



INTERNATIONAL  
COFFEE  
ORGANIZATION

**COFFEE**  
DEVELOPMENT REPORT



A Flagship Report of the International Coffee Organization

# THE VALUE OF COFFEE

Sustainability, Inclusiveness, and Resilience  
of the Coffee Global Value Chain

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The ICO's mission is to strengthen the global coffee sector and promote its sustainable expansion in a market-based environment for the betterment of all participants in the coffee sector.



# THE VALUE OF COFFEE

Sustainability, Inclusiveness, and Resilience of the Coffee Global Value Chain

2020  
COFFEE  
DEVELOPMENT REPORT

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# CONTENTS

<b>Acknowledgements</b>	<b>6</b>	<b>Part II: Section B</b>	<b>40</b>
<b>Abbreviations</b>	<b>7</b>	<b>Resilience of the coffee Global Value Chain</b>	
<b>Foreword</b>	<b>8</b>	Key findings	41
<b>Part I: Overview</b>	<b>10</b>	B.1. What is resilience in the context of the global coffee sector?	42
O.1. Objectives and structure of the report	11	B 1.1. Political instability and conflict in coffee-exporting countries	
O.2. Introduction: the value of coffee	12	B.1.2. Climate change and environmental shocks	
O.3. Main findings	15	B.1.3. Pandemics and public health crises	
O.4. Key areas for action for sustainable, inclusive and resilient growth of the C-GVC	20	B.1.4. Concentration of production in fewer origins and its impact on resilience	
<b>Part II: Section A</b>	<b>22</b>	<b>Part II: Section C</b>	<b>50</b>
<b>The rise of the coffee Global Value Chain: evolution and drivers of participation</b>		<b>Economic, social and environmental impacts of the coffee Global Value Chain in producing countries</b>	
Key findings	23	Key findings	51
A.1. Coffee export values have been increasing	24	C.1. Expansion of the GVC as a driver of sustainable and inclusive growth	53
A.1.1. Processed coffee exports increased more than green coffee exports since 1990s		C.2. Evidence on the socio-economic impact of the C-GVC	56
A.1.2. Which regions captured more value?		C.2.1. The C-GVC helps to remove obstacles for farmer participation in high-value markets	
A.1.3. Coffee exports are increasingly concentrated		C.2.2. Responsible trading practices and improved corporate governance in the GVC	
A.1.4. Functional upgrading in producing countries – development trajectories		C.2.3. Buyer-driven initiatives as a key feature of the C-GVC	
A.2. Determinants of GVC participation	33	C.2.4. Upgrading through post-harvest processing can facilitate participation in the GVC	
A.2.1. Indicators of GVC participation		C.2.5. The C-GVC facilitates FDI in post-harvest processing and value addition	
A.2.2. The drivers of GVC participation		C.3. The C-GVC can contribute to achieving the Sustainable Development Goals	63
A.2.3. Capital, domestic industrial capacity, and FDI drive processed coffee exports whereas tariffs reduce them		C.3.1. C-GVC and Gender	
A.2.4. Functional upgrading is an opportunity for Robusta producers with capital and industrial capacity, whereas product upgrading represents an opportunity for Arabica producers.		C.3.2. Productive employment and decent work for all	
		C.3.3. Environmental impact in the C-GVC	



<b>Part II: Section D</b>	<b>70</b>	<b>Bibliography</b>	<b>96</b>
<b>Policy implications and recommendations towards a sustainable, inclusive and resilient Global Value Chain</b>		<b>Annexes</b>	<b>101</b>
Key findings	71	Annex 1. Country name abbreviations	
D.1. Implications for the future integration of producing countries in the C-GVC	72	Annex 2. Determinants of countries' exports in coffee	
D.1.1. Recommendations for functional upgrading in the coffee sector of producing countries		Annex 3. Determinants of countries' GVC upgrading	
D.1.2. Recommendations for product and process upgrading in the coffee sector of producing countries		Annex 4. Determinants of revenues earned per kg of coffee harvested in Uganda case study	
D.2. Towards resilient, inclusive, equitable and sustainable C-GVCs	78		
D.2.1. A smart mix of voluntary industry and regulatory approaches			
D.2.2. Multi-stakeholder governance initiatives			
<b>Part III: Section E</b>	<b>84</b>		
<b>Market overview 2019/20: A year of unprecedented challenges</b>			
Key findings	85		
E.1 International prices 2019/20	86		
E.1.1. Prices remain low despite some rallies throughout the season			
E.1.2. Diverging trends among the group indicators			
E.1.3. Price volatility in spot and futures coffee markets			
E.2. Regional Supply and Demand in 2019/20	89		
E.2.1. Africa's exports rise			
E.2.2. Production from Asia and Oceania grows while exports fall			
E.2.3. After three years of growth, Mexico and Central American coffee production declines			
E.2.4. European demand and imports decline			
E.2.5. North America's coffee demand falls after significant growth in 2018/19			
E.2.6. South America's Arabica production			

# CONTENTS

## List of Figures

### Part I: Overview

<b>Figure O.1:</b> The C-GVC	12
<b>Figure O.2:</b> Coffee Prices remain below the 10-year average	14
<b>Figure O.3:</b> Non-producing countries have significantly increased exports of coffee	14
<b>Figure O.4:</b> Coffee production and exports	15
<b>Figure O.5:</b> Growth rates of coffee exports between the period 1991-1994 and the period 2015-2018 by coffee form	16
<b>Figure O.6:</b> Roasted coffee exports of Switzerland	16
<b>Figure O.7:</b> Growth rate of unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1995-1998) in case of soluble coffee exports	16
<b>Figure O.8:</b> Determinants of functional upgrading	17
<b>Figure O.9:</b> Impact channels of covid-19 in coffee-producing countries	17
<b>Figure O.10:</b> A beneficial exchange – the flow of intangible benefits from lead firms to farmers in the C-GVC	18
<b>Figure O.11:</b> Revenues in the GVC: versus conventional channels	18
<b>Figure O.12:</b> Key Sustainable Development Goals linked to the expansion of the C-GVC	19

### Part II: Section A

<b>Figure A.1:</b> Evolution of coffee exports over time and their share in world agricultural exports	24
<b>Figure A.2:</b> Coffee trade by coffee form and its evolution over time	24
<b>Figure A.3:</b> Production and export of coffee in 2018/19	25
<b>Figure A.4:</b> Growth rates of coffee exports between the period 1991-1994 and the period 2015-2018 by coffee form	25
<b>Figure A.5:</b> Growth rates of unit value by coffee form over time	26
<b>Figure A.6:</b> Growth rates of unit values of green coffee	26
<b>Figure A.7:</b> Regional distribution of the coffee trade by form of coffee and over time	27
<b>Figure A.8:</b> Concentration of coffee exports across countries over time (Relative Theil)	28
<b>Figure A.9:</b> Roasted coffee exports of Switzerland and Colombia	29

<b>Figure A.10:</b> Average annual ratio of processed coffee exports to total coffee exports in selected countries between 1991-2018	30
<b>Figure A.11:</b> Growth rate of per unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1991-1994) in case of roasted coffee exports (both in %)	31
<b>Figure A.12:</b> Growth rate of unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1995-1998) in case of soluble coffee exports (both in %)	31
<b>Figure A.13:</b> Growth rate of per unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1991-1994) in case of green coffee exports	32
<b>Figure A.14:</b> Determinants of countries' coffee exports	37
<b>Figure A.15:</b> Determinants of countries' GVC upgrading	38

### Part II: Section B

<b>Figure B.1:</b> Resilience Conceptual Framework	42
<b>Figure B.2:</b> Political Stability vs. coffee exports (2018)	43
<b>Figure B.3:</b> Coffee exports drop as a result of conflict	44
<b>Figure B.4:</b> Impact channels of covid-19 in coffee-producing countries	45
<b>Figure B.5:</b> GHS scores vs. log of coffee exports (2019)	46
<b>Figure B.6:</b> Concentration of production in fewer origins	48

### Part II: Section C

<b>Figure C.1:</b> Inclusive Value Chain Development Theory of Change	54
<b>Figure C.2:</b> A beneficial exchange – the flow of intangible benefits from lead firms to farmers in the C-GVC	56
<b>Figure C.3:</b> Price premiums for Supremo coffee in the Colombian coffee value chain	58
<b>Figure C.4:</b> Average revenues earned per kg of coffee harvested in the GVC versus conventional	59
<b>Figure C.5:</b> Regression results of average revenues earned per kg of coffee harvested (in Ugandan shillings) on participation in the GVC	59
<b>Figure C.6:</b> Coffee Processing	60
<b>Figure C.7:</b> Share of washed Arabica in total Arabica exports in selected countries	61

<b>Figure C.8:</b> Ownership of washing stations in Rwanda	62
<b>Figure C.9:</b> Sustainable Development Goals linked to the expansion of the C-GVC	63
<b>Figure C.10:</b> The circular economy model	69

#### Part II: Section D

<b>Figure D.1:</b> Number of harmful and liberalizing trade interventions (2009-2020)	73
<b>Figure D.2:</b> Due diligence process and supporting measures	79
<b>Figure D.3:</b> Distribution of value, costs and margins of plain dark chocolate tablets in 2018	81
<b>Figure D.4:</b> Action costs and profit margins in the Venezuelan Coffee Value Chain for the year 2020	82

#### Part III: Section E

<b>Figure E.1:</b> ICO composite indicator daily prices	86
<b>Figure E.2:</b> ICO group indicator daily prices	86
<b>Figure E.3:</b> Spot and futures daily coffee price variability (1 October 2019–30 September 2020)	88
<b>Figure E.4:</b> Day-to-day percentage variations in daily spot and futures prices (1 October 2017–30 September 2020)	88

### List of Tables

#### Part II: Section A

<b>Table A.1:</b> Conversion Rate of coffee weight to green bean equivalent	24
<b>Table A.2:</b> Description of indicators of GVC participation (dependent variables)	22
<b>Table A.3:</b> Description of drivers of GVC participation (explanatory variables)	34

#### Part II: Section B

<b>Table B.1:</b> Potential shocks/stressors and their potential impact on the C-GVC	42
<b>Table B.2:</b> GHS Score and Political Stability Indicator of the top-5 most coffee-dependent exporting countries (by 2018 share of coffee exports in total merchandise exports)	49
<b>Table B.3:</b> GHS Score and Political Stability Indicator of the top-5 largest exporting countries (by 2018 coffee exports)	49

### List of Boxes

<b>Box O.1:</b> Upgrading in the C-GVC	
<b>Box O.2:</b> Coffee prices and unit values	14
<b>Box A.1:</b> Arabica vs. Robusta coffee	27
<b>Box A.2:</b> Theil index of concentration	28
<b>Box A.3:</b> Switzerland and Colombia – successful GVC integration	29
<b>Box A.4:</b> Econometric approach to analysis of the determinants of GVC participation	36
<b>Box B.1:</b> Measuring resilience – an approach developed by COSA and partner organizations	43
<b>Box B.2:</b> Addressing and mitigating the covid-19 pandemic in African coffee-exporting countries	47
<b>Box C.1:</b> Buyer-driven programme for promoting a sustainable coffee sector in Burundi	53
<b>Box C.2:</b> Standards as an instrument to mitigate sustainability challenges	55
<b>Box C.3:</b> The Sustainable Quality Programme in Colombia	58
<b>Box C.4:</b> Sustainability programme in Uganda	59
<b>Box C.5:</b> Post-harvest processing methods	60
<b>Box C.6:</b> Evolution of wet mills in Rwanda	62
<b>Box C.7:</b> Youth and covid-19 recovery	66
<b>Box D.1:</b> Is protectionism on the rise in the coffee sector?	73
<b>Box D.2:</b> Upgrading participation in the Global Value Chain: the incentives provided by the European Union – Viet Nam Free Trade Agreement (EVFTA)	74
<b>Box D.3:</b> ICO Coffee Public-Private Task Force Process	80
<b>Box D.4:</b> Summary of cocoa and coffee studies / BASIC	81
<b>Box D.5:</b> Value chain analysis for decision support in the coffee value chain	82
<b>Box E.1:</b> The ICO composite indicator	87
<b>Box E.2:</b> About the Excessive Food Price Variability Early Warning System	88

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# ABBREVIATIONS

<b>4C</b>	The Common Code for the Coffee Community	<b>ICC</b>	International Coffee Council
<b>AfCFTA</b>	African Continental Free Trade Agreement	<b>ICO</b>	International Coffee Organization
<b>BASIC</b>	Bureau for the Appraisal of Social Impacts for Citizen information	<b>IDH</b>	Initiatief Duurzame Handel (The Sustainable Trade Initiative)
<b>BMZ</b>	German Federal Ministry for Economic Cooperation and Development	<b>IFPRI</b>	International Food Policy Research Institute
<b>CAT</b>	Chain Analysis Tool	<b>IPCC</b>	The Intergovernmental Panel on Climate Change
<b>CBI</b>	Centre for the Promotion of Imports from Developing Countries	<b>IFW</b>	Kiel Institut für Weltwirtschaft (Kiel Institute for the World Economy)
<b>CFC</b>	Common Fund for Commodities	<b>ILO</b>	International Labour Organization
<b>CGLF</b>	CEO and Global Leaders Forum	<b>ITC</b>	International Trade Centre
<b>C-GVC</b>	Coffee Global Value Chain	<b>JRC</b>	Joint Research Centre of the European Commission
<b>CPPTF</b>	Coffee Public-Private Task Force	<b>LICOP</b>	Living Income Community of Practice
<b>COSA</b>	Committee on Sustainable Assessment	<b>NSCP</b>	National Coffee Sustainability Plan
<b>CPI</b>	Consumer Price Index	<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>CWS</b>	Coffee Washing Stations	<b>OFMP</b>	L'Observatoire de la Formation des Prix et des Marges des Produits Alimentaires
<b>DG DEVCO</b>	Directorate-General for International Cooperation and Development of the European Commission	<b>RTG</b>	Research Training Group
<b>EBRD</b>	European Bank for Reconstruction and Development	<b>PPML</b>	Poisson Pseudo-Maximum-Likelihood Estimator
<b>ECA</b>	European Cocoa Association	<b>SCA</b>	Specialty Coffee Association
<b>EU</b>	European Union	<b>SCC</b>	Sustainable Coffee Challenge
<b>FAO</b>	Food and Agriculture Organization of the United Nations	<b>SDGs</b>	Sustainable Development Goals
<b>FDI</b>	Foreign Direct Investment	<b>STDF</b>	Standards and Trade Development Facility
<b>FNC</b>	Colombian Coffee Growers Federation	<b>TWs</b>	Technical Workstreams
<b>FSP</b>	Food Security Portal	<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>GAP</b>	Good Agricultural Practice	<b>UNICEF</b>	United Nations Children's Fund
<b>GCP</b>	Global Coffee Platform	<b>UNIDO</b>	United Nations Industrial Development Organization
<b>GDP</b>	Gross Domestic Product	<b>USD</b>	United States Dollar
<b>GHS</b>	Global Health Security	<b>VSS</b>	Voluntary Sustainability Standards
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	<b>WIPO</b>	World Intellectual Property Organization
<b>GTA</b>	Global Trade Alert	<b>WB</b>	World Bank
<b>GVC</b>	Global Value Chain	<b>WTO</b>	World Trade Organization
<b>IADB</b>	Inter-American Development Bank		
<b>ICAFFE</b>	National Coffee Institute, Costa Rica		

# FOREWORD



We have all been profoundly affected and troubled by the covid-19 pandemic, a dramatic global crisis with extreme consequences for the lives of people around the world from a health, social, emotional and economic perspective. We all hope that the emergency will end soon and recovery will speedily ensue. Sadly, with an unfolding economic recession the pandemic is having

major implications on poverty, food insecurity and health, especially in rural areas and among the most vulnerable and low-income parts of the world population, reversing the significant progress in reducing extreme poverty achieved over the last 25 years.

The coffee sector has also been hit by the coronavirus. The future of coffee and its resilience and adaptation to changes are threatened. The coffee value chain is facing an unprecedented situation, since coffee production, trade, retail and consumption have all been negatively impacted by the pandemic. Both supply and demand have become more unstable and uncertain, as a result of disruptions in the operation of coffee supply chains and significant alterations in the level and patterns of consumption.

Within this larger context, the cumulative effects of the coffee price crisis and the covid-19 pandemic present a major hazard for millions of coffee farmers who already struggle to cover their operating costs, let alone provide for their families. In addition, scarcity of resources generates a significant reduction of investment in the maintenance and modernization of plantations and farm operations as well as in the adaptation to climate change, thereby jeopardizing the sustainability and the very future of the coffee supply. Furthermore, many jobs across the coffee value chain, especially at the retail level, which often are held by young people, have recently been lost, extending the crisis to those with low-incomes and who are most vulnerable.

This report builds on the ICO's prompt assessment of the impact of the pandemic on the coffee sector and identification of options and partners to address the contingent problems and facilitate a prompt recovery for all coffee stakeholders, especially farmers and their families.<sup>1</sup> We have also incorporated some initial reflections on the resilience of the coffee GVC (C-GVC) to the pandemic, as well as to climate emergencies and weather shocks, political instability, and plant pests and diseases.

I am pleased to present the Coffee Development Report (CDR) which focuses on the analysis of the "value of coffee" from bean to cup, from farmers to consumers and from the agricultural production to disposal. It reflects the structural changes in international trade and the rise of Global Value Chains (GVCs), while maintaining an emphasis on the economic sustainability of the coffee sector. The report was particularly inspired by the seminal World Development Report 2020 of the World Bank which focuses on understanding the impact of Global Value Chains (GVCs) in the world economy on livelihoods in developing and transition countries.

Following the liberalization of the coffee sector at the national and international levels in the last three decades, trade within the GVC has increased considerably and, similarly to other agricultural and industrial products, the coffee chain is increasingly associated with specialization and high-efficiency operations, as well as durable and closer relationships between the actors involved. Moreover, the new role of lead firms in the C-GVC and their close relationships with suppliers has changed the governance and power balance in the coffee sector. It has opened up new opportunities for coffee growers to upgrade, gain access to the global market, and acquire knowledge and technology to improve quality, sustainability and profitability.

<sup>1</sup> ICO research on covid-19 (<https://linktr.ee/ICOResearch>) provided key inputs for the preparation of this Report through: the analysis of the effect on coffee demand and supply; a consultative process through direct contact with ICO members, the private sector and key development partners; a series of webinars, including a high-level online seminar held in June 2020 and a survey of the impact of covid-19 on coffee-producing countries.



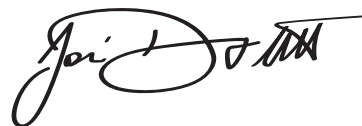
With this report we want to contribute to an understanding of the dynamics and governance of the entire coffee global value chain and its evolution over the years and to provide new quantitative analyses of the C-GVC, based on 30 years of detailed country level statistics and data-driven case studies integrated into the coffee sector and the wider debate on development. Even more strongly than before, I am convinced that the ICO, in accordance with its mandate, plays a key role in providing rigorous and independent data and analysis to policy-makers, industry and all coffee stakeholders, including consumers.

This is one of the first reports that presents evidence on the C-GVC based on sound empirical analysis, thereby generating interesting insights and recommendations. Within the GVC framework, the Report – for the first time – moves beyond the dichotomy of exporting/producing and importing/consuming countries to more accurately reflecting the complex reality of international trade in coffee and coffee products. Additionally, special attention is paid to how coffee global value chain can contribute to achieving the Sustainable Development Goals.

In spite of the significant evolution of the C-GVC, with expansion of demand and consumption of coffee in all forms and the growth of sustainable or certified coffee, many origins and their growers still encounter huge barriers to entering the higher-income segment and integrating in the GVC, missing the opportunity to increase value and revenues and achieve prosperity. The ICO advocates the mobilization of national and international support for millions of smallholder farmers to enable them to enter commercial global and local coffee value chains, and to benefit from growth opportunities in a coffee sector that is sustainable, inclusive and resilient to shocks.

The CDR 2020 wants to shed light on the actual value of coffee: how all the involved parties, all the segments in the coffee value chain, profit and earn their living from coffee production, transformation and commercialization. Providing insights on the evolution and key features of the C-GVC, coffee stakeholders can access through the report best practices, success stories and failures, as well as policy options and technical solutions towards sustainable pathways. Finally, it also reflects on how to address both structural weaknesses and the contingent covid-19 crisis, as well as the need for increased transparency to better integrate farmers into the higher-income segments of the C-GVC, enable consumers to make informed decisions, and achieve a more balanced value distribution in the chain.

Let me conclude by extending my personal compliments to the entire ICO team, as well as our international experts and external contributors, who accepted the challenge of initiating and blazing a new trail for the organization by producing, in spite of the pandemic, this timely Report. I hope it will inspire everyone interested in promoting the sustainable and just development of the coffee sector as a whole, and prosperity for all.



**José Sette**  
Executive Director, ICO





# PART I OVERVIEW

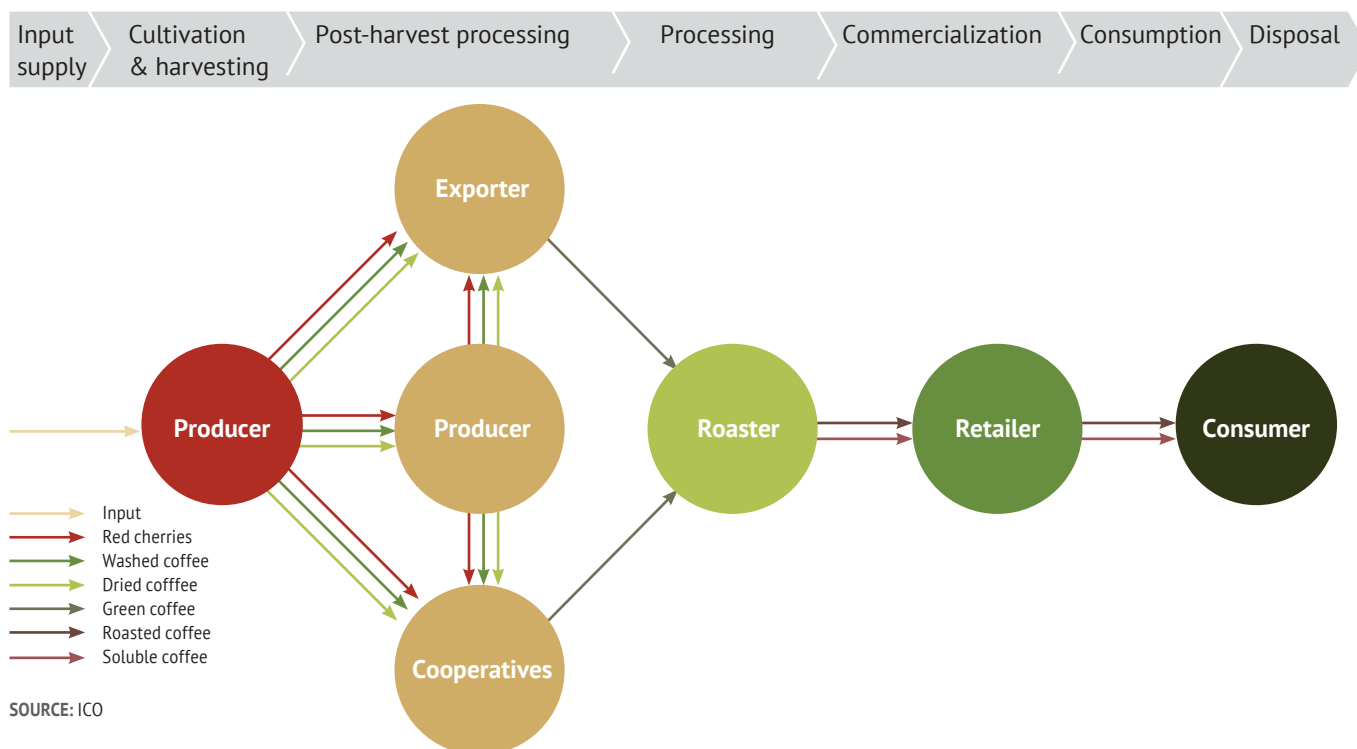
## 0.1. Objectives and structure of the report

This report analyzes the coffee sector through the lens of global value chains (GVCs). It provides insights into the coffee Global Value Chain (C-GVC) based on sound empirical analysis. It considers only the international trade dimension and does not cover local value chain and patterns of consumption. It is inspired by and aims, with its specific focus on the coffee sector, to complement the World Bank's seminal publication 'World Development Report 2020: Trading for Development in the Age of Global Value Chains'. The conceptual and analytical approaches of the World Bank report are applied to the coffee sector, furthering the understanding of how participation in GVCs impacts the livelihoods of coffee growers in middle- and low- income countries. This Coffee Development Report extends previous studies on value generation in the global coffee sector (e.g., Samper et al., 2017; ICO, 2019a) as well as coffee value chain analyses at the national level.

This report builds on the large body of GVC research and evidence that has emerged over recent years and contains new analytical work. Applying the GVC framework to the

coffee sector, the report moves beyond the dichotomy of exporting and importing countries in order to depict more accurately the new complex reality of international trade in coffee. Based on 30 years of ICO country-level statistics, farm-level data and case studies, the authors were able to conceptualize and project how the evolution of the C-GVC can impact producers and contribute to achieving the Sustainable Development Goals (SDGs). Special emphasis is placed on the impact of buyer-driven sourcing initiatives (either lead multinational firms and smaller scale specialty segment programmes) on coffee growers in producing countries particularly because these initiatives represent an epitome of GVC operations with integrated relationships along the GVC. Another reason for spotlighting these buyer-driven initiatives is data availability and the ability to evaluate their effects. Despite their success, such programmes are no panacea to the difficulties faced by coffee stakeholders. In particular, these programmes can still be considered niche and thus limited in the number of producers they work with, and in the influence they have on governance and power balance in the chain. Hence, this report also offers practical recommendations and solutions for policy makers and coffee stakeholders in support of a sustainable and inclusive expansion of the C-GVC. (Figure O.1)

FIGURE O.1: The C-GVC



SOURCE: ICO

Internationally traded coffee still accounts for more than 70% of coffee produced worldwide, however, domestic consumption is on the rise in many producing countries and therefore contributes to upgrading opportunities at origin. While the value creation from domestic consumption is not explicitly quantified in this report, the analysis considers the potential of leveraging existing processing capacity in countries to supply export markets as in the higher income producing countries.

The report is structured into five main sections divided into three parts. **Part I** provides an overview of the entire report. **Part II** is the topical part comprising Sections A, B, C and D. This part focuses on the evolution, determinants, and impact of the C-GVC and the ensuing policy recommendations for sustainable, inclusive, and resilient growth of the GVC. **Part III** consists of Section E and complements the topical GVC analysis with market information on prices and regional developments in coffee year 2019/20.

In particular, **Section A** shows trends in international coffee trade at both the global and the regional levels. It paints a detailed picture of the evolution of the C-GVC over the past three decades and identifies drivers of coffee GVC integration at the country level. In view of covid-19, **Section B** places specific emphasis on the aspect of resilience of value chains against a variety of shocks and stressors. **Section C** provides evidence on the economic, social and environmental impact of the C-GVC and the link with the SDGs, focusing on coffee-producing countries. The empirical evidence discussed contributes to a better understanding of the impact of GVC expansion on the upstream segment, specifically coffee cultivation and post-harvest processing. By putting coffee farmers at the centre of the analysis, the report explores how the integration of the most vulnerable link into the GVC can be ensured and whether this integration can contribute to the inclusive and sustainable transformation of the coffee sector. **Section D** extends recommendations towards an inclusive and sustainable expansion of the C-GVC. The discussion includes market-based and regulatory approaches. It highlights the role of multi-stakeholder initiatives and the development of value chain governance models that realize economic, social, and environmental benefits of the C-GVC for value chain actors and consumers. **Section E** presents the state of the coffee market in 2019/20 and major events and policies which took place in the last coffee year in order to provide the reader with a comprehensive picture of the state of the coffee sector. This section is an innovation in relation to last year's edition of the Coffee Development Report and will remain a standard feature of future reports.

With the dismantling of the ICO quota system in 1989 and increased globalization of processing and consumption the distinction between 'exporting/producing' and 'importing/consuming' countries has become blurred.

## 0.2. How to value coffee?

International trade is widely recognized as a key driver of economic growth, poverty reduction, and socio-economic development. The United Nations thus considers international trade as an important instrument for individual countries, regions, and the world as a whole to achieve the 2030 Sustainable Development Goals (SDGs). However, lower income countries still lag behind in terms of integration in the global trade system. Since the 1990s, international trade has seen a gradual liberalization. Trade negotiations under GATT and the World Trade Organization (WTO), which was established in 1995, significantly reduced barriers to trade. At the same time, advances in information and communication technology as well as logistics and transport dramatically lowered costs for firms to produce or procure resources and intermediate goods abroad and to access export markets and sell their products globally.

The rise of global value chains (GVCs) over the past 30 years has resulted in more complex and geographically fragmented supply chains for a vast variety of goods, ranging from smartphones to agricultural products. Whether 'spiderlike', with internationally sourced parts and components assembled at a factory, or 'snakelike', with value created step by step along the supply chain, GVCs today account for up to half of global trade (World Bank, 2019). According to the Organisation for Economic Cooperation and Development (OECD), 70% of international trade today involves GVCs as services, raw materials, parts, and components cross borders one way or another.<sup>2</sup>

GVCs are characterized by hyper-specialization (disaggregation of production processes in individual tasks carried out in different countries), high-efficiency operations, and closer and durable firm-to-firm relationships that allow for knowledge and technology transfer across borders (World Bank, 2019). Coffee is no exception in the era of GVCs and has seen production, value addition, and international trade change dramatically, with economic dividends in the form of higher productivity, employment and economic growth. On the other hand, as the whole C-GVC has become interlinked, it has generated an increased exposure to shocks, as demonstrated by the effect of climate change or more dramatically by the covid-19 pandemic (ICO, 2020a, 2020b, 2020c).

<sup>2</sup> <https://www.oecd.org/trade/topics/global-value-chains-and-trade>.

## BOX 0.1: Upgrading in the C-GVC

Participating in the global value chain is often conditional on upgrading and meeting the mandatory and voluntary standards required by governments regulators, the private sector and ultimately by consumers across the world. Upgrading can be defined as producers or firms moving to higher value activities to increase the added value, capabilities, and benefits from production<sup>1</sup>. In coffee value chains the following upgrading activities are common:

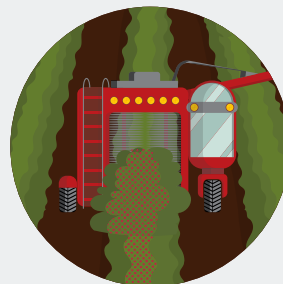


**Product upgrading** in the coffee value chain can occur through quality enhancements that enable farmers to tap into the specialty, premium or gourmet coffee segment. It also refers to the adoption of internal and external standards (certification

schemes or labels) for economic, social, and environmental sustainability. Upgrading facilitates producers' access to high-value coffee markets and is often associated with higher farm income, since consumers pay a price premium for the higher quality.



**Functional upgrading** refers to producers' and firms' taking on new roles, such as transforming green coffee, often as part of industrial processes, into more complex products, such as roasted or soluble coffee and more recently new ready-to-drink products.



**Process upgrading** involves increasing productivity (e.g., improved varieties, Good Agriculture Practices, mechanization of cultivation and harvest) and reducing per-unit cost which results in a corresponding increase in the gross margins of market

participants, such as coffee farmers or processors.

<sup>1</sup> Kaplinsky, R., & Morris, M. (2000). *A Handbook for Value Chain Research* (Vol. 113). Brighton: University of Sussex, Institute of Development Studies.

Traditionally, coffee has been viewed as a tropical commodity that links producing countries in the global South, along the so-called 'bean belt' that lies between the Tropics of Cancer and Capricorn, with consuming countries in the global North. The initial part of the chain – the agricultural production, harvesting and post-harvesting – is labour intensive, while the manufacturing component is rather more capital intensive. Following the dismantling of the ICO quota system in 1989 and with increasing globalization of processing and consumption of coffee across countries and geographies, the distinction between 'exporting/producing' and 'importing/consuming' countries has become blurred.

In addition, agricultural and trade liberalization and restructuring policies in coffee producing countries, including the reform of the role and function of coffee (marketing) boards, have opened new opportunities for coffee growers to cluster together and integrate into international supply chains and access traditional and new emerging coffee consuming markets in order to increase their profit margins.

With the rise of GVCs, the coffee sector has experienced growth in production, productivity, value addition, employment, and international trade.

Such policies have also allowed multinational buyers to broaden their operations and directly link with and purchase from coffee producers in a number of countries. Country governments and local coffee authorities and associations facilitated the private sector driven growth of the coffee value chain to a large extent.

For instance, the policies adopted by the Vietnamese government (e.g. substantial policies and investments to sustainably manage economic and environmental resources for the coffee sector, increase export earnings, and ensure stable production) have had a tremendous role in country's integration into and success in the global market (ICO, 2019b).

Another significant example is Colombia. The National Coffee Federation (FNC), the country's main coffee sector association, supports coffee growers by providing support in research, technical assistance, capacity building and market access. A large majority of small-scale farmers sell their production to FNC, and purchase guarantees introduced by FNC bring financial stability to coffee growers (Inter-American Development Bank, 2020). Hence, FNC has a key role in linking farmers to large buyers and high-value markets.

In 2008 the Ethiopian government set up the Ethiopian Commodity Exchange market (ECX) to organize Ethiopian coffee trade and the prices producers receive. It is compulsory for traders and exporters to go through the ECX, unless they are certified cooperatives, producers, or export straight from their commercial plantations. Studies are still being carried out on the differences between those producers who go through the Exchange, and those who do not (Hanino et al., 2019). Such policies and interventions have a considerable impact on the GVC operations and how the GVC actors benefit from them.

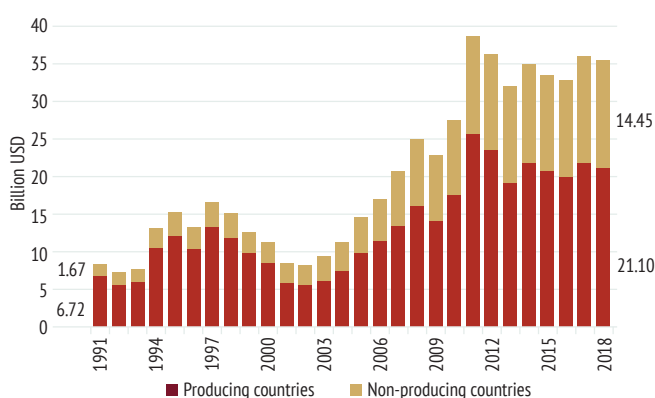
**FIGURE 0.2:** Coffee prices remain below the 10-year average



SOURCE: ICO

**FIGURE 0.3:** Non-producing countries have significantly increased exports of coffee

(All forms of coffee in current value)



SOURCE: ICO

### BOX 0.2: Coffee prices and unit values

Coffee prices play an important role in the debate on the development of the coffee sector. In this report several different prices and value concepts are used:

**International spot market prices:** ICO group indicators for Colombian Milds, Other Milds, Brazilian Naturals and Robustas (based on ex-dock quotations reported in main markets). See Box E.1 in Section E for details on the ICO group indicator.

The group indicator prices are combined in a single measure, the ICO composite indicator, which represents an 'average coffee price' used as benchmark by sector stakeholders, including industry and the public sector.

**National spot market prices:** Prices paid to growers refer to farm-gate prices reported in local currency by ICO Member countries.

**Futures market prices:** Quotations from the New York (Arabica) and London (Robusta) futures exchanges. The prices are the average of the 2nd and 3rd positions.

**Unit value:** Calculated value based on official trade data received by the ICO. The unit value of exports is calculated by dividing the inflation-adjusted (US Consumer Price Index) export value by export volume.

SOURCE: ICO document ICC-105-17 'Rules on Statistics – Indicator Prices'.

With the rise of GVCs, the coffee sector has experienced growth in production, productivity, value addition, employment, and international trade. To increase the value addition to the agricultural produce, three distinct opportunities and strategies for upgrading have been available. First, coffee growers have benefitted from *product upgrading* or 'decommodification' of green coffee. Value is added through increased product quality and unique geographical characteristics and other attributes (e.g., safety and sustainability), often as a result of integrated supply chain relationships as part of which (multinational) lead firms or even small coffee shops link farmers to high-value markets.

Second, some countries have moved up the value chain through engaging in *functional upgrading*, i.e., processing of green coffee. Traditional importing countries not only serve their own domestic markets but increasingly re-export coffee in processed form to end consumers worldwide. On the other hand, coffee-producing countries and non-traditional consuming countries also undertake increasingly more export-orientated processing activities or target local and regional markets.

Third, *process upgrading* at farm-level and in the roasting industry has led to higher efficiency and productivity. The results are lower costs per unit and increased competitiveness of some green coffee origins. Advanced processing techniques that are now available to a larger number of countries have increased the supply of processed coffee, in particular soluble coffee (see Box 0.1 for a taxonomy of upgrading).

The decommodification of green coffee through increased quality (specialty, organic, with geographical indication etc.) and the adoption of sustainability standards have been allowed for by government policies and further expanded by specific market access strategies and by buyer-led sourcing programmes. Direct sales, cupping contests and internet auctions are also contributing to this process by adding value to green coffee with a positive impact on farmers' revenues. This report also pays special attention to the impact of such private-sector driven initiatives on the producers. Despite the success of buyer-driven programmes, so far only a limited number of farmers have been reached and price premia remain modest (Samper et al., 2017). Expansion of benefits to a higher number of actors in the GVC requires substantial concerted efforts from various stakeholders including governments, local authorities, development and finance institutions, among others.

As a result of the growing demand for coffee worldwide, the value of annual coffee exports (green, roasted, soluble) more than quadrupled in the last 30 years.



It must be stressed that not all actors in the GVC have benefitted to the same degree from market liberalization and the development of the GVC. In many cases these programmes also reflect a shift in value chain governance from a market-based model to relational or other more integrated models in which (multinational) lead firms organize geographically fragmented activities. As a result, the degree of explicit coordination and the power dynamics between actors along value chains have changed in the past three decades (Gereffi, 2005).

Valued at over USD 200 billion annually, coffee is a growth market creating significant economic opportunities for growers and downstream value chain actors (Samper et al., 2017; ICO, 2019a). The global coffee trade is characterized by two main markets: the commodity market mainly offers bulk coffee produced in high volumes and of standard quality and is price-sensitive, while the niche specialty (premium) market offers higher prices for coffee exporters handling lower volumes of higher-quality coffee beans.<sup>3</sup>

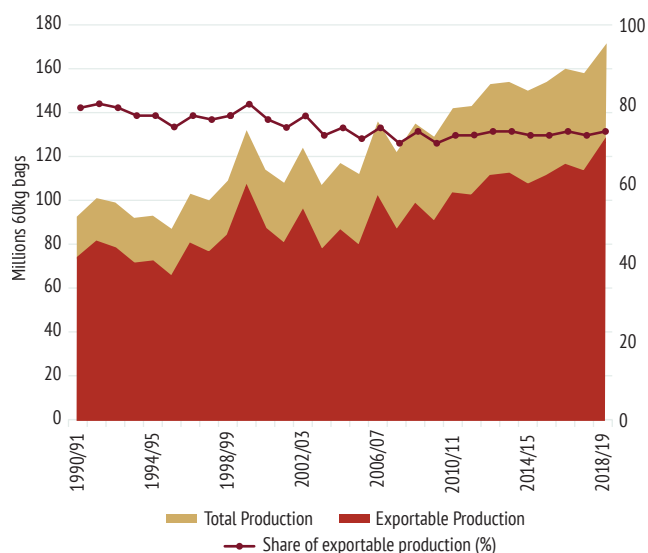
More than 90% of coffee (in volume) is still shipped in green form.<sup>4</sup> Hence, coffee remains by and large a raw commodity export (ICO, 2019a). In contrast, the processing of coffee is the domain of high-income industrialized countries in the North, which have themselves become important players in international trade. Leveraging their existing industrial bases, these countries re-export decaffeinated green as well as roasted and soluble coffee on a large scale (Samper et al., 2017). Entry barriers for processed coffee for coffee-producing countries remain high. Tariff barriers as well as strong competition from incumbent brands and technical challenges, particularly in the roasted coffee market, have so far limited the ability of producing countries to capture value addition opportunities (ICO, 2020d).

In addition, low international coffee prices since 2016 have put millions of coffee-growing households in middle- and low-income countries increasingly at risk (Figure O.2). With input and labour costs on the rise, revenues in many origins are insufficient to cover the cost of production and their cost of living and achieve a sound living income. In addition, reduced revenues affect the ability of farmers to invest in the maintenance, replanting and modernization of their plantations. Forgone investments in climate change adaptation could threaten future supply (ICO, 2019a). The chances for producing countries to move up the value chain ladder are diminishing due to reduced opportunities for capital formation to invest into manufacturing, branding and marketing (ICO, 2020b).

<sup>3</sup> To this day, there is not an exact and agreed definition of specialty coffee. According to the Specialty Coffee Association (SCA), coffees with cupping scores of 80 and above are considered specialty coffee. Associations in a few countries, such as the Asociación Cafés Finos Costa Rica, also have their own definition of specialty coffee, which usually also refers to the physical quality of the coffee bean, while cupping scores are used as a parameter for specialty coffees. Unique origins or terroirs are very important in the specialty segment, creating different product types. (European market potential for specialty coffee, Centre for the Promotion of Imports from developing countries (CBI, 2020).

<sup>4</sup> The focus in this study is on green coffee beans under the Harmonised System. The available data does not distinguish between bulk and specialty, premium or "gourmet" coffees.

FIGURE O.4: Coffee production and exports (1990/91-2018/19)



SOURCE: ICO

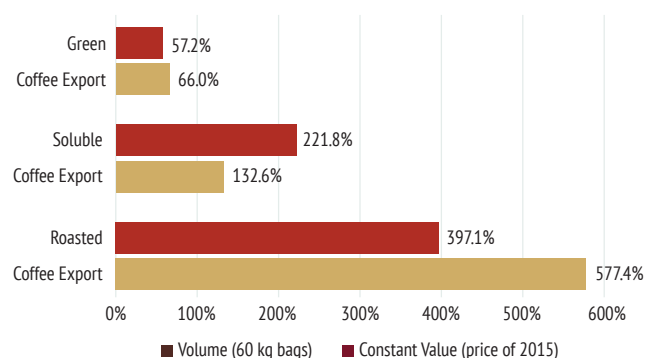
Since the beginning of 2020, the covid-19 pandemic has exacerbated the situation of producing countries affected by low prices and volatility. The global spread of the virus, in addition to its dramatic effect on public health, has resulted in supply chain disruptions and influenced global demand for coffee, representing an unprecedented shock to the sector (ICO, 2020a). The impact of the coronavirus crisis, climate change and the resurgence of protectionism over recent years could be serious impediments to the future expansion of the C-GVC thereby reducing related economic benefits and re-distribution of value.

### O.3. Main findings

Coffee is a growth market. Growing demand for coffee, in the last 30 years, has resulted in the expansion of coffee production and exports. Global coffee production (in volume) has increased by more than 60% since the 1990s with the ratio of Arabica to Robusta reaching roughly 60/40 (ICO, 2019a). With only 30% of production consumed domestically, coffee remains an export commodity. The value of annual cross-border coffee exports (all forms, i.e. green, roasted, soluble) has more than quadrupled from USD 8.4 billion in 1991 to USD 35.6 billion in 2018. The covid-19 pandemic is influencing coffee consumption trends and patterns.

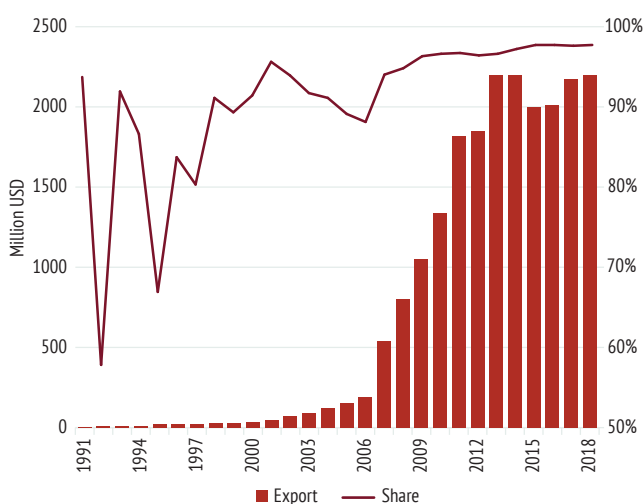
**International trade in coffee has become more complex.** Today more countries are participating in the global trade of coffee compared to 30 years ago. Non-producing countries have significantly increased exports of coffee (Figure O.3). International trade in processed coffee forms, such as roasted and soluble coffee, has grown more substantially than that of green coffee and this growth has been mainly driven by a small number of countries that capture a large value share of the GVC.

**FIGURE O.5:** Growth rates of coffee exports (at constant value and in volume) between the period 1991-1994 and the period 2015-2018 by coffee form (%)



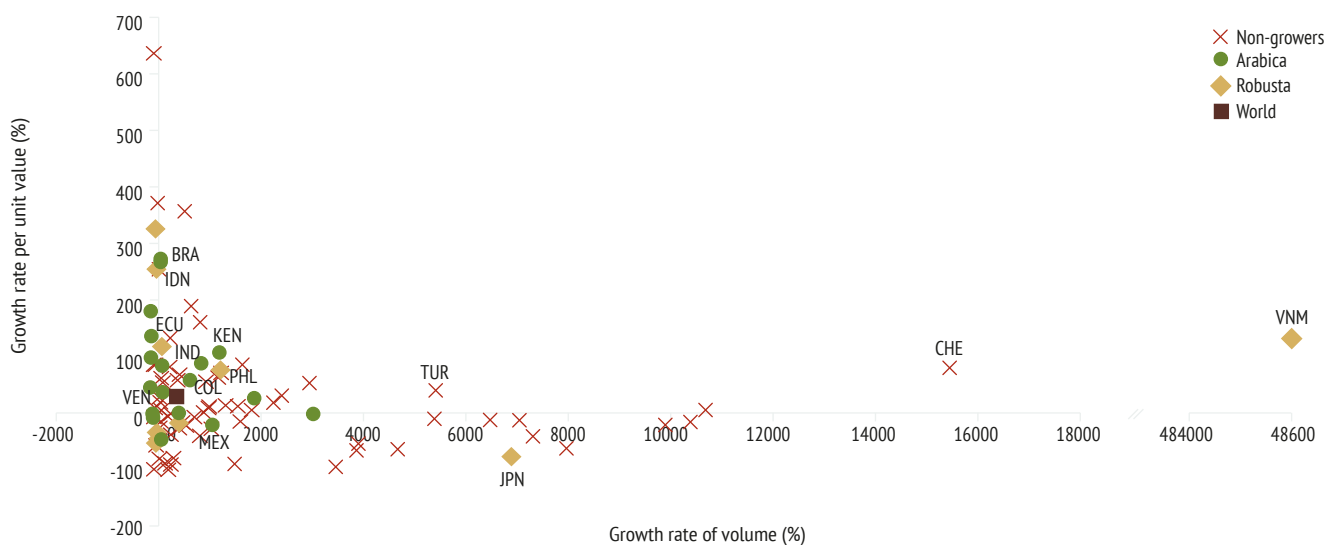
NOTES: The growth rate is calculated as follows:  $(\frac{\sum_{t=2015}^{2018} X_t - \sum_{t=1991}^{1994} X_t}{\sum_{t=1991}^{1994} X_t}) * 100\%$  where X refers to the respective export activity considered.  
SOURCE: ICO

**FIGURE O.6:** Roasted coffee exports of Switzerland



SOURCE: ICO

**FIGURE O.7:** Growth rate of unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1995-1998) in case of soluble coffee exports (both in %)



NOTES: The growth rate is calculated as follows:  $(\frac{\sum_{t=2015}^{2018} X_t - \sum_{t=1995}^{1998} X_t}{\sum_{t=1995}^{1998} X_t}) * 100\%$  where X refers to the respective export activity considered. Arabica (Robusta) growers are countries which, according to coffee production statistics, harvest coffee beans and whose harvest is mainly Arabica (Robusta) coffee. The figure displays a sub-set of countries due to data limitations and visualization reasons.  
SOURCE: ICO

The growth rates of roasted coffee exports – both in terms of unit value and volume – were the highest, followed by soluble coffee exports (Figure O.5). The unit values of both roasted and green coffee exports increased over time. The unit value increase in roasted coffee exports was much larger than that in green coffee. In contrast, the unit value of exported soluble coffee decreased over time.

