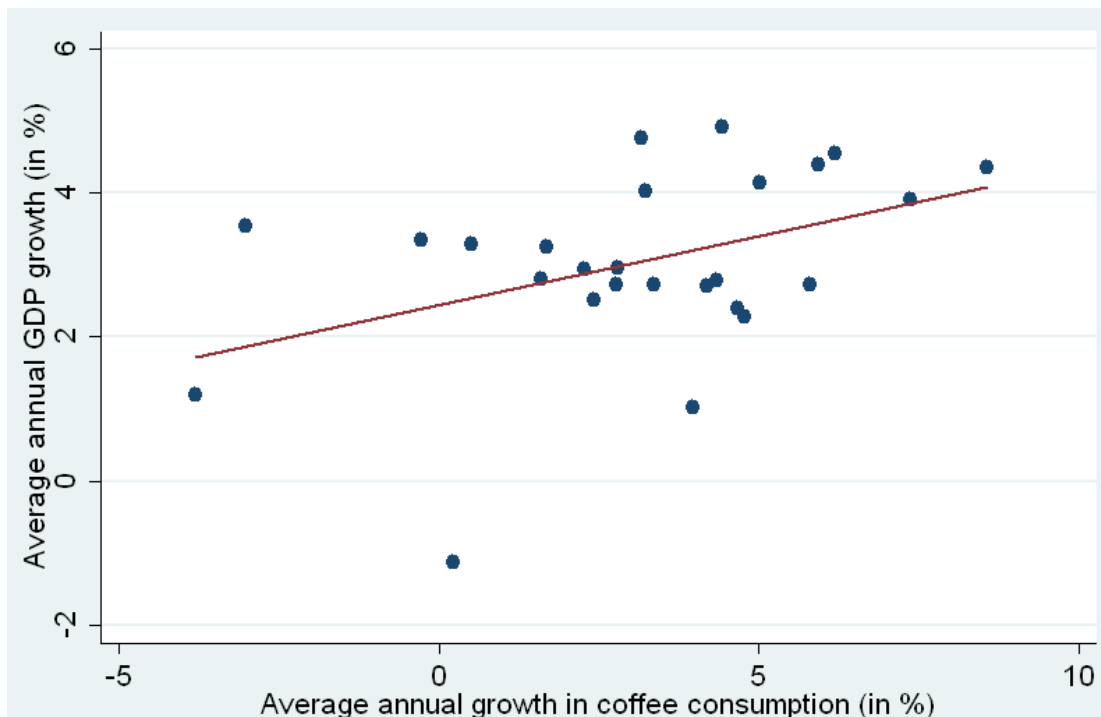
As a first step, the relationship between the variable of interest (growth in coffee consumption) and the key driver (GDP growth) is inspected visually. Figure 2 shows the annual GDP growth rates plotted against the annual growth rates in coffee consumption. Both variables are expressed in percentage terms. Each point in Figure 1 represents the annual average of the 20 countries contained in the sample.

⁶ Consumption refers to 'net-imports' of coffee importing countries and 'domestic consumption' for coffee exporting countries as per ICO definition.

The plot reveals that the average annual GDP growth rates of the sample fall in the range of -1.1% to +4.9%, while average annual growth rates of coffee consumption were between -3.8% and +33.1%.

The linear regression line (red) suggests a positive relationship between GDP growth and growth in coffee consumption. However, a more robust estimation requires controlling for country-specific characteristics or time-specific factors (e.g. coffee prices, mild winters and hot summers in any given year) that could drive consumption.

Figure 2: Relationship between GDP growth and growth in coffee consumption in the top-20 coffee-consuming countries. Annual sample average for the period 1990 – 2018.



Note: Two outliers have been removed from this graph (years 1992 and 1999)

Source: Own analysis based on ICO and World Bank data

Econometric analysis and results

A regression framework is employed to assess the relationship between GDP growth (dependent variable) and growth in coffee consumption. Additional independent variables are country- and time-specific controls for socio-economic development, market size, maturity of the coffee market.

Across a variety of model specifications, the regression results indicate that GDP growth and coffee consumption are correlated. The results are highly statistically significant (see Annex 1 for model specifications).

The regression results imply that on average a **one percent drop in GDP growth** globally is associated with **0.95 percent lower growth in coffee consumption**, in relative terms.⁷ This is a **reduction of growth in global demand for coffee by 1.6 million 60-kg bags** in absolute terms.⁸

These results suggest that even a modest decline in GDP growth as a result of the covid-19 pandemic could have a significant impact on global coffee demand. The model predicts that a larger drop in GDP growth or a global recession would have a proportionally greater effect. As a result, coffee consumption levels could stagnate (or even decline) compared to pre-crisis years that were characterized by steadily increasing demand for coffee (at a rate of 2 to 3% per annum).