High-income non-producing countries have significantly expanded exports of roasted coffee. Equipped with a significant industrial base and established brands, the European Union (EU), Switzerland and North America benefitted most from expanding trade, with strongly increasing value addition (Figure O.6).

Some Robusta-producing countries have successfully engaged in the manufacturing of soluble coffee. Producing countries such as Viet Nam and Ecuador increasingly engage in functional upgrading, thereby contributing to the global supply of soluble coffee in a competitive, low-margin market environment (Figure O.7).

Arabica-producing countries engage in product upgrading or ‘decommodification’ of green coffee. Value-addition occurs through increased product quality (e.g. specialty coffee, sustainability attributes), often as a result of integrated supply chain relationships between farmers and buyers (traders, roasters or retailers), as well as through the inflow of foreign direct investment (FDI), for example, in Peru and Rwanda.

The coffee sector provides value addition potential along the value chain through product upgrading (better quality and convenience), functional upgrading (more processing), and process upgrading (higher efficiency). The analysis shows that how and to which degree individual countries integrate in the C-GVC and, therefore, capture value, depends on a variety of factors, including natural endowments, economic development, domestic consumption, and industrial policies. (Figure O.8).

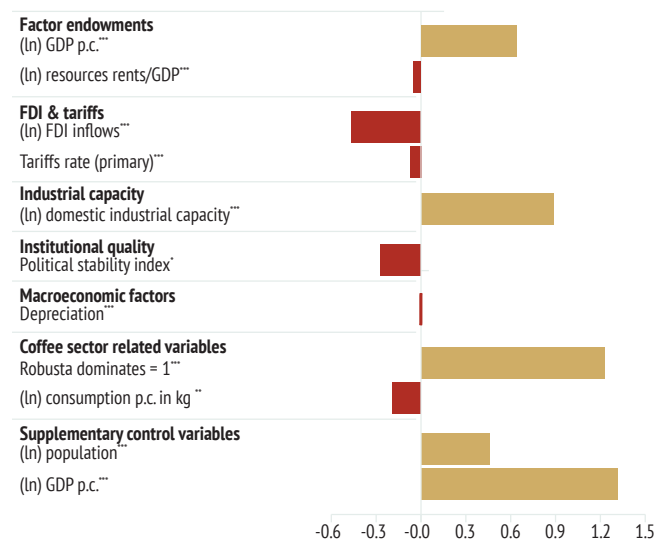
Tariffs deter functional upgrading activities of those seeking to capture higher added value. Higher import tariffs on processed coffees and non-tariff trade barriers are a significant hurdle for producing countries to access lucrative export markets (Figure O.8).

Potential shocks and stressors to the C-GVC include pandemics and health crises, climate change, political instability and conflict, and origin concentration. Disruptions triggered by shocks at the level of suppliers can have a ripple effect on the entire value chain and on upstream actors that are vulnerable to risk and the resilience of suppliers.

A new threat: the covid-19 outbreak has shown the fragility of the C-GVC. Supply chain disruptions triggered by pandemics and health crises, but also by climate change or emergencies, and political instability have the potential to severely hamper exports of coffee thereby affecting foreign exchange earnings and jobs in producing countries as well as the downstream operators of the GVC as well as consumers (Figure O.9).

Social services such as education, food and health security were strengthened to help rural communities to tackle the impact of the covid-19 pandemic. During the outbreak of the coronavirus pandemic buyers (traders, roasters, and retailers) who are in established long-term supply chain relationships with coffee growers have quickly mobilized substantial support to coffee rural communities. Leveraging existing channels and supply chain infrastructure a range of community-based services from cash to in-kind health technical support were provided. Hence, the global pandemic has highlighted that closer and durable relationships along the value chain can act as a safety net in a crisis situation.

FIGURE O.8: Determinants of functional upgrading



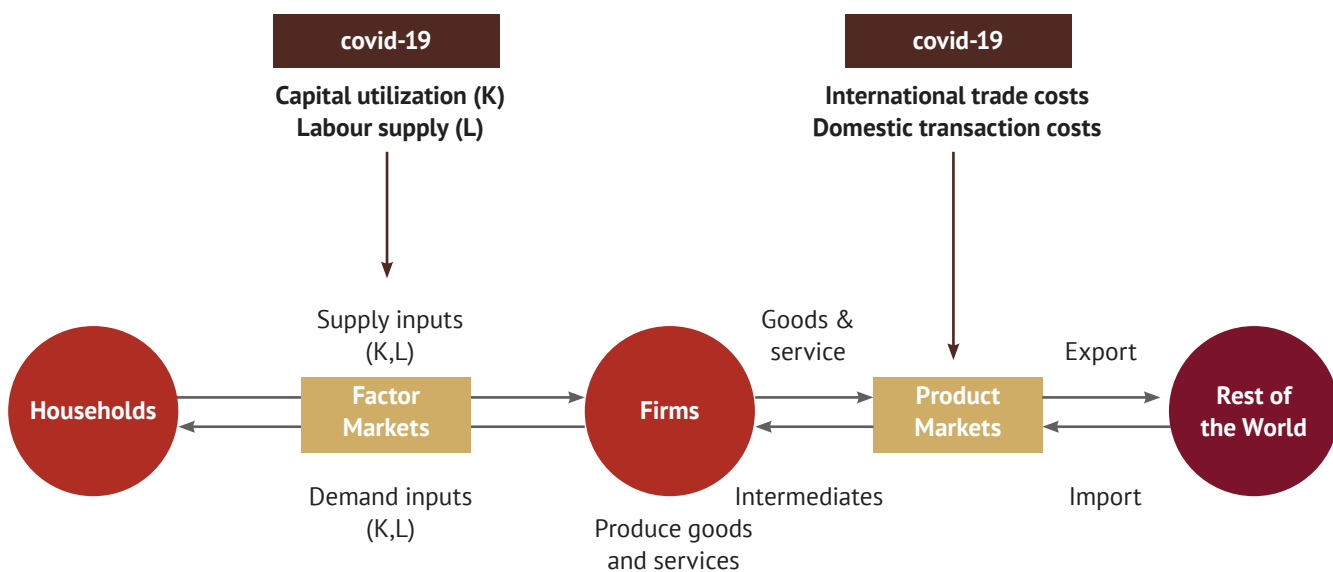
NOTES: Notes: N=244. The figures visualize the regression coefficients that are statistically significant. For the full regression outputs please refer to Annex 3. \*\*\* denotes p<0.01 \*\* denotes p<0.05 \* denotes p<0.1.

SOURCE: ICO

Part I: Overview

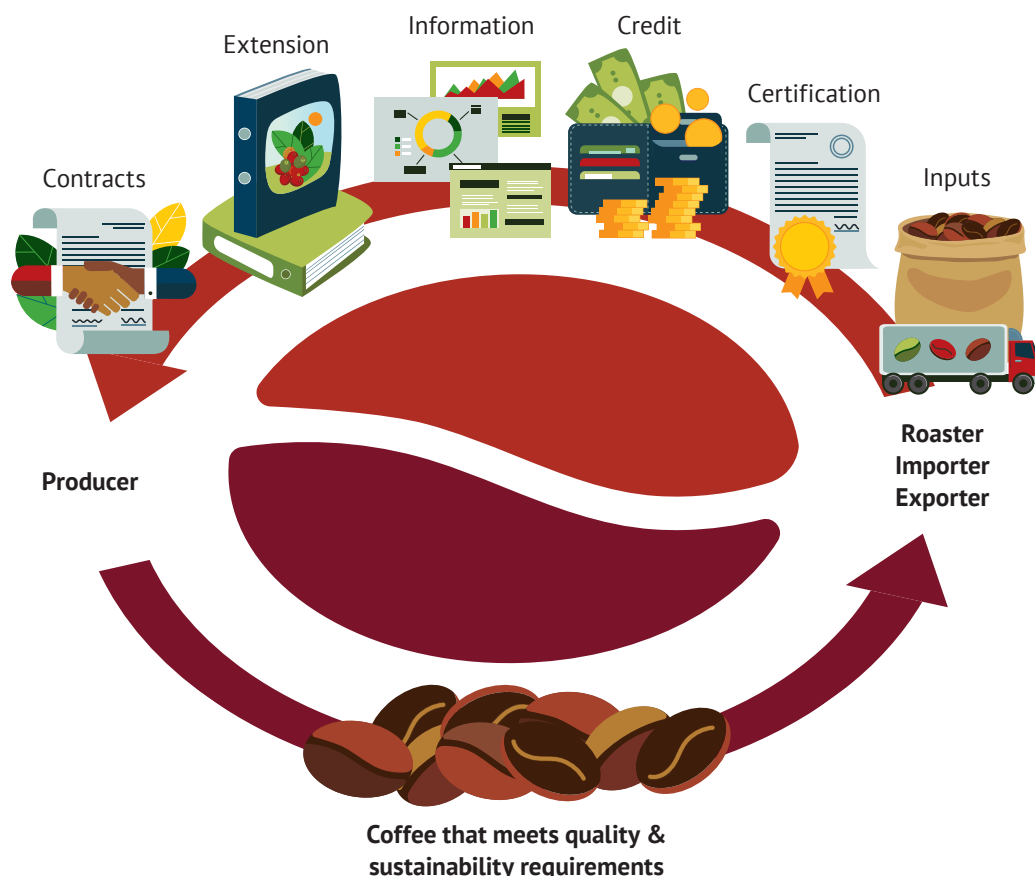
The coffee sector is also highly sensitive to climate variations. Climate change is likely to impact the global area suitable for coffee significantly in the long-term. Options to shift production exist but smallholder farmers do not have the resources, ability and flexibility to relocate and may be forced to abandon coffee production. Potential strategies to improve the resilience of the GVC to climate change include access to information, technologies, financial support, and research and development for improved and Green Good Agricultural Practices and climate-resistant varieties.

FIGURE O.9: Impact channels of covid-19 in coffee-producing countries



SOURCE: Based on World Bank (2014)

**FIGURE 0.10:** A beneficial exchange – the flow of tangible and intangible benefits from lead firms to farmers in the C-GVC



SOURCE: ICO

The C-GVC shares key characteristics of other GVCs. Specialization and durable relationships between the value chain actors have increased and fostered the transfer of technology, finance, and higher sustainability standards along the value chain to farms, resulting in higher productivity, value addition and job creation.

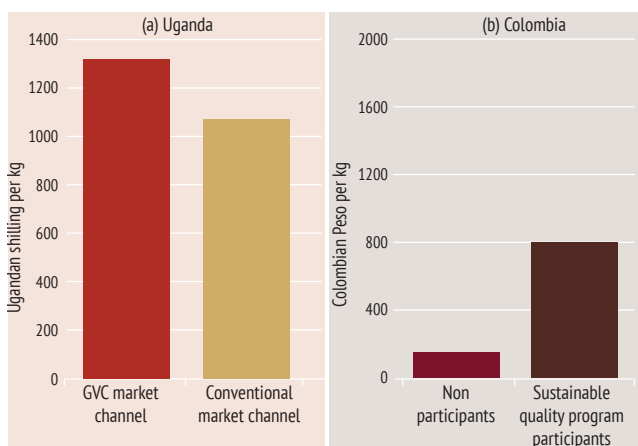
**Integration in the C-GVC helps to overcome the challenges faced by coffee growers.** Traditional coffee value chains are characterized by market failures, asymmetries and constraints that can be lifted by complementary public sector and market-driven interventions that are at the core of the C-GVC.

**A key aspect of the C-GVC is closer and more durable relationships among value chain actors.** Buyer-driven initiatives are implemented by multinational traders and roasters along with smaller buyers through direct trade activities. Tangibles (inputs, credit) and intangibles (knowledge, sustainability standards, and corporate governance) are transferred to upstream actors, including farmers. (Figure 0.10)

**Buyer-driven programmes are also carried out by small buyers.** Even if small value chain actors cannot have the same weight and impact of large multinational traders, roasters and retailers can engage directly with often marginalized rural communities by shortening the supply chain, cutting out most intermediaries and building multi-year relationships under an increased commitment to social responsibility.

**Integration in the C-GVC boosts improvements in productivity, quality, sustainability, and thus increases the revenues that producers earn.** Farmers can benefit from higher productivity and access to high-value markets, in some cases with purchase guarantees and more stable prices. Participation in buyer-driven programmes in the GVC is shown to increase coffee revenues earned by smallholder farmers by up to 30%. Moving up in the GVC can enhance the livelihoods of the producers (Figure 0.11).

**FIGURE 0.11:** Revenues in the GVC (buyer-driven programmes) versus conventional channels



SOURCE: Based on Arslan (2020)

SOURCE: Macchiavello and Miquel-Florensa (2020)



**The C-GVC facilitates FDI in post-harvest processing and value addition.** The increase in the number of coffee washing stations (CWS) is associated with major improvements in the quality of coffee produced and value addition as well as revenues for farmers. Lower transport costs along with higher prices paid for washed coffee, has led to more producers selling coffee cherries for processing in wet mills. Investments in processing stations facilitate producers' linkages to high-value coffee markets. Foreign investors are particularly effective at turning under-performing stations into high-capacity and efficient facilities, mainly due to stable marketing channels in the export markets, superior management practices and a higher capacity to implement required changes in the CWS, (Macchiavello and Morjaria, 2021)

**The expansion of the C-GVC contributes to achieving the Sustainable Development Goals.** Participation in the C-GVC can reduce poverty while improving food security, health, and access to quality education among farmers and farm workers. Voluntary Sustainability Standards and policies of lead firms improve gender equality and work conditions. It also facilitates partnerships between coffee stakeholders. Similarly, the negative environmental impact of the coffee sector can be reduced by greening the C-GVC and adopting a circular coffee economy (Figure 0.12).

**Coffee growers tend to benefit from close firm-to-firm relationships, but the distribution of gains in the GVC is in part driven by governance and power dynamics.** Within the C-GVC the distribution of gains is in part driven by governance and power dynamics. Important features of the coffee supply chains, such as costs and margins from farm to retail, remain opaque and living income gap assessments in producing countries are not widely available. Furthermore, private sector driven initiatives cannot be fully inclusive as they can cover only a small part of the supplier base.

**Coffee year 2019/20 is a year of unprecedented challenges.** Global coffee prices have trended downwards since November 2016, when the ICO composite indicator averaged 145.82 US cents/lb. The covid-19 pandemic presents an unprecedented joint supply and demand shock to the global coffee sector. Global output in 2019/20 is estimated at 169.34 million bags, 2.2% lower than in 2018/19.<sup>5</sup>

**Global coffee consumption is estimated to rise by 0.3% to 168.39 million bags in 2019/20.** There was a surge in demand at the start of the coronavirus pandemic (declared by the WHO on 11 March 2020) as a result of panic-buying and stockpiling. However, consumption in the remaining months of the coffee year is estimated downwards due to ongoing pressure from a global economic downturn and limited recovery in out-of-home consumption as country-wide social distancing measures remain in place.

**The pandemic has had an impact on the downstream components of the coffee supply chain.** Commercialization and retailing are also affected by restrictions in mobility and the closure of restaurants and coffee shops and offices, with impacts on home vs out-of-home consumption as well as on revenues and employment. Again, the industry promptly established safety protocols to reduce risks for workers and customers.

**FIGURE 0.12:** Key Sustainable Development Goals linked to the expansion of the C-GVC



SOURCE: ICO

Part I: Overview

**Covid-19 has also affected labour supply in a number of countries, either directly, due to illness, or indirectly, as government measures have restricted the movement of farm labourers and migrant workers.** However, much of the supply for coffee year 2019/20 was unaffected by covid-19, as harvesting in most countries had already concluded by the time the pandemic occurred and promptly many countries established protocol for coffee harvesting, processing and transport. With the outbreak of the second wave of the pandemic in the fall of 2020, new impact of the C-GVC can be expected and possibly reduced by capitalising on the experience gained and practices developed and applied in Spring 2020.<sup>6</sup>

**Regional highlights in coffee year 2019/20 are as follows:** Africa's exports have risen. Despite the growth in coffee production, exports from Asia and Oceania have dropped. After three years of growth, Mexico and Central American coffee production declined. South America's Arabica production has gone down while Robusta production has increased. Coffee demand in Europe and North America has fallen after significant growth in the previous year.

<sup>5</sup> ICO refers as coffee year the period October to September.

<sup>6</sup> The Global Coffee Platform compiled a list of best practices established to handle social distancing in coffee production prepared by a number of coffee producing countries ([www.globalcoffeeplatform.org](http://www.globalcoffeeplatform.org)) and the publication "How to respond to covid-19 in the coffee sector", CBI (2020).

## 0.4. Key areas for action for sustainable, inclusive and resilient growth of the C-GVC

The Report discusses a wide range of actions that can be taken to increase participation of producing countries and coffee growers in the GVC through upgrading, in addition to policies to increase the sustainability, inclusivity, and resilience of the C-GVC. While some solutions may require joint stakeholders' efforts to implement, they have the potential to contribute to the transformation of the coffee sector.

**There is significant potential for GVC upgrading.** In particular, countries growing Robusta coffee can realize significant benefits by functional upgrading (e.g., soluble coffee). Arabica producers, on the other hand, can benefit largely from product upgrading e.g. value addition through higher quality, sustainability standards, geographical attributes. Coffee producers can also upgrade their processes (higher efficiency, lower per-unit costs), in particular by accessing knowledge, innovation and resources provided by lead firms/buyers as part of closer supplier/buyer relationships.

**Upgrading efforts can be facilitated by the following instruments:** introduce policies to attract FDI, increase the capital base by eliminating barriers to investment, diversify away from resource sectors to ensure competitively priced labour, improve institutional and governance quality, and invest in infrastructure.

**Trade liberalization must remain firmly on the political agenda.** Remaining trade barriers, particularly, tariff escalation, significantly reduce producing countries' opportunities to add value by engaging in coffee processing and manufacturing. Newly signed free trade agreements (Africa Continental Free Trade Agreement, Regional Comprehensive Economic Partnership (RCEP), Viet Nam/EU, Mercosur/EU...) are also expected to boost regional and international coffee trade.

**Accessing high-value export markets is also affected by quantity.** To integrate smallholder farmers into the GVC lead firms (e.g., traders, roasters or retailers) require access to a larger supplier base with consistent quality so they can establish durable and close relationships. Smallholder farmers need to improve their skills and capacity and overcome market and infrastructure constraints.

**Strengthening both public extension services and government and buyer-driven extension programmes in the GVC can enable farmers to upgrade their products and processes.** Participation in high-value markets depends on the ability to meet stricter and higher quality, safety and sustainability standards (mainly voluntary standards and labels) compared to requirements to access commodity-grade coffee markets (mainly mandatory standards and regulations). This may be a serious obstacle for smallholder farmers that may be excluded from the C-GVC.

**Formation of farmer groups and cooperatives (horizontal coordination) needs to be promoted and supported.** Collective action can facilitate otherwise marginalized smallholder farmers' participation in the GVC by reducing costs of entry to high-value markets for groups of farmers. Action and support programmes to cluster coffee farmers

through the creation of cooperatives and consortia would enhance their bargaining power, opportunities for process and product upgrading (e.g. Jamaica Blue mountain coffee...) and market access both regionally and internationally.

**The distribution of the C-GVC gains remains unequal.** Participation in the C-GVC through inclusive value chain programs initiated by lead global firms creates surplus across the value chain. Yet, in most cases, a relatively small group of coffee growers participate in such programs. For a more equitable distribution of economic gains there is a need to expand and scale-up existing inclusive coffee value chain development activities and address concerns about value chain governance and distribution of gains.

**Lead firms can play a role in facilitating the adoption of certification of individual farmers, farmer groups or cooperatives for sustainable sourcing.** Providing accurate information regarding costs and benefits of standards, lowering high audit costs for individuals through promotion of group certification (or at landscape level) and identification of funding sources to support certification for growers creates opportunities to enter high-end markets with higher prices and revenues.

**Facilitating private-sector-driven GVC expansion is key.** Economic sustainability is essential for the lead firms in the GVC to carry out such activities. Enlarging the pool of suppliers (supported farmers) requires high levels of investment. This suggests a major role for development partners and finance institutions, as well as impact investors to provide matching funds (investment, grants and loans) to local governments and producers to implement supply chain programmes. Institutions and contract enforcement mechanisms should be in place along with financial support.

**Liberalization and structural reforms implemented by governments and coffee authorities.** Expansion of the C-GVC and of buyer-driven programmes has been made possible in part due to domestic agricultural and market liberalization policies, including changes to the role and function of commodity marketing boards over the last few decades. These changes have allowed growers to supply private sector buyers directly, leading to the emergence of buyer-driven programmes at various scales.

**Incentives can be given in the form of tax advantages to both domestic and foreign investors to encourage FDI and local investments for expansion and modernization of coffee plantation and mills.** Investment of lead firms in post-harvest processing capacity adds value. Attracting lead firms and both domestic and foreign investors can be a key driver in the transformation of a country's coffee sector, as shown by the case study of Rwanda presented in this report.

**The expansion of the C-GVC is driven by the private sector, but governments need to provide an enabling environment.** Introducing policies to ensure political stability and attract FDI to the coffee sector is important. Investments in connectivity and trade infrastructure are key to reducing trade costs and increasing the inclusiveness and resilience of the GVC.

**Investing in resilient infrastructure benefits coffee farmers.**

Investment in building and maintaining roads and trade-facilitation infrastructure reduces transport times and transaction costs for producers and firms and facilitates participation in the GVC. Expanding the catchment area of buyers or establishing coffee collection points in remote areas also helps link disadvantaged smallholder farmers to the GVC.

**Fostering the development and adoption of digital technologies increases efficiency and builds resilience.**

Digital technologies, including blockchain applications, will not only reduce the barriers and costs for farmers to link to existing high-value market channels (e.g. through timely and accurate information), but also increase traceability and provide reliable and more direct access to new markets (direct trade, e-commerce).

**Increasing transparency and traceability in coffee supply chains can help producers earn more.** Inflated premiums at retail level with no clear benefit for farmers can be limited if end-buyers pay premiums directly to producers or require that their suppliers do not add any margin to the premium part or price differential along the value chain.

**Market institutions and contract enforcement need to be strengthened to improve the efficiency of the value chain.** Introducing tighter quality monitoring schemes and regulations for post-harvest processing of coffee can improve quality and reduce the value losses associated with coffee quality uncertainty.

**A smart mix of market-driven initiatives and regulatory options should aim at maximizing the economic benefits of the GVC, living income for producers, and sustainability.** Market-driven sustainability initiatives, responsible sourcing programmes and Voluntary Sustainability Standards (VSS) are integral parts of C-GVCs and demonstrate that sustainability considerations are integrated into business and management systems. In addition, various importing countries have adopted due diligence legislation that hold (large) firms accountable for any human rights abuse or environmental damage within their supply chains. Strengthening local institutions for tighter monitoring of production activities and law enforcement is key to minimizing the potential adverse effects of the coffee value chain on social and environmental sustainability.

**The development of national and (sub-)regional coffee development strategies supports positioning in a growing global coffee sector.** Upgrading or diversification trajectories of individual countries should be based on an assessment of opportunities and constraints. Integration in the C-GVC, while developing national and sub-regional supply chains, requires targeted support of the private sector, donors, international organizations and international financial institutions.

**Public-private partnerships are conducive to GVC integration.** Private sector action and government support, including from local coffee regulatory agencies and other bodies, can show strong complementarity and foster and enable coffee producers and firms to effectively participate in the GVC. Specifically, addressing the high concentration of gains in the coffee industry requires policy actions to help

The coffee price crisis and the covid-19 pandemic have highlighted the importance of international cooperation between the public and private sectors to address the immediate challenges faced by coffee stakeholders and to build a sector that is inclusive, resilient, and sustainable.

rebalance bargaining power and value distribution among lead firms, their suppliers and other actors in the GVC, as well as the way in which production and trade rules (from standards/GAP to price and delivery) are set and agreed.

**Multi-stakeholder initiatives can improve the co-ordination of market-driven sustainability initiatives implemented by the GVC firms.** To scale-up successful private-sector led programmes it is crucial to engage public sector bodies, civil society and research institutions. Prominent private-sector initiatives in the sector are the Global Coffee Platform (GCP) and the Sustainable Coffee Challenge (SCC). More recently the ICO established the Coffee Public-Private Task Force (CCPTF). The latter brings together C-GVC lead firms (traders, roasters), sector initiatives (GCP, SCC) and ICO exporting and importing Members as well as engaged coffee stakeholders and development partners. It provides a unique forum for the public and the private sector to agree on a common and shared vision, objectives and a roadmap with concrete individual and joint actions and resources (e.g. closing living income gaps, SDGs, transparency, sustainable sourcing and production).

**Mechanisms to systematically collect and disseminate independent data on costs and margins in agricultural value chains should be developed and promoted for greater transparency.** Currently there is a lack of systematic data on supply chain practices, prices, costs and margins at different levels along the C-GVC, thus hampering transparency. Access to accurate and independent data and information for various stakeholders of the C-GVC (e.g. farmers, traders, roasters, governments of producing and consuming countries) is crucial for the negotiation of a common vision for the sector, and to address complex questions related to the distribution of GVC gains.

**The challenges faced by the coffee sector require effective dialogue among all sector stakeholders.** The coffee price crisis and the covid-19 pandemic have highlighted the importance of international cooperation between the public and private sectors to address the immediate challenges faced by coffee stakeholders and to build a sector that is inclusive, resilient, and sustainable. Better responses to shocks can be achieved through the development and implementation of new supply chain processes as well as health and safety procedures, in order to maintain the flow of goods and services under difficult circumstances, such as lockdowns.





# PART II

## SECTION A

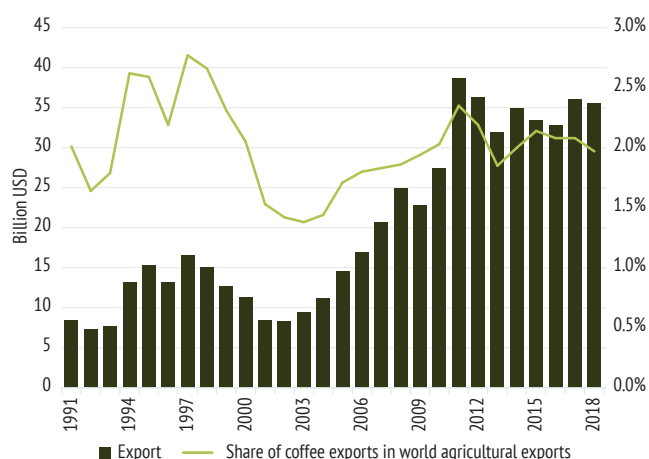
### The rise of the coffee Global Value Chain: evolution and drivers of participation

#### Key findings

- **Coffee is a growth market.** Global coffee production (in volume) has increased by more than 60% since the 1990s. With only 30% of production consumed domestically, coffee remains an export commodity. The value of annual cross-border coffee exports has more than quadrupled from USD 8.4 billion in 1991 to USD 35.6 billion in 2018.
- **International trade in coffee has become more complex.** Today more countries are participating in the global trade of coffee compared to 30 years ago, but many remain marginal actors. International trade in processed coffee forms, such as roasted coffee, has grown substantially and this growth has been mainly driven by a small number of countries that capture a large value share of the GVC.
- **The coffee sector provides value addition potential along the value chain through product upgrading (quality and convenience), functional upgrading (processing) and process upgrading (higher efficiency).** How and to which degree individual countries integrate in the C-GVC and therefore capture value depends on a variety of factors, including natural endowments, economic development, domestic agriculture, trade, industrial policies and international trade regimes.
- **Social upgrading is also important.** Integrating suppliers in the GVC can also generate a significant spillover on social upgrading related to employment and pay, gender and the environment.
- **High-income countries have expanded exports of roasted coffee.** Equipped with a significant industrial base and established brands, the European Union (EU), Switzerland and North America benefitted the most from expanding trade in processed coffee, with high value addition.
- **Some producers in Robusta-producing countries have successfully entered soluble coffee production.** Producing countries, such as Viet Nam and Ecuador, increasingly engage in functional upgrading, thereby contributing to the global supply of soluble coffee in a competitive, low-margin market environment.
- **Arabica-producing countries engage in product upgrading or ‘decommodification’ of green coffee.** Value-addition occurs through increased product quality, often as a result of integrated supply chain relationships between farmers and traders or roasters, as well as the inflow of foreign direct investment (FDI), for example, in Peru and Rwanda.
- **Trade barriers deter functional upgrading activities of those seeking to capture higher added value.** Higher import tariffs on processed coffees and non-tariff trade barriers are a significant hurdle for producing countries to access lucrative export markets.

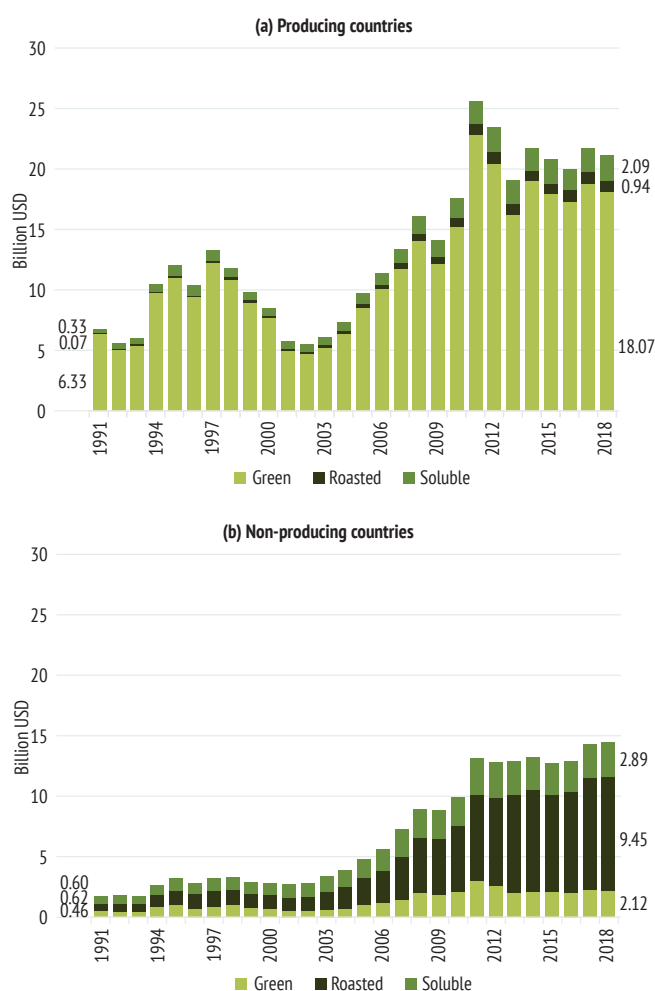
This section examines trends in the international trade of coffee over the past three decades. As a first step, the importance of coffee exports in the context of global agricultural trade is analyzed, followed by insights in emerging patterns in coffee trade considering the different forms of coffee, regions, and countries involved. The section also focuses on the evolution of upgrading in the C-GVC in order to establish an initial understanding of how regions and countries have integrated in the C-GVC. Lastly, the drivers of integration and upgrading in the C-GVC are analyzed.

**FIGURE A.1:** Evolution of coffee exports over time (in current value) and their share in world agricultural exports



SOURCE: ICO and WTO (2020)

**FIGURE A.2:** Coffee trade by coffee form and its evolution over time (in current value)



SOURCE: ICO

## A.1. Coffee export values have been increasing

Coffee export volumes have been steadily growing since the 1990s.<sup>7</sup> However, the growth in export earnings has been less steady than that of volumes due to significant fluctuations in international coffee prices over the past three decades. In particular, the price crisis of the early 2000s led to a decrease in export values. Overall, the value of annual coffee exports, of all forms, has more than quadrupled from USD 8.4 billion in 1991 to USD 35.6 billion in 2018 (Figure A.1). This was partly the result of a strong increase in coffee trade from 2004 to 2011. Before 2004 the expansion in the trade of coffee was moderate. Since 2010 the value of coffee exports has remained relatively stable between USD 31 and USD 36 billion.

In relation to world agricultural trade, coffee exports have generally grown at a lower rate, leading to a significant falling trend in the share of coffee from 2.62% of world agricultural trade in 1994 to 1.38% in 2003. As the value of the coffee trade started quickly expanding from 2004, the share of coffee exports in agricultural trade rebounded to about 2.35% in 2011. Since then, the growth in agricultural trade has slowed, and therefore the share of the coffee trade stabilized at around 2%.

### A.1.1. Processed coffee exports increased more than green coffee exports since 1990s

For the purpose of this analysis and in line with the ICO classification, internationally traded coffee products are differentiated in three forms: green coffee, roasted coffee and soluble coffee. Additional industrial processes are required for the transformation of green coffee into roasted coffee or soluble coffee which are, therefore, considered to be processed products. For comparability across forms, ICO relies on conversion rates. Table A.1 presents the conversion rate of green coffee to the roasted and soluble form of coffee. For example, to produce one kilogramme of roasted coffee 1.19 kilogrammes of green coffee are used. Similarly, 2.9 kilogrammes of green coffee are processed to produce one kilogramme of soluble coffee.

**TABLE A.1:** Conversion rate of coffee weight to green bean equivalent

Form of coffee	Conversion rate
Green coffee	1
Roasted coffee	1.19
Soluble coffee	2.6
Decaffeinated	1.05

NOTES: Conversion rate refers to the rate used to convert different forms of coffee to green bean equivalent multiply the net weight of coffee by  
SOURCE: ICO (2019e)

<sup>7</sup> The coffee "Quota Systems" officially ended in July 1989.

Coffee exports more than quadrupled over the last 30 years. A much higher value growth is observed for processed coffee products than for green coffee showing increased complexity of the C-GVC.

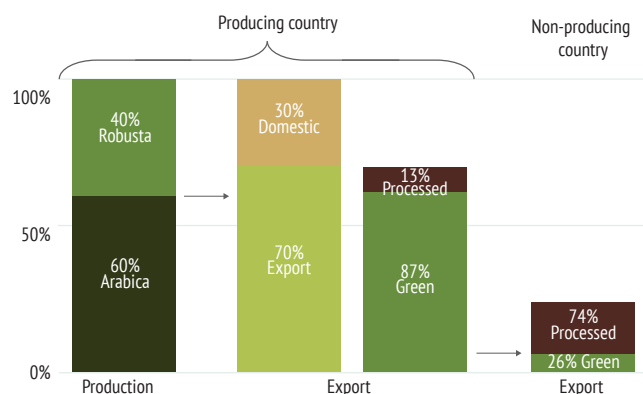
The values of the exports of the three forms of coffee have shown different patterns and trends. Exports of roasted coffee had the strongest growth, followed by soluble and green. Processed coffees accounted for significantly higher shares of coffee exports in 2018 than in 1991. The results remain unchanged after adjustment of export values for inflation.<sup>8</sup> In other words, the differential in value between green and processed coffee is increasing. This pattern can partly be explained by more efficient operations (higher output-input ratio) and also by the higher prices that consumers pay for coffee due, for instance, to the expansion of specialty segment and sustainably-sourced coffee.

Figure A.2 illustrate the evolution of coffee exports by form in current values separately for producing countries and non-producing countries. The value of total coffee exports increased threefold from USD 6.72 billion to USD 21.10 billion in producing countries during the past three decades whereas the value of exports increased from USD 1.67 billion to USD 14.45 billion – 8 times – in non-producing countries.

A closer look at coffee exports by form reveals that the growth rates in the export values of roasted and soluble coffee are much larger than that of green coffee in the past three decades. This holds true for both producing countries and non-producing countries. The overall trend suggests that non-producing countries are catching up with the coffee producers in terms of total coffee export values.

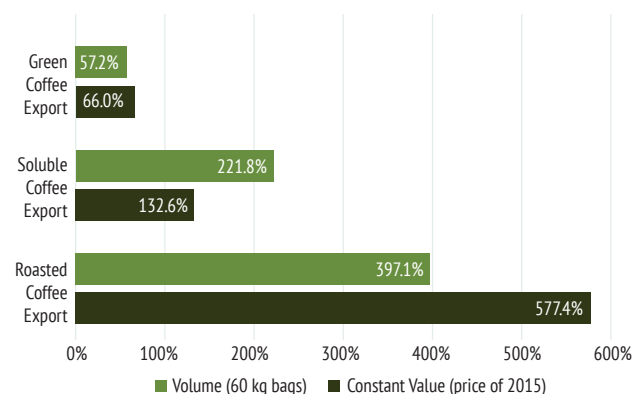
Next, the relationship between coffee exports at constant (inflation-adjusted) value and export volume is examined.<sup>9</sup> Figure A.4 shows the growth rate of coffee exports (unit values and volume) between the early 1990s and 2018. In line with the findings above, the growth rates of roasted coffee exports – both in terms of unit value and volume – were the highest, followed by soluble coffee exports. The growth rates of green coffee exports (in volume and value terms) were the lowest. It should be noted, however, that the period 1991-1994 was characterized by the end of the ICO quota system, an oversupply of coffee, and lower unit values on average. Hence, the growth in value between 1991-1994 and 2015-2018 may partly be explained by lower international prices resulting from oversupply of coffee in the former period.<sup>10</sup>

FIGURE A.3: Production and export of coffee in 2018



NOTE: The chart provides only an indicative representation of the link between production and export  
SOURCE: ICO

FIGURE A.4: Growth rates of coffee exports (at constant value and in volume) between the period 1991-1994 and the period 2015-2018 by coffee form (%)



NOTES: The growth rate is calculated as follows:  $\left( \frac{\sum_{t=2015}^{2018} X_t - \sum_{t=1991}^{1994} X_t}{\sum_{t=1991}^{1994} X_t} \right) * 100\%$  where X refers to the respective export activity considered.  
SOURCE: ICO

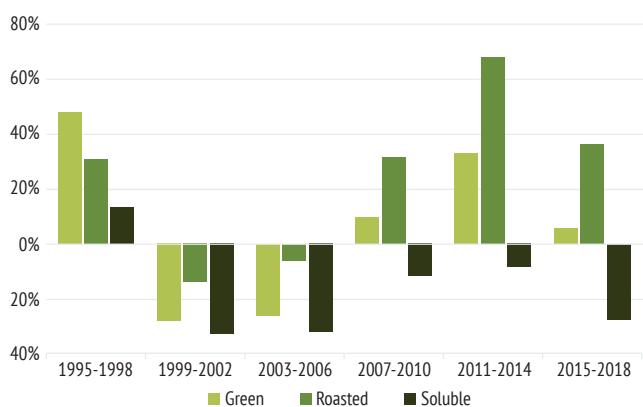
The growth rate of roasted coffee export value was much larger than that of volume meaning that there is a larger growth in value generated per unit (e.g. higher prices paid by the consumer for roasted coffee.) On the other hand, the difference in growth rates was much smaller but still positive for green coffee exports meaning green coffee unit values have been relatively stable. Lastly, the growth rate of soluble coffee exports in constant value was smaller than that of volume. The findings suggest that the unit values of both roasted and green coffee exports increased over time, the former increase being larger. In contrast, the unit value of exported soluble coffee decreased over the last 30 years.

<sup>8</sup> For further details, see Görlich et al. (2020).

<sup>9</sup> The average ICO Indicator Price (adjusted by United States Consumer Price Index CPI) was 0.479 USD/lb in the period 1991-1994 and 1.250 USD/lb in 2015-2018.

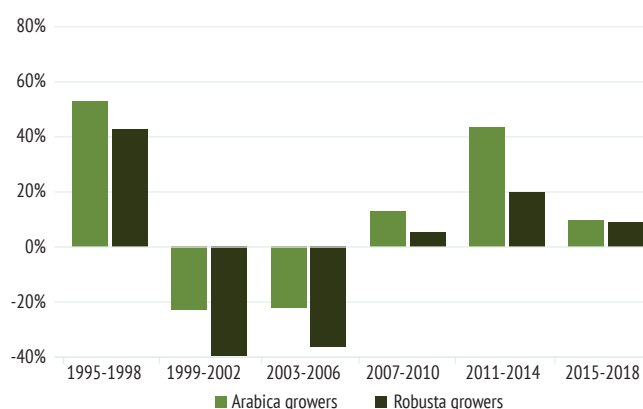
<sup>10</sup> Comparisons of export values over time are sensitive to the choice of the time periods. International coffee prices, like other commodity prices, are highly variable in the short term but do not show any long-term trend (ICO, 2019a).

**FIGURE A.5:** Growth rates of unit value by coffee form over time



NOTES: The growth rate of the unit value is calculated in the same way as in Figure A.4. Unit value of exports in the first period (1991-1994) is used as base. The unit value of exports is calculated by dividing the inflation-adjusted export value by export volume. SOURCE: ICO

**FIGURE A.6:** Growth rates of unit values of green coffee (in constant value)



NOTES: The unit value growth rate is calculated in the same way as in Figure A.4. Countries are classified as Arabica (Robusta) growers if they, according to coffee production statistics, harvest coffee beans and if their harvest is mainly Arabica (Robusta) coffee. SOURCE: ICO

The importance of soluble coffee and roasted coffee in coffee trade is increasing with higher values generated along the C-GVC.

Figure A.5 shows the evolution of unit values (export values divided by export volumes) of all three coffee forms in six periods over the last decade. Despite the similar general trends, the absolute unit value increase in exported roasted coffee was larger than the unit value increase in exported green coffee since the late 1990s. This implies that substantive value was added to roasted coffee exports, e.g., as the result of innovation (such as quality and convenience attributes) and the prosperity of the GVC actors likely increased.

In contrast, the unit value of exported soluble coffee decreased more strongly than that of green coffee in most periods. This is likely the result of a strongly expanding supply of soluble coffee in the global market, which may be driven, for example, by an increasing number of soluble coffee providers worldwide and/or advanced technologies that enhanced production efficiency. Samper et al. (2017) show that unit values of soluble coffee exported from non-producing countries is higher than from producing countries, suggesting that non-producing countries are able to add value (e.g., through branding), in a product category that is characterized by uniformity and low margins.

It should be noted that one reason why processed and green coffee unit values have similar trends over time is that green coffee is a key input for processed products. Hence, changes in the international price of coffee (due to the supply of green coffee relative to demand) affect the input costs and thus the output prices of processed coffee products).

A further breakdown of the category of green coffees into Arabica and Robusta suggests diverging trends in terms of unit values of exports (Figure A.6). The growth in unit values of green coffee exported by countries where Arabica coffee is the main cultivated variety, in most periods, is much larger than that achieved by Robusta growers. The increase in unit values and/or prices for Arabica exports was likely driven by the emergence of specialty, premium or gourmet coffee. The development of the unit value of Robusta exports is likely linked to the substantial increase in production of Robusta coffee, for instance, in Viet Nam, leading to significant additional supply (see Box A.1 for more information regarding Arabica and Robusta coffees).

### A.1.2. Which regions captured more value?

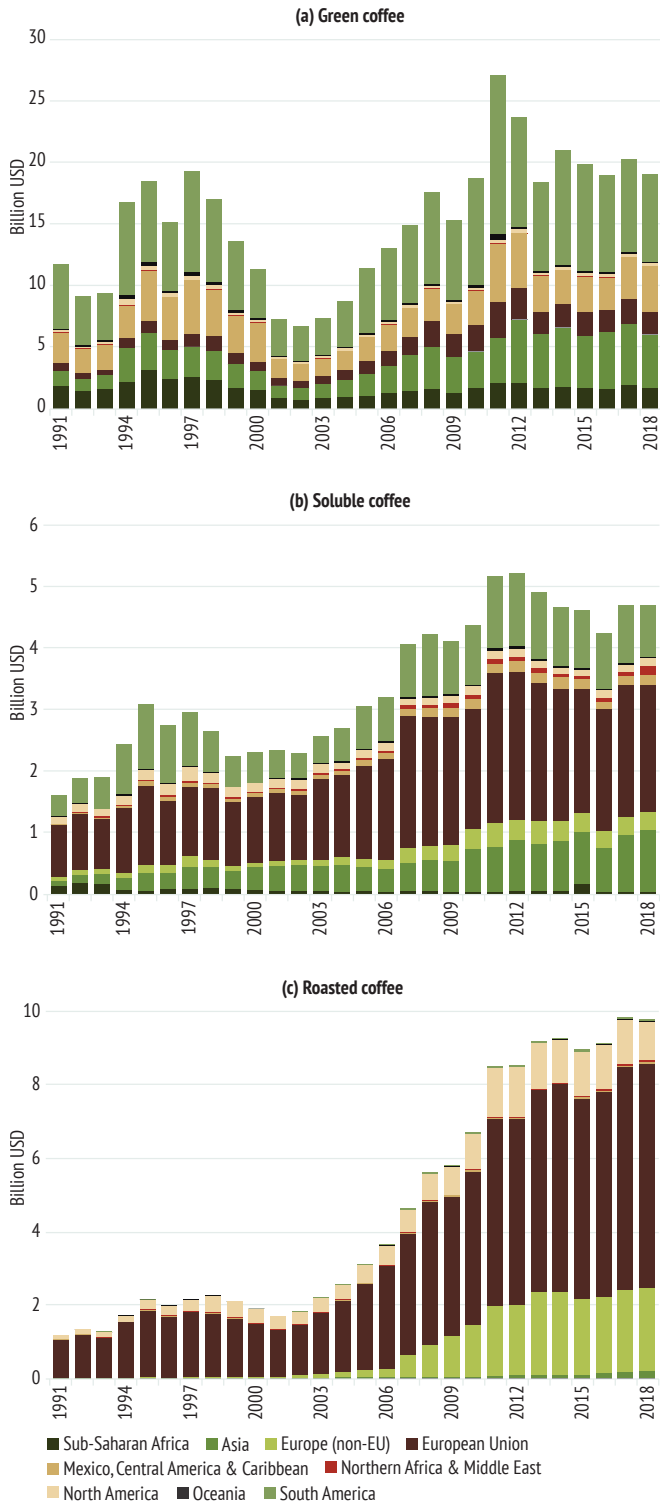
This sub-section examines the regional dimension of the expansion of the C-GVC. The evolution of the distribution of the values of coffee exports by coffee form across different world regions is presented in Figure A.7.

Green coffee is traded primarily by producing countries (labour intensive production). The analysis shows that South America, Asia, Central America and Africa, where a large share of countries are middle- and low-income countries, accounted for the great majority of green coffee exports (88% in 2018). This is not unexpected, since these regions are also the main coffee growers in the world (99% of the world coffee production in 2018).



High-income regions such as Europe and North America accounted for more than 95% of the roasted and 50% of the soluble coffee exports worldwide in 2018.

**FIGURE A.7:** Regional distribution of the coffee trade by form of coffee and over time (in constant value)



**NOTES:** The category 'Northern Africa & Middle East' also includes some Arab League countries (Comoros, Djibouti, Iran, Somalia and Sudan), categorized as Sub-Saharan African or South Asian countries by the UN. The categories European Union and Europe (non-EU) are based on EU membership in the coffee year 2018/2019 and includes the United Kingdom, which left the EU in 2020. **SOURCE:** ICO

**BOX A.1: Arabica vs. Robusta coffee**

Two main species of coffee are of economic importance worldwide: *Coffea Canephora* (also referred to as Robusta) and *Coffea Arabica*.<sup>1</sup> Roughly 60% of the world's coffee production is Arabica, while Robusta accounts for the remaining 40%. The largest Arabica coffee producers are Brazil, Colombia, Ethiopia, Honduras and Peru. Viet Nam, Brazil, Indonesia, Uganda and India are the five largest producers of Robusta coffee.

Arabica coffee grows at higher altitudes and has lower yields and lower resistance to weather shocks and pests and diseases compared to Robusta. However, while there is considerable variation, Arabica prices are roughly twice those of Robusta<sup>2</sup>. Arabica beans tend to have a sweeter, softer taste with flavours of sugar, fruit, chocolate, and berries. Arabica coffee contains more lipids and sugars and has higher (sometimes wine-like) acidity than Robusta. Arabica coffee quality is measured through an exercise called cupping and is the most important determinant of Arabica coffee prices in high-value markets.<sup>3</sup>

Robusta coffee is considered to be easier and less costly to produce. It produces fruit more quickly and yields more per tree than Arabicas. Robusta has a stronger, harsher, and bitter taste, and contains twice as much caffeine as Arabica beans. Although it is generally considered to be of inferior quality compared to Arabica, high-quality Robusta does exist and is used broadly in espressos for its deep flavour and good crema. High-quality Robusta is also used in blends (with Arabica coffee), whereas lower quality Robusta coffee is predominantly used in soluble coffee products.

<sup>1</sup> Wasserman, G. S., Bradbury, A., Cruz, T., & Penson, S. (2000). Coffee. *Kirk-Othmer Encyclopedia of Chemical Technology*, 1-22.  
<sup>2</sup> ICO statistics [http://www.ico.org/coffee\\_prices.asp?section=Statistics](http://www.ico.org/coffee_prices.asp?section=Statistics)  
<sup>3</sup> Traore, T. M., Wilson, N. L., & Fields, D. (2018). What explains specialty coffee quality scores and prices: a case study from the cup of excellence program. *Journal of Agricultural and Applied Economics*, 50(3), 349-368.

Higher income regions such as the EU, other Europe (non-EU) and North America were responsible for only about 11% of green coffee exports, since these are not coffee producers but import the majority of green coffee that was traded worldwide (76% in 2018) and (re)export only a small share of green coffee. The majority is processed for local consumption and for export. These regions are highly dominant in the export of roasted coffee, which requires additional processing (manufacturing is a capital intensive production) and has a higher product value. In 2018 these three regions accounted for more than 96% of roasted coffee exports. They also accounted for the majority of soluble coffee exports, but with a significantly smaller share of around 53% in the same year. The role of countries in the C-GVC is still quite clear: processing activities primarily occur in higher income regions that rely strongly on green coffee imports from the producing lower income regions. However, producing countries are progressing and are increasingly entering into the downstream processing operations of the C-GVC.

Against the background that the EU, Europe (non-EU) and North America together continuously accounted for more than 96% of roasted coffee exports over the past three decades, it is observed, for example, that countries in Europe (non-EU), notably Switzerland, played an increasingly important role as roasted coffee exporters (from 0.4% in 1991 to 23% in 2018). Over the same period, the share of the EU in roasted coffee exports shrank from 88% in 1991 to 63% in 2018. In terms of soluble coffee exports, substantial regional dynamics can also be seen. Here countries in Northern Africa and Middle East and, in particular, Asia increased their shares in soluble coffee exports. Countries in North Africa and the Middle East and Asia, for example, quadrupled their market share from 5% in 1991 to 22% in 2018. Their market expansion occurred at the expense of the market share of the EU and North America, which fell from 58% in 1991 to 47% in 2018.

This suggests that, although high-income regions seem to be more integrated into the processing part of the C-GVC, a number of other countries, particularly in Asia, moved up the C-GVC and became more involved in such processing work with higher value addition. However, other countries particularly in sub-Saharan Africa and South America seem to be less successful in such export-orientated functional upgrading, with exports of processed coffee that decreased or stagnated at an extremely low level over the research period.<sup>11</sup>

### BOX A.2: Theil index of concentration

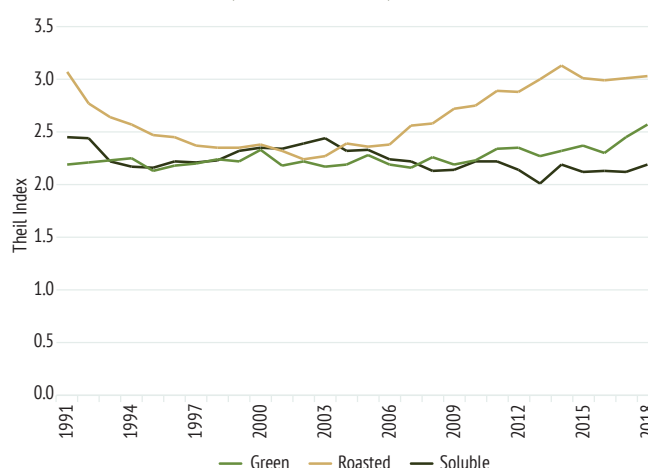
The generalized Theil index of concentration (see Bickenbach and Bode, 2008) is calculated as follows:

$$T = \sum_{i=1}^I \frac{\frac{X_i}{\Pi_i}}{\sum_{i=1}^I \frac{X_i}{\Pi_i}} \ln \left[ \frac{\frac{X_i}{\Pi_i}}{\frac{1}{I} \sum_{i=1}^I \frac{X_i}{\Pi_i}} \right]$$

where  $i = 1, \dots, I$  refers to the individual countries and  $X_i$  is the export activity considered.  $\Pi_i$  is a reference variable. Our analysis focuses on the relative Theil index, which incorporates country-level population statistics as reference to take into account countries' difference in size in the analysis of the development of concentration over time. The minimum value of the Theil index is zero. In this case, each country's share in the economic activity is proportional to its population share. In other cases, the value of the Theil index is positive, with a higher index representing a higher concentration. The analysis is carried out based on a smaller sample of countries for which country-level population data were made available by the World Bank (World Bank, 2020a).

<sup>11</sup> Brazil is an exception with a strong coffee industry and value addition that is not export orientated. The country has emerged as the second largest consuming country worldwide with an efficient processing industry, which however, primarily serves the domestic market. Another exception is Columbia (s. Box A.3).

**FIGURE A.8:** Concentration of coffee exports across countries over time (Relative Theil)



SOURCE: ICO and World Bank (2020)

Geographic concentration of the roasted coffee exports is higher than that of green and soluble coffee.

### A.1.3. Coffee exports are increasingly concentrated

Do the trends identified above imply that processing activities in the C-GVC (e.g., soluble and roasted coffee exports) became more concentrated in certain countries over time? To answer this question, the generalized Theil index of concentration was calculated (see Box A.2 for details on the methodology). In this measure, a higher value represents a higher level of concentration and, thus, inequality across countries in the coffee trade (Bickenbach and Bode, 2008). Three export activities are considered: green coffee exports, soluble coffee exports, and roasted coffee exports. Results plotted in Figure A.8 show that the concentration of roasted coffee exports was higher than that of the other two forms. In other words, the processing activity for higher value addition, namely roasted coffee exports, became relatively more concentrated across countries than that for both green and soluble coffee.<sup>12</sup> The concentration of roasted coffee exports decreased in the 1990s but rebounded after 2002. A similar trend can also be observed for soluble coffee exports.

<sup>12</sup> More concretely, the distribution of roasted coffee exports across countries has become much less proportional to their population shares over time. Further analysis also shows that the increasing concentration of roasted coffee exports was mainly driven by smaller countries taking over disproportionately high shares of roasted coffee exports in relation to their population sizes (see Görlich et al., 2020).

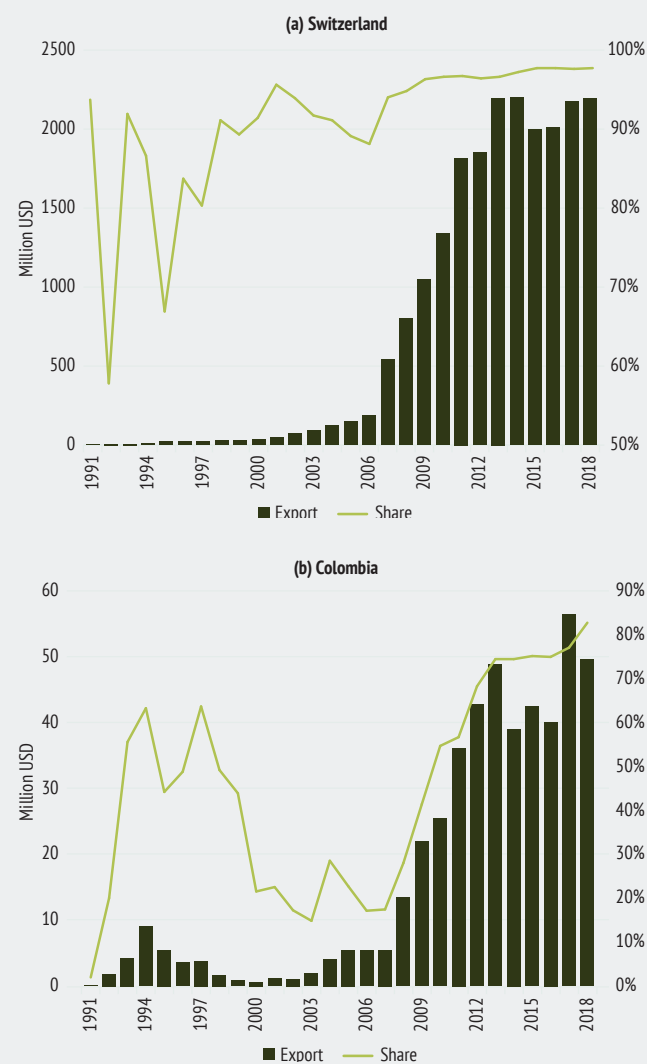
### BOX A.3: Switzerland and Colombia – successful GVC integration

A closer look at the country-level export statistics shows that the successful growth in and market acquisition by Switzerland and Colombia is likely the main reason behind the strongly increasing concentration of roasted coffee exports within Europe (non-EU) and within South America, respectively. Switzerland's market share in the roasted coffee exports of Europe (non-EU) increased particularly in two periods, namely from 1995 (67%) to 2001 (96%) and from 2006 (88%) to 2018 (98%), while its population share only slightly increased from 2.8% in 1991 to 3.6% in 2018. Switzerland's market expansion was highly likely attributable to Nestlé's innovation success through upgrading by developing and marketing a new capsule-based way of premium coffee consumption. All coffee encapsulated and sold by Nespresso for the global market is roasted in Switzerland.

The development of coffee capsules is a specific type of product upgrading combined with functional upgrading, by means of which the company moved upward in the C-GVC by carrying out innovation activities to create additional market value for its roasted coffee products.

Colombia played a similarly determinant role for the increasing concentration of roasted coffee exports in South America. Its market share in roasted coffee exports increased substantially (from 2% of the roasted coffee exports of South America in 1991 to 83% in 2018), while its population share stayed almost constant (11.2% - 11.7%) over time. The strong market expansion can be observed particularly in the early 1990s and since 2007 (Figure A.9). Unlike Switzerland, Colombia is a coffee-growing country and is well known for its high-quality Arabica coffee beans. Its success in roasted coffee exports indicates that Colombia also made progress in functional upgrading, i.e. it has moved up the C-GVC by carrying out more roasted coffee processing with higher value addition than before. Local engagement through, for example, the Colombian Coffee Federation with support from international coffee consumption promotion activities such as the Tomacafe programme seems to have helped Colombia to overcome the barriers to roasted

FIGURE A.9: Roasted coffee exports of Switzerland and Colombia



NOTES: The shares refer to the share of Switzerland's (Colombia's) roasted coffee exports in the roasted coffee exports in non-EU Europe (South America).  
SOURCE: ICO

coffee processing and thus to become more capable of satisfying global demand and also the expanding local consumption market (CBI, 2015; ICO, 2019a; Samper et al., 2017).

Further analysis reveals several key insights: first, more countries are now integrated into the C-GVC and can better reap the benefits of globalization than before, but the relative concentration across countries also increased over time – especially in the case of roasted coffee exports, but followed by green coffee exports in the recent past.<sup>13</sup>

<sup>13</sup> Additional decomposition analyses were carried out and are presented in detail in the working paper (Görllich et al., 2020). Specifically, the overall concentration was decomposed into two elements – extensive margin of concentration and intensive margin of concentration. The extensive margin of concentration reflects the share of countries involved in the exporting activities considered, whereas the intensive margin of concentration measures the export concentration among exporters.

Second, countries in Asia and Northern Africa and the Middle East became more involved in soluble coffee exports, while countries in Europe (non-EU) earned a larger market share in roasted coffee exports. Hence, Europe's (non-EU) particularly strong success in this regard led to a more equal distribution of roasted coffee exports across regions.

Third, the concentration of roasted coffee exports increased most substantially. Some countries in Europe (non-EU) and South America accounted for disproportionately higher or disproportionately lower shares of the roasted coffee exports of the region than their population shares (see Box A.3 which illustrates the cases of Switzerland and Colombia).

### A.1.4. Functional upgrading in producing countries – development trajectories

A comparative analysis of the degree to which producing countries are engaged in functional upgrading reveals a very heterogeneous picture, both across countries and time. Figure A.10 shows, for selected countries, the evolution over time (1991-2018) of the ratio of processed coffee to green coffee export values in three categories: 'low' indicating that the vast majority of coffee is exported in green form, 'medium' for countries that export a considerable amount of processed coffee in comparison to overall exports, and 'high' for countries that are majority processed coffee exporters in value terms.

Among the countries in the 'low' category, Colombia is characterized by a relatively stable share of 10% export of processed coffees compared to the overall coffee export value since the late 1990s.<sup>14</sup> Nicaragua, on the other hand, initially saw the share increasing to over 6% in the early 2000s. In recent years the share dropped to less than 3%. Viet Nam's exports of processed (primarily soluble) coffee have significantly increased over the last period (2014-2018). This trend is likely to continue in view of the increase in demand from non-traditional markets and due to a new trade agreement with the EU that came into force in 2020 and scraps remaining tariffs on processed coffee exports.

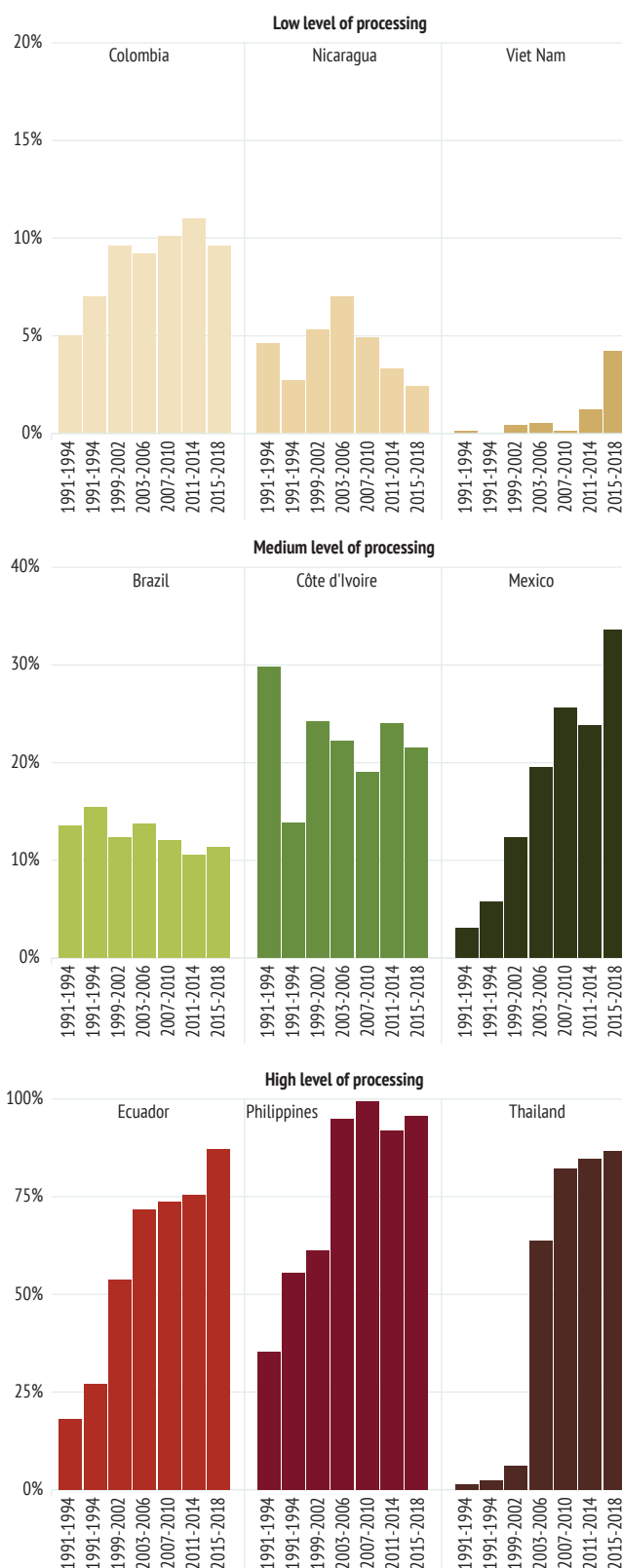
The 'medium' group includes Brazil and Côte d'Ivoire, which had a significant industrial processing base (compared to domestic production volumes) by the end of the 1990s. The share of processed coffees in total exports has stagnated in recent years at 10% (Brazil) and 20% (Côte d'Ivoire). Meanwhile, Mexico has continuously increased its exports of processed coffees relative to total coffee exports. Since the 2000s more than 30% of export earnings can be attributed to processed coffees, underscoring the successful upgrading of Mexico's coffee sector.

The countries in the 'high' group are countries that transitioned from cultivating to processing coffee. Ecuador, the Philippines, and Thailand have allocated resources to build an industrial base to produce soluble coffee, which makes up more than 75% of exports in value terms. To meet the demands of the industry, these countries have become importers of green coffees.

### A.1.5. Successful product upgrading

Successful product upgrading increases value addition (e.g., through enhanced product quality, branding, food safety, convenience and sustainability and geographical attributes) and thus enables exporters to receive higher prices. Our analysis suggests that such product upgrading has been particularly successful in the case of roasted coffee. While a positive trend in unit values is also observed for exported green coffee (particularly that exported by Arabica growers), the unit value increase in roasted coffee was much higher than in green coffee. In the case of soluble coffee exports, the evolution of unit values is generally found to be negative. In the following section the development of export volume and unit value for all three forms of coffee is assessed, comparing the periods 1991-1994 and 2014-2018.

**FIGURE A.10:** Average annual ratio of processed coffee exports to total coffee exports in selected countries between 1991-2018



NOTES: The calculation is based on export statistics in constant value. The bars represent the seven time periods used for this analysis (1991-1994, 1995-1998, 1999-2002, 2003-2006, 2007-2010, 2011-2014 and 2015-2018) for each country. SOURCE: ICO

<sup>14</sup> As shown in A.1.3 Colombia succeeded in acquiring a larger market share of roasted coffee exports compared to other countries in South America. Despite its success, Colombia still accounted for only a small share of roasted coffee exports worldwide.

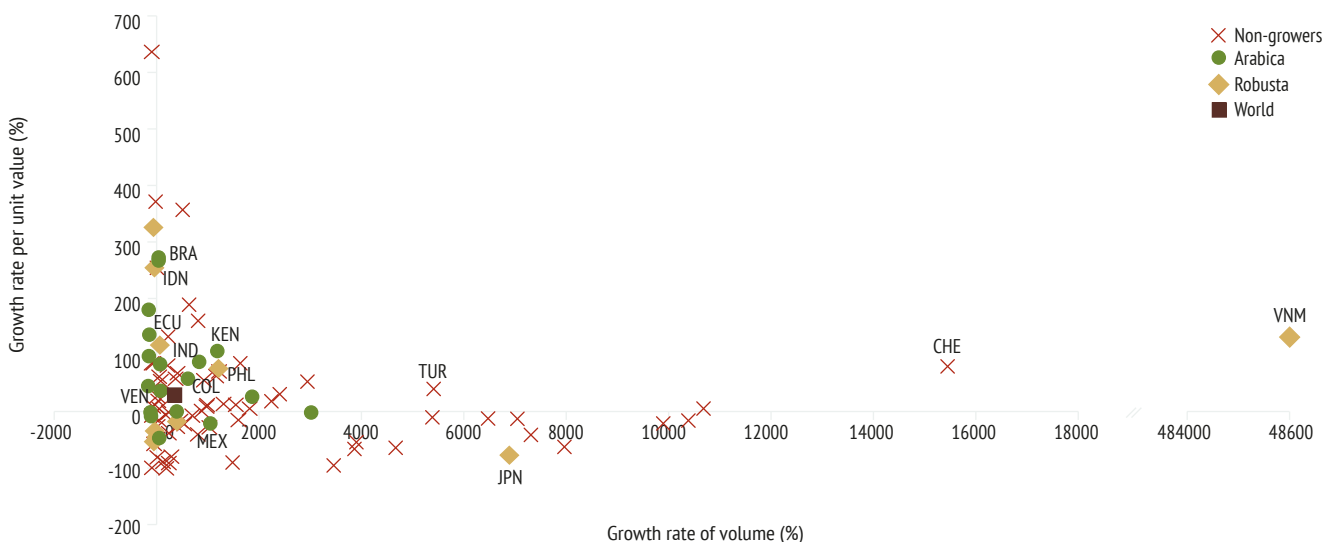
### Roasted coffee exports

In the case of roasted coffee exports, most countries expanded their export volume over time, but not all of them were able to increase their unit value of exports over the same period (Figure A.11). Viet Nam expanded its export volume of roasted coffee substantially – albeit from a very low base – and was also able to achieve a higher unit value for its roasted coffee in the recent period (2015-2018) compared to the early 1990s. So did Switzerland, where the growth rates of both unit values and volumes were smaller than Viet Nam, however. Kenya, the Philippines, Mexico, and Colombia experienced high growth volumes in roasted coffee, whereas Brazil, Indonesia, Ecuador, and India experienced high unit value increases for their roasted coffee products in the recent past.

### Soluble coffee exports

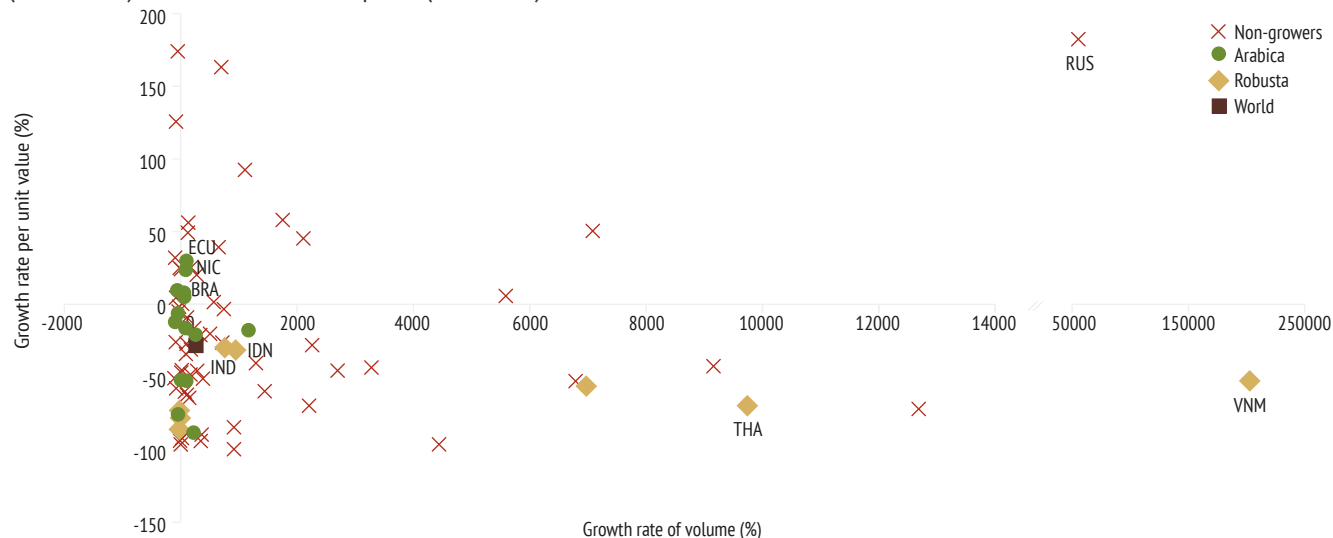
Most countries involved in soluble coffee exports faced lower unit values recently (2015-2018) than before (1991-1994), while they generally expanded their export volumes over time (Figure A.12) towards price-sensitive merging coffee consuming countries. Viet Nam stands out here as well. However, in contrast to the unit value increase observed in its exports of roasted coffee, the unit value of Viet Nam’s soluble coffee exports has decreased strongly over time. Despite the generally negative price trend in soluble coffee exports, some countries, such as Ecuador, Nicaragua, and Brazil, enjoy higher soluble coffee prices in the export market today than in the early 1990s.

**FIGURE A.11:** Growth rate of per unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1991-1994) for roasted coffee exports (both in %)



**NOTES:** The growth rate is calculated in the same way as in Figure A.4. Arabica (Robusta) growers are countries which, according to coffee production statistics, harvest coffee beans and whose harvest is mainly Arabica (Robusta) coffee. The figure displays a sub-set of countries due to data limitations and visualization reasons. See Annex 1 for country name abbreviations. **SOURCE:** ICO

**FIGURE A.12:** Growth rate of unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1991-1994) for soluble coffee exports (both in %)



**NOTES:** The growth rate is calculated in the same way as in Figure A.4. Arabica (Robusta) growers are countries which, according to coffee production statistics, harvest coffee beans and whose harvest is mainly Arabica (Robusta) coffee. The figure displays a sub-set of countries due to data limitations and visualization reasons. See Annex 1 for country name abbreviations. **SOURCE:** ICO

The results likely reflect increased efficiency in soluble production (process upgrading), which has led to higher global supply of soluble coffee (in bulk form with no branding) and falling real prices. This finding is in line with the development of unit values of exports presented in Figure A.4 as well as with previous analysis carried out by Samper et al. (2017).

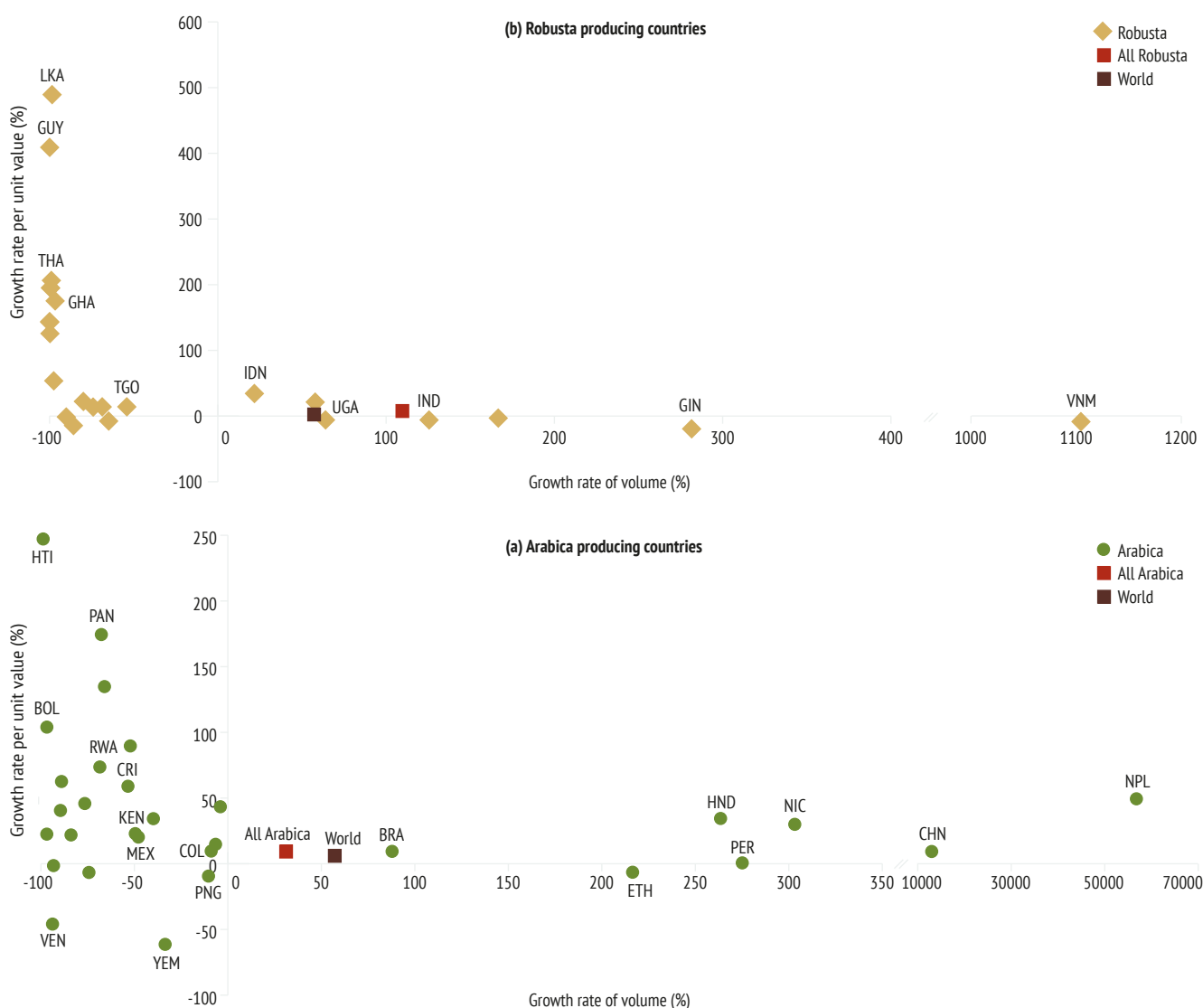
### Green coffee exports

Figure A.13 shows that most coffee growing countries were able to receive higher unit values for their exported green coffee in the 2015-2018 period compared to the 1994-1998 period. This may in part be driven by differences in the international price of coffee in the respective time periods, which is why the comparison growth rate for individual countries should be interpreted with caution. However, the comparison across countries or groups (Arabica vs. Robusta)

remains valid. It provides insights into the relative ability of countries to upgrade their green coffee sector. More Arabica growers realized higher unit values for their exported green coffee than Robusta growers. Interestingly, many of these coffee growers recorded a reduction in export volumes recently. Hence, it is possible that some of these coffee-growing countries focused on quality over quantity in order to achieve higher prices in the specialty, premium, gourmet coffee segment. The findings also reflect that coffee from certain countries and regions fetches a higher premium than others, mainly due to quality attributes arising from regional differentiation in addition to quality attributes (e.g. Blue Mountain in Jamaica, Yirgacheffe in Ethiopia, and Sumatra in Indonesia), even though the effect may still be relatively small, as suggested by Samper et al. (2017).<sup>15</sup>

Among the Arabica growers, Nicaragua, Peru, Honduras, and Ethiopia more than tripled and Brazil almost doubled their

**FIGURE A.13:** Growth rate of per unit value vs. growth rate of volume between the recent period (2015-2018) and the first period (1991-1994) for green coffee exports (both in %)



**NOTES:** The growth rate is calculated in the same way as in Figure A.4. Arabica (Robusta) growers are countries that, according to coffee production statistics, harvest coffee beans and whose harvest is mainly Arabica (Robusta) coffee. The figure displays a sub-set of countries due to data limitations. See Annex 1 for country name abbreviations. **SOURCE:** ICO

<sup>15</sup> See also section B.3 of this report for details on processing operations and section D for price differentials for various types of coffees.



volume of green Arabica coffee exports but did not achieve significantly higher unit values. In contrast, Rwanda, Kenya, Mexico, and Costa Rica saw their Arabica export volumes decrease but enjoyed large unit value increases.

Viet Nam gained in the group of Robusta growers in terms of the growth of volume of green coffee exports. Uganda increased its green Robusta exports but received lower values per unit. Indonesia, on the other hand, experienced an increase both in the volume of green Robusta coffee exported and unit values received for it.

The analysis shows that some countries were more successful than others in integrating into the C-GVC in past decades, whether through functional upgrading, product upgrading or process upgrading. This raises further questions as to why some countries performed better than others and what drives their GVC integration. The next section seeks to answer this question.

## A.2. Determinants of GVC participation

About 70% of the coffee produced worldwide is exported and green coffee accounts for 90% of all coffee exported. Little export-orientated processing takes place in coffee-growing countries. Hence, value addition remains concentrated in green coffee-importing countries and their leading companies. However, there is considerable variation across coffee-growing countries. This variation suggests that some countries are better able to capture value from their basic coffee production. It is precisely this variation that can be assessed through an econometric analysis. In the following, some general insights into determinants of coffee exports are provided, followed by an analysis of the determinants of **functional upgrading** and **product upgrading**.

In addition, a higher value added to the final product can be reached by increased productivity, decreased overall costs and a corresponding increase of the gross margins of market participants (**process upgrading**). However, the latter cannot be monitored via classical trade statistics that focus on export/import values. To explore which factors influence a country's GVC integration for the coffee industry, the outcome variables focusing on exports, imports, functional upgrading, and product upgrading are covered.

### A.2.1. Indicators of GVC participation

Two possible ways are considered here in which coffee exporting countries can add value to green coffee:

1. A country can **improve the value of green beans** exported by product upgrading (e.g., improving through selective picking by hand, introducing high-value post-harvest processing, such as washing, or adopting safety and sustainability standards, along with promotion and branding and geographical indication).
2. Countries participate in the coffee global value chain by **functional upgrading** and producing **processed products**, such as roasted or soluble coffee.

Value addition through product upgrading: selective picking by hand, high-value post-harvest processing such as washing, or by adopting safety and sustainability standards, along with branding and geographical indication.

Measuring coffee exports and imports at the country level is relatively straightforward, since international trade data is often reported by countries or can be obtained through mirror statistics. To measure functional and product upgrading at the country level, on the other hand, is more challenging. Inputs and final products may cross a border several times with corresponding changes in ownership. Transaction data is often considered confidential. As a result, it is often impossible to accurately track the progress of a batch of green coffee from harvest to the point of consumption. However, the sequential nature of the three coffee forms (green, roasted, soluble) is used to create a measure that can capture functional upgrading in GVCs. Soluble and roasted coffee represent processed forms of green coffee. Accordingly, the distance to the final consumer is reduced. Therefore, a higher share of exports in soluble and roasted coffee out of total exports is used herein as an indication of GVC upgrading.<sup>16</sup>

To measure product upgrading within the green coffee value chain, export revenues in constant USD per unit of green coffee exported are used, based on the assumption that higher per unit values indicate upgrading through attributes, such as quality, safety, and sustainability (e.g., selective picking, post-harvest processing, sustainability certifications, branding and geographical indication). Table A.2 summarizes the indicators used in the analysis to proxy country-level GVC participation.

**TABLE A.2:** Description of indicators of GVC participation (dependent variables)

GVC participation indicators	Description
Coffee exports	Annual coffee exports (value in USD)
Functional upgrading	Ratio of roasted and soluble coffee to green coffee exports
Product upgrading	Unit value of green coffee exports (export value divided by export volume)

<sup>16</sup> The analysis also takes into account that coffee-growing countries naturally show higher levels of exports of green coffee and have lower values of functional upgrading compared to non-growing countries.

## A.2.2. The drivers of GVC participation

Following Fernandes et al. (2020), several different domains are defined that capture determinants of integration into the GVC. These domains include factor endowments, geography, foreign direct investment (FDI), tariffs, domestic industrial capacity, institutional quality and macroeconomic factors. Table A.3 describes the explanatory variables used in the analysis.

### Factor endowments

Factor endowments include natural resources, capital, and arable land. Natural resources are denoted by the natural logarithm of rents from resources scaled by gross domestic product (GDP). An abundance of natural resources (e.g., petroleum or copper) is closely linked to GVC integration, because agricultural products and commodities are used in a variety of downstream products (Fernandes et al., 2020). In the case of coffee, a country abundant in natural resources such as petroleum might face the ‘Dutch disease’ as labour flecks to the petroleum sector bidding up the prices of labour in other industries. Also, the dominance of the petroleum sector might bid up currency prices, making it more difficult for exporters in other sectors to compete. As a result, coffee may be adversely hit by a burgeoning trade in natural resources.

In addition, capital endowment, proxied by the natural logarithm of capital over GDP, is included. Capital endowment is especially important for the sections of the processing industry located further downstream in the value chain (Fernandes et al., 2020). In line with this, processed coffee exports are expected to be driven by capital endowments. The relevance of this variable is likely to be smaller for green coffee, which is still mainly harvested by hand by smallholder farmers. Land endowment is measured by the natural logarithm of arable land in 1,000 ha over GDP.

### Geography

Geography in the coffee industry is more commonly understood in terms of altitude, soil quality or climate zones. However, in the GVC literature, geography takes on a different meaning. Here it refers to geographic proximity of growers to processors and of processors to distributors and retailers. The basic idea is that higher value addition is possible when stakeholders are located in the same geographic space. This occurs because transacting partners share the same pool of workers (who carry knowledge and ideas) and communication is enhanced. Growers and processors within the same neighbourhood, separated by only a short distance, are more likely to exchange ideas and work more closely towards streamlining production (Ellison

**TABLE A.3:** Description of drivers of GVC participation (explanatory variables)

Domain	Explanatory variables	Description
Factor endowments	(ln) resource rents/Gross domestic product (GDP)	Total natural resources rents (% of GDP)
	(ln) capital / GDP	Capital stock at constant 2011 national prices (in mil. 2011 USD) in relation to GDP (constant 2010 USD)
	(ln) arable land / GDP	Normalized arable land area in 1000 ha in relation to GDP (constant 2010 USD)
Geography	(ln) distance to processing hubs	Average distance of the capital of Italy, Germany and the US
FDI & tariffs	(ln) FDI inflows	Foreign direct investment: Inward flows
	Tariffs rate (primary)	Tariff rate, applied, weighted mean, primary products (%)
Industrial capacity	(ln) domestic industrial capacity	Manufacturing, value added (% of GDP)
Institutional capacity	Political Stability Index	Political Stability and Absence of Violence/Terrorism: Estimate
Macroeconomic factors	Currency depreciation	Official exchange rate (Local Currency (LCU) per USD, period average)
Coffee sector related variables	(ln) consumption p.c. in kg	Consumption per capita
	Arabica dominates (dummy)	A dummy if the country reported any production of coffee and Arabica dominates
	Robusta dominates (dummy)	A dummy if the country reported any production of coffee and Robusta dominates
Supplementary control variables	(ln) GDP p.c.	GDP (constant 2010 USD) and Population, total
	(ln) Population	Population, total



Investors that bring resources, technology and human capital enable the transformation of low-performing businesses into high-productivity, high-value generating businesses.

et al., 2010). Following the approach of Fernandes et al. (2020) the average distance to main manufacturing hubs is introduced and aligned to the coffee industry. The natural logarithm of the average distance to the capital of Germany, the USA and Italy is defined. These countries were selected because they are major hubs for coffee consumption and processing of coffee. The expectation is that GVC integration decreases as the distance from these hubs increases.<sup>17</sup>

### FDI and tariffs (Trade policy)

In the context of low prices, individual producers and firms have difficulties in covering operating costs and investing in upgrading their technologies and equipment (ICO, 2019a, d). The result is a shortfall in productivity. This vicious cycle can be broken by investors that bring resources, technology and human capital, thus enabling the transformation of low-performing businesses into high-productivity, high-value generating businesses. This is the role that FDI is expected to play. Stiglitz notes that FDI investment “brings with it not only resources, but technology, access to markets, and (hopefully) valuable training, an improvement in human capital” (Stiglitz, 2000). In this analysis the natural logarithm of FDI inflows is included.

Tariffs are a strongly scrutinized component of any trade study. Low-income coffee-growing and industrialized coffee-importing countries exhibit a certain degree of path-dependency, each specializing in their own comparative advantage (coffee growing vs processing). The reduction or abolition of tariffs would make imports of coffee cheaper for industrialized countries. However, in many countries (especially importers) ‘tariff escalation’ can be observed, meaning imports of processed coffees are subject to higher levies than green coffee (ICO, 2020d). Here the tariff rate on primary goods is used to capture the effect on GVC integration. A reduction in tariffs would be expected to be associated with increased specialization, increasing the value-added captured by low- and medium-income coffee producing countries in this analysis.

<sup>17</sup> It should be noted that, in the case of coffee, the argument of Fernandes et al. (2020) may be less valid due to the dependency of coffee cultivation on climatic conditions (e.g. production takes place in the tropical coffee belt) and given that processors have traditionally been located in the global North, close to consumers. Further research is required in the adaptation of the GVC framework to the specificities of the coffee sector.

### Industrial capacity

Countries with larger domestic industrial capacity have a more established tradition in trade (Fernandes et al., 2020). In the context of the C-GVC, the domestic industry would be expected to drive imports of green coffee for processing and exports of processed coffee and GVC upgrading. Domestic industrial capacity is proxied with the natural logarithm of manufacturing value added as a percentage of GDP.

### Institutional quality

Political stability is an important factor for firms to invest in production techniques and to establish an industry in the long run. An index of the Worldwide Governance Indicator family of the World Bank measures perceptions of the likelihood of political instability and/or politically motivated violence at the country level. The index ranges from -2.5 to 2.5 with lower values indicating less political stability. The index measures the perception of the likelihood of political instability and/or politically motivated violence. See also Section B in which the link between political instability and resilience is further elaborated.

### Macroeconomic factors

A country’s overall economic environment can be a key driver of GVC integration. For example, exchange rates can represent a source of comparative advantage. Here changes in the exchange rate are captured by use of a variable measuring the depreciation of the local currency against the USD. In the short run, unexpected depreciation makes imports costlier and exports cheaper. Since the world market for green coffee is, in particular, characterized by a high level of competition, green coffee exports would be expected to be most affected by changes in the exchange rate.

### Coffee sector-related variables

In an attempt to adapt the approach of Fernandes et al. (2020), specific control variables are included to take into account specificities of the coffee sectors of individual countries: first, a variable that indicates if the country is a coffee grower in which Arabica dominates; second, a variable that indicates if the country is a coffee grower in which Robusta is the more important species. This has various reasons. Coffee-growing countries typically export higher volumes of green coffee and are less reliant on foreign imports of green coffee. Moreover, coffee-growing countries are likely to demonstrate reduced levels of functional upgrading, as the previous descriptive analysis has shown. However, if we focus only on coffee-growing countries, Robusta growers might demonstrate higher processing activity than Arabica growers since the market for soluble coffee (Robusta-based) is less difficult for developing country processors to enter than the market for roasted coffee (Arabica-based).

A currency depreciation positively affects a country's competitiveness in the green coffee markets but not necessarily for soluble or roasted coffee exports.

#### BOX A.4: Econometric approach to analysis of the determinants of GVC participation

The econometric approach relies on a modified form of the Fernandes et al. (2020) framework, which was also applied by the World Bank for the GVC participation analysis in the World Development Report 2020. The distribution of coffee imports and exports follows a Poisson distribution without negative values. Accordingly, the Poisson Pseudo-Maximum-Likelihood Estimator (PPML) is used.<sup>1</sup> However, the measure of functional GVC upgrading does not similarly follow a Poisson distribution. Relative exports of different forms of coffee are highly skewed because exporting activities (green, soluble, roasted) tend to be located in different countries. Consequently, many countries export high shares of processed coffee and only small amounts of green coffee. Hence, an additional specification only focusing on coffee-growing countries is also included in the analysis. The general specification can be formulated as:

$$Y_{it} = \alpha + X'_{it}\beta + \delta_t + u_{it}$$

where  $Y_{it}$  is the dependent variable measuring GVC integration of country  $i$  at time  $t$ . This includes single specifications on the coffee imports, exports and GVC upgrading. Applying PPML does not require any transformation of the dependent variable (such as taking the natural logarithm) and accordingly also includes observations where the dependent variable equals zero. For all variables 4-year averages are applied. The reasoning for applying the average is that it firstly reduces the possibility of noise introduced by outliers. Second, some of the independent variables are unavailable for some years. Accordingly, this adjustment to the data avoids the loss of observations. Nonetheless, we do not have full coverage for all independent data for the period 1991-1994. For this reason, the focus is on six periods between 1995 and 2018. The vector  $X_{it}$  comprises a vector of potential determinants of the GVC participation (our independent variables),  $\delta_t$  are period fixed effects, and  $u_{it}$  is an independent and identically distributed error (i.i.d.).

<sup>1</sup> Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and Statistics*, 88(4), 641-658.