Discussion and next steps

The results derive from the analysis of historical data covering a sample of twenty countries. There is considerable variation in the outcome variables reflecting regional and global economic downturns of the past (e.g. 1998 Asian Financial Crisis, 2008 Great Recession). In principle, this variation helps to isolate effects from statistical noise and enables robust predictions.

⁷ This assumes that the relationship between GDP growth and growth in coffee consumption established for the sample countries is similar in those markets that are not included in the sample (the remaining 29% of global coffee demand).

⁸ This estimate is based on global demand for coffee of 168 million 60-kg bags in 2018, the final year of the underlying dataset.

However, the predictive power of the model is subject to some limitations. These are related to the use of historical data to project the impact of the covid-19 pandemic, which in many ways is exceptional.

First, none of the previous financial crises are likely to compare, in terms of the magnitude and severity of the shock (but potentially also the recovery), to the impact of covid-19 on the global economy.

Second, many of the measures taken by governments in response to covid-19 are unprecedented. For example, social distancing measures have caused a shutdown of large parts of the retail, hospitality and tourism sectors. This could severely affect out-of-home consumption and, thus, overall demand for coffee if the shortfall is not compensated by increased at-home consumption.

Finally, besides a reduction in the quantity of coffee consumed that is analyzed in this brief, substitution effects are likely. Price sensitive consumers could seek cheaper alternatives to the coffee they used to purchase pre-crisis, e.g. substituting high-end brands and specialty coffee with lower cost offerings. Further research is required to quantify this effect.

This is a first step in the assessment of the covid-19 pandemic on the global coffee sector, providing insights to inform the debate among and between public and private sector stakeholders.

The analysis presented herein focuses on demand-side effects. However, the covid-19 crisis also affects the supply side. As the virus continues to spread in coffee-growing countries, coffee production and supply chains are likely to be severely disrupted.

Hence, it is important to extend the analysis to the supply side in order to achieve a more comprehensive understanding of the net effect on the market including on international and domestic coffee prices. Only if specific implications of the pandemic for coffee growers, traders, roasters and consumers are well understood can effective emergency and recovery measures be identified in order to overcome the crisis and to ensure the long-term sustainability of the global coffee sector.

ANNEX 1: Econometric approach and regression results

A **log-log fixed effects regression framework** is employed to assess the relationship between GDP growth and growth in coffee consumption.

The **dependent variable** is the natural logarithm of coffee consumption in a given country and year. The **main independent variable** included in the analysis is the natural logarithm of real GDP (in constant 2010 USD).

Additional independent variables are country- and time-specific controls for socio-economic development (UN Human Development Index), market size (natural logarithm of population), maturity of the coffee market (dummy variable, where 1 indicates that annual coffee per-capita consumption exceeds the sample median of 3.2 kg). Finally, control variables (dummies) are added for each year in the dataset, with 1990 being excluded as base year.

Four models were specified that differ in terms of the inclusion of specific control variables (Table A1). The coefficient for the main explanatory variable ‘Log GDP real’ is positive and statistically significant across all models. This suggests that GDP growth and coffee consumption are positively correlated.

The results of the regression are robust to the exclusion of outliers with slightly diminished but highly statistically significant coefficients.

Table A1: Relationship between GDP growth and coffee consumption in the top-20 coffee consuming countries. Estimation results of the Log-Log fixed effects model.

VARIABLES	(1) Log coffee demand	(2) Log coffee demand	(3) Log coffee demand	(4) Log coffee demand
Log GDP real	1.052*** [0.0627]	0.923*** [0.102]	1.186*** [0.0873]	0.952*** [0.0997]
Human Development Index		-0.413 [0.797]	-0.283 [0.795]	-0.213 [0.780]
Log Population aged >=15		0.812*** [0.172]		0.773*** [0.169]
High per-capita coffee consumption* (y=1)			0.222*** [0.0439]	0.212*** [0.0431]
Year fixed effects	✓	✓	✓	✓
Country fixed effects	✓	✓	✓	✓
Constant	-13.96*** [1.696]	-24.52*** [2.622]	-17.59*** [2.047]	-24.90*** [2.566]
Observations	578	566	566	566
R-squared	0.639	0.648	0.650	0.664

* Annual coffee consumption above sample median (3.2 kg/capita)

Standard errors in brackets: *** p<0.01, ** p<0.05, * p<0.10

Source: ICO