An additional control variable is the natural logarithm of per-capita coffee consumption. Intuitively, higher domestic coffee demand usually leads to higher imports of all forms of coffee. However, a strong domestic demand for coffee might further stimulate domestic production and processing capabilities that can be leveraged for exports. This variable therefore helps to take into account the potential role of domestic consumption and a thriving industry as a driver of export-orientated upgrading in countries such as Brazil or Indonesia.

#### Supplementary control variables

Additional variables are introduced to control for income levels (natural logarithm of GDP per capita) and market size (population). Relatively lower income countries are more likely to produce coffee, but may fail to upgrade their production towards higher quality or processed coffee and accordingly fail to capture any gains in value addition. A variable for a country's population controls for size or scale effects. A larger population might require higher imports and exports. But the scale of trade may be due just to population size, not differences in demand per capita.

The empirical model of the analysis is presented in Box A.4. The next sub-section presents the key results.

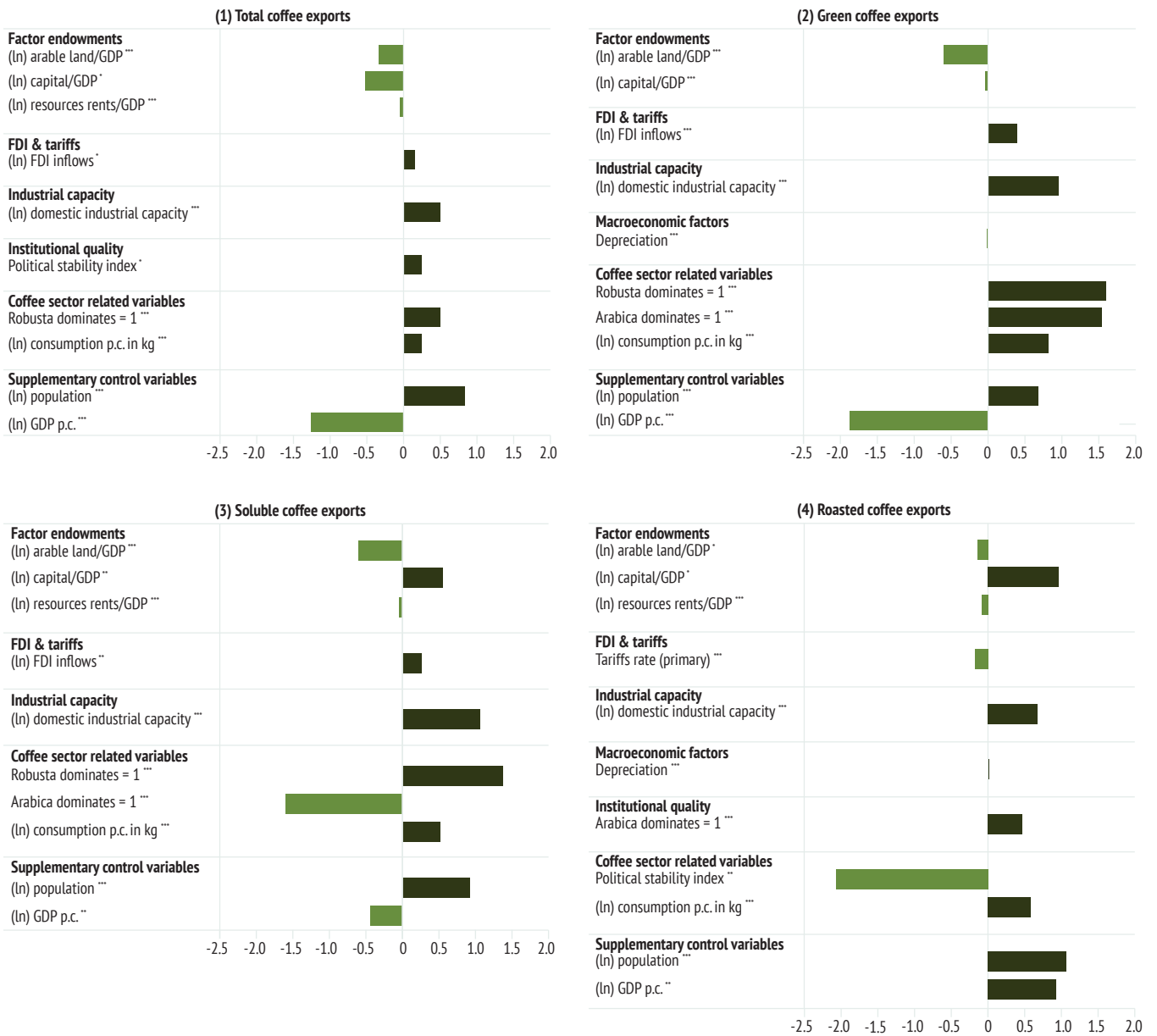
#### A.2.3. Capital, domestic industrial capacity, and FDI drive processed coffee exports whereas tariffs reduce them

Results of the empirical analysis are presented in Figure A.14 and in long form in Annex 2. In four charts the coefficients of the explanatory variables are plotted, indicating the level of statistical significance. The first chart (1) shows the determinants of export value (all forms of coffee). Green bars indicate a positive relationship between the explanatory variable, for example the population size and the value of coffee exports; red bars indicate a negative relationship. Charts (2) to (4) contain the results for specific coffee forms (green, roasted or soluble). Overall, the empirical results are in line with the expected relationships between determinants and outcome variables.

Findings suggest a 'Dutch disease' effect, wherein countries with a strong natural resource sector, such as Nigeria and Angola, often manifest a weaker export performance for all forms of coffee. This problem holds for both processed and unprocessed coffee while, in terms of magnitude, the largest negative effect is on exports of roasted coffee. Some countries with strong natural resource endowments such as Nigeria and Angola have recently taken some action with international support to better deal with the 'Dutch disease' problem.<sup>18</sup>

<sup>18</sup> In October 2020, the federal government ratified Nigeria's membership of the ICO. Nigeria aims to invest in the coffee industry to diversify its oil-dependent economy and ensure sustainable development. <https://nationaleconomy.com/features/how-membership-of-ico-can-improve-coffee-production-in-nigeria/> Similarly, Angolan government is working with the coffee stakeholders and UNCTAD to take advantage of the opportunities that the coffee sector offers breaking the dependency of the economy on oil and ensuring sustainable and inclusive economic growth. <https://unctad.org/news/angola-eyes-former-coffee-glory-more-sustainable-growth>

**FIGURE A.14:** Determinants of countries' coffee exports



NOTES: N=780. The figures visualize a sub-set of regression coefficients which are statistically significant. For the full regression outputs please refer to Annex 2. \*\*\* denotes  $p < 0.01$ , \*\* denotes  $p < 0.05$ , \* denotes  $p < 0.1$ .  
SOURCE: ICO

Additionally, capital endowments help to bolster exports of processed coffee. This is consistent with our expectation that it is precisely the processed coffee products that necessitate the highest injection of capital. A large endowment of arable land does not increase coffee exports. In fact, countries with low arable land endowment dominate the coffee value chain.

An interesting finding is the impact of industrialization. Domestic industrial capacity positively correlates with all forms of coffee exports. While this result is not surprising for processed coffee, it is observed that exports of green coffee are higher in countries with a large industrial capacity. Industrial resources, skills, and methods can be applied to the agriculture sector, thereby enabling higher productivity and value addition.

Trade barriers seem harmful to coffee exports, but especially for roasted coffee. FDI inflows positively affect exports of green and soluble coffee. However, this measure lacks granularity and the sector-specific FDI inflows cannot be tracked.

Countries with a higher political stability export significantly more roasted coffee. This might be linked to the high level of investment needed to establish an industry specialising in roasted coffee, a finding in line with our prior results on domestic industrial capacity and capital endowments. As expected, currency depreciation boosts a country's competitiveness in the green coffee markets (traded on the New York and London commodity futures markets) but this does not apply to soluble or roasted coffee exports.

In addition, domestic consumption is linked with increased exports of all coffee varieties. This indicates that a domestic preference for coffee appears to build a base for supporting a thriving domestic coffee industry (see also Samper et al., 2017). If a country is mainly a Robusta producer it is also more likely to commence exporting soluble coffee. This illustrates that domestic Robusta cultivation is used as an input for processed coffee. A similar pattern is not observable for roasted coffee, where the barriers to market entry are much higher. Interestingly, cultivation of Arabica coffee even decreases the volume of roasted coffee exported. This shows that the roasted coffee sector is dominated by non-coffee-growing countries.

Countries with very low income levels (per capita GDP) appear to be locked into green coffee exports. A possible explanation is that lower income countries suffer from relatively undiversified economies and low levels of industrialization. However, soluble coffee is also more likely to be exported by lower income countries. Since there is already some value creation embodied in soluble coffee, this might serve as a step in the direction for increased value creation within these countries. Roasted coffee is predominantly exported by industrialized countries.

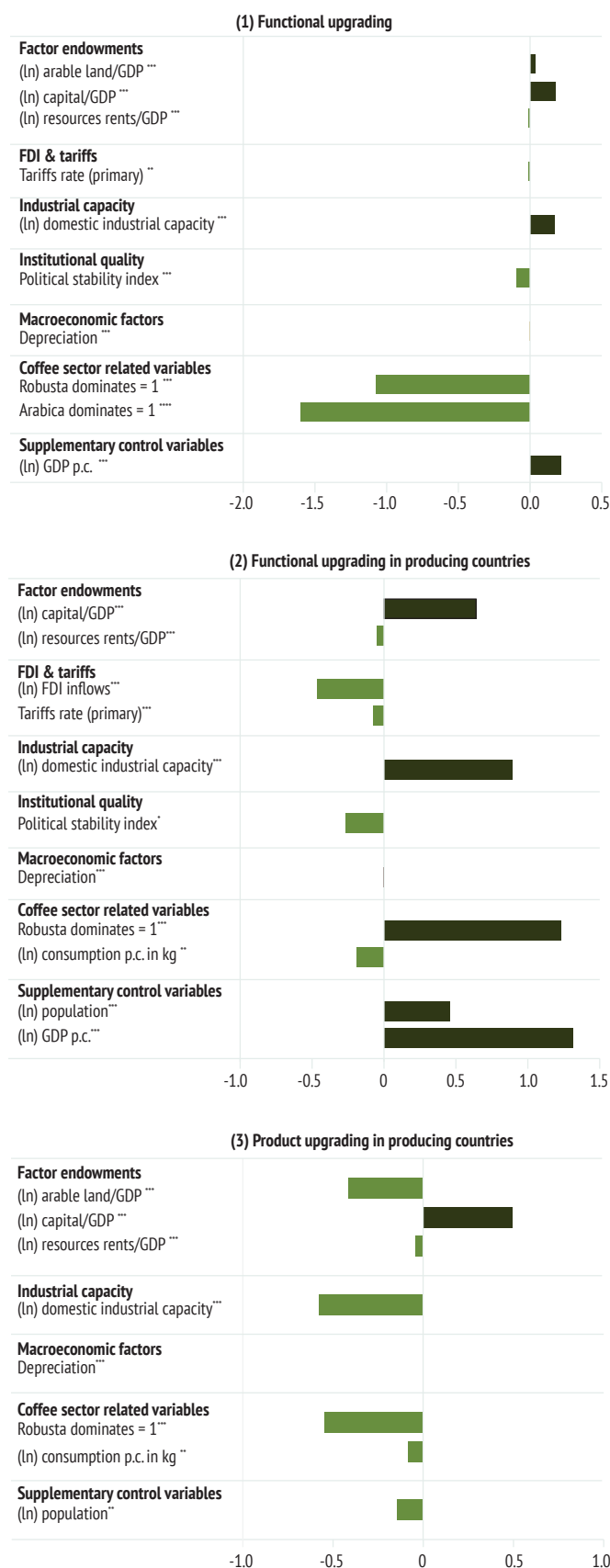
#### A.2.4. Capital endowment and domestic industrial capacity matter for GVC upgrading

Figure A.15 presents the results of the analysis regarding determinants of functional and product upgrading in three charts (for full results refer to Annex 3). Chart (1) shows the estimation results for the full sample of both producing and non-producing countries. Chart (2) depicts the results of an estimation with a reduced sample comprising only coffee-growing countries. Finally, chart (3) contains the results of an estimation of the drivers of product upgrading within green coffee production (sample restricted to coffee-growing countries).

A similar negative pattern for natural resources is observed for functional and product upgrading. This is in line with the findings on the determinants of exports. As argued, the presence of competition from natural resources, such as petroleum, appears to crowd out upgrading efforts in the coffee industry. Examples for oil-producing countries include Nigeria, Angola, and Venezuela.

Competition from natural resources may be crowding out upgrading efforts while domestic industrial capacity positively correlates with processed coffee exports.

FIGURE A.15: Determinants of countries' GVC upgrading



NOTES: Sample size n=737 for model (1), n=244 for model (2) and n=250 for model (3). The figures visualize a sub-set of regression coefficients which are statistically significant. For the full regression outputs please refer to Annex 3. \*\*\* denotes p<0.01 \*\* denotes p<0.05 \* denotes p<0.1. SOURCE: ICO

Moreover, higher levels of capitalization are consistent with higher evidence of processing and product upgrading. Low- and medium-income coffee producers require a minimum level of capitalization in order to carry out any processing or product upgrading and thereby add value to the raw commodity. Industrial capacity is also strongly related to functional upgrading. However, industrial capacity does not determine improvements in the unit value of green coffee. This provides opportunities for countries with a weak industrial base to increase revenues with the introduction of product upgrading, which is less capital-intensive and not reliant on industrial capacity to add value to its produce.

Tariffs negatively affect countries that seek to add value to their exports by functional upgrading and stepping up their processed coffee exports. FDI inflows seem not to be a major driver of both product upgrading and upgrading towards coffee processing. However, some positive effects of FDI appear on exports of green and soluble coffee (Figure A.15). Accordingly, it can be concluded that FDI inflows in coffee-growing countries are more important for exports of green coffee than processed coffee as they tend to influence investment in land, cultivation, and post-harvesting.<sup>19</sup>

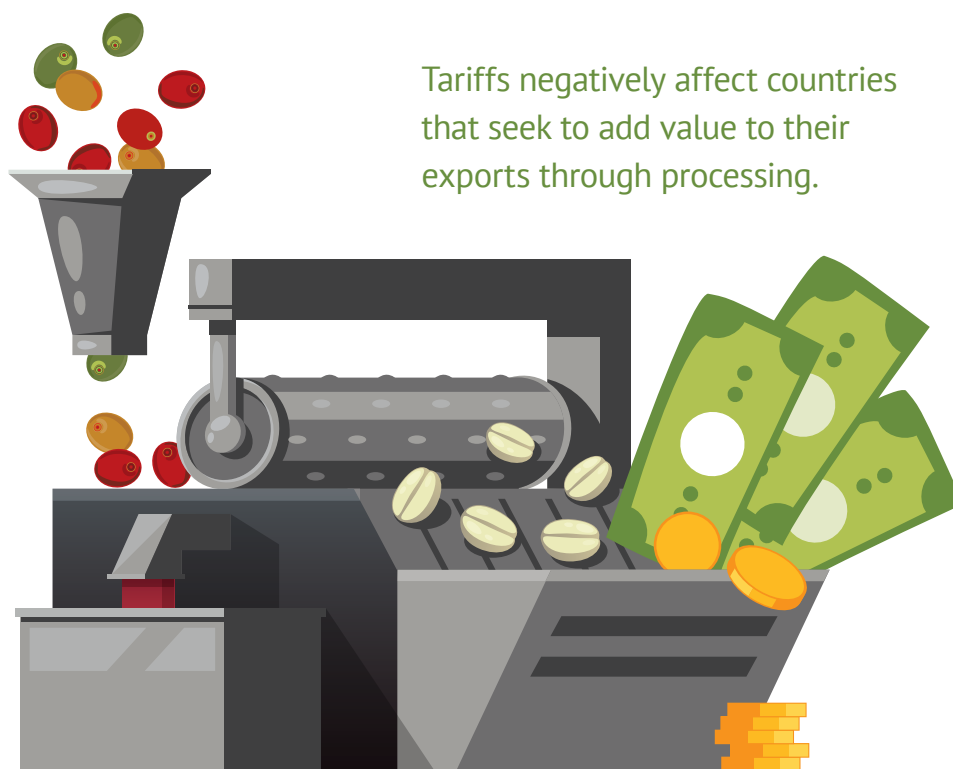
Political instability appears to reduce the ability of countries to functionally upgrade but has no significant effect on product upgrading. Moreover, depreciation supports product upgrading by making exports of green coffee relatively more competitive on the world market.

A higher income is strongly associated with the production of an increased volume of processed coffee and the magnitude of the effect is sizeable. Similar to industrial capacity, GDP per capita is not an important determinant of product upgrading, implying that relatively lower income countries can also enter green coffee markets with a higher per unit value.

Coffee-growing countries are more likely to export coffee in green form than in processed form. However, the results in chart (3) suggest that this is particularly true for Arabica-producing countries as revealed by the higher functional upgrading activity of Robusta-growing countries. This is in line with more stringent entry barriers encountered by firms aiming to export roasted versus soluble coffee, for which Robusta serves as the main input.

Somewhat surprisingly, higher arable land-to-GDP ratios are associated with higher functional upgrading but lower product upgrading. The latter finding suggests an opportunity for small countries to specialize in a higher product quality when exporting green coffee.

Lastly, distance to processing hubs, such as Germany and the USA, is negatively associated with functional upgrading for coffee-producing countries. This finding supports the argument that processing activities are highly concentrated in countries that do not produce coffee. Overall, integration into the GVC is related to natural endowments, government policies and investment decisions of the private sector. Coffee sector development strategies can provide a guiding and supporting framework for individual countries and regions to position themselves in the GVC in terms of production (expansion, maintenance, and incentives) and market access (mix of product, price, place).



Tariffs negatively affect countries that seek to add value to their exports through processing.

<sup>19</sup> However the FDI inflows used in the analysis are country-level FDI and thus not necessarily channelled towards the coffee sector.







# PART II

## SECTION B

### Resilience of the coffee Global Value Chain

#### Key findings

- **Potential shocks and stressors to the C-GVC include pandemics and health crises, climate change, political instability and conflict, and origin concentration.** Disruptions triggered by shocks at the level of suppliers can have a ripple effect on the entire value chain and on upstream actors that are vulnerable to risk and the resilience of suppliers. Supply chain disruptions have the potential to severely hamper exports of coffee, thereby affecting foreign exchange earnings and jobs in producing countries.
- **The covid-19 outbreak has shown that the C-GVC can be fragile.** Two channels are identified through which coffee supply is affected in the short-term: reduced labour supply as well as supply chain disruptions and delays. A large share of coffee-producing countries have below-world-average health infrastructure to respond to health crises.
- **The coffee sector is also highly sensitive to climate variations.** Climate change is likely to impact the global area suitable for coffee significantly in the long-term. Options to shift production exist but smallholder farmers do not have the resources, ability and flexibility to relocate and may be forced to abandon coffee production. Potential strategies to improve the resilience of the C-GVC to climate change include access to information, technologies, financial support, and research and development for improved and Green Good Agricultural Practices and climate-resistant varieties.
- **Coffee-producing countries are affected by political instability and conflicts.** Countries that are highly dependent on coffee exports are more vulnerable to political instability and should strive to increase the resilience of the coffee sector and diversification to secure export earnings and jobs.

The analysis in the previous section shows that countries have taken different paths for integrating into the C-GVC and therefore vary in their ability to reap benefits arising from hyper-specialization on specific tasks and durable relationships along the value chain (e.g. producers and buyers). However, these key characteristics of GVCs can come at a cost. The covid-19 pandemic and the resulting supply chain disruptions have exposed weaknesses in the international trade system (ICO, 2020a, 2020b, 2020c). A lack of diversification of the supplier base, reduced stocks and inventories and few redundancies in logistics operations make the overall system vulnerable to shocks. Such disruptions and shocks can have a ripple effect on the entire value chain and on vulnerable upstream actors.

This section aims to explore the link between key characteristics of the C-GVC and vulnerability to a variety of supply-side shocks. Production and trade in the coffee industry are subject to various supply-side risks affecting any one or several producing countries (ICO, 2019a). These include agricultural risks, such as the impact of adverse weather events and the spread of plant pathogens affecting farm yields and quality. Transportation infrastructure failures, including those triggered by climate change impacts (The Economist, 2019) or catastrophic events such as the explosion in the port of Beirut in 2020 may be rare but can severely disrupt supply chains. Political instability and conflict often have economy-wide effects (e.g. currency devaluations, shrinking FDI) that lead to a deterioration of the business climate, lower investment and stagnation. The covid-19 pandemic, on the other hand, is a stark reminder that public health crises triggered by the outbreak and spread of infectious diseases represent an additional, perhaps so far underestimated, risk to the global coffee sector.

Disruptions at the level of suppliers can have a ripple effect on the entire value chain and on upstream actors that are vulnerable to risk and the resilience of suppliers, especially the large producing countries. Potential shocks/stressors and their potential impact on the C-GVC in the short, medium and long term are listed in Table B.1. The fragility of the C-GVC in view of a variety of possible shocks ties into the larger debate on resilience in international development (Barrett and Constanas, 2014) and within the context of agriculture and food systems (FAO, 2016; COSA, 2018).

**TABLE B.1:** Potential shocks/stressors and their potential impact on the C-GVC

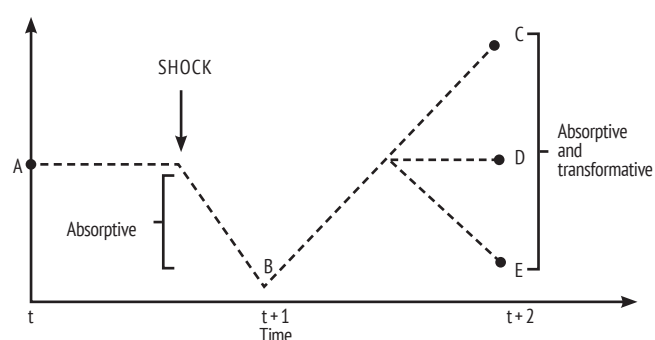
Shock/Stressor	Impact	
	Short-term	Medium- to Long-Term
Pandemics	High	Low/Medium
Climate change and environmental stressors	Low	High
Political instability and conflicts	High	Low/Medium
Origin Concentration	Low	High
Demography (ageing populations)	Low/Medium	High

## B.1. What is resilience in the context of the global coffee sector?

Resilience can be defined as “the capacity that ensures stressors and shocks do not have long-lasting adverse development consequences” (Constas et al., 2014). In other words, resilience describes an entity’s ability to return to or exceed the pre-event level of development within a short period of time after the occurrence of a shock. Béné et al. (2012) divide this ability to adequately respond to shocks into three core components of resilience: the absorptive, adaptive and transformative capacities (Figure B.1). Absorptive capacity describes the ability to moderate or buffer the immediate impact resulting from a shock in t+1. The adaptive capacity describes the ability to adjust to the changed circumstances, whereas transformative capacity refers to the ability to transform to a new, more resilient system following the shock in t+2 (Béné et al., 2012; Béne et al. 2015; COSA, 2018).

This concept of resilience was used in the development of measurement frameworks that enable (rapid) assessment of resilience at household or community level (see Box B.1). It can also be applied to institutions, infrastructures and higher-level systems, including GVCs. In the C-GVC, it is especially important to assess and improve resilience at origin in order to guarantee continuity of supply. For lead firms in the C-GVC, a country-level resilience assessment can be useful as part of a supply risk analysis. For producing countries, improving the resilience of value chains is vital

**FIGURE B.1:** Resilience Conceptual Framework



SOURCE: COSA (2018)

to strengthen the link to export markets and to maintain foreign exchange earnings and jobs.

The following assessment of risks to the higher-level system of the C-GVC complements the broad existing literature on the concept of resilience and measurement frameworks. As a first step, using available country level data it expands on some of the determinants of GVC integration discussed in the previous section (political stability) and includes an assessment of GVC fragility in the context of the covid-19 pandemic. More research is required in this field.

### B 1.1. Political instability and conflict in coffee-exporting countries

#### Measuring political stability

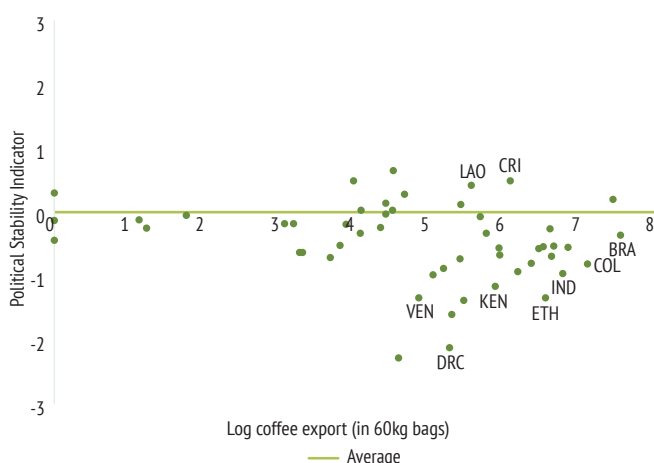
Political stability and the absence of conflict are important drivers of investment and the development of an industry over time. This sub-section analyzes the relationship between coffee exports and political stability relying on the World Bank ‘Political Stability and Absence of Violence/Terrorism’ indicator also used in the analysis of drivers of GVC integration in sub-section A.2 (see Table A.2).

Figure B.2 shows the relationship between coffee exports (natural logarithm of export volume) and the political stability indicator in 2018. Within the sample of coffee exporters only few countries are above the global average of zero. The political stability indicator for the ten largest coffee-producing countries ranges shows high variability. The analysis reveals that Viet Nam is the only country among the top-10 producing countries that scores above the global average as well as the average of high-income countries (0.04). The remaining top-10 producers remain below the global average of zero. The overall picture suggests that a large share of coffee-producing countries is affected by political instability and conflict.

#### Empirical evidence on the impact of conflict on coffee exports

The impact of political instability and, in particular, conflict on the coffee sector can be severe. The degree to which a nation’s coffee sector is affected by conflict depends on various factors, including its intensity, duration and regional concentration in coffee-growing regions and/or near export

**FIGURE B.2:** Political Stability vs. log of total coffee exports (2018)



NOTES: See Annex 1 for country name abbreviations.

SOURCE: Authors' calculations based on ICO and World Bank data.

### BOX B.1: Measuring resilience – an approach developed by COSA and partner organizations

COSA and its partners define resilience as “the capacity of people, communities, or systems to prepare for and to react to stressors and shocks in ways that limit vulnerability and promote sustainability”.<sup>1</sup>

Measuring resilience of coffee-producing households and value chains can be time-consuming and resource intensive. With the support of the Ford Foundation, COSA and partnering organizations have built on state-of-the-art conceptual frameworks and best practices to develop a streamlined and relatively low-cost option to obtain a good understanding of resilience in the field.<sup>1,2</sup> With a small number of key metrics, producers and managers can gauge their resilience and understand the strengths and weaknesses of both farm households and supply chains.

The working group included FAO, International Center for Tropical Agriculture, Lutheran World Relief, Conservation International, Sustainable Food Lab, Catholic Relief Services, and Root Capital, who together devised indicators that reflect resilience’s multidimensionality. COSA’s method then integrates them into composite indices to facilitate understanding.<sup>2</sup>

The indicators, accompanying metrics, and usage guidelines are freely available as a COSA contribution to the public good. They take a capital-based approach by identifying, measuring and valuing their impacts and dependencies on natural, social, human and produced capital stocks. They also reflect the three capacities of resilience (absorptive, adaptive and transformative), thus accounting for both static and dynamic resilience components.<sup>3</sup> For coffee, the indicators have been field tested in Guatemala, Kenya, Nicaragua and Peru and were discussed at the COSA-led Resilience Learning Forum with nearly 200 global participants.<sup>2</sup>

In the case of Guatemala, using micro-data, COSA evaluated the effect of donor interventions on the well-being of farm households experiencing income losses from leaf rust. The study identified which factors most affected farmers’ resilience to this shock and how each absorptive, adaptive and transformative capacity influenced their income and led to demonstrated greater resilience. The COSA resilience approach can be adapted to different levels of rigor, from rapid assessment with 11 basic key performance indicators to comprehensive impact assessment.<sup>4</sup> Companies and institutions can gain farm-level and supply chain insights for day-to-day management that can also reveal emerging risks at origin.

<sup>1</sup> Serfilippi, E., & Ramnath, G. (2018). Resilience measurement and conceptual frameworks: a review of the literature. *Annals of Public and Cooperative Economics*, 89(4), 645-664.

<sup>2</sup> COSA (2018), Resilience Measurement: Differences and Similarities with Sustainability, URL: <https://thecosa.org/wp-content/uploads/2018/06/Issue-Brief-Resilience-and-Sustainability-Measurement-201800628-v3.pdf>.

<sup>3</sup> COSA (2018), Simpler Resilience Measurement: Tools to Diagnose and Improve How Households Fare in Difficult Circumstances from Conflict to Climate Change, URL: <https://thecosa.org/wp-content/uploads/2018/04/COSA-FORD-Simpler-Resilience-Measurement-Full-20180413.pdf>.

<sup>4</sup> Serfilippi E., De Los Rios C. & d’Errico M. 2020. Coffee in crisis offers a lesson in resilience – Evidence from Guatemala. FAO Agricultural Development Economics Working Paper 20-02. Rome, FAO.

## Climate change is a major resilience stressor with long-term consequences on the livelihoods of coffee farmers as well on coffee supply.

infrastructure. Figure B.3 illustrates this by depicting the development of coffee exports for Angola, Ethiopia, Rwanda and Yemen after the outbreak of a major conflict. Pre-conflict levels of exports (index = 100) refer to the 3-year average of coffee exports prior to the eruption of violence.

In the 1970s, Angola was one of the largest coffee producers in Africa. From 1975, Angola found itself in a prolonged civil war that destabilized the country's economy and impeded its coffee production and exports (ICO, CFC and WB, 2000). Only 5 years into the civil war, coffee exports had decreased by more than 70% compared to the pre-conflict level and kept falling. Within the 26 years of war the country's exports dropped from 2.5 million 60kg bags prior to the conflict to less than 10,000 bags and have not recovered since. However, as mentioned above, the Angolan government has recently started to work with the coffee stakeholders to take advantage of the opportunities that the coffee sector offers for sustainable economic growth. ICO is also helping Gabon to develop a new coffee development strategy.

After the start of the Ethiopian Civil War in 1974, the country's exports dropped and remained below the pre-war level, fluctuating between 70-90% of previous exports. After the end of the civil war in 1991, the coffee sector recovered and kept growing from this point onwards. Today, Ethiopian coffee exports have more than doubled compared to the pre-war levels in the 1970s.

In the 1990s, the Rwandan coffee sector experienced challenges as a result of three factors: the drop in international coffee prices after the end of coffee export quotas, the liberalization of the coffee sector induced by the government, and a civil war (Guariso et al., 2011). Coffee exports dropped dramatically and have not recovered since. However, as the analysis in the previous sub-section shows, Rwanda is among those Arabica-producing countries that could significantly increase unit values of export. This suggests that, in line with the UN's slogan 'building back better', the government supported the transformation of the Rwandan coffee sector away from merely focusing on quantity towards exporting high-quality washed coffee, serving as evidence for the sector's sufficient adaptive and transformative capacity and external support (see also Box C.6).

A recent example of conflict in a coffee-producing country is the civil war in Yemen, which broke out in 2015. Over the past 5 years, coffee exports have reduced by 30% compared to pre-war levels. As demonstrated above in other contexts, conflicts might represent an opportunity for policymakers to restructure and invest in the coffee sector and shift its focus towards high-value markets for an effective recovery.

## B.1.2. Climate change and environmental shocks

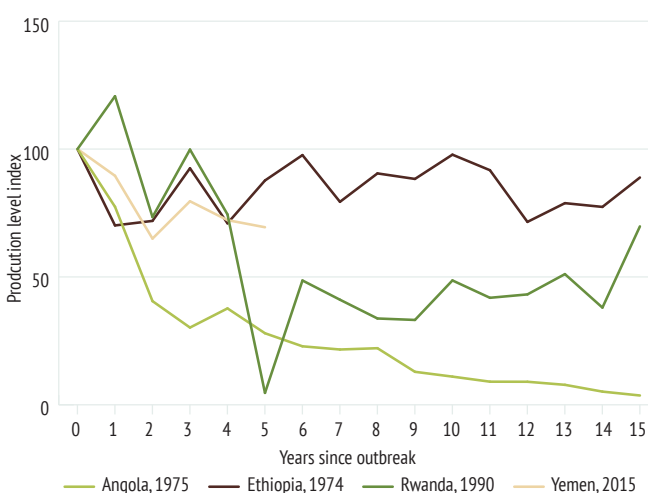
The agricultural sector is highly sensitive to climate variations. Coffee is grown in specific and climate-sensitive areas that could no longer be suitable as temperatures increase. Therefore, climate change is a major resilience stressor with long-term consequences on the livelihoods of coffee farmers as well on the supply-side of the coffee value chain.

Higher temperatures are expected to reduce yields of Arabica coffee while Robusta coffee is expected to suffer from increasing variability of intra-seasonal temperatures. Additional impacts are expected to occur on coffee quality. As temperature rises, coffee ripens more quickly leading to a fall in inherent quality (ITC, 2010).

Sachs et al. (2019), based on the Global Agro-ecological zones (GAEZ) datasets, estimate that in the next 30 years 75% of available, unforested land suitable for Arabica farming will be lost due to climate change, and 63% of similarly suitable land for Robusta farming. However,

- There is vastly more land available suitable for coffee (over 9 times as much land is estimated to be suitable for Arabica production globally in 2050 than the total of land currently under its cultivation, largely in Brazil).
- The land currently being used by coffee farmers in many regions will become unsuitable economically. (14% of land currently under Arabica cultivation is at risk of becoming economically unsuitable, but there are major differences by origin).
- Country-specific features show different levels of fragility and resilience to climate which therefore creates varying problems both for smallholder farmers and the coffee industry as a whole.
- While coffee production as a whole can shift, smallholder farmers in a number of countries are unlikely to migrate and will be forced to abandon coffee production.

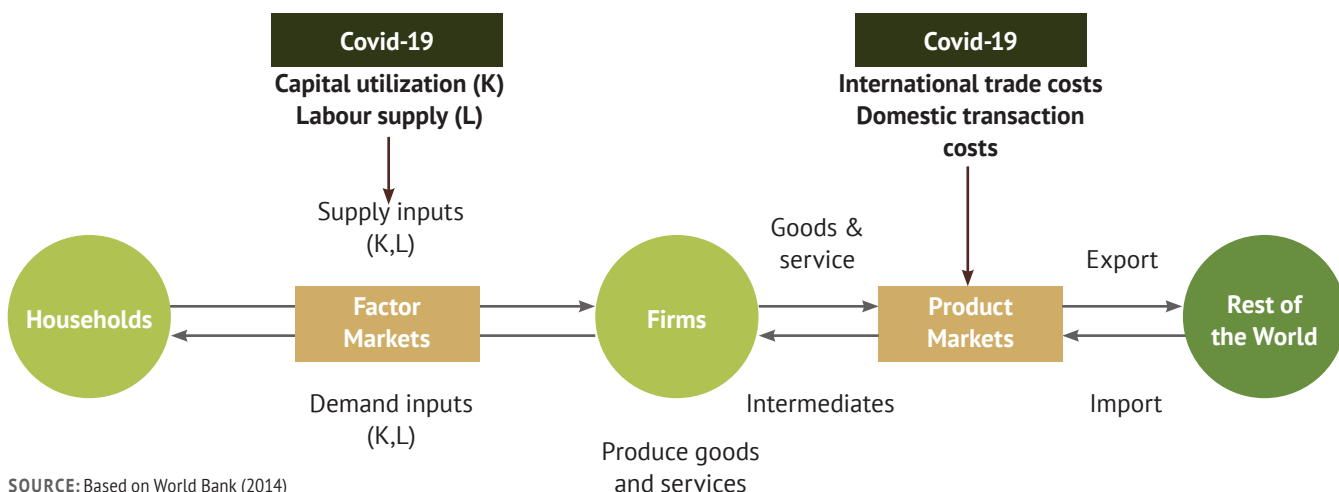
**FIGURE B.3:** Coffee exports drop as a result of conflict



NOTES: The reference value of the index (t=0) describes the three-year average in coffee exports prior to the start of the conflict. The legend presents the country and starting year of the conflict (t=1).

SOURCE: ICO

**FIGURE B.4:** Impact channels of covid-19 in coffee-producing countries



SOURCE: Based on World Bank (2014)

- The coffee industry will be affected due to further reduction of origin and concentration and lost farmers’ knowledge and expertise that could take decades to recover.

In many tropical and subtropical regions, climate change is fast becoming an environmental disaster for farmers, with decreased water availability, new or altered insect and pest pressures, and increased risks of extreme events threatening crop yields and farmer livelihoods (IPCC, 2007). Climate change is expected to affect coffee producers substantially, in particular, smallholders who are least prepared and equipped to cope with drastic events.

There are a number of socio-economic, geographic, and institutional factors which contribute to the vulnerability of coffee-producing countries to climate change. The International Trade Centre (ITC, 2010) has identified potential actions and responses to improve the resilience of the C-GVC to climate change.

Knowledge/extension services can support growers towards specialized and climate-friendly coffee production, crop management expertise (against extreme events, climate variability, and pest and diseases) and appropriate water infrastructure (irrigation systems, storage facilities for preservation of water sources, water extraction, transportation) in particular in areas prone to drought.

Water management infrastructure enables the efficient use of water, energy and labour resources in coffee processes allowing improved resource management and product quality at the farm level. Water management infrastructure contributes to climate adaptation by securing water availability and regularity during relevant processes in the coffee value chain.

Overall, strategic support and interventions should be developed to improve resilience of the GVC to climate shocks, such as:

- Improving access to information including market information, farming technology and monitoring of changes in climate and production.
- Establishing financial mechanisms including climate insurance, access to micro-credit to facilitate adaptation, i.e. organic, substitute crops, new varieties, and shading.

- Investing in social capital, i.e. building structures that enable smallholders to access the resources necessary to adapt to climate change, access new markets and exploit the social and environmental value of their farming activities.
- Evaluating available adaptation techniques, such as shade management systems.
- Designing and implementing financial mechanisms to facilitate investment, including green bonds, impact investment and other tools.
- Shifting production to more suitable areas and devising strategies to diversify production.
- Strengthening farmer organizations and regional and national development and environmental policies.
- Supporting research on the site-specific impacts of climate change on coffee.
- Facilitating genetic breeding for higher yields, better quality and strength, and resilience to climatic shocks.
- Establishing greenhouse gas emission baselines and monitoring carbon sequestration rates.

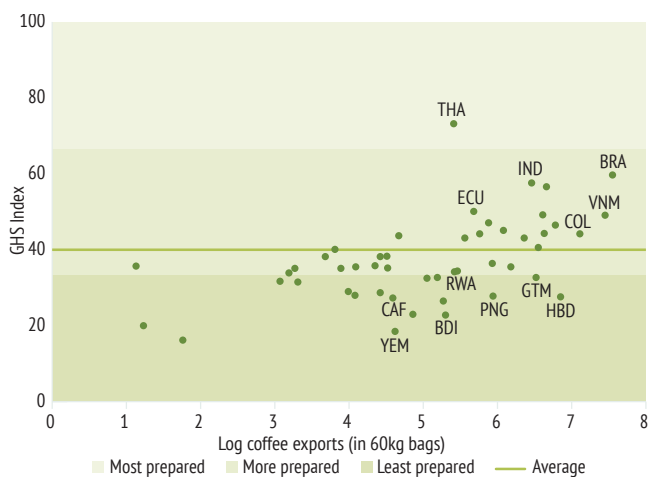
### B.1.3. Pandemics and public health crises

The covid-19 pandemic may be unprecedented in terms of its large-scale impact on lives and economies around the world, but is by no means the first outbreak that came with a significant toll. Previous SARS epidemics in Asia (2002-2004) and Ebola epidemics in West Africa (2013-2016) had severe countrywide or regional economic impacts (World Bank, 2014). The containment required significant long-term efforts and in many cases coordination with and support by the international community.

Learning from the current covid-19 experience as well as previous outbreaks, two channels are identified through which coffee supply is affected in the short-term: reduced labour supply as well as supply chain disruptions and delays (Figure B.4). The spread of the virus reduces the availability of labour along the value chain either directly, due to illness,



**FIGURE B.5:** GHS scores vs. log of total coffee exports (2019)



NOTES: See Annex 1 for country name abbreviations.

SOURCE: Authors calculations based on GHS and ICO data.

or indirectly, due to reduced mobility, social distancing and lockdown measures. Trucking, handling, storage, port operations and customs processes are slowed down by the same factors. Reduced availability of shipping containers could also affect the shipment of coffee (ICO, 2020b).

The resilience of coffee production and exports against covid-19 and future outbreaks will depend, among other factors, on the capacity of individual countries to detect a virus, contain its spread and treat those who have fallen ill, in addition to the success of the scientific community

The covid-19 pandemic has shown that public health crises triggered by the outbreak and spread of infectious diseases represent an underestimated risk to the global coffee sector.



Global Health Security (GHS) Index assesses countries' health security and capabilities across various dimensions and thus is a measure of the general capabilities of a country's health infrastructure.

to develop an effective cure and vaccination. The coffee sectors of those countries that can mobilize an effective public health response and have a robust health system are likely to be affected less severely and for a shorter amount of time. Hence, the risk of supply chain disruption can be considered lower in such countries.<sup>20</sup>

In addition, the capacity of public coffee sector bodies and the private sector to develop, disseminate and implement new health guidelines and protocols is an important determinant of the adaptive capacity of the coffee value chain. For instance, in the initial period of the covid-19 pandemic (March-June 2020) a number of coffee-producing countries set up safety harvesting, post-harvesting and transport protocols.<sup>21</sup> Likewise, specific protocols and good practices have been promptly developed and applied in all the other components of the C-GVC, customs, transport, storage, manufacturing, and retailing showing the efforts taken by all of the actors in the coffee sector to increase resilience and the C-GVC.

### Measuring the ability to respond to pandemics

Existing measures, while often not very granular, provide a good starting point. One comprehensive indicator is the newly developed Global Health Security (GHS) Index. It assesses countries' health security and capabilities across various dimensions and provides estimates for 195 countries.<sup>22</sup> According to GHS in 2019, the average overall GHS Index score globally was 40.2 out of a possible 100. While high-income countries reported an average score of 51.9, the Index shows that collectively, international preparedness for epidemics and pandemics remains very weak (Figure B.5).

The GHS Index scores for the ten largest exporting countries range from 27.6 (Honduras) to 59.7 (Brazil). Only two countries out of the top-10, Brazil and Indonesia, report scores above the average of high-income countries of 51.9. Two countries (Guatemala, Honduras) are below the global average of 40.2. Countries with economies that are most dependent on coffee exports and have GHS scores below the global average are predominantly located in Africa and Central America and include Burundi, Central African Republic, Guatemala, Honduras and Rwanda (Tables B.2 and B.3).

<sup>20</sup> A good public health response may help the country to be less affected by the pandemic so people continue to work as usual. Note, however, that supply chain disruptions might still be relevant if international transportation is affected or upstream/downstream partners in other countries are affected.

<sup>21</sup> See [www.globalcoffeeplatform.com](http://www.globalcoffeeplatform.com) for details

<sup>22</sup> The GHS Index is a project of the Nuclear Threat Initiative (NTI) and the Johns Hopkins Center for Health Security (JHU) and was developed with The Economist Intelligence Unit (EIU). <https://www.ghsindex.org/about/>.



### BOX B.2: Addressing and mitigating the covid-19 pandemic in African coffee-exporting countries

The Inter African Coffee Organisation (IACO) has joined forces with the International Coffee Organization (ICO) and the Centre for Agriculture and Biosciences International (CABI), to design an emergency intervention programme to alleviate the impact of coronavirus disease (covid-19) on Africa's coffee sector. The initiative, estimated to cost €14 million, aims to alleviate market disruptions and food, nutrition and income security challenges facing millions of smallholder coffee farmers across 11 countries for an initial three-year period. The risk posed by covid-19 to Africa's agricultural sector remains critical given the sector accounts for 23% of the continent's Gross Domestic Product, with food and agricultural exports averaging USD 35 billion to USD 40 billion annually. Out of this, agricultural products including coffee and food worth USD 8 billion flow through intra-regional trade every year, highlighting the need to safeguard Africa's food systems against the pandemic. Covid-19 has revealed the critical weaknesses of agricultural systems in Africa, and particularly growing concerns regarding its coffee value chain. ICO projects a loss of exports valued between USD 100 million and USD 200 million, potentially affecting 6.6 million jobs in the coffee sector, particularly in the East Africa region.

This pandemic has dealt a major blow to the coffee economy. World prices were already bad for producers at the beginning of the year before covid-19. Unfortunately, the outbreak worsened the downward trend in coffee prices to the disadvantage of vulnerable smallholder producers. Action is therefore needed to build resilience that will protect African coffee producers. Activities along all value chains across the continent have been disrupted, leading to stockpiling of coffee at farm levels, reduced prices to growers, reduced domestic

consumption due to closures of coffee roasting units, cessation of movements and meetings, and closure of distribution outlets. This joint venture by IACO, ICO and CABI aims to address these challenges and add to ongoing efforts under the Africa Coffee Facility (ACF) set up to promote domestic coffee consumption in the continent. The program adds to support systems and agricultural practices which will ensure sustainable intensification among smallholder coffee farmers in a manner that ensures income security devoid of price shocks from the international markets, guarantee food and nutrition security of the smallholder coffee systems and promote the creation of entrepreneurial jobs beyond farming, both in the rural and urban areas. As priority actions, the programme will focus on building a system where coffee smallholders are able to earn living incomes by systematically incorporating high-value nutritious crops that provide income during coffee off-seasons. It will consequently ensure that producing countries remain food secure amid reduced food imports due to covid-19 and mitigate any future disruptions. In addition to ensuring income and food and nutrition security, the proposed complementary crops will form the basis for developing rural-based Small and Medium Enterprises in aggregation, grading, packaging and distribution of coffee and produce from the associated crops. In the medium and long term, the resilience created will make operators eligible for loan financing requests, giving them the ability to consolidate their investments, thus creating business for the supporting development financing institutions such as the Afrixembank. The programme proposal supported by the African Union Commission has been submitted to the European Commission for consideration. It was endorsed by the International Coffee Council at its 127th Session in September 2020 and is now under negotiation for financing.

The GHS Index Score is a measure of the general capabilities of a country's health infrastructure. Hence, the effectiveness of the response and therefore the resilience to shocks also depends on political decisions in the mobilization of the existing institutions, structures and processes, as the performance of individual countries during the covid-19 crisis shows (Lafortune, 2020). Furthermore, the GHS Index is measured at country-level and differences between rural and urban areas in terms of public health infrastructure are unlikely to be taken into account. Further refinement of risk measures will clearly be necessary.

Countries with economies that are most dependent on coffee exports and have GHS scores below the global average are predominantly located in Africa and Central America.

**TABLE B.2:** GHS Score and Political Stability Indicator of the top-5 most coffee-dependent exporting countries (by 2018 share of coffee exports in total merchandise exports)

Country	Share of coffee exports in total exports (in %)	GHS Score overall	Political Stability Indicator
Burundi	33.7	22.8	-1.60
Ethiopia	23.9	40.6	-1.34
Honduras	23.3	27.6	-0.55
Nicaragua	17.4	43.1	-0.80
Uganda	16.0	44.3	-0.69
Global average	n.a.	40.2	0.00
Avg high-income countries	n.a.	51.9	0.4

SOURCE: Authors' calculations based on ICO, GHS and World Bank data.

**TABLE B.3:** GHS Score and Political Stability Indicator of the top-5 largest exporting countries (by 2018 coffee exports)

Country	Coffee exports (in thousand 60kg bags)	GHS Score overall	Political Stability Indicator
Brazil	35,383	59.7	-0.36
Viet Nam	27,866	49.1	0.20
Colombia	12,808	44.2	-0.81
Honduras	7,144	27.6	-0.55
India	5,967	46.5	-0.96
Global average	n.a.	40.2	0.00
Avg high-income countries	n.a.	51.9	0.4

SOURCE: Authors' calculations based on ICO, GHS and World Bank data.

### B.1.4. Concentration of production in fewer origins and its impact on resilience

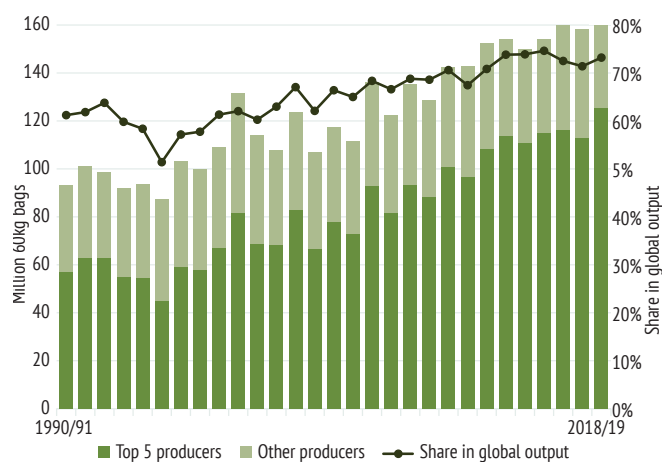
In this sub-section the data points on political instability as well as pandemic readiness are combined with ICO coffee export data to assess the following questions: first, does the increasing concentration of coffee production in fewer origins increase the fragility of GVC coffee supply? Second, are those countries that are heavily dependent on coffee exports among the more or less fragile?

Over the last three decades, a trend towards concentration of production in a small number of origins could be observed (Figure B.6). Ex-ante it is unclear if a trend towards fewer coffee origins leads to a C-GVC that is *more or less* resilient. Higher concentration in fewer origins could decrease resilience as country-specific shocks would weigh more heavily in a less diversified sector, therefore disrupting coffee supply. However, concentrating coffee production in only a few origins could also increase resilience of the C-GVC if the origins are less fragile, e.g., show lower levels of political instability and higher levels of pandemic readiness.

Coffee-producing countries should position themselves among the less fragile or risky origins and, therefore, foster GVC integration through policies that increase their absorptive, adaptive and transformative capacities. Table B.2 presents evidence that this is particularly relevant for countries that are highly dependent on coffee exports. These countries should strive to increase resilience in the coffee sector to secure export earnings and jobs.

The GHS Index score and the political stability indicator for the top-5 most coffee-dependent countries are generally low, meaning countries which depend most on coffee

FIGURE B.6: Concentration of production in fewer origins



SOURCE: ICO

have lower capabilities in terms of health infrastructure and political stability. None of the countries report GHS scores above the average of high-income countries and five countries (Burundi, Central African Republic, Guatemala, Honduras, and Rwanda) remain below the global average in terms of health infrastructure. Regarding the political stability indicator, all largest coffee producers and most coffee-dependent countries are below the global average except for Rwanda. Less coffee-dependent countries exceed the global average of the GHS Index of health infrastructure, while Brazil and Indonesia exceed the high-income country average. In terms of political stability, the picture is mixed meaning a clear trend cannot be observed regarding the relationship between dependency on coffee and political stability (Table B.3).



# PART II

## SECTION C

### Economic, social and environmental impacts of the coffee Global Value Chain in producing countries

#### Key findings

- **Integration in the C-GVC helps to overcome the challenges faced by coffee growers.** Traditional coffee supply chains (producer/exporter-importer/consumer) are characterized by market failures, asymmetries and constraints that can be overcome by complementary public sector policies and market-driven interventions that are at the core of the C-GVC.
- **A key aspect of the C-GVC is closer and more durable relationships among value chain actors.** Buyer-driven initiatives are implemented by multinational traders, roasters and retailers along with smaller buyers through direct trade activities. Tangibles (inputs, credit) and intangibles (knowledge, sustainability standards, and corporate governance) are transferred to upstream actors, including farmers.
- **Integration in the C-GVC boosts improvements in productivity and value addition as well as fostering local employment.** Farmers can benefit from higher productivity and access to high-value markets, in some cases through ‘contract farming’<sup>23</sup> and purchase guarantee schemes that enable farmers to be better equipped against price volatility. Participating in buyer-driven programmes is shown to increase coffee revenues earned by smallholder farmers by up to 30%. Moving up in the GVC can enhance the livelihoods of the producers.
- **The expansion of the C-GVC contributes to achieving the Sustainable Development Goals.** Participation in the C-GVC has been shown to reduce poverty and inequalities, while increasing food security, health, and access to quality education among farmers and farm workers. Increasingly widespread voluntary sustainability standards supported by lead firms generates social upgrading such as improving gender equality and working conditions. Similarly, the negative environmental impact of traditional coffee production and trade can be reduced through technology transfer, best practices and capacity building.
- **The distribution of the C-GVC gains remains unequal as relational supply chain models require scaling up and governance questions need to be addressed.** Farmers have been shown to benefit from close firm-to-firm relationships but relevant programmes still only reach a relatively small number of farmers. Within the C-GVC the distribution of gains is in part driven by governance and power dynamics (FAO 2020; WTO 2017).
- **Farmer groups and cooperatives can help producers to access to high-value markets.** When farmers are clustered and networked through consortia and cooperatives they are able to achieve higher quality and quantity (critical mass) and therefore are able to join the GVC and more profitable export markets (See Pataconi and Russo, 2015). Farmer groups are characterized by more efficient and affordable access to inputs, knowledge, technology and markets and both generate local value addition and shorten the supply chain. Therefore, the development of local value chains, with the expansion of domestic consumption, provides additional income opportunities for smallholder farmers.

The rise of the C-GVC has resulted in new opportunities for both coffee-producing countries and traditional importing countries to expand trade and benefit from value addition and access to high-value markets. This section focuses on the coffee-producing countries, thereby contributing a better understanding of the impact of GVC expansion on the upstream segment, specifically coffee cultivation and post-harvest processing. By putting coffee farmers at the centre of the analysis, we explore how the most vulnerable actors in the chain, especially the small coffee growers, can be integrated into the GVC and whether the expansion of the GVC can contribute to the inclusive, sustainable and structural transformation of the coffee sector.

<sup>23</sup> FAO defines **contract farming** “as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices. The arrangement also invariably involves the purchaser in providing a degree of production support through, for example, the supply of inputs and the provision of technical advice. The basis of such arrangements is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the company to support the farmer’s production and to purchase the commodity”.



A conceptual framework is introduced that identifies key impacts of the C-GVC in terms of addressing market failures in rural areas that currently hold back farmers and shows, through a theory of change, how long-term objectives, such as profitability of coffee farming and social and environmental goals, can be achieved. Data-driven case studies, based on rigorous impact analysis, illustrate GVC impact across coffee-producing countries, both on farms and further downstream actors in the value chain. Finally, by mapping GVC impacts against specific SDGs, wider economic, social, and environmental implications are discussed.

This section focuses mainly on initiatives driven by the private sector in the C-GVC. There are a great number of such initiatives, however, the Report includes just a few for which information is easily available including a buyer-driven programme implemented in partnership with the ICO (Box C.1). The authors would like to stress that multinational buyer-driven programmes, that are typical of GVC operations, foster closer relationships with suppliers providing, for instance, information, technology, and input to producers. On the other hand, the C-GVC governance structure and the asymmetries due to the unbalanced power between buyers and suppliers may reduce the opportunities for integration and benefits to smallholder farmers, especially for least developed and low-income countries (FAO, 2020; WTO, 2017).

The growth of the coffee C-GVC and of buyer-driven programmes have been made possible partly as result of domestic agricultural and market liberalization policies including changes in the role and functions of commodity marketing boards over the last few decades. Liberalization and structural reforms implemented by governments and coffee authorities in a number of countries allowed growers to supply private sector buyers directly, leading to the emergence of buyer-driven programmes at various scales.

While evidence shows that producers benefit from participation in the GVC and from buyer-driven supplier development programmes, it must be noted that policies and monitoring mechanisms are required to ensure a balanced firm-to-firm relationship and the effectiveness and the long-term impact of those programmes.

For example, a recent FAO (2020) assessment of the effects of GVC participation on the economic growth of the agricultural and food sectors, shows also that "... changes in GVC participation are, on average and *ceteris paribus*, positively associated with changes in agriculture value added per worker, net to time-invariant confounders, whereas mixed results found on the import tariff and non-tariff barriers – including barriers to service trade – should be seen as the first obstacle to increase GVC participation and improve domestic value added. The presence of signs of heterogeneity by geographical location confirms that general universal recipes do not exist". Furthermore, the authors of the FAO study argue that "GVC have thrived on the back of many asymmetries. Specifically, examples of high concentration of gains are found in many agribusiness value chains. In the coffee industry, for example, the four largest international trading companies account for 40% of the gains ...". Therefore, policy actions need to be considered

to help rebalance the different bargaining power and value distribution between lead firms and their suppliers and the other actors in the GVC as well as the way in which the rules of production and trade (from standards/GAP to price and delivery) are set and agreed.

With regard to domestic government policies, as mentioned in the overview of the Report, policies adopted by the Vietnamese government in the last decade (e.g. substantial investments to sustainably manage economic and environmental resources for the coffee sector, increase export earnings, and ensure stable production) have played an enormous role in the integration into and success in the C-GVC by Viet Nam (ICO, 2019d).

Again, it is known that Colombia's main coffee sector association (FNC) provides tremendous support to coffee growers (e.g. technical assistance and capacity building) and almost all small-scale farmers sell their coffee to FNC (Inter-American Development Bank, 2020). Hence, FNC has played an important role in linking farmers to large buyers and high-value markets. Another example for government interventions is the Ethiopian Commodity Exchange market (ECX) set up by the Ethiopian government in 2008 to organize Ethiopian coffee trade and prices producers receive. The impact of the ECX on productivity, market access and the livelihood of farmers, has been recently analysed in Handino et al. (2019) assessing the difference between them and the cooperatives that sell certified coffee through the unions they belong to, and are allowed to bypass the more commodified ECX market leaving them better off compared with those going through the Exchange. Evidence regarding these programmes is largely anecdotal since there is little rigorous analysis to determine the effects of such large-scale interventions.

Finally, another reason for the buyer-driven focus in this report is data availability and the ability to isolate and evaluate the effects of the initiatives. This section comprises several data-driven case studies from various parts of the world which rigorously analyzed the GVC impact across coffee-producing countries.

Sound Government policies are still the key drive to integrate successfully in the Global coffee market.

## C.1. Expansion of the GVC as a driver of sustainable and inclusive growth

### Key sustainability challenges in the coffee sector remain...

The coffee sectors in producing countries are often associated with various market failures, such as limited access to information about new technologies and state-of-the-art and climate-smart farming methods, market requirements or prices, lack of access to inputs required to produce high-value coffee products, lack of access to finance, and high transport and transaction costs to access output markets.

As a result, coffee supply chains in many countries are characterized by high transaction costs, inefficient production and products with little value addition. In particular, smallholder coffee growers lack the capacity to invest in their coffee plantations, improve productivity of operations, and add value to their produce in order to be able to participate in the GVC (Figure C.1).

### ... exacerbated by the coffee price crisis and the covid-19 pandemic ...

This is exacerbated by the coffee price crisis, as several years of low producer prices have eroded the economic viability of coffee production in many origins (ICO, 2019a). The covid-19 pandemic has put additional pressure on the sector. Even before the price crisis and the global pandemic producers in traditional coffee supply chains were challenged in adhering to the highest social and environmental standards, a situation that could worsen in view of economic pressures, resulting in detrimental social effects (such as higher prevalence of child labour or low wages) and impact on the environment (such as land degradation and depletion of natural resources).

On the other hand, successful upgrading of on-farm operations or adoption of Good Agricultural Practices and standards by farmers may be insufficient to unlock the benefits related to the GVC. Finding niche markets for high-value outputs is essential. For instance, only a fraction of coffee produced according to specific quality and sustainability standards can be marketed as such, undermining the economic viability and sustainability of upgrading efforts made by producers in conventional coffee value chains (Panhuysen and Pierrot, 2018).

#### BOX C.1: Buyer-driven programme for promoting a sustainable coffee sector in Burundi

Within the framework of promoting Public Private Partnerships, the ICO contributed to the design and monitoring of a programme to promote a sustainable coffee sector in Burundi, an active member of the Organization. The project aimed to improve the skills of smallholder coffee farmers in order to increase productivity and the quality of their coffee to generate profit and to improve their living standards and enable them to continue farming coffee as a profitable business and access the coffee Global Value Chain.

The programme was driven by Sucafina, a leading trader, which set up the Kahawatu Foundation and appointed the project implementation team. The project with a budget of USD 1.6 million covered activities over four years (2014-2017), while pursuing fundraising. IFAD granted project offices to Kahawatu in Bujumbura. Since the project's inception in March 2014, the foundation has secured funds from various partnership agreements targeting specific beneficiaries:

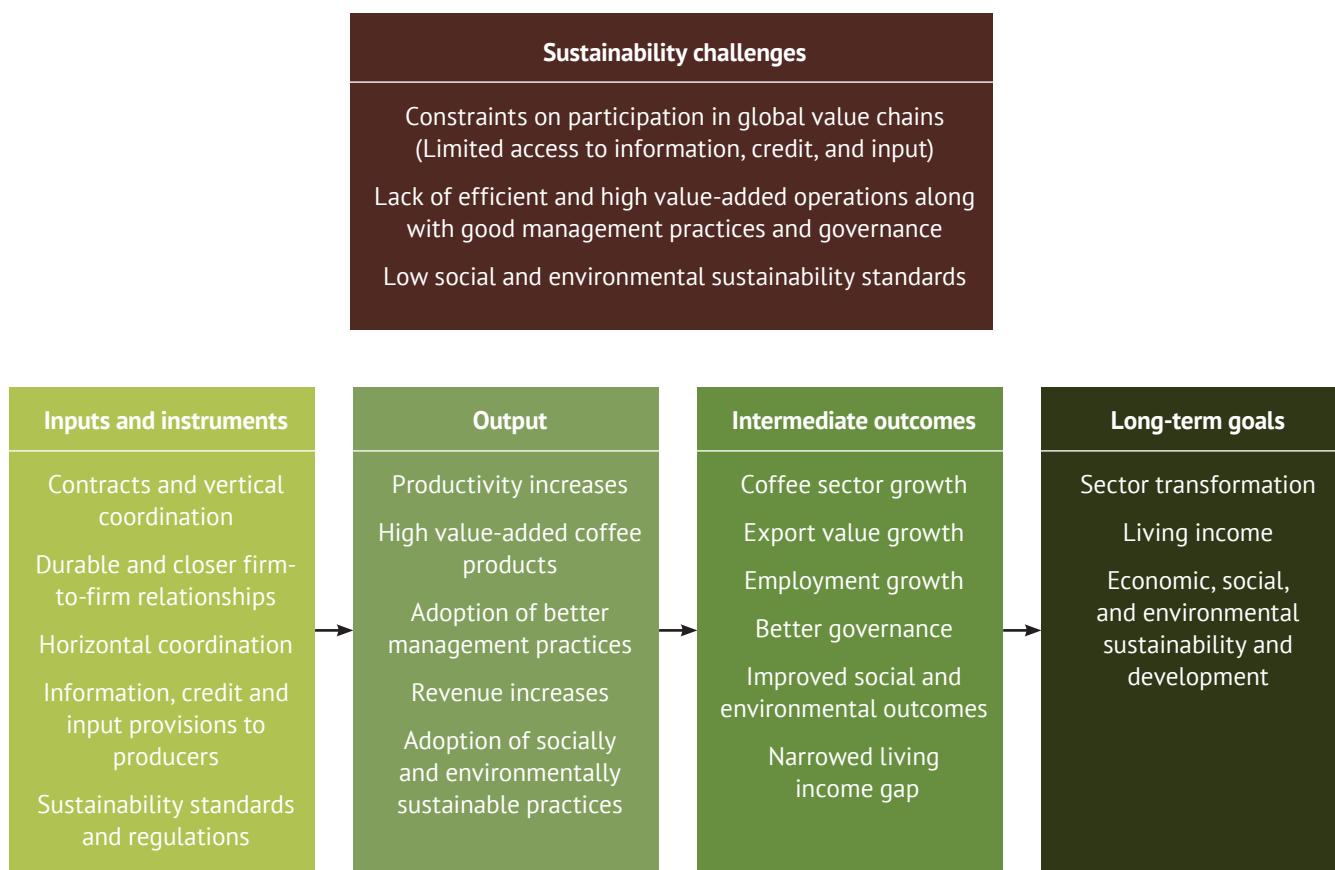
- USAID (USD 5.5 million) for 22, 500 beneficiaries
- GIZ (477,200 Euros) for 14,000 beneficiaries
- Nestle (USD 33,000) for 100 beneficiaries
- Starbucks (USD32,000) for health insurance and medical equipments to 54,000 farmers
- Catholic Relief Services (USD 500,000) for 4,000 beneficiaries.

With the support from various partners, project implementation continues covering:

- Providing good agricultural practices to farmers;
- Establishing demonstration plots and farmer field schools;
- Promoting coffee nurseries;
- Planting improved varieties or replacing old trees;
- Promoting environmentally friendly coffee farming;
- Facilitating access to inputs (fertilizers, planting materials);
- Promoting organic fertilization;
- Building/strengthening the capacity of farmers' organizations
- Agri-business development
- Community engagement
- Youth and gender involvement in agriculture

The Sucafina/Kahawatu model is being replicated in Rwanda and Uganda. The Kahawatu Foundation has been registered in Switzerland as a not-for-profit organization and is responsible for implementing sustainability projects on behalf of Sucafina SA. For more information, visit the Kahawatu foundation: [www.kahawatu.org](http://www.kahawatu.org).

**FIGURE C.1:** Inclusive Value Chain Development Theory of Change



SOURCE: Adapted from Janvry and Sadoulet (2020)

**... but can be addressed through value chain development instruments.**

Within the framework of inclusive development efforts, GVC actors mobilize resources and tools to address the constraints to efficiency and value addition.<sup>24</sup> As the expansion of the GVC is primarily driven by the private sector, these comprise long-term contracts, closer relationships along the value chain, vertical coordination, and FDI. For instance, long-term contracts are a powerful instrument linking smallholder coffee producers to high-value coffee markets. In addition to minimizing market risks, contracting firms can provide farmers with services to overcome barriers in order to comply with stringent international and voluntary standards (quality, safety and sustainability) required by national regulators and high-value coffee markets in the GVC.

Horizontal coordination (formation of farmer groups, consortia or cooperatives) is another instrument employed within the framework of inclusive development of the GVC. Cooperatives reduce transaction costs and encourage vertical integration and also reduce the costs of investment in their coffee business for individual farmers.

Voluntary sustainability standards (VSS), another instrument to pursue sustainability, have become widely used within the GVC. Driven by ethical consumerism, lead firms in the C-GVC are adopting increasingly stringent voluntary standards to minimize the risks associated with global coffee production (see Box C.2 for detailed information on sustainability standards). Governments, on the other hand, can create a set of regulations and policies that provide a legal framework for sustainable value chains and mobilize support as part of an enabling environment approach (Figure C.1).

<sup>24</sup> Inclusive value chain development is a holistic approach to sustainable sectoral transformation (Donovan et al., 2016; de Janvry and Sadoulet, 2020). Inclusiveness implies facilitating – otherwise marginalised – smallholder farmers’ participation in value chains. Inclusive value chain development efforts have been strongly supported by the World Bank and institutions alike as a pro-poor growth strategy in the past decade (World Bank, 2019).

### Short-term outputs...

Removal of constraints (e.g. input unavailability and knowledge barriers) facilitates farmers' access to the knowledge and technologies required for participation in the C-GVC. Inputs and services provided within the framework of value chain development efforts not only integrate producers but also increase their performance. Short-term results include higher productivity and revenues created along the chain. Closer and more durable relationships facilitate the transfer of higher sustainability standards in addition to better management practices and governance from lead firms to the upstream value chain actors.

Inclusive value chain development efforts made by the lead GVC actors contribute to economic, social, and environmental sustainability of the C-GVC and to achieving the Sustainable Development Goals.

### ...and intermediate outcomes...

Improvements in productivity and value addition boost export value and create local employment opportunities, thereby increasing incomes of farming households and the wider coffee-growing community. Similarly, adoption of higher sustainability standards and better agricultural and management practices and corporate governance contribute further to improved economic, social, and environmental outcomes, such as a living income for farmers and a living wage for workers, higher export revenues, employment creation, better governance, and economic growth, as well as reducing negative environmental impact and improving gender equality.

### ... in the pursuit of a sector transformation.

GVC-driven improvements of the economic viability of coffee production and equitable distribution of gains related to upgrading would contribute to sustainable transformation of the coffee sector along with the achievement of Sustainable Development Goals, such as reduced poverty, improved health and education, gender equality, and climate action.

#### BOX C.2: Standards as an instrument to mitigate sustainability challenges

National and international standards and conformity assessment procedures for health and safety, the environment, labour, and quality are set and enforced by governments primarily to protect consumers, workers, and the environment but also to facilitate trade and market access. But in a GVC world, the private sector is increasingly setting and requiring "voluntary" standards across global supply chains. Driven by consumer demands and national regulatory pressures, private standards and labels are growing in importance. Through standards, knowledge and technology can be transferred in a codified way to firms and workers along the value chain. Currently, approximately one third of global coffee production is associated with one or more sustainability certifications<sup>1</sup> and the amount of coffee produced in compliance with sustainability standards is increasing at a rapid rate. Although the lead companies in the GVC have developed their own sustainability standards schemes (e.g. Starbucks' C.A.F.E. Practices and Nestlé's Nespresso AAA) the majority of the world's sustainable coffee production is certified by third parties. The most common independent standards in the coffee sector are:

*The Common Code for the Coffee Community (4C):* 4C has the largest certified coffee area, over 1.3 million hectares and registered the largest growth in area. The 12 principles established by the 4C Code of Conduct are based on good agricultural and management practices, international

conventions and recognized guidelines accepted in the coffee sector.

*Rainforest Alliance:* the vision of Rainforest Alliance is a world where people and nature thrive in harmony. In 2018, Rainforest Alliance merged with UTZ. The sustainability standards comprised under the Rainforest Alliance seal aim at conserving forests, advancing the rights of rural people, improving the livelihoods of farmers and forest communities, and building climate resilience.

*Fairtrade International:* Fairtrade's main focus is on economic and social sustainability, ensuring decent working conditions for hired labour and a Fairtrade Minimum Price and/or Fairtrade Price Premium for producers. The minimum price aims to cover the producer's cost of sustainable production, whereas the price premiums aim to allow farmers to invest in improving their quality of life (achieving a living income). Fairtrade offers a higher price premium for organically grown products.

*Organic:* Organic certification focuses on environmental sustainability aspects of coffee production. The cultivation practices need to be in line with the certification standards implemented by the respective certification organization (e.g., no use of pesticide or mineral fertilizers). Organic certification standards vary between countries but generally require good agricultural practices that reduce adverse environmental impacts.

<sup>1</sup> <https://www.iisd.org/system/files/publications/ssi-global-market-report-coffee.pdf>

## C.2. Evidence on the socio-economic impact of the C-GVC

Over the past decade, a considerable body of literature that documents the socio-economic impact of agricultural GVCs has emerged. This section presents and synthesizes evidence from the coffee sector including a recent study by FAO (2020) and new empirical studies from producing regions focusing mainly on private sector driven initiatives.

This report does not cover the role of development aid in the integration of smallholder farmers into the coffee C-GVC as this would require additional and ad-hoc analysis. Latest available figures indicate that USD 350 million is allocated annually to the sustainability of the coffee sector.

### C.2.1. The C-GVC helps to remove obstacles for farmer participation in high-value markets

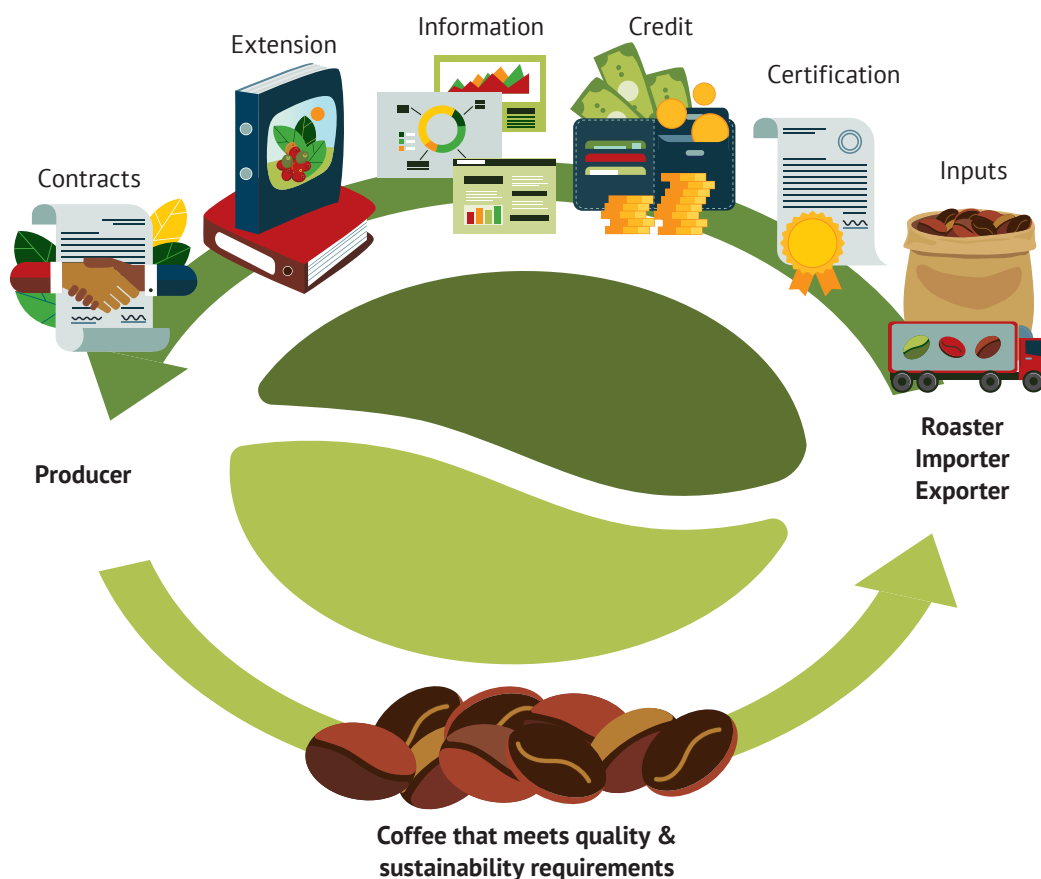
The expansion of the GVC can have a positive impact on addressing challenges faced by coffee growers. Within the framework of inclusive and sustainable value chain development activities, and pursuing inclusive business models, lead firms such as (multinational) traders, roasters or retailers can help small suppliers to overcome the barriers to participation in high-value markets and reduce the problems associated with traditional coffee supply chains. The actual ability of many smallholder coffee farmers to

integrate into the C-GVC depends on a number of factors, ranging from technology and skills, to quality, quantity and proximity as well as their (weak) bargaining power. Overcoming those constraints is still a huge challenge for a large number of individual small farmers.

A key aspect of the GVC is closer and durable relationships along the value chain, established commonly through contracts or other forms of agreements. Durable relationships between global firms and farmers link smallholder coffee producers or their associations, cooperatives and groups to high-value global coffee markets thereby securing demand for their produce and reducing market risks, as well as price fluctuations and price thresholds.

Figure C.2 depicts the relationship between producers and the buyers of coffee including the flow of produce (coffee) to the trader/roaster and flow of tangibles (e.g. credit, input) as well as what the World Bank terms the 'flow of intangibles' (e.g. technology, skills) in support of the farmer. In most cases within the framework of these durable and closer relationships, lead firms provide technical assistance in order to improve the productivity and quality of coffee production. In some cases, global firms coordinate the provision of inputs and pre-harvest finance, enabling increases in farm productivity and coffee quality. Some contracts stipulate a price premium conditional on that coffee supplied by producers satisfies the required safety, quality and sustainability standards. Provision of social services (health, education) to farmers and their families is also included in buyer-driven programmes.

**FIGURE C.2:** A beneficial exchange – the flow of tangible and intangible benefits from lead firms to farmers in the C-GVC



SOURCE: ICO



### C.2.2. Responsible trading practices and improved corporate governance in the GVC

Lead firms in the global value chain are more likely to adhere to responsible trading practices. Responsible trading practices in the C-GVC can include long-term purchase commitments and other contractual features that provide stability and predictability to farmers. Typically, this also includes a short invoice period, no excessive contract terms and no transfer of costs to counterparts (ICO, 2019a). Responsible trading practices that are based on transparency, stability and fairness are more common in GVCs compared to traditional trade relations in commodity markets (Saenger et al., 2014; Romero Granja and Wollni, 2019).

Lead exporters in the C-GVC tend to promote inclusive business models with initiatives to improve business conduct and practices in value chains compared to the less easily monitored and less visible (smaller) firms in traditional coffee value chains. A recent study by Bager and Lambin (2020) evaluates the sustainability practices, such as price transparency, zero child labour, gender equality, health and education support, climate action, and water pollution management, adopted by firms operating in the coffee sector. They find that only one-third of firms have strict commitments to sustainability practices and these are usually large actors that adhere to sustainability practices as part of corporate policies. They show that global companies have higher internal sustainability standards and responsible corporate governance compared with smaller firms, which more often rely on external standards or lack explicit commitments or resources to implement sustainable practices. There is evidence from a wide range of sectors, including coffee, that firms in developing countries that trade with international firms tend to adopt higher standards and benefit from spillovers regarding corporate governance and managerial practices (World Bank, 2019; EBRD, 2019; Macchiavello and Morjaria, 2021).

While details cannot be provided in this report, a key role in integrating smallholder farmers in the GVC and in developing local economies is played by domestic and international non-governmental organizations (NGOs). They are frequently engaged to support local rural communities by virtue of their close relationship with farmers and their families and a deeper knowledge of the local environment, needs, customs and challenges.

### C.2.3. Buyer-driven initiatives as a key feature of the C-GVC

In response to the limitations of traditional coffee value chains, such as high market risk and limited economic benefits for producers, in addition to government-led programmes, new buyer-driven initiatives have emerged. Such buyer-driven programmes have been possible as a result of domestic market liberalization and efforts to restructure the role and functions of commodity marketing boards which allowed growers to supply directly private sector buyers.

Buyer-driven initiatives are an increasingly common feature of the C-GVC. Global buyers have recently re-organized their supply chains to achieve greater collaboration and coordination among up- and downstream value chain actors. The result is a shift towards relational supply chain models (Gereffi, 2005). Some initiatives include a buyer's commitment to purchase the coffee produced by farmers within the programmes, often at a premium price, provided that the coffee satisfies the required safety, sustainability, and quality standards. Buyers' commitments have the potential to reduce market risks faced by producers and to provide a secure and profitable market for their produce.

Typically, buyer-driven programmes also include support to coffee growers to help them improve their productivity in a socially and environmentally conscious manner and to make them more resilient to price shocks. Programmes include provision of training and technical assistance by agronomists to foster good agricultural practices, farm and pest management, and financial literacy in addition to financial services (Macchiavello and Miquel-Florensa, 2020). In addition, private-sector suppliers' development programmes are associated with provision of community-based social services covering a wide range of areas, from education and food security to health that were strengthened to allow rural communities to tackle the impact of the covid-19 pandemic.

Buyer-driven initiatives can now be found across all coffee-producing regions and include both Arabica and Robusta producers. The scope and reach of these schemes and, therefore, the number of farmers benefitting varies greatly, depending on sourcing regions and the size of the lead firm (see also Boxes C.3 and C.4 for examples from South America and Africa). The shift towards relational supply chain models does not only increase the coordination between lead firms and farmers but also affects power dynamics. This can have implications for the distribution of gains, but is still not well understood since systematic data and information are missing (see also Section D for initiatives that aim at increasing supply chain transparency).

Positively, it has become apparent during the outbreak of the coronavirus pandemic that buyers (traders, roasters, and retailers) who are in established long-term supply chain relationships with coffee growers have quickly mobilized substantial support to rural coffee-growing communities. Leveraging existing channels and supply chain infrastructure a range of services from cash to in-kind health technical support were provided. Hence, the global pandemic has highlighted that closer and durable relationships along the value chain can act as a safety net in a crisis situation.<sup>25</sup>

### C.2.3.1. Direct trade initiatives – access to niche markets

In addition to large actors, smaller companies in the global value chain differentiate themselves through innovative sustainability practices, such as direct trade or relationship coffee (Bager and Lambin, 2020). Direct trade implies buyers' direct engagement with producing communities thereby shortening the supply chain and cutting out most intermediaries and building multi-year relationships under

Participation in buyer-driven programmes in the GVC is shown to increase coffee revenues earned by smallholder farmers by up to 30%.

an increased commitment to social responsibility (Grabs and Ponte, 2019). Such initiatives are part of inclusive value chain development efforts and are promoted as offering upgrading opportunities for otherwise marginalized rural communities. A key aspect of these initiatives is transparency of suppliers and pricing, with the goal of ensuring that fair prices are paid to coffee producers. Additionally, these buyers often adopt more sustainability practices compared to farmers in conventional value chain relationships (Bager and Lambin, 2020; FAO, 2020).

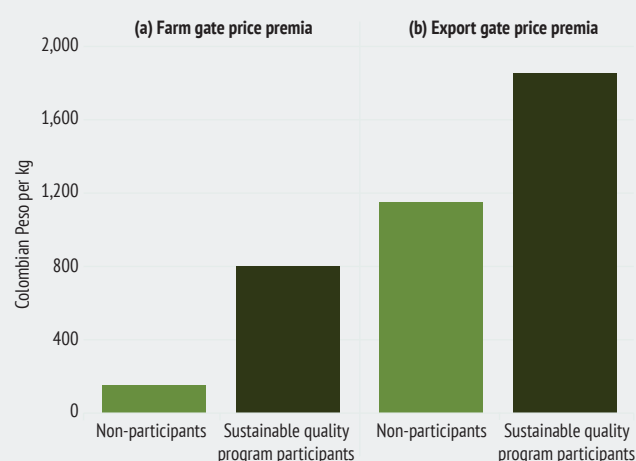
#### BOX C.3: The Sustainable Quality Programme in Colombia

The Sustainable Quality Programme was launched in 2003 and implemented across 80,000 eligible farmers in 1,000 villages in Colombia over a period of 10 years. The programme has been implemented by a lead global firm in the coffee value chain on behalf of a large multinational by the Federación Nacional de Cafeteros de Colombia (FNC). The programme consists of contractual arrangements with producers, processors, exporters, and the multinational buyer and only sources high-quality coffee. The contractual arrangement between the multinational buyer and the exporter includes provisions for a price premium of approximately 15%. In addition, the programme provides extension services and support for plot renewal and inspection conditions and compliance with the requirements of the programme. The programme is also a prominent example of buyer-driven adoption of Voluntary Sustainability Standards (VSS), such as Fairtrade, Rainforest Alliance or 4C on a large scale.

Macchiavello and Miquel-Florensa (2020) analyze the effects of this programme using comprehensive administrative data collected from customs and other administrative records, as part of the routine operations of the FNC and the implementing partner. They show that participation in the programme induced farmers to upgrade their farms: coffee trees were replanted, better environmental practices were adopted, there was an expansion in the land cultivated, and there was a consolidation towards more productive farmers. For the regions participating in the programme, the quality of the coffee increased (Figure C.3).

Relative to the conventional coffee trade, the profits of participating farmers increased by 15%, without any reduction in the profits of other farms that did not join the programme. Given a 20% price premium paid by the programme's buyer at the export gate relative to standard coffee, the Sustainable Quality Programme increased profits in the Colombia coffee chain by about 30%. As a result of the success of the programme in Colombia, its operations have been expanded and it currently operates in more than 30 regions around the world with hundreds of thousands of farmers receiving support from the Sustainable Quality Programme.

FIGURE C.3: Price premium for Supremo coffee in the Colombian coffee value chain



SOURCE: Macchiavello and Miquel-Florensa (2020)

<sup>25</sup> <https://www.cbi.eu/market-information/coffee/how-respond-covid-19-coffee-sector>  
<https://www.olamgroup.com/news/response-to-covid-19.html>  
<https://www.nestle.com/media/pressreleases/allpressreleases/coronavirus-covid-19-response-partnership-ifrc>  
<https://stories.starbucks.com/press/2020/starbucks-commits-10m-usd-in-covid-19-relief-for-partners-around-the-world/>  
<https://www.lavazza.com/en/about-us/media-centre/coronavirus-emergency.html>

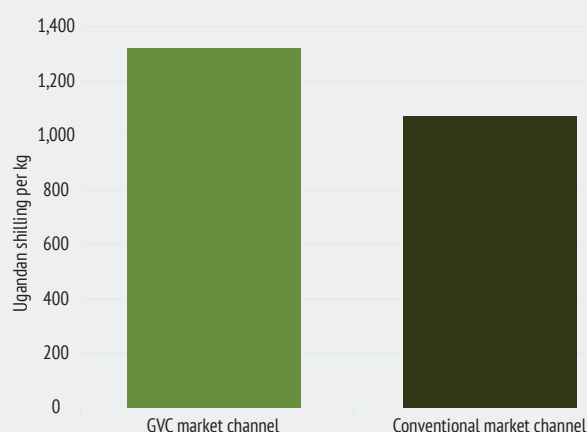
### BOX C.4 : Sustainability programme in Uganda

A multinational trading company, ECOM Agroindustrial, entered the Ugandan market after liberalization of the coffee sector in 1996 and has assisted coffee growers in adopting better farming practices and obtaining sustainability certifications, such as organic and Rainforest Alliance, in the past 20 years. The trading house has worked closely with nearly 30,000 coffee farmers since its first organic certification in 1999 and has been at the forefront of major sustainable innovations as well as quality improvements. The efforts in seven coffee-growing areas across the country ensure that farmers can add value to their crops while the exporter adds value to Ugandan coffee exports.

In eastern Uganda, in particular, a sustainability project was launched in 2000 that currently reaches about 7,000 farmers who have certified their coffee farms (4C, organic, UTZ and Rainforest Alliance) and produce sustainable coffee. The programme is implemented by a subsidiary of ECOM, Kawacom U (Ltd) through contracting smallholder farmers, covering farm certification costs, and investing the price premium into providing inputs for coffee production and funding for community projects, such as construction of schools. The company provides regular extension services to ensure compliance of the coffee produced with the quality and sustainability standards. The extension services that support quality improvements and certification benefit the farmers in the programme, thus enabling them to participate in higher value markets.

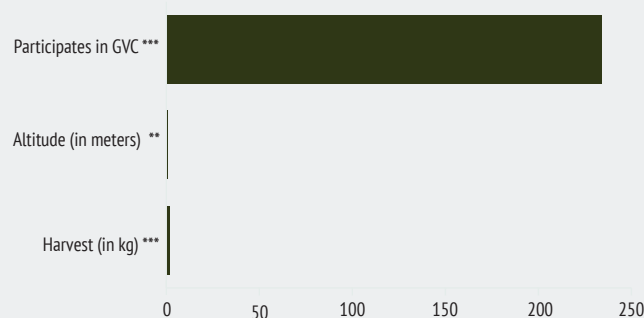
A comparison of market channels shows that farmers selling their coffee through the GVC receive approximately 25% higher prices than those who participate in traditional coffee markets, considering other factors that may affect coffee quality and quantity (Figure C.4).

**FIGURE C.4:** Average revenues earned per kg of coffee harvested in the GVC versus conventional



Additional analysis reveals that farmers who take part in the programme have higher levels of knowledge about coffee quality, indicating that extension services are beneficial for diffusion of know-how to primary producers.

**FIGURE C.5:** Regression results of average revenues earned per kg of coffee harvested (in Ugandan shillings) on participation in the GVC



NOTES: N=1525. The figure visualizes a sub-set of regression coefficients which are statistically significant. \*\*\* denotes  $p < 0.01$  \*\* denotes  $p < 0.05$  \* denotes  $p < 0.1$ ;  
SOURCE: Based on Arslan (2020)

Direct trade and relationship coffees can contribute to lower transaction costs (due to fewer middlemen), greater transparency along the value chain, and the establishment of longer-term and more equitable terms of trade in addition to greater bargaining power for producers (Grabs and Ponte, 2019). However, very few evaluations of this relatively new niche market feature have been made. Vicol et al. (2018) analyze the welfare effects of relationship coffee (direct engagement of roasters with producer communities) in Indonesia driven by Australian roasters who seek to ensure specialty coffee production in a socio-economically and environmentally sustainable way. Results suggest that the relationship coffee model can increase incomes of participating farmers. However, these benefits seem to be captured by few producers and raise concerns about the distribution of gains and inclusiveness.

**Buyer-driven programmes and direct trade initiatives offer upgrading opportunities and higher revenues but reach only a small number of small coffee suppliers.**

The capacity of small buyers to provide significant support to farmers may be limited compared to multinationals that often have in-house agronomists and subsidiaries offering tailored financial services. More research is needed regarding the costs and benefits, in addition to inclusiveness and sustainability, of direct trade initiatives. Adoption of ICT technology, including use of block-chains, is reported to foster a more direct connectivity between farmers and their groupings (associations, cooperatives, consortia) to niche markets with possible reduction of physical and financial transaction costs and limitations.

### BOX C.5: Post-harvest processing methods

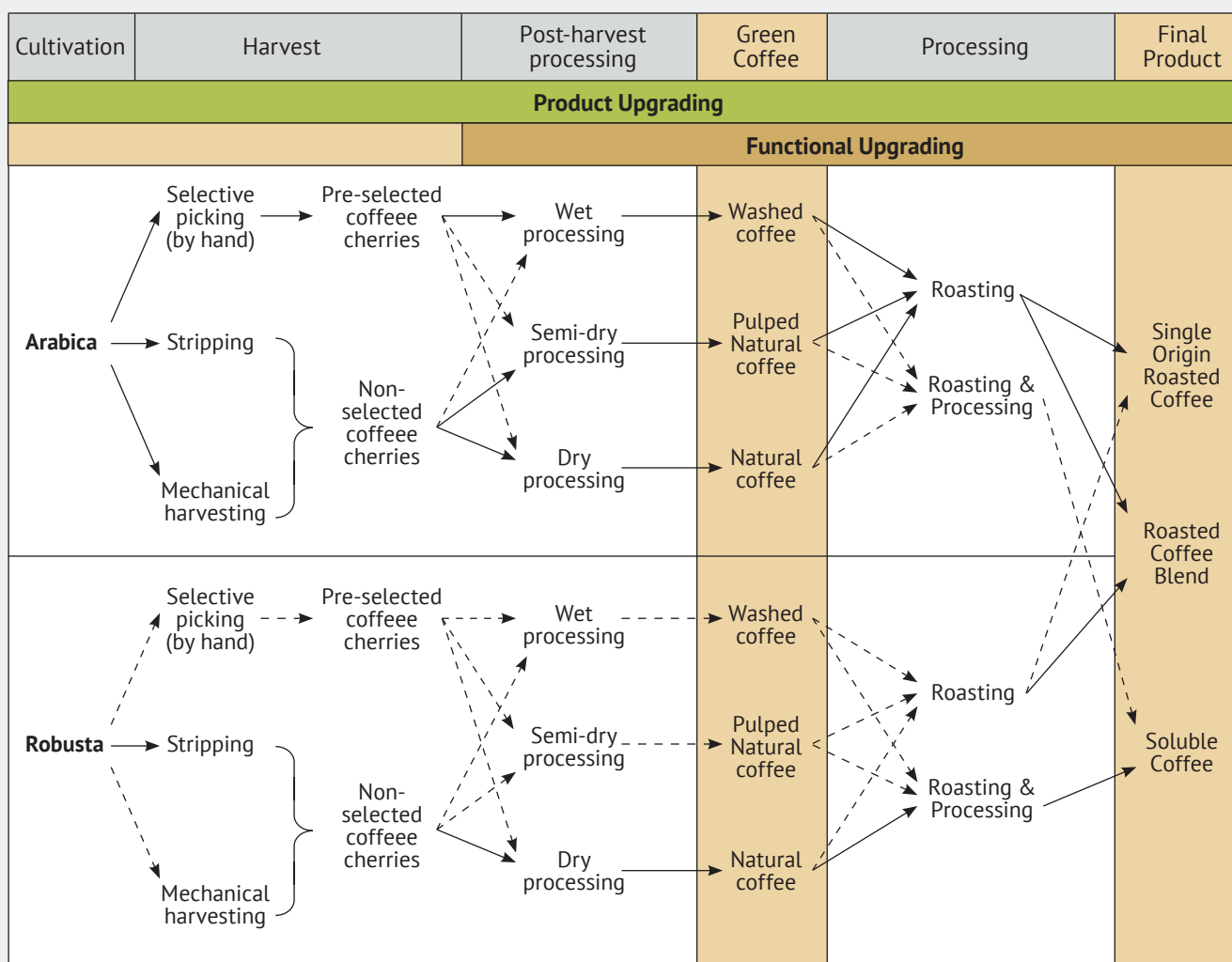
Three coffee processing methods are common: wet processing, dry processing and hybrid methods that combine elements of both wet and dry processes.

**Wet processing or washing** is carried out in wet mills (washing stations) where cherries are pulped immediately after harvesting, fermented in tanks, and washed in clean water to remove the mucilage. The wet parchment coffee is then dried in the sun. Upon reaching a certain moisture level (10-13%), the parchment coffee is then hulled, i.e., the outer skin (parchment) is removed.

For **dry-processed or unwashed coffee** (also called naturals), cherries are dried on mats or concrete patios. After drying, the outer layer of the cherries is removed by hulling in dry mills. The dry method differs from the wet method in that the skin of the cherries (pulp) and sugary mucilage layers are not removed and instead cherries are sun-dried.

Coffee can also be processed using **hybrid methods ('honey' coffee or pulped naturals)** to create new differentiations in flavour. 'Honey' processing is a demanding method. Harvested cherries are first pulped and then spread out for drying without any washing, leaving part of the pulp (cherry skin) on the bean. Coffee beans are spread thinly on drying beds and turned frequently (every hour for 10-15 days).

FIGURE C.6: Coffee Processing



SOURCE: Based on Wintgens (2004)

## C.2.4. Upgrading through post-harvest processing can facilitate participation in the GVC

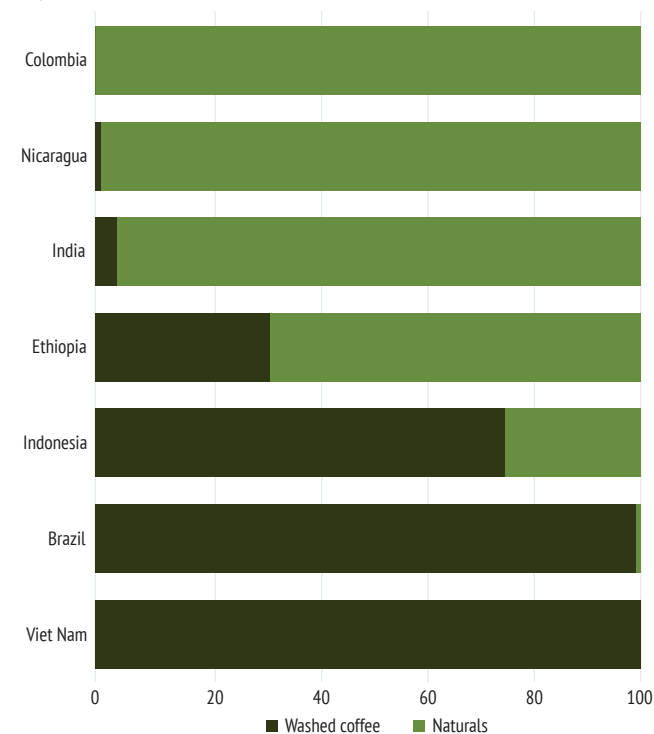
Quality and productivity improvements at the farm level and adoption of GAP and sustainability standards can foster upgrading and therefore the integration of coffee growers into the GVC as well as allowing them to receive a premium for the upgraded produce. In addition, important levers for value addition exist in the area of post-harvest processing of coffee. This refers to the mechanical and biological treatment of the freshly harvested coffee cherries through which the beans are separated from the pulp and subsequently dried and hulled in order to be stored and shipped without loss of quality and safety.

Different post-harvest practices exist that can be differentiated by the type of processing steps employed, with wet and dry processing as main categories (see Box C.5 for more information regarding different processing methods). Some countries, such as Colombia and Nicaragua, are traditionally producers of washed Arabica coffee, whereas Brazil is a large exporter of dry processed (or naturals) coffee. Robusta is also mainly processed using the dry method in Viet Nam and Uganda (Figure C.7).

The processing method and its correct implementation have a significant impact on coffee quality. Coffee quality is generally higher using wet processing (Nure, 2008; Minten et al., 2019). This is the result of better preservation of the intrinsic flavour and aroma of the coffee bean in the wet process. Naturals or pulped naturals on the other hand can lead to heterogeneous coffee batches and more defective beans. As a result, washed coffee commands significantly higher prices in international markets (Minten et al., 2014).<sup>26</sup> Hence, production and export of washed coffee offers opportunities for value addition and price premiums.

However, wet processing of coffee requires skill and standardised processes, since coffee quality is substantially affected by the quality of processing activities, such as fermenting and drying. Hence, if quality protocols are not implemented correctly, the washing of coffee may fail to add value to the coffee. Modern coffee washing stations seem to fare better than small-scale home processing. A recent study conducted by Arslan (2020) shows that wet-processing undertaken at the farm-level results in losses

**FIGURE C.7:** Share of washed Arabica in total Arabica exports in selected countries



NOTES: The figure depicts the 5-year average (2015-2019) of the share of washed Arabica in total Arabica exports of selected countries.

SOURCE: ICO

for Arabica producers in Uganda compared to the sale of unprocessed coffee cherries to a modern central wet mill. This is partly because coffee that is wet-processed at homesteads is of lower quality on average than coffee delivered to a modern washing station. The difference largely arises from a lack of resources and capacity by smallholder farmers to process their coffee in a way that is required by high-value markets. Consistently, findings of Vicol et al. (2018) suggest that farmers in Indonesia who sell their unprocessed coffee cherries to a centralised wet mill are better off than those who home-process their coffee. They argue that, in wet mills, good quality control procedures are in place whereas farmers generally have less well-developed quality control systems. Hence, to maintain quality, wet-processing activities should be undertaken in suitable washing stations.<sup>27</sup>

<sup>26</sup> It should be noted that natural coffees and those processed using a hybrid method have found a niche in the specialty coffee segment and command a significant premium. Many Central American countries that exclusively produced washed coffee have started producing naturals and semi-washed.

<sup>27</sup> Additionally, wet processing also increases water usage. Resulting waste water flows may have adverse effects on the environment. Modern washing stations operating in the GVC are more likely to safely dispose waste water after wet processing. How the GVC can reduce the adverse environmental footprint of coffee production is further elaborated in section C.4



## C.2.5. The C-GVC facilitates FDI in post-harvest processing and value addition

To take advantage of market opportunities related to wet-processing in countries where this is not widely adopted, construction of modern coffee washing stations (CWS) has been a successful strategy to improve coffee quality and potentially achieve higher participation in the GVC and a premium. Indeed, there is an increasing tendency to build or modernize coffee-processing stations in some producing regions. For instance, lead firms in the C-GVC have set up a fully-equipped modern processing station (wet mill) in Uganda and established many coffee buying centres across the region in order to facilitate market access for farmers and buy freshly harvested coffee directly and easily from farmers (Arslan, 2020). This shortens the value chain, minimizes post-harvest quality deterioration (due to shorter transport time) and ensures that post-harvest processing is undertaken in a modern facility where quality and safety parameters are being monitored.

On the same note, Minten et al. (2017) demonstrate that the increase in the number of washing stations in Ethiopia over the past decades is associated with major improvements in the quality of coffee produced. As a result of a dense network of CWS and lower transport costs along

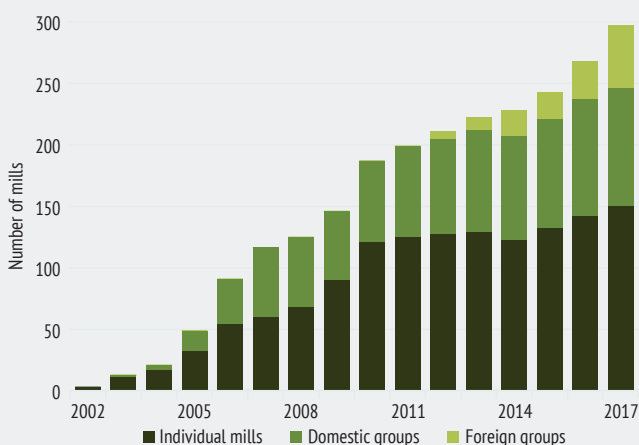
with higher prices paid for washed coffee, more producers started selling coffee cherries for processing in wet mills compared to the previously common dry-processed coffee at homesteads. In addition, the growth in the number of wet mills is found to be associated with investment in improved harvest practices and to increase further the quality of fresh coffee produced at the farm level and add further value to the product. The number of specialty coffee buyers seeking high-quality coffee from all over the world significantly increased in parallel. Hence, investments in processing stations facilitate growers' linkages to high-value coffee markets.

The evolution of the Rwandan coffee sector is another example of the integration into the GVC going hand in hand with a substantive sectoral transformation. Similar to the trend in Ethiopia, the number of washing stations in Rwanda increased substantially from two in 2002 to 300 in 2018 (see Box C.6). As a result of increasing numbers of CWS, the share of washed coffee production went up from 30% in 2010 to 60% in 2016 (Agrilogic, 2018). Macchiavello and Morjaria (2018) estimate that, given that the price of high-quality coffee produced at the modernized mills is 45-50% higher than that of the conventional coffee, doubling the amount of coffee exported as high-quality coffee can lead to a 10-20% increase in coffee export revenues for Rwanda.

### BOX C.6: Evolution of wet mills in Rwanda

In a recent study, Macchiavello and Morjaria (2021) analyze the role, nature, and impact of FDI in Rwanda's coffee sector. During the first half of the 20<sup>th</sup> century, coffee became an important part of the Rwanda economy representing 55% of its export revenues at independence. The sector started to decline in the 1980s – a deterioration that accelerated with the end of the ICO quota system in 1989 – and nearly collapsed with the 1994 genocide. Since the end of the war the sector has steadily recovered and today Rwanda is generally perceived as one of the most dynamic origins, particularly

FIGURE C.8: Ownership of washing stations in Rwanda



SOURCE: Macchiavello and Morjaria (2021)

in the specialty segment. Currently, there are around 300 washing stations – a remarkable expansion if one considers that there were only a handful of CWS in the country in the early 2000s. Besides the rapid expansion in the number of washing stations, another trend has been the emergence of larger groups – i.e., firms that own and/or operate multiple washing stations. While the vast majority of newly built CWS continue to be set up by firms that manage only one station, a process of consolidation has taken place in the industry: by 2017, around half of the CWS were owned by firms that operate multiple stations. In later years, the industry has witnessed the entry of foreign groups. The restructuring of the industry has happened mostly through a process of acquisition, in which washing stations incurring management and financial difficulties were taken over by groups.

Furthermore, the study explores the drivers and consequences of this pattern of acquisitions. The analysis reveals that foreign groups are particularly effective at turning around under-performing stations: following acquisition by a foreign group CWS significantly increase their capacity utilization, reduce their unit operation costs, and increase quality of coffee, both in terms of coffee grades as well as implementation of certification schemes and voluntary standards. The improvement in performance most likely arises from the synergies between stable marketing channels in the export markets with superior management practices of the washing stations in the rural areas – partly driven by a professionalization of management of the CWS and a superior capacity in implementing required changes.



This would amount to an additional 3-6% increase in total export revenues and a substantial increase in economic growth. As a result of the growth in high-quality coffee production thanks to the increasing number of washing stations, Rwanda has gone from having a handful of trade partners worldwide in 2012 to over 40 today, demonstrating the increasing integration within international trade and participation in the global value chain (Agrilogic, 2018).

Functional upgrading is associated with improved operations and incomes, yet the extent to which producers benefit from it depends on the institutional set-up in the country (e.g., governance and contract enforcement) and on the efficiency of the local supply chain.<sup>28</sup> A case study from the Rwandan coffee sector underlines this relation: in addition to the increasing number of washing stations, another important trend has been the emergence of larger multinational firms owning and operating multiple CWS (Box C.6). The analysis by Macchiavello and Morjaria (2021) reveals that foreign groups are particularly effective at turning under-performing stations into high-capacity and efficient facilities. Being acquired by a foreign group entails a bundle of changes, but the improvement in performance stems from a combination of stable marketing channels in the export markets, superior management practices and a higher capacity to implement required changes in the washing stations. Good governance practices are important for economic and social sustainability. Global value chains thus play an essential role in diffusion of better management practices and governance along the value chain. In addition, governments need to establish an institutional setup that supports a private-sector-driven transformation of the coffee sector.

While beyond the scope of this report, it should be highlighted that FDI in processing plants (typically for soluble coffee) can bring substantial resources to producing countries and creates direct and indirect employment as well as backward linkages to suppliers.<sup>29</sup>

Upgrading products and processes improve efficiency of operations and incomes but the extent to which producers benefit from upgrading depends also on the institutional set-up.

<sup>28</sup> This argument has been supported by robust empirical evidence. For instance, Saenger et al. (2014) show how value chain efficiency and product quality can be improved through third-party contract enforcement interventions.

<sup>29</sup> For instance, Nestlé invested USD 154 million in a soluble coffee factory in Mexico in 2018. The investment created 2,750 direct and indirect jobs in the initial phases and the number is expected to increase to 1,200 direct jobs and 12,000 indirect jobs at the end of the expansion. Similarly, Nestlé keeps expanding the company's production capacity in India, one of the fastest growing markets worldwide. The company invested in roughly USD 100 million in the state over the past three years. The latest expansion created employment for nearly 250 people. (Information based on company press releases)

### C.3. The C-GVC can contribute to achieving the Sustainable Development Goals

The analysis so far has shown that integration of coffee producers in the C-GVC has the potential to generate tangible benefits ranging from higher productivity and improved profitability and revenues to the adoption of enhanced social and environmental standards, technology and best practices. Governments, international and regional development and financial institutions as well as private sector and civil society organizations are engaged in agri-business development and in the C-GVC in particular to implement the 2030 Development Agenda focusing (Kaplinsky, 2016) on those sustainable development goals that are more closely related to the coffee C-GVC (Figure C.9). Recent assessment of links between the coffee sector and the SDGs has been carried out by Sachs et al. (2019).

It is worth mentioning the direct link between the C-GVC and SDG 9 on sustainable industry, innovation and infrastructure. As mentioned earlier in the Report, the decommodification of coffee and the opportunities to upgrade in the GVC work hand in hand with reliable infrastructure and innovation. FDI, for instance, in the form of processing facilities in areas where infrastructure might be underdeveloped, incentivizes authorities to invest in and improve the local infrastructure

**FIGURE C.9:** Sustainable Development Goals linked to the expansion of the C-GVC



SOURCE: ICO

(transport, logistic, quality) and reduce transaction costs and increase economic activity in the coffee growing communities. It should be noted that SDG target for “value addition to commodities” is the only commodity-specific target in the Sustainable Development Goals, so upgrading in the coffee value chain is a measurable metric for the coffee sector to show commitment to the Development Agenda 2030. By fostering collaboration and joining forces along the value chain for sustainable and inclusive development, the C-GVC can also contribute to SDG 17 on “partnerships for the goals” (see also Section D.2.2 for public-private initiatives in the coffee sector).

A detailed analysis on how the C-GVC can help coffee-exporting and importing countries to achieve the Sustainable Development Goals is outside the scope of this report. However, reflections can focus on: economic sustainability in connection with price, value distribution and income of farmers (and with focus on women); and the environmental sustainability of the coffee value chain. Both topics are predominant in the global policy debate of the coffee community and include discussions of regulations and voluntary actions. Therefore, a special emphasis is put on SDG 5 (Gender equality), SDG8 (decent work and economic growth), and SDG12 (Responsible consumption and production) (See Figure C.9 key SDGs related to the C-GVC).

### C.3.1. C-GVC and Gender

Enhanced participation of coffee growers in the GVC can have not only spillover effects on incomes and poverty reduction but also contribute to closing the gender gap and indirectly benefit women. The subjective well-being of women who are employed in high-value export industries is found to be higher due to improved living standards, particularly among the poorest women (Van den Broeck and Maertens, 2017). A key aspect of inclusive value chain development efforts undertaken by companies operating in GVCs is gender-inclusivity. As part of these efforts, firms in GVCs employ more women than non-GVC firms across a wide range of countries (Rocha and Winkler, 2019). These global firms increase female employment and income and reduce gender disparities in labour markets. Evidence also shows that there is a clear positive association between employment in high-value export sectors within GVCs and women’s empowerment (Said-Allsopp and Tallontire, 2015; Krumbiegel et al., 2020).

#### C.3.1.1. Gender-inclusive programmes within the GVC

Sustainability standards internalised by lead firms are effective instruments within the GVC to promote gender-inclusive coffee production and processing activities. For instance, the approach taken by sustainability labels (e.g., Rainforest Alliance and Fairtrade) to gender equality and women’s empowerment is based on non-discrimination and encouraging women to participate actively in workers’ and farmers’ organizations. They rely on strict regulations designed to foster equal opportunities, while preventing gender inequality and sexual harassment or exploitative behaviour.

There is evidence from the coffee sector that a considerable gender gap exists in accessing extension services, with women being less likely to receive visits from extension agents and attend training (Meemken et al., 2017b). Hence, the GVCs’ particular emphasis on gender inclusivity in the form of implementing gender-sensitive extension and gender awareness programmes for farmer groups is highly relevant. Well-designed extension programmes consider the cultural, time, mobility and educational constraints faced by female farmers (Croppenstedt et al., 2013). An example is the Coffee Initiative of Technoserve, a project conducted in East Africa to integrate context-appropriate strategies for gender equality and increasing women’s ability to benefit from improvements in coffee agronomy. The project partners have developed strategies to recruit women not only as participants in training but also as farmer trainers to lead the training. After the introduction of targeted approaches to encourage women’s participation in the programme, the attendance rate of women in training approximately doubled from 20% to 40% (ICO, 2019c).

Recognising that gender equality is a key concern in the sustainability of coffee value chains, Nestlé, a leading premium coffee roaster, has adopted a gender equality strategy that includes a wide array of policies and actions to increase women’s empowerment and reduce gender disparities. In particular, a gender analysis tool has been developed to measure the level of gender equality within the value chain, through rigorous collection and analysis of data to use as a basis for developing context-specific interventions.<sup>30</sup> In addition to extension, providing female farmers with leadership and management training, increasing the number of female extension workers, overcoming established social norms and empowering women can reduce gender disparities within value chains, thus contributing to SDG 5.

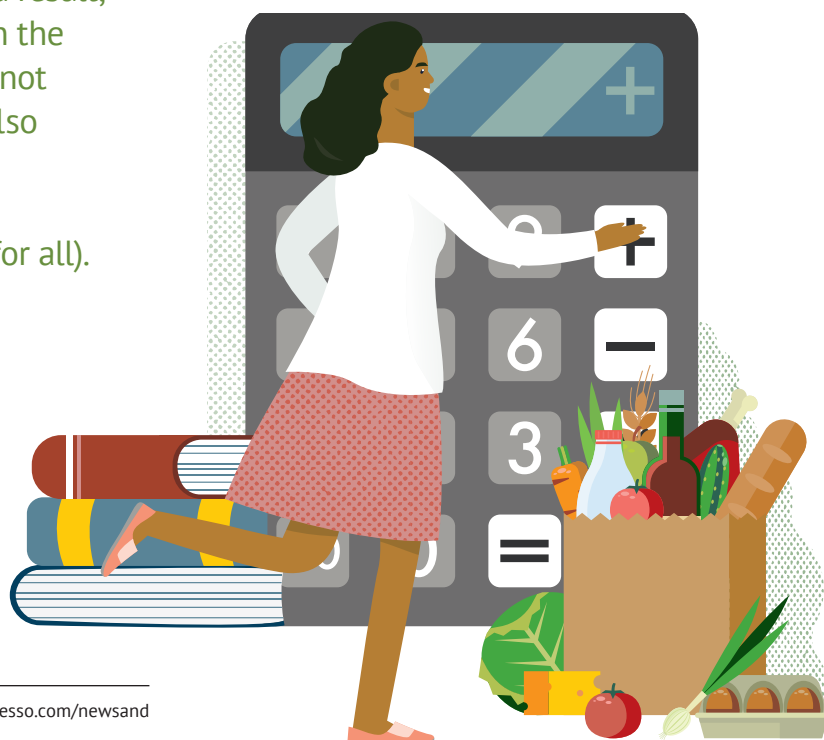
Voluntary sustainability standards are found to positively affect the distribution of wealth and assets within households in favour of women. For example, in the context of Uganda, Meemken and Qaim (2018) document that in households operating in conventional coffee supply chains most assets are owned by the male household head alone, whereas in households participating in higher-value certified markets, most assets are owned jointly by the male head and female spouse.

Moreover, higher gender equality within the household allows for further investments in health and education. There is substantial evidence that female control over household income increases the share of resources allocated towards household goods, such as food, education, and health (Hoddinott and Haddad, 1995; Duflo, 2003; de Janvry and Sadoulet, 2006; Robinson, 2012). As a result, higher employment, income, and control over resources for women can improve children's nutritional, health, and education outcomes. Hence, gender-inclusive approaches within the C-GVC not only benefit women but also other household members, including children, and further contribute to the efforts for achieving SDG 2 (zero hunger and improved nutrition), SDG 3 (good health and well-being) and SDG 4 (education for all).

Female control over household income increases the share of resources allocated to food, education, and health. As a result, gender-inclusive approaches within the C-GVC can contribute to achieving not only SDG 5 (gender equality) but also SDG 2 (zero hunger and improved nutrition), SDG 3 (good health and well-being) and SDG 4 (education for all).

### C.3.2. Productive employment and decent work for all

A key aspect of the inclusiveness and social sustainability of the C-GVC is the employment opportunities created within the chain, both in the labour-intensive ends of the chain, the agricultural production and retailing. This encompasses the number of jobs created for otherwise marginalized individuals and youth. Despite the coffee sector having been identified as being capable of creating opportunities for a large number of unemployed youth (Ahaibwe et al., 2013; Bamber et al., 2014), fluctuating coffee revenues reduce the motivation of producers to engage in coffee cultivation and negatively affect the perceptions of young women and men of coffee as a potentially viable economic activity (UNIDO, 2013). However, with better revenues and youth inclusive programmes, the C-GVC can increase the engagement of youth with coffee production. For instance, COOPAIN, a cooperative of coffee and cocoa producers in Peru, pursuing organic certification for high-value markets, was able to increase returns for farmers by approximately 15% and re-engage youth in productive activities (Martin and Paz, 2012). Another example of inclusiveness in the GVC is the programme implemented by Technoserve which supports the development of tens of thousands of producers in Ethiopia, Kenya, Tanzania and Rwanda. As part of their efforts to incorporate youth in the training programs (along with women), Technoserve recruited trainers from children of coffee farming families in the local areas. This provided an important opportunity for off-farm employment, but also provided them with knowledge of how improved farming techniques can increase yields and that coffee production can be a profitable business. A global firm in the C-GVC, Nestlé, is working with government officials in the four countries that are members of the Pacific Alliance trade group – Chile, Mexico, Peru and Colombia – to create 2,900 jobs for young people over three years and teach job-hunting skills.



<sup>30</sup> The full report is available at: <https://www.nestle-nespresso.com/newsandfeatures/nespresso-aaa-program-gender-equality>

A coffee diploma programme developed by the Coffee Directorate of Kenya and Kimathi University of Technology fills skills gaps and produces graduates that can further drive change in the coffee sector (World Bank, 2019). Training targeted at youth in agricultural production and creating job opportunities for them within the GVC contributes to the creation of productive employment and decent work for all (SDG 8) in addition to reducing inequalities (SDG 10).

Employment opportunities also incorporate the quality dimension of those jobs created in the GVC. The concept of job quality incorporates both earnings and working conditions, including working hours, benefits, and the health and safety environment among others. Even so, working conditions appear to commonly fall short of international standards in lower income countries.

Partly in response to current unfavourable working conditions and their contradiction with inclusive and sustainable development goals, global firms are increasingly adopting higher standards that stipulate socially sustainable production, including a minimum income in some cases. As an example, Fairtrade certifications require minimum prices and premiums for all certified products. Evidence shows a

higher level among satisfaction of workers who participate in global value chains that are sustainability-certified. Both job satisfaction and wages are documented to be higher on Fairtrade plantations compared to non-certified farms in Ghana (Krumbiegel et al., 2018).

Studies also show that workers' reported well-being is affected by many factors other than earnings. In particular, occupational health and safety are found to affect well-being four times more than other aspects of working conditions (Domat et al., 2013). In the coffee sector in particular, agrochemical use is one channel through which the health and safety of workers may be affected. Eco-certification (e.g., organic) requires growers to discontinue use of any chemical inputs, such as fertilizers and pesticides, and adopt various conservation and pollution prevention practices. Voluntary sustainability standards (labels) often include provisions that prohibit use of certain hazardous chemicals, in addition to training on yield-enhancing organic technologies and non-chemical measures of pest control.

In a recent study, Sellare et al. (2020) show that Fairtrade certification reduces the incidence of pesticide-related acute health symptoms, as a result of training and other services related to the safe utilization of hazardous materials, use of protective gear, and occupational health. In an earlier study, Asfaw et al. (2010) also demonstrate that the incidence of acute illness symptoms due to pesticides and the associated cost of illness significantly decrease with the adoption of voluntary standards. In sum, evidence shows that the sustainability standards increasingly adopted by lead firms in the global value chain have positive effects on health and safety, as well as on the wages of the workers, and closely relate to SDG 8, which highlights the need for improvements in working conditions, in addition to SDG 3 (good health).

Another potentially negative impact of coffee value chains on humans is child labour and forced labour. While the coffee sector is not considered to commonly employ children compared to other commodities and industries, the involvement of children in coffee production in a number of producing countries is causing increasing concern, especially in view of the economic hardship of coffee-growing households resulting from the covid-19 pandemic.

Studies that analyze the time allocation of children between education and labour in the coffee sector suggest that short-term substitution takes place. In other words, an economic shock may lead parents to decide to allocate more of their child's time towards labour instead of education and this decision largely depends on the household income level (Basu and Van, 1998; Kruger, 2007). In addition, Beck et al. (2019) find that, when coffee prices fall, coffee-growing households' adults increase their wage labour while children and adolescents substitute for adults on the farm. Price fluctuations in the coffee market thus may have serious implications on child labour, children's educational investment, and development outcomes of coffee-growing households. Hence, with the intensifying global covid-19 pandemic there is a risk that the prevalence of child labour increases in coffee production as a response to volatile prices and to compensate for the loss in incomes (ILO and UNICEF, 2020).

### **BOX C.7: Youth and covid-19 recovery**

One of the risks associated with the future of the CGVC is due to aging coffee farmers while the new generation are growingly abandoning their "family business" in coffee production to find better opportunities and jobs that they see as more progressive and lucrative for their future. Furthermore, many of the jobs often held by young people across the coffee value chain have recently been lost due to the pandemic. For the International Coffee Day 2020 the ICO launched a new initiative the "coffee next generation" to promote a sustainable and inclusive recovery from the coronavirus pandemic by investing in young women and men and by catalyzing technical and financial support from the coffee community, donor partners and civil society ([www.internationalcoffeeday.com](http://www.internationalcoffeeday.com)). Investing in youth will generate both innovative and sustainable solutions for the coffee sector, contributing to build back a better and more equitable and prosperous coffee sector", enabling recovery from the crisis and building a stronger future, positively impacting coffee communities around the world. It will also mitigate the lack of engagement of youth in coffee farming and other areas of the value chain. 'Coffee's Next Generation' is intended to engage ICO Members and all coffee stakeholders to work together with youth organizations, industry leaders and associations, international organizations, development and financial partners and coffee consumers, to invest in the youth and bring to life their innovative ideas and enthusiasm to benefit the whole coffee community and to recover from the pandemic making the future more inclusive, sustainable and prosperous for all. Youth and covid-19 recovery was selected as the ICO theme for coffee year 2020-21.



### C.3.3. Environmental impact in the C-GVC

#### C.3.3.1. Potential adverse effects of the C-GVC on the environment

The overall debate on GVCs has highlighted the environmental consequences that are associated with their rise (World Bank, 2019). These can be negative or positive depending on the characteristics of value chains. The effects may also vary according to the geographic location of specific production processes along a given value chain. GVCs are associated with an increase in economic activity that can lead to environmental deterioration, the result of a scale effect. The effect would be greater if production increased more in countries with higher polluting industries, for instance. Global value chains, by promoting the division of production processes in steps, encourage certain types of economic activity to relocate internationally. The effects can be exacerbated by varying regulations, if polluting tasks of production move to countries with lax regulations (ibid).

In the coffee value chain, on the other hand, the fragmentation of production steps in countries of the global south (coffee cultivation) and the global north (coffee processing) is due to the agro-climatic requirements of the coffee plant and the historical location of major consumer markets. Typical concerns of GVCs regarding increasing air pollution and carbon dioxide emissions (footprint) and depletion of resources apply to the coffee sector from production to disposal. Coffee farming itself is identified as one of the hot spots for greenhouse emissions mainly due to the use of synthetic fertilizers and pesticides (Tchibo, 2008). A study by van Rikxoort et al. (2014) shows that the carbon footprint of coffee depends on emissions from soils and the production and application of fertilizers, emissions from pruning and crop residues decomposing on the ground, and methane emissions from the waste water that is generated during wet (post-harvest) processing activities, such as pulping and fermentation.

Wet coffee processing of coffee requires large amounts of water – in flotation, pulping of cherries to remove the skin, and mucilage removal following fermentation. In particular, the water used for fermentation contains high amounts of acidic nutrients. In most cases, infiltration of water into the soil is the easiest form of disposal for smallholder growers who undertake primary home-processing. The untreated release of the waste water can contribute to the contamination of water supplies for humans and animals living downstream from the producers.

The rise of upgrading activities in the GVC and production of more complex coffee products (e.g., soluble, roasted) may have additional environmentally adverse effects, depending on the technology used and regulatory context in which the firms operate. Shipment and transport activities along with packaging and retailing all around the world contribute to emissions and global warming through a variety of channels.

Life cycle assessments which consider many factors such as ozone depletion, possibility of acidification, fossil fuel depletion, and CO<sub>2</sub> gas emissions are utilized to understand the effects on the environment of the coffee sector. Hicks (2019) finds that considerable environmental impact occurs due to coffee growing and the energy to brew coffee and from the disposal stage of the products. Nearly all single-serve coffee pods, as with other packaging material, and in most cases single-use coffee filters in conventional brewing go to landfill. Other alternatives for coffee brewing such as biodegradable coffee pods are in the works, but such products still lack a thorough life cycle assessment to truly understand their true effects.

Another potentially concerning environmental impact of coffee production is deforestation. While FAOSTAT estimates that coffee production uses 10.5 million hectares, which shows a decline in the land under coffee compared to a decade ago, these estimations do not capture the shift in production areas, for instance, from low altitudes to higher altitudes that are mostly comprised of forests. With climate change, coffee production is slowly shifting to more suitable regions, such as higher altitudes, which puts forest areas at risk. Hence, the increasing demand for coffee could lead to higher levels of land use change or deforestation exacerbating the effects of emissions and climate change.

**Participation in the C-GVC has been shown to reduce poverty and inequalities, while increasing food security, health, and access to quality education in coffee-growing communities.**

### C.3.3.2 The C-GVC can reduce the negative environmental effects of traditional coffee production and trade and boost responsible production and consumption

Laws and regulations, including due diligence, are instruments to mitigate the negative environmental consequences of coffee production. Due diligence laws, such as the 'Loi de Vigilance' in France, hold companies responsible for any environmental damage, such as deforestation, arising from production and processing activities in the value chain (small and medium enterprises may be exempt). Additionally, certification by voluntary sustainability standards has been widely adopted in the C-GVC (Potts et al., 2014). Sustainability standards and, in particular, eco-labels lead to more environmentally-friendly production and decreases in the use of agrochemicals, such as fertilizers and pesticides in coffee value chains (Blackman and Naranjo, 2012; Ibanez and Blackman, 2016; Vanderhaegen et al., 2018). However, adoption and maintenance of standards is costly and therefore often challenging for smallholders. Lead firms in coffee value chains assist farms in obtaining certification and complying with the sustainability standards (e.g., through buyer-driven initiatives as elaborated above).

In addition to complying with international and national laws and regulations and adopting sustainability standards, lead firms can financially sustain the adoption of other environmentally sustainable technologies with high levels of economic activity. Often these firms are pioneers of sustainability innovations and thus play the key role in reducing the footprints of coffee production on the environment, e.g., through green and sustainable applications. For instance, major roasters like Nestle are now building plants incorporating environmentally-friendly technologies, such as treatment and reuse of water, use of 100% of coffee waste to produce energy, and use of 100% renewable electricity.

Going a step further, a number of actors in the GVC started adopting the 'circular economy' approach which is based on self-renewal. It is a cycle rather than a series of processes with a beginning and an end. Instead of disposing of an obsolete product or a by-product, the circular economy model aims at recycling, repairing, and reusing (Figure C.10)

To reduce waste at farm level, for example, pruned coffee stems are used to fuel furnaces for coffee dryers. Coffee cherry pulp is used as fertilizer or to produce cascara. For instance, Sucafina, a leading sustainable farm-to-roaster coffee company from Switzerland, created the Farmer Hub Initiative as a circular model and, working in a loop with the farmers, provides farmers with better access to resources and goods while ensuring environmental sustainability.

Recently, there has been a surge of companies using coffee waste (e.g. used grounds and discarded coffee cherry pulp) to create new products, such as paper, 3D printer filament, charcoal, textiles, and others. On the consumption side, some companies in the GVC are developing compostable or reusable coffee pods, and cups from used coffee grounds or coffee husk. A study by Misra et al. (2008) shows that coffee grounds contain on average about 10-15% oil by weight.<sup>31</sup> Hence, it is possible to collect waste coffee grounds and convert them into biofuels and some companies have started investing in such initiatives.

An interesting example of a spin-off from the C-GVC is small-scale pyrolysis from coffee waste in Viet Nam. UNIDO has brought Swiss technology to Viet Nam to turn the waste into a clean energy source and biochar. This makes it possible to minimize agricultural waste while also reducing the unhealthy and polluting emissions associated with conventional processing of coffee waste, and enriching the soil. It has also allowed for a non-traditional but significant upgrading since a local manufacturer was supported to adopt and further commercialize the technology. The ICO is planning to work with all involved parties to promote the technology in other producing countries. Clean technology and green investments and initiatives can mostly be sustained through public-private partnerships engaging government, GVC actors and development finance institutions.

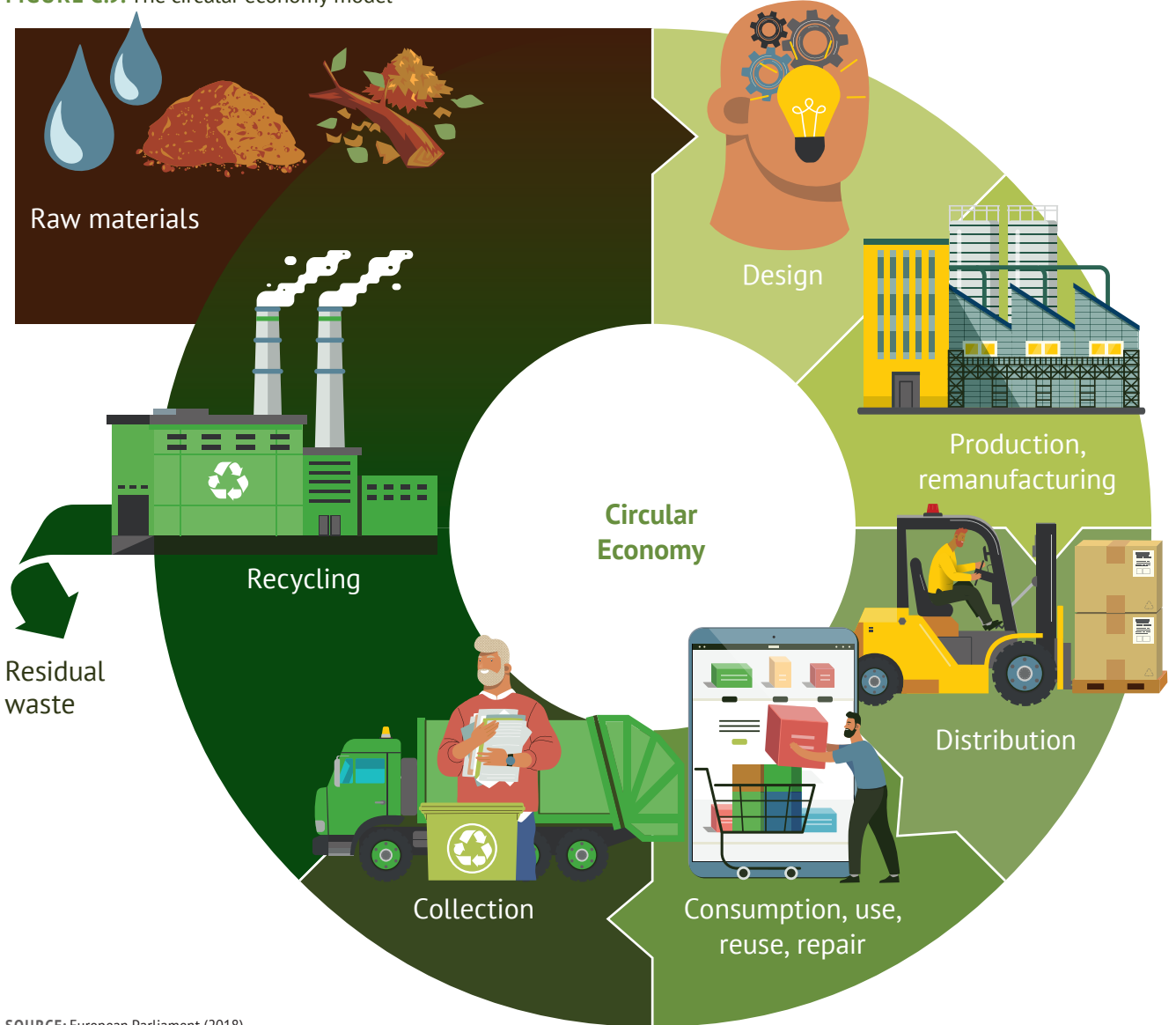
Recent discussions and actions by public and private actors engaged in the coffee C-GVC have been brought about by the media creating significant consumer awareness and engagement to encourage responsible consumption (SDG 12) in connection with efforts to reduce single-use plastics and packaging.

In sum, the relational aspect of value chains facilitates the development, transfer and adoption of green and clean technologies enabling higher environmental standards throughout the value chain including for primary producers and end consumers. The GVC also promotes improvements in productivity with useful production technologies and management practices, and contributes to reducing the need for expansion in the coffee production area and thus environmental degradation. Tilting the scale towards the sustainable transformation of the coffee sector, the C-GVC can contribute to SDG 12 (responsible consumption and production), SDG 13 (climate action), and SDG 15 (life on land).

<sup>31</sup> For details see <https://briefs.techconnect.org/wp-content/volumes/Cleantech2008/pdf/70158.pdf>

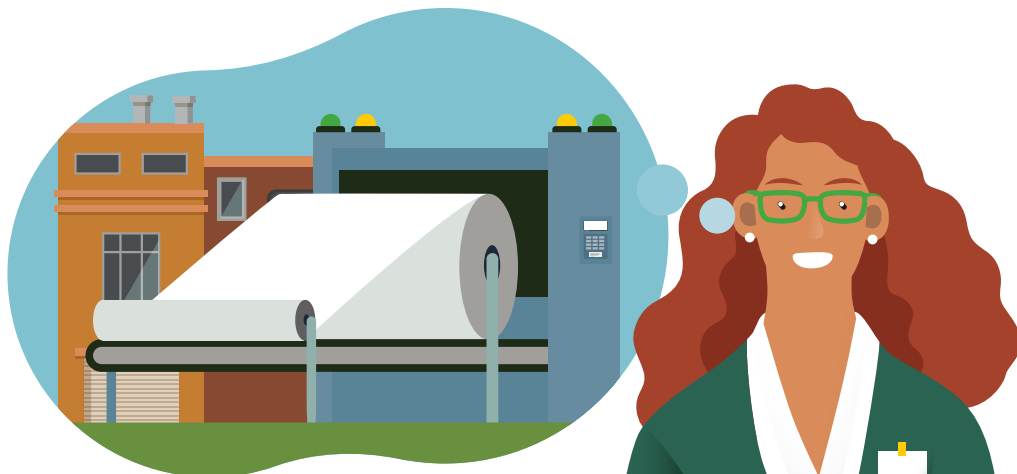


**FIGURE C.9:** The circular economy model



Part II: Section C

SOURCE: European Parliament (2018)



The relational aspect of the GVC facilitates adoption of green and clean technologies throughout the value chain and can contribute to SDG 12 (responsible consumption and production), SDG 13 (climate action), and SDG 15 (life on land).



# PART II

## SECTION D

### Policy implications and recommendations towards a sustainable, inclusive, and resilient Global Value Chain

#### Key findings

- **The expansion of the C-GVC is driven by the private sector, but governments need to provide an enabling environment.** Policies to attract FDI and large buyers of coffee, investments in connectivity and transport, trade facilitation and quality infrastructure are key to facilitate sustainable GVC operations and to increase resilience against shocks. Reducing trade barriers is key to facilitate producing countries' participation in the trade of processed coffee. Newly signed free trade agreements are expected to boost regional and international trade.
- **Digitalization and e-commerce** are likely to shorten the distance between coffee farmers and consumers with potential for reduction of costs, increased traceability and a more transparent documentation of value created along the value chain, thereby increasing opportunities for farmers to increase their incomes.
- **A smart mix of market-driven initiatives and regulatory options should aim at maximizing the economic benefits of the GVC and living income, while ensuring social and environmental sustainability.** Examples include industry commitments to sustainability and the widespread adoption of voluntary sustainability standards. In addition, various importing countries have adopted due diligence legislation that hold (large) firms accountable for any human rights abuse or environmental damage across their supply chains. New commitments on livelihoods also contribute to the sustainability of the coffee sector.
- **The development of national and (sub-)regional sustainable coffee development strategies supports positioning in a growing global coffee sector.** Upgrading or diversification trajectories of individual countries should be based on an assessment of opportunities and constraints. Integration in the C-GVC while developing national and sub-regional supply chains requires the targeted support of the private sector, donors, international organizations, and international financial institutions.
- **The challenges faced by the sector require dialogue among all sector stakeholders.** The coffee price crisis and the covid-19 pandemic have highlighted the importance of international cooperation among the public and private sectors to address the immediate challenges faced by coffee stakeholders and build a sector that is inclusive, resilient and sustainable.
- **Constructive dialogue, consensus building and joint action between public and private sector stakeholders requires accurate and timely information.** Important features of coffee supply chains, such as costs and margins from farm to retail, remain opaque and living income gap assessments in producing countries are not widely available. The coffee sector can learn from national and international initiatives on transparency and governance in agricultural supply chains.

Over the past three decades, traditional importing countries have expanded their export-orientated processing activities and continue to dominate the global trade in roasted and, to a lesser extent, soluble coffee. Does this mean that producing countries can move on a trajectory towards greater GVC integration or will they remain trapped in market segments characterized by low value addition? This section focuses on key policy implications derived from the findings of the previous sections. First, strategies to facilitate upgrading in the C-GVC and, second, policies to improve the sustainability, inclusivity, and resilience of the GVC are discussed.

## D.1. Implications for the future integration of producing countries in the C-GVC

This report provides a differentiated view of the development of the C-GVC. Typical upgrading paths were traced for high-income and low-income countries on the one hand, and producers and non-producers on the other hand. Within the category of producing countries a further breakdown by countries that predominantly grow Arabica or Robusta further adds to the richness of results.

The analysis of trade data, covering the past three decades, reveals that some countries successfully emerged from being exclusively exporters of green coffee to more diversified exporters of green and processed coffee (e.g., Colombia, Ecuador, Viet Nam). Others have transitioned from producers of commodity-grade green coffee to more differentiated green coffees that fetch a premium in international markets (e.g., Rwanda, Peru). There are also countries that have been less fortunate in positioning themselves in the C-GVC with little or no upgrading. Others, like the Philippines and Thailand, have moved away from growing coffee to manufacturing.

The analysis of the determinants of functional upgrading suggests that, all else being equal, high-income and capital-rich countries have a higher share of processed coffee in exports. In contrast, product upgrading is a route that can be taken by lower income countries because capital and industrial capacity are largely unrelated to this approach. Hence, country-specific endowments that are difficult to change in the short-term (if at all) can lead to a path dependency. However, examples of individual countries that successfully upgraded their coffee sector show that sound sectoral policies and strategies and support by public institutions matter and are the key to success.

### D.1.1. Recommendations for functional upgrading in the coffee sector of producing countries

#### Robusta-growing countries

There is potential for functional upgrading, in which Robusta-producing countries move from exporting commodities to exporting simple manufacturing goods. The analysis has shown that income (GDP per capita) is no longer as powerful a determining factor in the production of processed coffee products. Unlike in the past, soluble coffee is nowadays increasingly exported by lower-and middle-income countries. Capital endowment is relevant, FDI inflows are supportive, and – importantly – a higher domestic industrial capacity is positively related to soluble exports. Notably, there is also evidence for a Dutch disease effect at work, which is known for driving up labour costs and tying in resources.

#### BOX D.1: Is protectionism on the rise in the coffee sector?

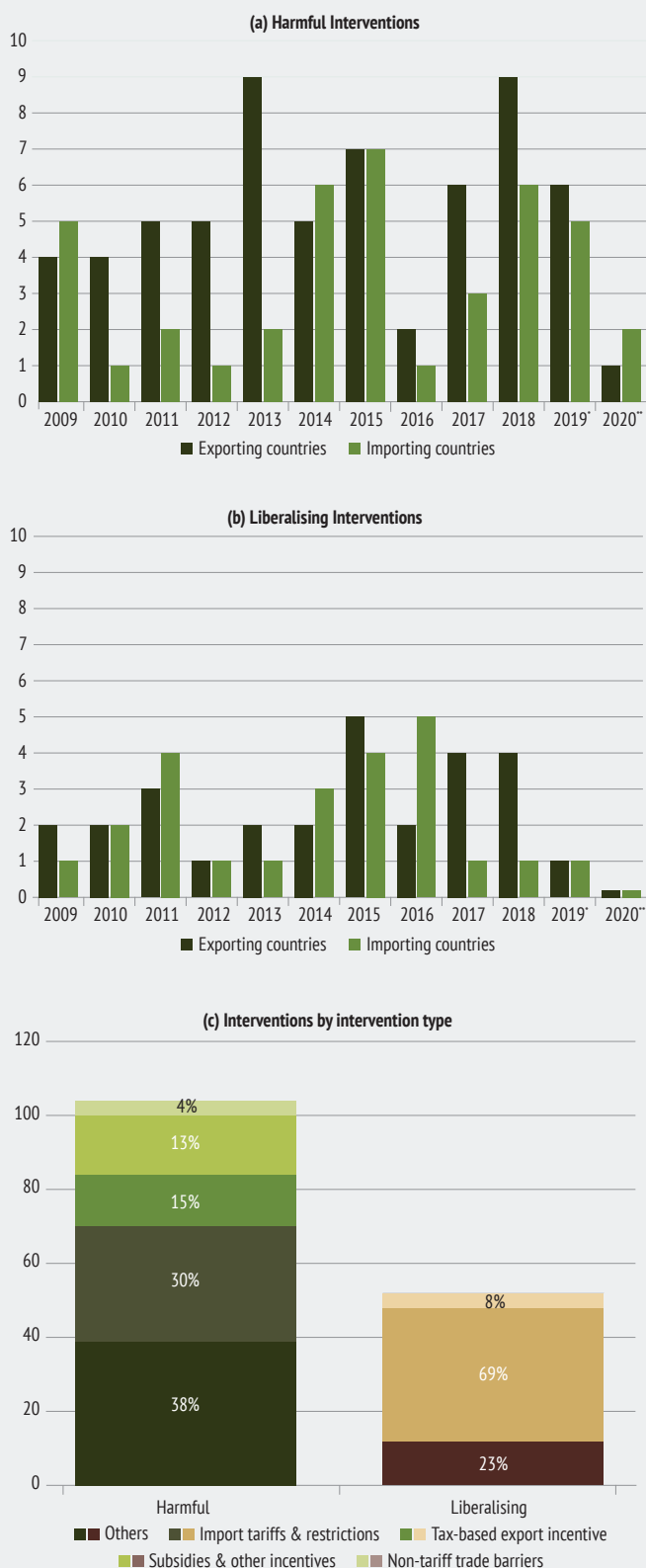
The analysis on determinants of GVC participation in Section A suggests that remaining trade barriers need to be eliminated in order to enable coffee-producing countries to engage in functional upgrading. However, in recent years the public sentiment in many advanced economies has become critical of globalization. Some governments have already reverted to protectionist rhetoric and policies. While the sabre-rattling about retaliatory import tariffs on coffee makes news headlines, is there concrete evidence that, over the past decade, a roll-back of the liberalization agenda of the 1990s and 2000s has occurred?

An analysis of trade policy interventions between 2009 and 2020 has been carried out using data from Global Trade Alert (GTA), a platform that was launched in 2009 in response to the financial crisis and the expectation of the widespread adoption of trade-distorting policies. The platform evaluates interventions by their expected impact that can be either 'harmful' or 'liberalising'. Harmful interventions refer to those that discriminate against foreign commercial interests by favouring domestic businesses. These interventions include trade barriers, such as import tariffs, but also other trade-distorting measures. Liberalising interventions, on the other hand, promote trade on a non-discriminatory basis, for example by dismantling harmful policies.

The descriptive analysis compares the number of interventions implemented by exporting and importing countries that are related to the coffee sector. The sample includes 43 ICO exporting Member countries, and the 30 largest importing countries (including all ICO Members), which represent more than 95% of global coffee exports and imports, respectively. For this sample, between January 2009 and August 2020, GTA recorded 156 interventions that have benefitted or harmed partners in the international trade of coffee. As interventions are reported with a time lag, figures for 2019 and 2020 likely understate the true number of policies that were implemented in those years. Of all harmful interventions, 60.5% were implemented by exporting countries, whereas importing countries accounted for 39.5%. Liberalising interventions were roughly balanced between exporting countries at 53.8%, and importing countries at 46.2%. A visual analysis of the data plotted in figure (a) cannot confirm a clear trend towards more discriminatory interventions. However, figure (b) suggests there is also no significant negative time trend in interventions that benefitted other countries.

Looking at the top-15 implementers in the sample, Brazil, the largest coffee-producing country, accounted for 32 interventions (23 harmful, 9 liberalising). This is equivalent to more than one-fifth of all interventions recorded between 2009 and 2020. Among coffee-producing countries, Brazil is followed by India and Indonesia with 14 and 12 interventions, respectively.

**FIGURE D.1:** Number of harmful and liberalizing trade interventions (2009-2020)



**NOTES:** The category 'Import tariffs & restrictions' entails import tariffs, import tariff quotas and import bans. 'Subsidies & other incentives' entails production subsidies, interest payment subsidies and in-kind grants. 'Non-tariff trade barriers' includes sanitary and phytosanitary measures as well as import-related non-tariff measures. 'Tax-based export incentives' have been classified as such by GTA. **SOURCE:** Authors calculation based on ICO and GTA data.

The Russian Federation, the fourth largest importer of coffee, is ranked first among the importing countries with 14 interventions, eight of which were harmful, and six liberalising. The EU, ranked second among the importers, recorded seven interventions (five harmful, two liberalising). However, it should be noted that some EU member states, such as Belgium, Denmark, France, Germany, Latvia and the United Kingdom, individually introduced additional interventions that the GTA deems harmful. Assessing harmful and liberalising interventions by intervention type, figure (d) reveals that the changes in import tariffs play an important role in the coffee sector. Import tariffs make up 43% of all trade interventions implemented between 2009 and 2020. The analysis shows that among the liberalising interventions the elimination or reduction of import tariffs plays a dominant role.

The indicators, accompanying metrics, and usage guidelines are freely available as a COSA contribution to the public good. They take a capital approach by identifying, measuring and valuing their impacts and dependencies on natural, social, human and produced capital stocks. They also reflect the three capacities of resilience (absorptive, adaptive and transformative), thus accounting for both static and dynamic resilience components.<sup>3</sup> For coffee, the indicators have been field tested in Guatemala, Kenya, Nicaragua and Peru and were discussed at the COSA-led Resilience Learning Forum with nearly 200 global participants.<sup>2</sup>

In the case of Guatemala, using micro-data, COSA evaluated the effect of donor interventions on the well-being of farm households experiencing income losses from leaf rust. The study identified which factors most affected farmers' resilience to this shock and how each absorptive, adaptive and transformative capacity influenced their income and led to demonstrated greater resilience. The COSA resilience approach can be adapted to different levels of rigor, from rapid assessment with 11 basic key performance indicators to comprehensive impact assessment.<sup>4</sup> Companies and institutions can gain farm-level and supply chain insights for day-to-day management that can also reveal emerging risks at origin.



## **BOX D.2: Upgrading participation in the Global Value Chain: the incentives provided by the European Union – Viet Nam Free Trade Agreement (EVFTA)**

### **1. EVFTA: the deepest FTA signed by Viet Nam to date**

The EVFTA, on top of the issues typically covered by an FTA, includes specific chapters promoting standards harmonization and market access in key sectors (e.g. cars). It also includes provisions deepening the existing WTO regime (e.g. Intellectual Property Rights (IPR), services, subsidies, trade and customs facilitation, Government Procurement) and promoting a levelled playing field with the EU (e.g. trade and sustainable development, with two subsections focused on environment and workers' rights and State-Owned Enterprises (SoEs)).

### **2. Viet Nam vs. other “middle-income trapped” countries: a wide-open external trade policy**

Viet Nam recently reached lower-middle-income status. It is highly competitive in relatively low-skilled and labor-intensive stages of production but it faces the risk of falling into the so-called middle-income trap, i.e. increased labor costs eroding competitiveness in the low value-added sectors combined with the inability to compete in higher value-added sectors. However, unlike other countries generally qualified as “middle-income trapped”, Viet Nam adopted a very open trade policy which brought about several FTAs. While this is “not a guarantee for good global value chain (GVC) performance” – key to escaping from the “trap” (Berger and Bruhn, 2017), the integration promoted by deep FTAs, and especially the EVFTA, provides a set of opportunities that, if properly exploited, might further the participation of key Viet Namese economic sectors in the global value chain.

### **3. EVFTA opportunities for Viet Nam’s production value chain (VC) upgrading: indirect factors**

The EVFTA makes two different sets of VC upgrading opportunities available to Vietnamese enterprises<sup>32</sup> :

1. Indirect, as it requires the Government to promote substantial domestic legal, administrative and institutional reforms necessary to facilitate trade reducing the impact of the so called “beyond the border measures”; and

2. Direct, through the reciprocal elimination of customs duties.

– Indirect measures. Every chapter of the EVFTA requires members to introduce reforms reducing the cost of doing business in Viet Nam and upgrading the business and legal environment. These reforms will mainly benefit Vietnamese private businesses, as well as EU investors and exporters, and focus on several topics improving in particular the efficiency of domestic institutions (e.g. customs, agencies in charge of Sanitary and Phytosanitary Standards (SPS) and Technical Barriers to Trade, IPRs-enforcement authorities). Customs and quality-infrastructure agencies dealing with imports are particularly relevant for exports and VCs, taking into consideration the high foreign content of Vietnamese exported products;

– Promoting a level playing field between SoEs and private businesses, and stimulating FDIs in high technology and key services sectors.<sup>33</sup>

### **4. Direct factors stimulating VC upgrading in Viet Nam: agricultural and food sector**

Tariff escalation, whereby import tariffs increase with each step of processing, is a mechanism generally adopted by countries to protect their processing industries. While at present, EU average tariffs applied to Vietnamese agriculture and fishery exports are very low, as Viet Nam exports mainly primary products, EU tariff escalation might represent an important obstacle to VC upgrading of exported products. For example, while the export of raw coffee to the EU is almost duty free, the tariff on imported drinks containing coffee is more than 11%. This is similar for fresh (4.2%) and processed shrimps (18%). The escalation is even more severe in sectors where the EU applies specific tariffs (i.e. different from *ad valorem* ones).

The EVFTA elimination of tariffs (71% since entry into force, the remaining within 7 years) will also remove the tariff escalation phenomenon and is an incentive for Vietnamese farmers to upgrade the VC for selected products (e.g. engaging in food processing instead of exporting primary products) to benefit from market access opportunities. Of course, succeeding in the highly competitive EU market will require further action, in particular the upgrading of national quality infrastructure and institutions supporting the sector, the development of products' reputation and an increase in the capacity of producers in agronomics-related issues (including the use of fertilizers, pesticides, etc.) (McKenna, 2017).

<sup>32</sup> (Berger and Bruhn, 2016)

<sup>33</sup> Dordi (2016) and Borlini, Dordi (2017) clarifies that EVFTA will limit the State intervention to cases of market failure and to the provision of public goods.

The EVFTA SPS and TBT chapters create the right background for a general improvement of the quality infrastructure in Viet Nam, providing conditions for the improvement of the quality of Vietnamese agricultural products. Finally, Geographical Indications might represent an important tool to facilitate the access of specific Vietnamese products into the EU distribution system.

In conclusion, the EVFTA provides direct and indirect incentives for Vietnamese businesses to upgrade the VC of several industrial sectors in Viet Nam, thereby increasing the added value that remains in the country. The combination of tariff removal and improved institutional and legal environments, which also represent important incentives for FDIs, provides Viet Nam with favourable conditions for moving on from low-skilled and labour-intensive stages of production, reducing the risk of falling into the so-called middle-income trap.

**Borlini, L., & Dordi, C. (2016).**

Deepening international systems of subsidy control: the (different) legal regimes of subsidies in the EU bilateral preferential trade agreements. *Colum. J. Eur. L.*, 23, 551.

**Dordi, C. (2016).**

How do PTAs Address “Competitive Neutrality” between State and Private Owned Enterprises?. *VNU Journal of Science: Social Sciences and Humanities*, 32(15).

**Berger, A., Bruhn, D., Bender, A., Friesen, J., Kick, K., Kullmann, F., Roßner, R. & Weyrauch, S. (2016).**

Deep preferential trade agreements and upgrading in global value chains: the case of Vietnam (No. 92). *Studies*.

**Berger, A., & Bruhn, D. (2017).**

Vietnam’s preferential trade agreements: implications for GVC participation and upgrading.

**McKenna, M. (2017).**

Agribusiness in 2035: A Global Value Chains Perspective, 111-131.

**MUTRAP (2011).**

Assessing the Impact of Rules of Origin in Vietnam FTAs

**MUTRAP (2014).**

Sustainable Impact Assessment EU-Vietnam FTA

**MUTRAP (2017)**

Impact Assessment: EU-Vietnam FTA

Introducing policies to attract FDI, increasing capital by eliminating barriers to investment, diversifying away from natural resource sectors, strengthening institutional quality, and improving infrastructure are key to successfully upgrading in the GVC.

In order to tap the potential, countries growing Robusta coffee can use standard instruments to achieve upgrading in the GVC: introduce policies to attract FDI, increase the capital base by eliminating barriers to investment and diversify away from resource sectors to ensure competitively priced labour. The strengthening of institutional quality (and resulting lower propensity for political instability) is an important driver of upgrading and importantly, increases the resilience of the sector and value chains.

The case of Viet Nam highlights another important determinant of successful GVC integration: connectivity. A good transportation infrastructure, the possibility for international logistics firms to operate in the country, and quick handling at ports and borders allows countries to be better connected to global markets and thus benefit more from GVC integration.

Removing tariff- and non-tariff trade barriers remains key. The analysis strongly supports the importance of beneficial trade regimes and shows the significantly negative impact of trade barriers. In GVCs, goods and services cross borders several times during the production process. Tariffs will therefore accrue several times and add up as the number of production steps increases. Delivery times are also important, since the high degree of specialization in GVCs requires a frictionless interaction between the suppliers. Tariffs and, especially, non-tariff trade barriers slow down this interaction. Hence, in order to reap the full potential of GVCs, the world community must continue to pursue low trade barriers and negotiate trade agreements. With a liberal trade regime and good transportation and communications infrastructure, even small countries in remote locations can become beneficiaries of global markets.

However, a general obstacle to GVC proliferation across the world is increasing protectionism (World Bank, 2019). While there is no compelling evidence that harmful policies are on the rise in the coffee sector (see Box D.1), tariff escalation is still a factor. Hence, the trade liberalization agenda and reduction of non-tariff barriers have to stay firmly on the agenda of forums including the WTO and within other regional and multilateral forums. Coffee producers should take advantage of programmes such as the Standards and Trade Development Facility (STDF) and Aid for Trade as well as several support programmes by development partners.

Various recently negotiated free trade agreements are likely to provide a major push for further liberalization of the global trade in coffee, benefitting producers and consumers across exporting and importing countries. The agreement between the EU and Viet Nam (See Highlight/see Box D.2) that came into force in August 2020 and is now in the process of domestic ratification by the regional and national parliaments of the EU Member States and the deal reached between the EU and the Mercosur bloc, which includes Brazil, will both address tariff escalation. This would remove obstacles to upgrading in the coffee sectors of some producing countries. Similarly, the African Continental Free Trade Area is expected to boost regional trade through closer integration of the continent.

The covid-19 experience underpins the importance of sector bodies and the private sector reacting swiftly to shocks and adapting to new environments, for example, through the development and implementation of new supply chain processes as well as health and safety procedures, in order to maintain the flow of goods and services under difficult circumstances, such as lockdowns.

### Arabica-producing countries

Green Arabica coffees are transformed mainly into roasted coffee and, to a lesser extent, into soluble. However, production and export of roasted coffee remains marginal in most Arabica-growing countries and therefore options for export-orientated functional upgrading have been limited.<sup>34</sup> There are several reasons that impede Arabica-growing countries from entering the downstream activities of the value chain: (1) the higher perishability of roasted coffee and, thus, the limited possibilities and higher costs of transporting over long distances, (2) strong national brands in high-income consuming countries paired with limited demand in the growing countries' domestic economies, (3) tariff escalation in the industry, i.e., higher tariffs on processed coffee, and (4) an increasing concentration of roasted coffee exports, making it harder for new entrants to compete (ITC, 2011; ICO, 2020d).

Unless these constraints are addressed, significant export revenue gains for Arabica-growing countries are more likely to derive from product upgrading, i.e., improving the quality of the green Arabica coffee beans through, for example, adopting improved varieties, more sophisticated and advanced cultivation methods, harvesting technology and post-harvest processing, and the adoption of standards as well as through geographical indication and branding. This means that so far there has been a rather severe impediment for these countries to engage in downstream activities through functional upgrading along the C-GVC, which is unfortunate because roasted coffee has seen the biggest increases in export value, as shown above.

<sup>34</sup> A notable exception is Ecuador, an Arabica-Robusta dual producing country that has build significant processing capacity for soluble coffee. In value terms, exports of soluble coffee represent 87% of total exports in 2015-2018 as green coffee export volumes declined while soluble coffee exports increased compared to the 1990s.

### D.1.2. Recommendations for product and process upgrading in the coffee sector of producing countries

Some coffee-growing countries, in particular Arabica producers, have not engaged in and benefitted from functional upgrading via coffee processing. However, these countries can realize other significant GVC benefits, especially those deriving from product upgrading (higher quality, standards, other attributes). Samper et al. (2017) highlight the significant scope for value addition in relation to non-tangible attributes such as geographical indicators, the potential of which has not been exploited to the same extent as in other agricultural sectors (e.g., wine). Finally, growers can engage in process upgrading (higher efficiency, lower per-unit costs) in particular with support and resources received from lead firms as part of closer relationships between producers and buyers of green coffee. Besides Arabica producers, these benefits can also be reaped by Robusta-producing countries that fail to establish processing capacity within their borders.

Country-specific endowments and characteristics that limit the ability for functional upgrading may present less of a barrier to product upgrading. However, linking to high-value export markets does require the expansion of GVC relationships to a new and larger pool of producers. The key to expansion is, on the one hand, to reduce existing barriers that prevent lead firms (e.g., traders, roasters or retailers) to extend durable and closer relationships to a larger number of farmers across wider regions. On the other hand, it is necessary to enable farmers to participate in high-value markets by building skills and capacity while lifting market and infrastructure constraints. In terms of reducing barriers and enabling farmers, there is the potential for strong complementarity between development partners, the private sector, government, local coffee authorities and bodies, and civil society.<sup>35</sup> Another factor that also influences the integration of coffee growers into the C-GVC is size of smallholder farmers in many producing countries. Therefore, action and support programmes to cluster coffee farmers through the creation of cooperatives and consortia would enhance their bargaining power and ability to trade regionally and globally.

### Facilitating private sector driven GVC expansion

Participation in the C-GVC through inclusive supply chain programs initiated by lead global or regional firms (such as those presented in the case studies from Colombia and Uganda) has been shown to create surplus across the value chain which is shared among producers, processors, and traders. Yet, in most cases, a relatively small number of coffee growers participate in such programs. For a more equitable distribution of economic gains enabling more farmers to benefit from high-value markets, there is a need to expand and scale-up existing inclusive coffee value chain development activities and address concerns about value chain governance and distribution of gains.

<sup>35</sup> For instance, Rwandan government has played a central role, encouraging leading roasters to develop links to Rwandan coffee, provide technical assistance and even market Rwandan coffee (Behuria, 2020)

In most cases, however, participation in high-value markets is conditional on meeting stricter quality, safety and sustainability criteria compared to commodity-grade coffee markets. In many countries extension services that support farmers to increase quality and productivity are or were provided by public institutions. However, following the liberalization of the coffee sector and the widespread defunding of coffee institutions, services have been reduced. Hence, strengthening public extension programs that pay special attention to better agronomic and harvest practices would enable farmers to link to high-value markets. However, this report has shown that, as part of the GVC, farmers can also increasingly benefit from technical assistance and technology transfer provided by lead firms (buyers) within long-term supply chain relationships. This can fill the gap in regions where public extension services are weak. There is a key role here for development partners such as regional and international organizations, financial development institutions and NGOs to foster cooperation.

Horizontal coordination activities (formation of farmer groups and cooperatives) should be encouraged to facilitate smallholder farmers' participation in the GVC, reducing the costs of entry to high-value markets for groups of farmers. Cooperatives and farmer groups provide effective vertical integration for GVC participation, reducing the transaction costs incurred by large actors in the value chains.

Lead firms can play a role in facilitating the adoption by certification of individual farmers, farmer groups or cooperatives. Providing accurate information improves farmers' understanding of the costs and benefits of standards. High audit costs, which are also increasingly identified as a barrier to the adoption and maintenance of sustainability standards by individual coffee growers, can be reduced, for example, through the promotion of group certification (or at landscape level) and the identification of funding sources to support certification for growers. Many certification schemes only apply to cooperatives and require farmers to have a certain minimum farm size, which results in the exclusion of a large share of smallholder coffee farmers from the benefits of upgrading.

From a lead firm's point of view, economic viability and sustainability are key for introducing and scaling up inclusive value chain development activities or entering new coffee regions. Provision of technical assistance, extension, input and credit to ensure that farmers produce high-quality and sustainable coffee is costly. Hence, enlarging the pool of supported farmers requires high levels of working capital. This suggests a major role for development finance institutions to provide liquidity to coffee buyers with sufficient capacity to implement supply chain programmes. Providing services such as pre-harvest finance to farmers is risky, since farmers may choose to sell to other buyers under incomplete contract enforcement. In order to mitigate default risks, institutions and contract enforcement mechanisms should be improved alongside the establishment of risk-sharing mechanisms (first loss guarantees) extended to local financial institutions, for example by development banks.

Investment of lead firms in post-harvest processing capacity adds value. More efficient supply chains also increase the share of the world market price for coffee received by farmers, which is particularly important in periods of low prices. When the capacity of washing stations falls below the production potential of the region, farmers revert to home-processing their coffee with potentially large reductions in quality, and therefore in price and income. Attracting lead firms and foreign investors can be a key driver in the transformation of a domestic coffee sector, as the case study of Rwanda shows. Incentives can be given in the form of tax advantages to foreign investors to encourage FDI for the expansion and modernization of coffee mills.

### Lifting constraints and strengthening market institutions – the role of governments and development organizations

Horizontal policies and investments in rural infrastructure can also benefit coffee farmers. Physical constraints, such as the distance to coffee-buying centres, are linked to participation in high-value markets. Growers with higher proximity to coffee-buying centres (collection points) are more likely to sell their coffee in high-value markets. Expanding the catchment area for buying coffee or establishing coffee collection points in remote areas would link disadvantaged farmers to the GVC. Since coffee is grown in high altitudes and mostly in mountainous areas, infrastructure investments (e.g., building and maintaining roads) would reduce transport time and costs and facilitate participation in the GVC.

Fostering the development and adoption of digital technologies (including blockchain applications) will not only reduce the barriers and costs for farmers to link to existing high-value market channels (e.g., through timely and accurate information), but also increase traceability and provide access to new markets (direct trade, e-commerce). Digital platforms can increase the visibility of producers and expand the reach of buyers at a lower cost for buyers to interact with the producers. Hence, they can also facilitate expansion of buyer-driven sustainability programmes. Digital platforms can enable producers to meet buyers and exporters and engage in contracts more easily. These platforms may not necessarily enforce contracts, but can

Digital technologies reduce the barriers and costs for farmers to link to high-value market channels and increase traceability and provide access to new markets.

<sup>36</sup> <https://cpoinnovation.com/blockchain-marketplace-launched-by-indian-coffee-board-to-improve-supply-chain/>



allow for building a public record of past compliance. As a result, reputation and prestige concerns would play an active role in incentivising contract compliance for both sides. To the extent that consumers are willing to pay a higher price for sustainably sourced coffee, digitalization would expand the size of the market as well (Macchiavello and Miquel-Florensa, 2020). The example of India shows that there is a role for coffee authorities (Coffee Board of India) to work together with development institutions and the private sector in the development and dissemination of digital applications for the sector.<sup>36</sup>

Market institutions and contract enforcement need to be strengthened to support the expansion of the GVC in countries that lag behind in value chain integration. Quality uncertainty in processed coffee markets undermines the efficiency of the value chain. Addressing this market failure requires efforts and interventions at the broader level. Introducing tighter monitoring schemes and regulations for post-harvest processing of coffee can improve market efficiency and, therefore, reduce the cost associated with common market failures.<sup>37</sup>

Increasing transparency and traceability in coffee supply chains can help limit margin escalation. This is a widespread phenomenon leading to inflated premiums for certified coffees at retail level with no benefit for farmers (Naegele, 2019). A possible solution is for end-buyers to pay premiums directly to producers or to 'demand their suppliers to not add any margin to the premium part or price differential along the value chain' (ICO, 2019a).

To benefit from complementarities, the individual elements should be combined in a National Coffee Sustainability Plan (NCSP). In combination with an assessment of 'differentiated needs, challenges, and opportunities within the country's coffee sector' the NCSPs would offer clear strategic plans for supporting producers, promoting sustainable coffee production, and aligning producing regions with the SDGs (Sachs et al., 2019). A regional approach in which countries with similar objectives are grouped together could realize synergy effects and facilitate targeted support of the private sector, donors, international organizations and international financial institutions.

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<sup>37</sup> For instance, Costa Rica adopted a nation-wide policy and, taking necessary actions, established itself as a producer of high-quality coffee. Coffee growers in Costa Rica do not process coffee cherries and must instead sell their produce to cooperatives for processing while cooperatives are heavily monitored to ensure quality standards (Wollni & Zeller, 2007). A similar strategy has been adopted in Rwanda and Kenya. Producers in Rwanda are encouraged to market their cherries fresh and cooperatives along with the increasing number of wet mills process coffee cherries (Mujawamariya et al., 2013; Behuria, 2020). Similarly, Kenyan coffee producers with a coffee farm size of less than 5 acres are not allowed to process their coffee and must sell their coffee fresh (Mude et al., 2016).

## D.2. Towards resilient, inclusive, equitable and sustainable C-GVCs

In order to ensure growth in C-GVCs that leads to equitable outcomes, all sector stakeholders need to be aligned. In principle, the aim of maximizing the benefits of GVCs and at the same time minimizing potential adverse effects can be achieved either by an entirely market-driven approach, or through a regulatory approach and public policies. In practice, a mix of the market-driven and regulatory approach can be found.

### D.2.1. A smart mix of voluntary industry and regulatory approaches

Market-driven sustainability initiatives respond to increasing consumer demand for socially equitable and environmentally sustainable coffee. Corporate responsible sourcing programmes are integral parts of C-GVCs and demonstrate that sustainability considerations are integrated into a company's business and management systems. Voluntary Sustainability Standards (VSS) are the "principal approach used by companies to implement sustainable practices on coffee farms". In addition, corporate producer support, community development and landscape management approaches are increasingly widespread (ICO, 2019a). Annual sustainability investments in the sector are estimated at USD 350 million (Steemers, 2016) but fall significantly short of the required USD 10 billion (Sachs et al., 2019).

In addition, some producing countries have implemented policies and set up institutions in support of the coffee sector. The support ranges from investments or research and development to increase productivity and quality as well as resilience of coffee production to the introduction of exchanges to facilitate price discovery and trade or interventions in the market to guarantee minimum prices (ICO, 2019a). Together these public sector efforts attempt to enable farmers to not only integrate in C-GVCs by lowering existing barriers, but also increase the value that is retained by farmers and the domestic value chain through shifts in the power dynamics. For instance, mobilizing funds to support investments in specific attributes which increase the competitiveness of locally produced coffee products in high-value markets is another effective strategy.<sup>38</sup>

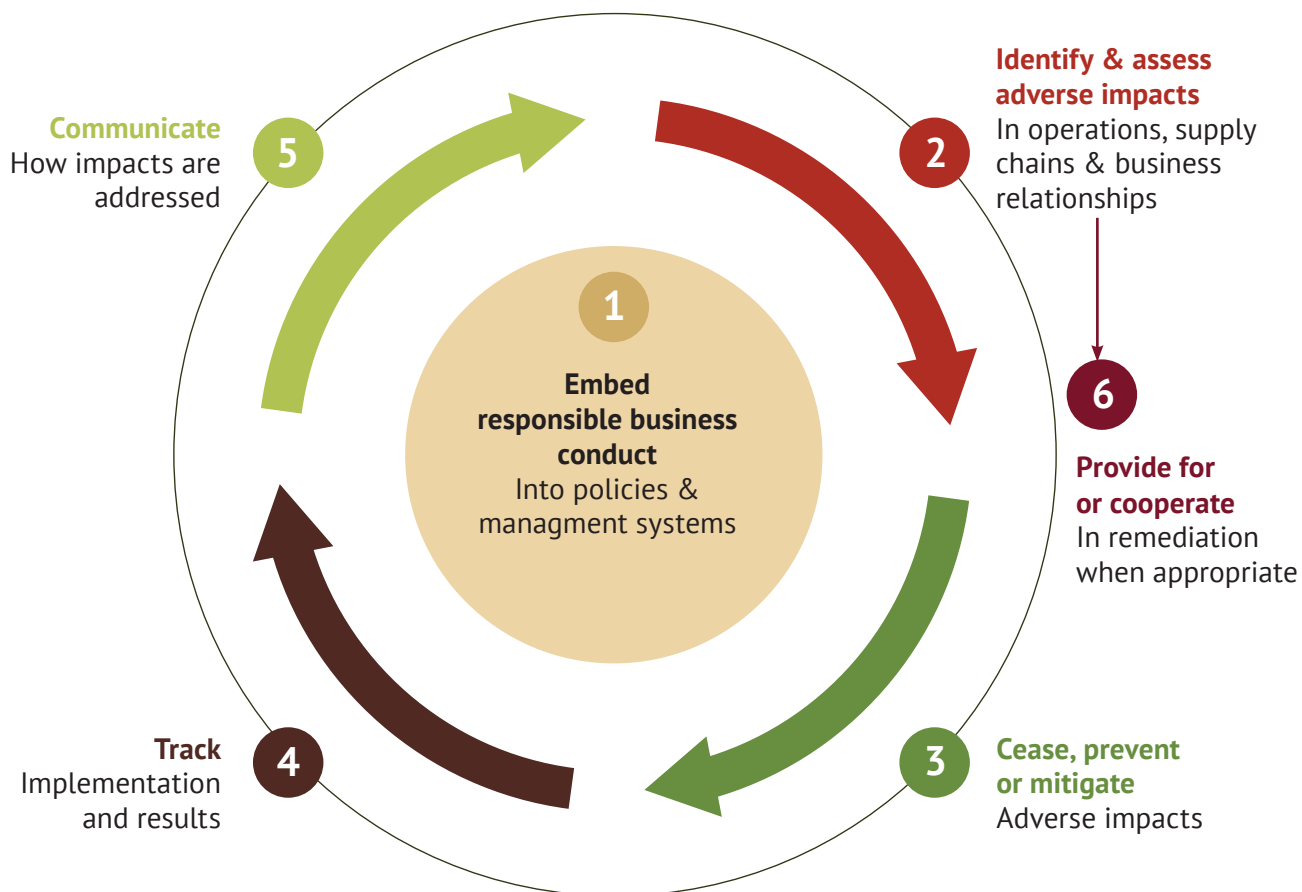
Strengthening institutions for tighter monitoring of production and processing activities and law enforcement at the local level are key policies to ensure sustainability.

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<sup>38</sup> Rwanda Coffee Farmers Federation (RCCF) has secured funds for adoption of internationally accepted coffee packaging bags which will ensure the supply of safe products to regional and international markets enabling Rwandan coffee to leverage coffee export on global markets.



**FIGURE D.2:** Due diligence process and supporting measures



SOURCE: OECD Due Diligence Guidance for Responsible Business Conduct, 2018

In producing countries, the regulatory approach entails laws and regulations that ensure the adoption and enforcement, for example, of labour and environmental standards. The national laws often comply with international standards, yet the weak enforcement of these laws results in non-compliance. Hence, strengthening institutions for tighter monitoring of production and processing activities and law enforcement at the local level is key to minimize potential adverse effects on the coffee value chain.

Consumers are increasingly concerned about the social and environmental footprint of GVCs (World Bank, 2019). Governments in consuming countries have started to take action to address gaps in statutory legislation and enforcement along international supply chains by introducing due diligence laws (Figure D.2). Due diligence laws hold the companies responsible for any human rights abuse and environmental damage across the whole supply chain.<sup>39</sup> Stricter regulations and due diligence contribute to the sustainability of coffee production and trade.<sup>40</sup>

Circular economy applications should be promoted to minimize the environmental footprint of the C-GVC.

In order to reduce the negative environmental effects of the GVC and build resilience against climate change, climate-smart and environmentally friendly production and consumption technologies should be adopted. At the production level there are a number of strategies to reduce the negative effect of the coffee sector on climate change. These strategies include (1) introducing trees in plantations, a system associated with lower carbon footprints than monocultures (2) optimizing fertilizer production and use, and (3) reducing emissions from fermentation and wastewater production. At the consumption level, efforts should be made and incentives should be given to encourage responsible consumption (e.g. reducing single-use plastics and packaging items). The circular economy applications (e.g. compostable or reusable coffee pods, and cups from used coffee grounds or coffee husks) should be promoted to minimize the environmental footprint of the C-GVC.

<sup>39</sup> Due diligence is a process through which firms can identify, prevent, mitigate and account for how they address their actual and potential negative effects as an integral part of business decision-making and risk management systems (OECD, 2018).

<sup>40</sup> Stricter regulations may also represent a barrier to entry to markets further marginalizing actors with limited resources. Such standards are costly to meet and thus costs should be shared by actors along the value chain including consumers.

## D.2.2. Multi-stakeholder governance initiatives

Since the 2000s, various multi-stakeholder governance initiatives have emerged in the coffee sector. These initiatives aim to improve the co-ordination of market-driven sustainability initiatives implemented by individual companies (often GVC lead firms), while engaging public sector bodies, civil society and research institutions in coffee-producing and -consuming countries. Two prominent initiatives with a large and diverse membership of industry and sector stakeholders are the Global Coffee Platform (GCP) and the Sustainable Coffee Challenge (SCC). In addition, in 2019 the ICO launched the Coffee Public-Private Task Force (CCPTF), an initiative that brings together C-GVC lead firms (traders, roasters), sector initiatives (GCP, SCC) and ICO Member states (see Box D.3). The CCPTF process provides a unique forum for key GVC actors and governments of producing and consuming countries to agree on common objectives for the global coffee sector (e.g., living income, SDGs) and a roadmap with concrete individual and joint actions and resource mobilization. The initiative is based on the principle of national sector schemes of importing countries in other commodities, such as cocoa (see Box D.4), taking it to a more complex international level through the integration of producing countries.

For a diverse group of stakeholders of the C-GVC that includes farmers, traders, roasters, governments of producing and consuming countries to negotiate a common vision for the sector that includes complex questions of distribution of GVC gains, it is crucial to have access to accurate and independent data and information. However, supply chains are typically opaque. Currently, transparency is low, since there is a lack of systematic data on supply chain practices, prices, costs and margins at different levels along the C-GVC. Hence, the functioning of price transmission mechanisms as well as the occurrence of market imperfections may remain undiscovered. Similarly, the lack of data in relation to the Living Income benchmarks and gaps for coffee-producing countries/regions is an obstacle in agreeing on sector-wide targets. However, both in the context of supply chain transparency and Living Income, much can be learned from existing initiatives in other sectors.

In order to respond to concerns about unfair trading practices and the efficient functioning of markets, various countries, regions (e.g., EU) and international organizations (e.g., OECD) have developed mechanisms to systematically collect and disseminate independent data on costs and margins in agricultural value chains. These mechanisms vary greatly in terms of the level of detail and frequency of data collection. A report commissioned by the Joint Research Centre (JRC) of the European Commission provides a comprehensive overview of different models in terms of costs and benefits (Balthussen et al. 2019). The French Observatory on Prices and Margin Formation of Food Products (OFPM, L'Observatoire de la Formation des Prix et des Marges des Produits Alimentaires) is characterized by the most comprehensive collection of data, covering different agricultural subsectors, such as meat and dairy.

### BOX D.3: ICO Coffee Public-Private Task Force Process

In September 2018, the International Coffee Council (ICC) adopted Resolution 465 on “coffee price levels”. This led to a Sector Dialogue organized by the ICO, engaging relevant sector stakeholders and the broader international community in a dialogue on coffee price levels. The process culminated in the development of a joint Declaration of Intent of stakeholders from both the private and public sector in the form of the “London Declaration” which was signed in September 2019 by 12 GVC lead firms (traders, roasters) and welcomed by the ICC, which also requested the ICO to set up a Coffee Public-Private Task Force (CPPTF).

In the months that followed, the ICO held a series of webinars in which the Coffee Public-Private Task Force (CPPTF) was formed, consisting of 16 private sector ‘sherpas’—representatives of the signatory companies—and 16 public sector representatives of ICO Member countries, both importing and exporting. The aim of the CPPTF and its related Technical Workstreams (TWs) is to implement ICC Resolution 465 and the London Declaration, thereby actively advancing the work of the Sector-wide Dialogue initiated and led by the International Coffee Organization (ICO). The objectives of the Task Force are to:

1. Drive the discussion on a joint long-term vision beyond 2020 for the sector in order to achieve transformational solutions towards a sustainable, inclusive and resilient C-GVC.
2. Build consensus among public and private sector coffee stakeholders on a roadmap for the implementation of the commitments and concrete actions contained in the London Declaration and in line with the International Coffee Agreement [2007] to achieve the long-term vision.
3. Define new joint concrete, practical, actions that build on local initiatives, and resource allocation; and monitor and report on progress and measure impact.

The ultimate objective of the Task Force is to build consensus on priority issues and actions to be submitted for consideration to the International Coffee Council (ICC) and the CEO and Global Leader Forum (CGLF).

The observatory has a strong integration into sectoral and political processes. The annual report is discussed and approved by a roundtable of sector stakeholders (farmers and agri-processors) before submission to the French parliament.

Meanwhile, for the coffee and cocoa global value chains, pilot studies have been carried out that aim at both assessing the social and environmental impacts of coffee production and the distribution of value from coffee farmers to the end consumers (see Box D.4). Value chain

## BOX D.4: Summary of cocoa and coffee studies / BASIC

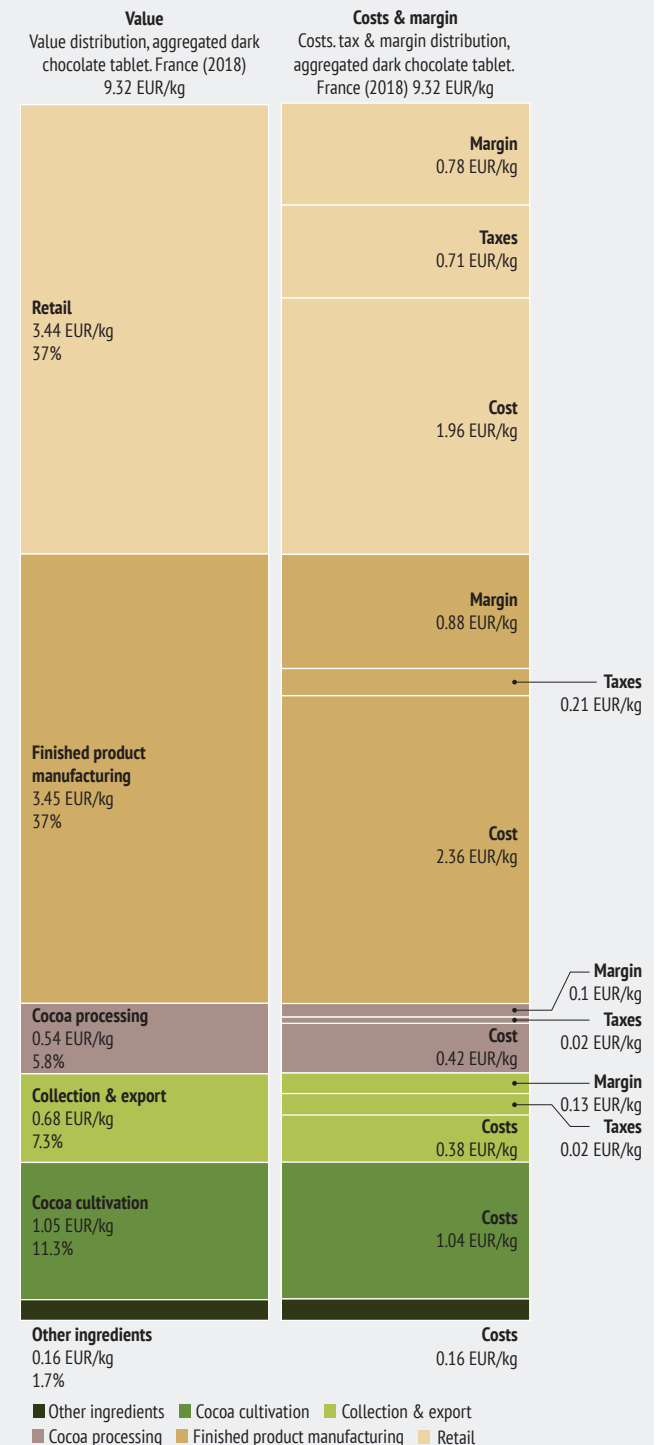
In 2018, BASIC conducted a study on value distribution in the coffee sector, focusing on Colombia, Peru and Ethiopia for the three countries of origin, and France as an end-market. The study aimed at both assessing the social and environmental impacts of coffee production and the distribution of value from coffee farmers to the end consumers. One of its key results is the diverging trend over the past 20 years between the stagnation of the value generated in producer countries and the increase of the value created in consumer countries, in large part explained by new trends in consumption (e.g., capsules, pods) and the increasing influence of intangible dimensions in the market (e.g., brand reputation). Building on the innovative methodologies developed for this research on value distribution in the coffee sector, BASIC has conducted an in-depth analysis of the cocoa-chocolate value chains on behalf of the FAO, the European Commission (DG DEVCO) and the European Cocoa Association (ECA).

Going beyond the study on the coffee sector, this new research has enabled (i) the preparation of detailed estimates of the distribution of prices, costs and margins at each stage of the cocoa-chocolate value chains and (ii) identification of the main upstream and downstream drivers explaining discrepancies in this distribution between products and/or origins.

Similarly to coffee, the study demonstrated that differentiation in value creation and cost takes place mainly in the two last stages of the chain (chocolate brands and retailers). Major factors linked to this downstream differentiation are brand reputation and market segmentation, as well as other less tangible consumer product attributes.

In addition to the associated report, this research has enabled BASIC to develop a tool called the “Cocoa Value Chain Calculator”, which will be disseminated among cocoa stakeholders, both public and private. This tool will enable them to visualize easily the distribution of value, costs, tax and margins along the cocoa-chocolate chains, make customized estimates and build simulations taking into account a living income for cocoa farmers or the price transmission to consumers.

FIGURE D.3: Distribution of value, costs and margins of plain dark chocolate tablets in 2018



SOURCE: FAO & BASIC (2020)

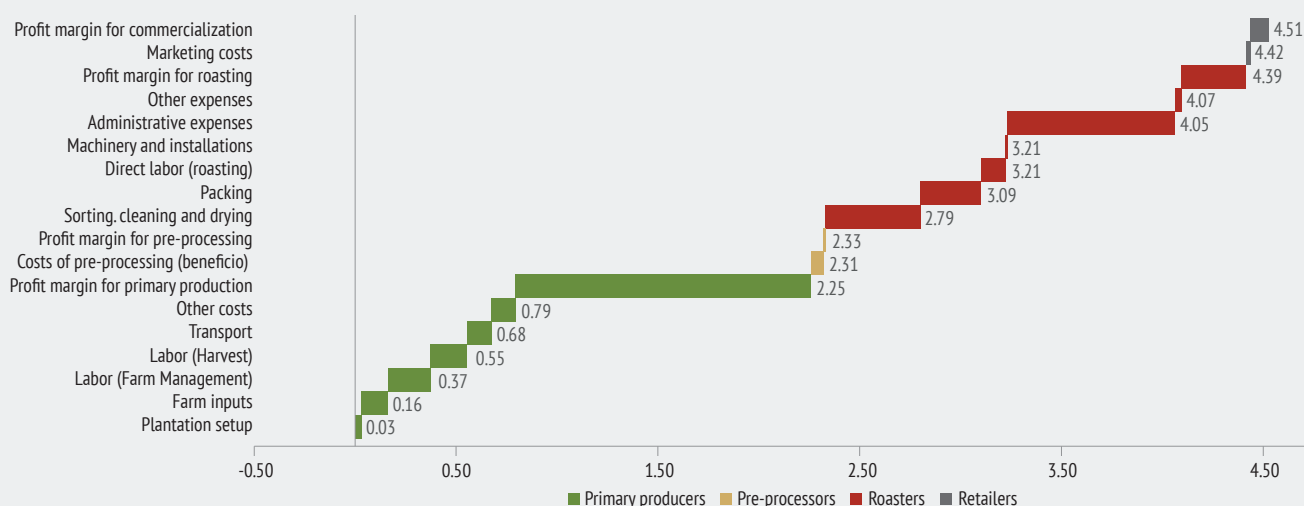
### BOX D.5: Value chain analysis for decision support in the coffee value chain

Value chain analysis can be a powerful tool for improving decision making at the farm and firm level as well as for designing sectoral development policies. Value chain analysis becomes more powerful when it uses not just a description of qualitative aspects in the value chain but also quantitative data on prices, costs per unit and profit margins. For that purpose, the United Nations Industrial Development Organization (UNIDO) has developed a tool for quantitative value chain analysis standardizing the input of quantitative data on production, the calculation of cost indicators and the computation of visual outputs that show the progressive aggregation of costs and profit margins up to the final value of the product; in other words, the tool shows how value is added along the chain. UNIDO's chain analysis tool (CAT) can display the value addition for either the entire production chain or for specific segments of the chain. Analysts can also apply a range of criteria that reflect different time periods, country or region, type of companies, type of technology, etc. allowing for comparisons.

Depending on the aim of the analysis, the input data would usually reflect real values collected from firms along the value chain, but can also represent theoretical scenarios, future projections, best practices or targets. For the coffee value chain, the tool would require the collection of data at the level of primary production, processing (pulping and removal of mucilage and parchment), roasting and packaging as well as commercialization via wholesaling and retailing.

Figure D.4 illustrates the typical output of the CAT for the coffee value chain in Venezuela. The bar charts show the average cost and profit margin contributions along the value chain, as collected from interviews with coffee value chain actors (green=primary producers, yellow=pre-processors, red=roasters, grey=retailers) in September 2020. Roasted coffee ready for consumption was sold to consumers at 4.51 USD/kg, much higher than in 2019 when consumer prices in Venezuela were at 2.81 USD/kg on average. The high price reflects the latest price increase in the international commodity exchanges for Arabica coffee, but also some structural issues in the Venezuelan coffee sector, such as a low harvest and parts of national production being sold to neighbouring countries. A higher selling price is also reflected in the relatively (in comparison to total value per kg) high profit margins for primary production (1.46 USD/kg), roasting (0.32 USD/kg) and commercialization 0.09 (USD/kg). Important cost elements lie in the administrative costs and drying and sorting (for the part of roasting) and in the labour costs (for the part of primary production). The costs of farm inputs are rather low, reflecting in part the substantial under-funding in the Venezuelan coffee plantations resulting in low yields and low profit per hectare of plantation. Note that the aim of the figure below is mainly to demonstrate the tool output. The prices used in the analysis reflects the recent liberalization policy in the country. Venezuela is thus a very particular case and currently not comparable to other countries. Margins are expected to change rapidly as the coffee economy adjusts to the new system.

FIGURE D.4: Action costs and profit margins in the Venezuelan Coffee Value Chain for the year 2020



SOURCE: UNIDO project data

The above constitutes only one way of using the CAT. Each farm decision and policy action that leads to a change in application of inputs, improved management, technological innovation, changes in market conditions and policy frameworks can be reflected in the CAT, illustrating changes in chain actors' average costs and profit margins. Knowing the scope of operation of actors one can predict changes in overall profits and, in comparison with other business opportunities, one can also make assumptions about changes in next year's production. As such, the CAT constitutes a comprehensive management and policy analysis tool with many prospects for application in coffee value chains around the world.

analysis can be a powerful tool for improving decision making and designing sectoral development policies. The United Nations Industrial Development Organization (UNIDO) has developed a tool for quantitative value chain analysis that standardises the input of quantitative data on production, the calculation of cost indicators and the computation of visual outputs that show the progressive aggregation of costs and profit margins up to the final value of the product; in other words, the tool shows how value is added along the chain (see Box D.5). Such efforts could be a first step on the way to a systematic and independent data collection and analysis in order to inform value chain actors and provide reliable information for discussion in multi-stakeholder governance initiatives, such as the ICO Coffee Public-Private Task Force process.

With regard to Living Income benchmarks and gaps, the existing work of the Living Income Community of Practice (LICOP) in a variety of sectors, including tea, cocoa and coffee, as well as more recently the IDH Task Force for Living Income, provide a rich resource that can be further extended if industry and the public sector provide necessary resources and support.

Multi-stakeholder governance initiatives aim to improve the co-ordination of market-driven sustainability initiatives implemented by individual companies while engaging public sector bodies, civil society and research institutions.





# PART III

## SECTION E

### Market overview 2019/20: A year of unprecedented challenges

#### Key findings

- **Coffee year 2019/20 is a year of unprecedented challenges.** Global coffee prices have trended downwards since November 2016 when the ICO composite indicator averaged 145.82 US cents/lb. The covid-19 pandemic presented an unprecedented joint supply and demand shock to the global coffee sector. Global output in 2019/20 is estimated at 169.34 million bags, 2.2% lower than in 2018/19.
- **Covid-19 has affected labour supply in a number of countries,** either directly, due to illness, or indirectly, as government measures have restricted the movement of farm labourers and migrant workers. However, much of the supply for coffee year 2019/20 was unaffected by covid-19 as harvesting in most countries had already concluded by the time the pandemic occurred.
- **Global coffee consumption is estimated to rise by 0.3% to 168.39 million bags in 2019/20.** There was a surge in demand at the start of the pandemic as a result of panic-buying and stockpiling. However, consumption in the remaining months of the coffee year is estimated downwards due to ongoing pressure from a global economic downturn and limited recovery in out-of-home consumption as countrywide social distancing measures remain in place.
- **Regional highlights in coffee year 2019/20 are as follows: Africa's exports have risen.** Despite the growth of coffee production in the region, exports from Asia and Oceania declined. After three years of growth, Mexico and Central American coffee production fell. South America's Arabica production has gone down while Robusta production has increased. Demand for coffee in Europe and North America has fallen after significant growth in the previous year.

Coffee year 2019/20 has been a challenging year for the world coffee sector. Global coffee prices have trended downwards since November 2016 when the ICO composite indicator averaged 145.82 US cents/lb. Further, covid-19, which was declared a global pandemic on 11 March 2020 by the World Health Organization<sup>43</sup>, presented an unprecedented joint supply and demand shock to the global coffee sector.<sup>44</sup>

Much of the supply for coffee year 2019/20 was unaffected by covid-19, since harvesting in most countries had already concluded by the time the pandemic occurred. Global output in 2019/20 is estimated at 169.34 million bags, 2.2% lower than in 2018/19. Arabica output is estimated to decrease by 5% to 95.99 million bags while Robusta output is expected to rise by 1.9% to 73.36 million bags. Covid-19 has affected labour supply in a number of countries, either directly due to illness or indirectly as government measures have restricted the movement of farm labourers and migrant workers. The impact of limited supply, however, is more likely to affect the 2020/21 harvest, particularly if there is a resurgence of the pandemic in the Autumn. Yields may also be impacted since labour is used not just in harvesting, but also for maintenance of trees during the growing season.

In 2019/20, global coffee consumption is estimated to fall by 0.9% to 167.59 million bags. At the start of 2019/20, global demand for coffee was strong following an increase of 5% in 2018/19 to 167.84 million bags, above the long-term average of 2.1%. There was also a surge in demand at the start of the pandemic as a result of panic-buying and stockpiling. However, consumption in the remaining months of the coffee year is estimated downwards due to ongoing pressure from a global economic downturn and limited recovery in out-of-home consumption as countrywide social distancing measures remain in place.

This section provides an overview of the coffee market in coffee year 2019/20. The first part looks at the movement in the international coffee price, as well as trends among the group indicators and volatility. The second part looks at regional production, consumption, and trade and the climatic and socio-political context affecting each region.

<sup>43</sup> See <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020>.

<sup>44</sup> See <http://www.ico.org/documents/cy2019-20/coffee-break-series-2e.pdf> for a more detailed analysis.

**FIGURE E.1:** ICO composite indicator daily prices



SOURCE: ICO

**FIGURE E.2:** ICO group indicator daily prices



SOURCE: ICO

The ICO composite indicator for coffee year 2019/20 averaged 107.18 US cents/lb, which compares to 100.57 US cents/lb for the coffee year 2018/19 and 111.54 US cents/lb in 2017/18.

## E.1 International prices 2019/20

### E.1.1. Prices remain low despite some rallies throughout the season

International coffee prices refer to the ICO composite indicator (see Box E.1). In coffee year 2019/20, prices started the year below 100 US cents/lb, reaching a season low of 93.63 US cents/lb on 17 October 2019. The ICO composite indicator averaged 97.35 US cents/lb in October 2019 before rising to 107.23 US cents/lb in November 2019. Prices continued to climb on signals of strong demand, lower inventories of certified stocks and tightening supplies, averaging 117.37 US cents/lb in December 2019, which was the highest monthly average since October 2017.

In January 2020, the ICO composite indicator reversed its gains over the previous two months, averaging 106.89 US cents/lb due to a rise in certified stocks as well as the upcoming harvest for Brazil's on-year 2020/21 crop. International prices fell again in February 2020 to an average of 102 US cents/lb before rising to an average of 109.05 in March 2020 due to concerns about the immediate availability of washed Arabica as well as disruptions to the supply chain, given that March is usually a month of lower stock on-hand in countries with crop years commencing in April (Figure E.1).

However, the composite indicator declined over the next three months from 108.91 US cents/lb in April 2020 to 99.05 US cents/lb in June 2020. In the first half of July, prices hovered around 100 cents/lb, ranging between 98.59 US cents/lb and 102.73 US cents/lb. In the second half of July, daily prices rose considerably, bringing the monthly average to 103.66 US cents/lb. In August, the daily composite indicator continued to climb, averaging 114.78 US cents. The daily composite indicator started on a high note in September, but began to fall in the middle of the month, averaging 116.25 US cents/lb.

The ICO composite indicator for coffee year 2019/20 averaged 107.18 US cents/lb, which compares to 100.57 US cents/lb for the coffee year 2018/19 and 111.54 US cents/lb in 2017/18.

### E.1.2. Diverging trends among the group indicators

Prices for all group indicators, except Colombian Milds, fell in October 2019 compared to the previous month. In November, all group indicators rose, with the largest increase for Brazilian Naturals, which grew by 12.1%, to 109.94 US cents/lb, reflecting in part the smaller harvest due to the biennial decline in Brazil's Arabica production as well as the weakness of the Brazilian currency. In December 2019, the Arabica group indicators increased further, but Robusta prices fell by 0.1% to 73.22 US cents/lb in anticipation of large Robusta crops from Viet Nam and Indonesia.

All group indicators fell in the first two months of 2020, reversing the gains made at the end of 2019. Then, in March

## The prices for Colombian Milds, Other Milds, and Brazilian Naturals rose in coffee year 2019/20 whereas Robusta prices fell compared to in 2018/19.

2020, prices for all Arabica group indicators rose, while Robusta prices fell by 0.9% to 67.46 US cents/lb. Arabica group indicators remained firm due to uncertainty about the immediate availability of washed Arabica as the World Health Organization declared covid-19 a global pandemic in mid-March while at the same time inventories were running seasonally low. In April 2020, prices for Colombian Milds and Other Milds grew, but prices for Brazilian Naturals and Robusta fell. Ongoing uncertainty about the supply of washed Arabica coupled with a surge in demand stemming from panic buying due to covid-19 helped to drive up prices for Mild Arabicas in April 2020 (Figure E.2).

In May 2020, all Arabica group indicators declined due to growing concern over whether demand could be sustained while prospects for the global economy became gloomier. However, Robusta prices rose after 5 months of decline, in part boosted by demand for cheaper coffee. The same trend occurred in June 2020, but in July all group indicators increased. This trend continued in August as certified stocks on the futures markets reached their lowest volumes in 3.5 years for Arabica stocks and 22 months for Robusta stocks. The prices for all group indicators rose in September for the third consecutive month, though at a much slower rate compared to August.

In 2019/20, Colombian Milds averaged 153.72 US cents/lb, 17.3% higher than in 2018/19 while Other Milds averaged 147.73 US cents/lb, 14.7% higher. During the coffee year, the differential between Colombian Milds and Other Milds ranged between 0.03 US cents/lb and 14.36 US cents/lb. Prices for Brazilian Naturals rose by 5.9% to 107.36 US cents/lb in coffee year 2019/20 compared to in 2018/19, when they averaged 101.38 US cents/lb. In contrast to the Arabica indicators, Robusta prices fell by 9.6% to an average of 68.93 US cents/lb compared to 76.20 US cents/lb in 2018/19.

### E.1.3. Price volatility in spot and futures coffee markets

Over the past coffee year, coffee prices experienced several spikes and high volatility (variability). The ICO composite indicator ranged between 93.60 and 124.49 US cents/lb on a day-to-day basis and the futures price of Arabica ranged between 92.90 and 139.97 US cents/lb, both reaching their lowest level on 17 October 2019. The ICO composite indicator reached its highest level on 7 September 2020 while Arabica futures prices reached it on 16 December 2019. The standard deviation of the composite indicator, which captures the spread of these daily spot prices around the annual average price, was 7.2 US cents/lb (versus 5.9 US cents/lb in the previous coffee year), while the standard deviation of futures prices was 11 US cents/lb (versus 7.8 cents/lb in the previous coffee year).

### BOX E.1: The ICO composite indicator

The ICO composite indicator price is calculated based on the market share of exports of each group of coffee, that is Colombian Milds, Other Milds, Brazilian Naturals and Robusta. The procedures for the collection, transmission, calculation and publication of group and composite prices are described in document ICC-105-17. The growths included in each group indicator are presented below:

Group Indicator	Growths
Colombian Milds	Colombian Excelso European preparation screen size 15
	Colombian Excelso UGQ screen size 14
Other Milds	Costa Rica Hard Bean
	El Salvador Strictly High Grown
	Guatemala Hard Bean
	Guatemala Prime Washed
	Honduras High Grown
	Honduras High Grown European Preparation
	Mexico Prime Washed
Brazilian Naturals	Brasil Santos 3/4 screen size 14/16
	Brazilian Santos 2/3 screen size 17/18
Robusta	Côte d'Ivoire Grade 2
	Indonesia EK Grade 4
	Uganda Standard
	Viet Nam Grade 2

Every two years, in accordance with the Rules on Statistics – Indicator prices, contained in document ICC-105-17, the market share in each group and their weightings for the calculation of the ICO composite and group indicator prices are reviewed.

The current shares of the markets in each group of coffee and their weightings for the calculation of group and composite indicator prices are contained in document ICC-105-17 Add. 4. The table below shows the share of each group indicator in the composite indicator price.

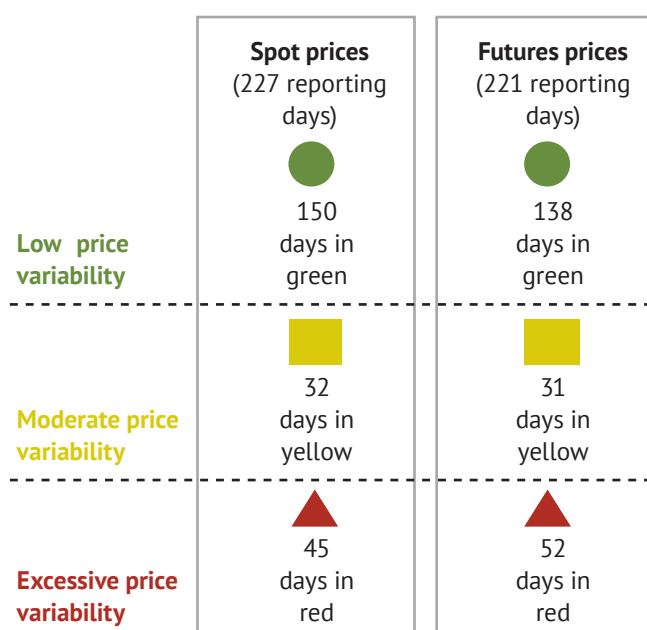
Group Indicator	Share
Colombian Milds	12%
Other Milds	21%
Brazilian Naturals	30%
Robusta	37%

SOURCE: ICO

The high fluctuations in daily coffee prices were flagged on the **Excessive Food Price Variability Early Warning System**, maintained by IFPRI's Food Security Portal, which identifies periods of unusual price volatility (i.e., price variability that exceeds a pre-established estimated band). Between 1 October 2019 and 14 August 2020, spot (ICO Composite) prices<sup>45</sup> reported 48 days of moderate variability and 45 days of excessive variability over a total of 260 reporting days (Box E.2). Futures coffee (Arabica) prices reported 37 and 79 days of moderate and excessive variability, respectively, over a total of 254 reporting days (Figure E.3).

These considerable shifts in prices (mainly driven by Arabica coffee as opposed to Robusta) are also evident in Figure E.4, which plots day-to-day percentage variations of the corresponding spot and futures prices. As depicted by the vertical red lines, which identify periods of moderate or excessive price volatility, the 2019-20 coffee year was more volatile than previous crop years. Three specific periods of unusual variability were December 2019-January 2020, March-May 2020, and August-September 2020. As discussed in the ICO Coffee Break Series N.2 Volatile Coffee Prices: Covid-19 and Market Fundamentals, poor harvest prospects in some producing countries, strong demand and declining global inventories were the main factors that explained price spikes during late 2019/early 2020. The rapid spread of covid-19 exacerbated price fluctuations between March-May 2020 due to disruptions downstream in the value chain and increased global market uncertainties. In contrast to world market prices of major staple foods, the first months of the covid-19 pandemic contributed to a higher volatility in coffee prices, which eventually lessened until mid-August and September 2020 when prices spiked again due to supply tightness in some Arabica varieties.

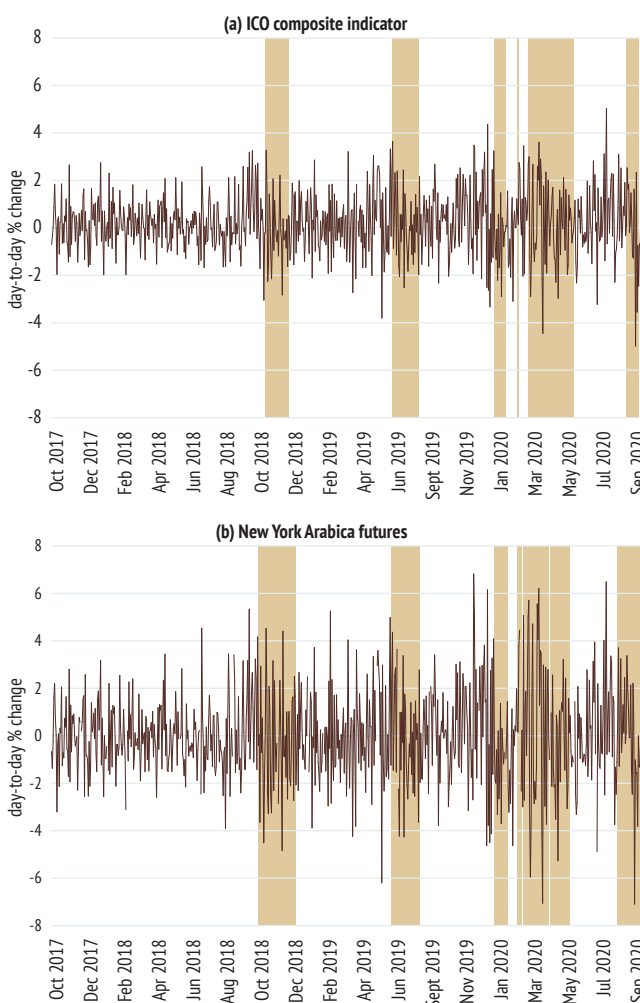
**FIGURE E.3:** Spot and futures daily coffee price variability (1 October 2019 – 30 September 2020)



NOTE: The spot price is the ICO Composite Indicator and the futures price is the New York Arabica price. Source: Excessive Food Price Variability Early Warning System.

<sup>45</sup> The ICO composite indicator is based on prices for prompt shipment, that is, shipment within 30 calendar days from the date of contract.

**FIGURE E.4:** Day-to-day percentage variations in daily spot and futures prices (1 October 2017 – 30 September 2020)



NOTE: The vertical pink lines identify periods of moderate or excessive price volatility according to the Excessive Food Price Variability Early Warning System. SOURCE: ICO, Bloomberg.

The rapid spread of covid-19 exacerbated price fluctuations between March - May 2020 due to disruptions downstream in the value chain.

**BOX E.2: About the Excessive Food Price Variability Early Warning System**

This tool was developed and is maintained by IFPRI's Food Security Portal (FSP). It identifies periods of abnormal price volatility (i.e., price variability that exceeds a pre-established threshold estimated using advanced statistical methods) and monitors a wide set of world commodity markets, including coffee. It is updated on a daily basis modelling day-to-day price fluctuations and uses a traffic light system alerting to the number of days of excessive, moderate or low price variability. For more details, visit <http://www.foodsecurityportal.org>.



## E.2. Regional Supply and Demand in 2019/20

### E.2.1. Africa's exports rise

African coffee production peaked at 21.55 million bags in 1980/81, and averaged 19.69 million bags over the rest of the decade before falling to 16.43 million bags in 1990/91 just after the end of the quota system when several national coffee markets were liberalised. Regional output continued to drop, averaging 16.06 million bags during the 1990s. Many farmers turned to other more remunerative crops, particularly during periods of low prices, and regional output reached a low of 13.91 million bags in 2005/06. Since then, several governments have strengthened national policies to provide support to their coffee sectors. The measures taken include guaranteeing a minimum price, increasing agricultural extension services, or providing inputs, particularly for rehabilitating trees. Regional production grew at an average annual rate of 2% in the last ten years but is estimated to decline by 0.2% to 18.83 million bags in 2019/20. Swarms of locusts, particularly in East Africa,<sup>46</sup> which first appeared in early 2020, pose a threat not just to coffee crops next year but also food security, leaving coffee farmers particularly vulnerable while coffee prices remain low. Affected countries have implemented control measures to mitigate the impact, but another outbreak in the autumn remains a concern.<sup>47</sup>

Since 1990/91, regional consumption has grown at an average annual rate of 3.2% from 4.9 million bags in 1990/91 to an estimated 11.67 million bags in 2019/20. Africa's consumption accounted for 7% of global consumption in 2019/20, which is 1.6 percentage points higher than its share in 1990/91. The five largest consuming countries in the region are Ethiopia, Algeria, Morocco, South Africa and Egypt and account for nearly 70% of regional consumption.

As consumption remains relatively low compared to other regions, much of the coffee produced in Africa is exported. Exports from the region in the first ten months of the coffee year reached 11.65 million bags, 5.1% higher than the same period in 2018/19. Trading under the African Continental Free Trade Agreement (AfCFTA) was to begin on 1 July 2020, but covid-19 delayed this deadline to January 2021. AfCFTA was established to create a single continental market for goods and services as well as a customs union with free movement of capital and business travellers. AfCFTA

**African Continental Free Trade Agreement (AfCFTA), established to create a single continental market for goods and services, is expected to further boost trade between the African countries that have ratified this agreement.**

is expected to further boost trade between the African countries that have ratified this agreement.<sup>48</sup>

Ethiopia is the region's largest consumer and producer. After a decrease of 19% to 5.56 million bags in 2010/11, production in Ethiopia has grown steadily and is estimated to increase by 2.1% to 7.7 million bags in 2019/20, due to beneficial weather and adequate rain. Around half of Ethiopia's production is consumed internally and local consumption is estimated to rise by 0.4% to 3.73 million bags in 2019/20. Ethiopia is the second largest exporter in the region and its shipments are primarily green coffee. However, in 2019, the country enacted a new marketing and export policy to allow direct exports by smallholders and encourage vertical integration to improve traceability. Exports from October 2019 to July 2020 reached 3.42 million bags, 14% higher than in 2018/19. Ethiopia's main export destinations are Germany, Saudi Arabia, Japan, the USA and Belgium.

Uganda is the second largest producer and largest exporter in Africa. After declining by 7.4% to 4.6 million bags in 2017/18, Uganda's production grew by 2.3% to 4.7 million bags in 2018/19 and is estimated to increase by 4.2% to 4.9 million bags in 2019/20 due to good weather and higher yields from new trees coming into production. As around 5% of its harvest is consumed domestically, Uganda exports almost all of its coffee.

In 2019/20, total shipments are projected to reach 5.2 million bags. Uganda's exports consist of green Arabica and Robusta. Uganda's share of Arabica shipments has grown over time from 5% in 1986/87 to a high of 26% in 2017/18. Arabica's share of total exports in 2019/20 is estimated to decrease to 20% as result of a larger Robusta harvest. The main destinations in 2019/20 were Italy, Sudan, Germany, India and Spain, which accounted for around 75% of total exports. In August 2020, the Parliament of Uganda passed the 2018 National Coffee Bill, which replaces the Uganda Coffee Authority Act, Cap. 325 enacted in 1991. Provisions of the bill include regulation for the entire national coffee value chain rather than just off-farm activities, requiring the Uganda Coffee Development Authority to establish a voluntary coffee auction system, establishing the UCDA as responsible for coffee extension services, and allowing for UCDA to register and promote stakeholders across the national coffee value chain into a national registry.<sup>49</sup>

During the quota period, annual production in Côte d'Ivoire averaged 3.76 million bags. Output fell to an average of 3.45 million bags in the 1990s and then declined significantly to an annual average of 2.2 million bags following civil wars in the early 2000s and 2010/11 as well as the international coffee price crisis. After falling to 837,000 bags in 2010/11, coffee production has grown by an annual average of 8.4% to 1.47 million bags in 2017/18. Output increased by 66.2% in 2018/19, reaching 2.45 million bags, but is expected to decline by 10.2% to 2.2 million bags in 2019/20.

<sup>46</sup> See <https://www.fitchratings.com/research/sovereigns/locusts-create-additional-downside-risk-for-east-african-sovereigns-11-06-2020>.

<sup>47</sup> See <http://www.fao.org/ag/locusts/common/ecg/562/en/DL503e.pdf>

<sup>48</sup> See <https://www.un.org/africarenewal/magazine/august-2020/arz/afcfta-secretariat-commissioned-accra-free-trade-set-begin-january-2021>.

<sup>49</sup> See [https://ugandacoffee.go.ug/sites/default/files/Resource\\_center/National%20Coffee%20Bill%202018.pdf](https://ugandacoffee.go.ug/sites/default/files/Resource_center/National%20Coffee%20Bill%202018.pdf) and <https://dailycoffeenews.com/2020/08/10/ugandan-parliament-approves-coffee-regulations-that-reach-farm-level/>.

As consumption in Côte d'Ivoire is negligible, almost the entire harvest is exported. In 2019/20, exports are estimated to decline by around 11% to 1.8 million bags because of lower output. The main destinations in 2019/20 were Algeria, Spain, India and Senegal, which account for nearly 75% of shipments. Around 18% of its exports are soluble coffee, and Côte d'Ivoire accounts for 96% of all soluble exports from Africa.

Tanzania is the region's fourth largest producer and exporter. Its output has grown from an average of 724,000 bags in the late 1960s to 856,000 bags in the 1970s to a high of 1.19 million bags in 2008/09. Since then, its production has alternated between years of growth and loss, ranging between 641,000 bags in 2011/12 and 1.18 million bags in 2018/19. Tanzania is expected to harvest 875,000 bags in 2019/20, 25.5% lower than the year before due, in part, to the effects of ongoing low prices that have led farmers to use fewer inputs or abandon coffee growing. Tanzania consumes around 90,000 bags a year, which is around 10% of its production.

In the first ten months of 2019/20, Tanzania's coffee shipments declined by 23.7% to 826,000 bags, due largely to lower output this season. The majority of its exports consist of green coffee, of which 65% is Arabica and 35% is Robusta. However, Tanzania also exports soluble coffee, which accounts for around 1% of all shipments. The main destinations for its coffee are Japan, Germany, Italy, Belgium and the USA. In 2018, the government of Tanzania issued new procedures for the production and sale of coffee, according to which all coffee was required to be sold at a central auction that is owned and managed by the Tanzania Coffee Board, and all smallholder farmers were organized into cooperatives. In 2019, new auction sites were opened in additional designated zones closer to where coffee is harvested to reduce the time in transit, provide payment to farmers sooner and lower financing costs. Additionally, farmers could make direct export sales if the buyer purchases coffee at a price higher than the auction price.

**In 2018, the government of Tanzania issued new procedures for the production and sale of coffee, according to which all coffee was required to be sold at a central auction that is owned and managed by the Tanzania Coffee Board, and all smallholder farmers were organized into cooperatives.**

Algeria is the region's second largest consumer, and in 2019/20, demand is estimated at 2.15 million bags, 2% lower than in 2018/19. Low prices in recent years have boosted consumption in Algeria, which does not produce coffee and relies on imports to meet demand. Viet Nam has become the largest source for its imports in recent years, surpassing Côte d'Ivoire in 2013/14 and accounting for around 60% of the total. Côte d'Ivoire is the second largest source, representing around 23% of imports, followed by Uganda and Indonesia.

Morocco is the region's third largest consumer and relies on imports. After declining by 10.4% in 2013/14, consumption increased at an average annual rate of 6.2% in each of the following 5 years. In 2019/20, demand is estimated to decrease by 1.1% to 747,000 bags. Uganda was the most significant source of coffee, representing 22% of total imports by Morocco. Uganda is followed by Indonesia (20%), Viet Nam (18%), Togo (8%), and Guinea (8%).

## **E.2.2. Production from Asia and Oceania grows while exports fall**

Production in Asia and Oceania has grown at an average annual rate of 4.9%, from 14.59 in 1990/91 to 49.81 million bags in 2018/19. Much of this growth occurred in Viet Nam, which is now the largest producer in Asia and Oceania. In 2019/20, regional output is estimated at 50.92 million bags, 2.2% higher than a year ago. A number of the region's producers grow both Arabica and Robusta coffee. Regional Arabica production accounts for 7% of the world's Arabica output, while Robusta represents 64% of global production. Exports from the region in the first ten months of the coffee year reached 34.1 million bags, 4.2% lower than the same period in 2018/19.

Coffee consumption in Asia and Oceania represented 22.1% of world consumption in 2019/20, which has increased from 13.4% in 1990/91. This growth has primarily come from newer markets as Japan's share has declined during this period. Since a fall in 2002/03, regional consumption has grown at an average annual rate of 5% from 17.1 million bags in 2002/03 to an estimated 37.07 million bags in 2019/20. Japan is the region's largest consumer followed by Indonesia, the Philippines, Viet Nam and South Korea.

After three years of decline, production in Indonesia is estimated to rise by 16.4% to an estimated 11.2 million bags in 2019/20 due to beneficial weather. Indonesia produces both Arabica and Robusta coffee, and the share of Arabica has increased from around 10% in the early 2000s to 21% in 2019/20. In the last five years, around 43% of Indonesia's crop was consumed internally, which is up from 20% in the first half of the 1990s. However, domestic consumption is likely to decline by 1% to 4.75 million bags in 2019/20, as growth in the early part of the year is offset by a loss in demand due to covid-19.

Exports from Indonesia in the first ten months of the coffee year increased by 29.4% to 5.3 million bags, largely due to the larger crop this year. Indonesia ships green, roasted, and soluble coffee, whose shares of exports are 87%, 1%, and

12%, respectively. The USA was the largest destination for green exports followed by Italy, Egypt, Malaysia and Japan. Malaysia, Spain and India were the main destinations for roasted coffee while the Philippines, Malaysia and the United Arab Emirates were for soluble coffee.

Indonesia also regularly imports coffee, averaging around 1.1 million bags a year in the last five years. Around 53% of its imports are soluble coffee with Brazil, Malaysia, India, Viet Nam and China as the main origins. Green coffee imports account for 45%, and Viet Nam, Brazil and Timor-Leste are the top 3 origins. Around 2% of imports are roasted coffee, the majority of which comes from Malaysia and the USA.

After reaching a record of 6.16 million bags in 2016/17, India's production fell by 5.6% to 5.8 million bags in 2017/18. The following year, output recovered by 3.3% to just over 6 million bags, but is forecast to decline by 2.5% to 5.85 million bags in 2019/20. India produces both Arabica and Robusta coffee, but the share of Arabica has declined from 52% in the late 1980s to 31% in the five most recent years. Since July 2018, the Coffee Board of India and Precision Agriculture for Development-India Foundation have run a mobile services project (Coffee Krishi Taranga) to provide agricultural extension service to farmers, which has 25,353 farmers registered through February 2020.<sup>50</sup> Around a quarter of India's production is consumed internally, estimated at 1.47 million bags in 2019/20, while the rest is exported.

In the first ten months of the coffee year, India shipped 4.49 million bags, 13.4% lower than the same period in 2018/19. Measures against covid-19, including a national lockdown, limited the availability of traders and workers, causing coffee to stockpile in warehouses.<sup>51</sup> India ships green and processed coffee. Out of total exports, the share of green coffee declined from 77% in the mid-2000s to 67% in the two most recent years. During the same period, the share of soluble coffee in total exports rose from 23% to 33%, while roasted coffee represented just 0.1% of total shipments. The main destinations for green shipments are Italy, Germany, Belgium, Jordan and Libya while for soluble they are the Russian Federation, Poland, Turkey, Malaysia and Indonesia.

India's imports grew from an annual average of 14,000 bags in the first half of the 1990s to 1.31 million bags in the last five years. The majority of its imports are green coffee, with Viet Nam, Kenya and Uganda as the major origins. Soluble coffee accounts for the remaining 5% of its imports, over half of which comes from Viet Nam.

Viet Nam's production grew at an average annual rate of 19.8% from 73,000 bags in 1980/81 to 31.5 million bags in 2019/20, but annual growth has only been 2% in the last five years. Viet Nam is predominantly a producer of Robusta coffee, but also started producing Arabica coffee around 2010, which now accounts for around 5% of total production. Domestic consumption in Viet Nam has grown from an average of 78,000 bags in the first half of the 1980s to an estimated 2.58 million bags in 2019/20.

Viet Nam's production grew at an average annual rate of 19.8% from 1980/81 to 2019/20, but annual growth has only been 2% in the last five years.

Viet Nam's exports have also grown along with its production, and in the first ten months of 2019/20, it shipped 23.24 million bags, 6.7% less than in the same period last year. While, the majority of its exports are green coffee, the volume of soluble coffee has grown from 1,000 bags in 1996/97 to 1.37 million bags in 2018/19. Germany, the USA, Italy, Spain and Japan account for 48% of Viet Nam's green exports while the Philippines, the Russian Federation, Japan, United Arab Emirates and Poland represent 63% of soluble shipment destinations. As discussed in further detail (see Box D.2), Viet Nam concluded a trade agreement with the EU on 30 June 2019, which entered into force on 1 August 2020 and includes reductions in tariffs for processed coffee. Currently, green shipments to the EU account for 46% of all exports of unprocessed coffee,<sup>52</sup> while soluble shipments to the EU account for 26% of Viet Nam's soluble exports.

Japan is the region's largest and world's fourth largest consumer. After reaching 7.91 million bags in 2016/17, Japan's consumption declined over the next two years, falling to 7.56 million bags in 2018/19, 2.4% lower than the previous year. In 2019/20, demand is estimated 1.1% lower at 7.48 million bags.

Japan is the world's third largest importer. After increasing by 11.1% to 8.16 million bags in 2018/19, Japan's imports in the first 8 months of coffee year 2019/20 reached 4.72 million bags, 12.2% lower than in the same period a year ago. Around 90% of Japan's imports are green coffee, the majority of which is sourced from Brazil, Viet Nam, Colombia, Ethiopia and Indonesia. Imports of roasted coffee represent 3%, with the USA, Switzerland and the UK as the main origins, while soluble accounts for 8% of total imports, with Brazil, Viet Nam and Colombia as the main origins.

The Republic of Korea is the world's 11<sup>th</sup> largest consumer. Demand for coffee has grown at an average annual rate of 4% from around 811,000 bags in 1990/91 to 2.48 million bags in 2018/19. Its consumption is estimated to increase by 0.7% to 2.49 million bags in 2019/20.

Imports by the Republic of Korea in calendar year 2019 increased by 8.1% to 3.133 million bags. Around 84% of its imports are green coffee and the main origins are Brazil, Viet Nam, Colombia, Ethiopia, and Honduras. Most of its imports of roasted coffee, which account for around 8% of all imports, originate from the USA, Italy, Switzerland, Japan and Malaysia. Soluble imports also account for around 8% of its volume, but are sourced from Brazil, Colombia, Germany, Viet Nam and Malaysia. The Republic of Korea has been a net exporter of soluble coffee since 2005 with China, the Russian Federation, Israel, Poland and Australia as the main destinations.

<sup>50</sup> See [https://www.indiacoffee.org/Publications/Jan-Feb%202020\\_final.pdf](https://www.indiacoffee.org/Publications/Jan-Feb%202020_final.pdf).

<sup>51</sup> See <http://www.fao.org/in-action/food-for-cities-programme/news/detail/en/c/1272232/>.

<sup>52</sup> See [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1412](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1412).



### E.2.3. After three years of growth, Mexico and Central American coffee production declines

Coffee is an important commodity for the economies of Mexico and Central America, accounting for a significant proportion of their rural employment and export earnings. Before the covid-19 pandemic broke, the region was still adapting to the impact of the fall in international prices, ongoing outbreaks from coffee leaf rust as well as a prolonged drought. Production in Mexico and Central America is expected to total 20.7 million bags at the end of coffee year 2019/20, which is 4.6% lower than the previous year. The region's four biggest producers (Honduras, Mexico, Guatemala, and Nicaragua) supply 97.3% of its total coffee output.

Shipments from Mexico and Central America represent approximately 13% of coffee exports from producing countries, with a regional total smaller only than that of Africa. It accounts for over 21% of the global Arabica supplies and is an especially important producer of high-quality Arabicas. Exports from the region in the first ten months of the coffee year reached 14.2 million bags, 9.3% lower than the same period in 2018/19. Consumption in the region is expected to fall by 0.1% to 5.43 million bags in coffee year 2019/20. With an average annual per capita coffee consumption of 1.4 kg, the region represents an important market with significant potential for demand growth.

Production in the region's biggest supplier of coffee, Honduras, dropped by an estimated 7.2% to 6.8 million bags in the 2019/20 harvest. Falling prices and climate change, as well as the impact of the drought and outbreak of coffee leaf rust, have led many producers to abandon their farms and migrate northwards in recent years. This has resulted in a reported 5.3% fall in the area under coffee production in Honduras in 2019/20.<sup>53</sup>

Only around 6% of Honduras' coffee crop is consumed internally, while the rest is exported. Alongside lower production, the volume of exports from Honduras has also decreased, falling to 5.2 million bags in the first ten months of coffee year 2019/20. This is 17.8% lower compared to the same period last year. Honduras exports solely green coffee and the main buyers are Germany, the USA, Belgium, Italy and France.

In order to improve productivity in the sector, as well as in response to the covid-19 pandemic, the Honduran government initiated the *Bono Cafetalero* programme, through which over 91,000 small and medium producers, representing 87% of all Honduran coffee producers, are being granted fertilizers.<sup>54</sup> This is expected to lead to improvements in productivity and in the incomes of coffee-producing households in 2020/21.

Production in Mexico fell by 5.8% to an estimated 4.1 million bags in 2019/20, comprising 3.9 million bags of Arabica and 200,000 bags of Robusta. The Secretariat of Agriculture and Rural Development of Mexico estimates that 500,000 growers and 3 million Mexicans depend on coffee for their livelihood, with over 92% of coffee cherry supply coming from small producers with cultivated areas of less than five hectares.<sup>55</sup> As part of its National Development Plan 2019-2024, the government is providing annual support of 5,000 pesos (approx. US\$ 230) to small- and medium-scale coffee producers through the *Producción para el Bienestar* programme. The support is aimed at promoting the renewal of coffee plantations, value addition and the conservation of biodiversity.<sup>56</sup> By the end of July 2020, support had been provided to over 164,000 coffee growers.

Mexico's exports fell by 2%, to 2.3 million bags in the first ten months of the coffee year. Mexico is both the region's largest Robusta producer as well as its largest exporter of processed coffee. Shipments of roasted and soluble account for around 35-40% of Mexico's total coffee exports. The main destinations for soluble exports are the USA, Guatemala, Nicaragua, El Salvador and Peru. Mexico is also the region's largest consumer, accounting for around 47% of regional demand. In 2019/20, its consumption is estimated to decline by 1% to 2.43 million bags.

At 3.9 million bags, the production of Guatemala in 2019/20 is similar to the previous year's level. The country has seen only a minor drop in its shipments as a result of covid-19 – 3.8% in the first ten months of the coffee year 2019/20 compared to the same period in 2018/19. Measures adopted by producers, including arranging for transportation of workers from their communities to workplaces, and the implementation of hygiene measures and work distancing, have helped to mitigate the impact of the pandemic on the sector.<sup>58</sup> Processed coffee exports represent less than 1% of the total. The main destinations for green exports are the USA, Japan, Canada, Belgium and Italy.

Following instability and economic contractions since 2018, Nicaragua's coffee production fell by 3.7% in 2019/20 to 2.7 million bags. Access to credit for producers, already affected by ongoing sociopolitical unrest, is expected to further worsen in 2020/21 due to the impact of covid-19. Exports of Nicaraguan coffee have however increased steadily, reaching 2.5 million bags in the first ten months of coffee year 2019/20, 3.4% higher than the same period in the previous year. Export revenues have registered a stronger growth, rising 9.1% to over USD 441 million in October 2019–July 2020. The majority (98%) of Nicaragua's exports are green coffee with the USA, Germany, Belgium and Italy as the main destinations.

<sup>53</sup> See <https://www.reuters.com/article/honduras-coffee/honduras-coffee-exports-to-fall-as-farmers-plaint-deepens-industry-idUSL2N26B03S>.

<sup>54</sup> See <https://www.cnbs.gob.hn/blog/2020/06/04/bono-cafetalero-beneficiara-a-mas-de-500-000-personas-del-sector-caficultor/>.

<sup>55</sup> See <https://www.gob.mx/agricultura/es/articulos/el-cafe-una-produccion-en-manos-sabias>.

<sup>56</sup> See [https://www.dof.gob.mx/nota\\_detalle.php?codigo=5565599&fecha=12/07/2019](https://www.dof.gob.mx/nota_detalle.php?codigo=5565599&fecha=12/07/2019).

<sup>57</sup> See <https://www.gob.mx/agricultura/es/articulos/produccion-para-el-bienestar-en-la-recta-final-de-entrega-de-apoyos?idiom=es>.

<sup>58</sup> See <https://www.maga.gob.gt/garantizan-produccion-de-cafe-frente-al-covid-19/>.

To strengthen the coffee sector, the government launched the National Plan for the Development of Nicaraguan Coffee Farms, 2020-2023. The Plan aims to increase productivity and improve the profitability and incomes of producer families.<sup>59</sup> Since 2013, Nicaragua has also allowed the production of Robusta coffee and, in 2016, expanded the regions where Robusta is authorized to be planted.<sup>60</sup>

Production in Costa Rica increased by 5.1% to 1.5 million bags in 2019/20. The covid-19 pandemic has not had a serious impact on the country's coffee industry. The harvest of the 2019/20 crop was completed before the introduction of social distancing measures, and shipments from Costa Rica did not face major logistical challenges at its main destination ports.<sup>61</sup> Exports in the first ten months of the coffee year were nevertheless 5.2% lower, at 857,000 bags, then in the same period of the previous year.

In response to the covid-19 pandemic, the Ministry of Agriculture and Livestock of Costa Rica has authorised sanitary protocols developed by the Costa Rican Coffee Institute (ICAFÉ) which are to be followed by farm workers, producers and extension workers during the harvest of the 2020/21 crop. ICAFE has also initiated a campaign calling on those seeking employment to register their interest in working on coffee harvesting. Around 12,000 people have responded to the campaign, while the demand for workers is expected to be approximately 70,000 in August 2020–March 2021.<sup>62</sup> Border closures, coupled with the reliance on migrant workers from Nicaragua and Panama, are expected to have an impact on the harvesting of the 2020/21 crop.<sup>63</sup>

#### E.2.4. European demand and imports decline

Europe's coffee consumption has grown by an average annual rate of 1.3% from 38.41 million bags in 1990/91 to an estimated 55.09 million bags in 2019/20. The EU is by far the largest consumer globally and accounts for 82% of regional demand within the continent. The Russian Federation is the second largest, representing 9%, while Ukraine and Switzerland are the next largest, each representing 2% of regional consumption. Europe meets its demand for coffee through imports, which are expected to decrease in 2019/20 after expanding by 4.7% to 99.77 million bags in 2019/20. Around 68% of Europe's imports are of green coffee while roasted represents 19% and soluble 13%

In 2019/20, coffee consumption in the EU is estimated at 45.05 million bags, 1.3% lower than in 2018/19, when demand grew by 3.5% to 45.62 million bags. Within the EU, Germany, France, and Italy are the three largest consuming countries, accounting for 45% of total consumption in the bloc.

Imports by the EU reached 55.89 million bags in October 2019 to May 2020, 3.4% lower than in the same period one year earlier. Around 70% of EU imports are unprocessed coffee and the main sources are Brazil, Viet Nam and Honduras. Roasted coffee makes up 19% of the EU's imports, but the majority of trade is between EU member countries. The largest external partner for roasted coffee is Kenya. Around 11% of the EU's imports were of soluble coffee. Like roasted coffee, much of the soluble trade is internal. However, Brazil and India are the two largest external partners.

The EU signed a trade agreement with Viet Nam in 2019, which entered into force on 1 August 2020. Upon entry into force, customs duties on goods in category A, including most forms of coffee, were eliminated. While Viet Nam is currently the EU's second largest source for green imports, which are not subject to tariffs, it is the tenth largest origin for soluble coffee, which was subject to tariffs.<sup>64</sup>

Re-exports by the EU in October 2019 to May 2020 reached 26.65 million bags, 2.8% lower compared to the same period in 2018/19. Around 47% of the bloc's re-exports are roasted coffee, and the largest external partners are the Russian Federation and Ukraine. Green re-exports represent 29%, and soluble coffee account for 24% of the total. The largest external buyer of green (mainly decaffeinated) coffee is the USA, while for soluble coffee they are the Russian Federation, Ukraine, Australia, and South Africa.

Coffee consumption in the Russian Federation has grown by 5.2% a year since 1991 and is expected to rise by 1% to 4.74 million bags in 2019/20. Traditionally a tea-drinking society, coffee demand in Russia is dominated by soluble coffee, though the expansion of international coffee chains has led to an increase in demand for roasted coffee more recently.

In the first eight months of coffee year 2019/20, the Russian Federation imported 4.19 million bags, 9.1% more than in the previous year. Soluble coffee represented 43% out of their total imports. Brazil is the main source, accounting for around 22% of total soluble imports, followed by Germany (17%), India (19%), and Viet Nam (7%). Around 49% of their imports are green coffee, used by local processors, and the top three origins are Viet Nam, Brazil, and Colombia. The share of roasted coffee imports has grown from 2% in 2000 to 11% in 2019, with Italy, Germany, and the Netherlands as the top three origins.

Re-exports by the Russian Federation in the first eight months of coffee year 2019/20 reached 951,000 bags, 30% higher than in the same period in 2018/19. Most of Russian re-exports consist of soluble coffee, accounting for around 87% of the total. The main destinations are Belarus, Kazakhstan, Georgia, Israel and Uzbekistan. Green coffee re-exports represent 1%, and roasted coffee accounts for 12% of the total. The main buyers of green coffee re-exports are Belarus, Kazakhstan and Finland while for roasted coffee they are Belarus, Ukraine and Kazakhstan.

<sup>59</sup> See <https://inta.gob.ni/wp-content/uploads/2020/03/plan-caficultura-.pdf>.

<sup>60</sup> See <https://www.mag.gob.ni/documents/Legislacion/Resoluciones/RM-187-2016.pdf>.

<sup>61</sup> See <http://www.icafe.cr/exportacion-de-cafe-de-costa-rica-con-tendencia-positiva-en-el-mercado/>.

<sup>62</sup> See <https://www.presidencia.go.cr/comunicados/2020/06/autorizado-protocolo-sanitario-en-el-sector-cafetalero/>.

<sup>63</sup> See <https://www.reuters.com/article/us-health-coronavirus-costa-rica-coffee/costa-rican-coffee-may-go-unharvested-as-pandemic-creates-migrant-worker-shortage-idUSKBN2411W9>.

<sup>64</sup> See [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1412](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1412) and <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2020:186:FULL&from=EN#page=173>.



### E.2.5. North America's coffee demand falls after significant growth in 2018/19

North America is the third largest coffee consuming region in the world, accounting for around 19% of global consumption. Its share has declined from 21% in the early 1990s as consumption in other regions has increased. After growing by 6.1% in 2018/19, growth is estimated to fall by 0.8% in 2019/20, and consumption is estimated to reach 31.43 million bags.

The USA is the region's largest and world's second largest consumer of coffee. Demand in the USA has grown in each season since a downturn in 2014/15 and is expected to decrease by 1.2% to 27.43 million bags in 2019/20. While the USA produces coffee, local production only meets around 0.1% of its annual demand and, thus, the country relies on imports. The bulk of imports are green coffee (86%) while both roasted and soluble coffee have 7% shares of the market. The main sources of imports are Brazil, Colombia, Viet Nam, Mexico and Honduras, which represent around 70% of total import origins. After falling by 4.9% to 28.26 million bags, USA's imports rose by 11.5% to 31.5 million bags in 2018/19. Its imports for the current coffee year through May 2020 are 18.83 million bags, 9.2% lower than in the previous year.

Re-exports by the USA in the first eight months of coffee year 2019/20 reached 1.91 million bags, 0.2% lower than in the same period in 2018/19. Most of the USA's re-exports consist of roasted coffee, accounting for around 58% of the total. The main destinations are Canada, the Republic of Korea, Japan, Mexico and Taiwan. Green coffee re-exports represent 19%, and soluble coffee account for 23% of the total. The main buyers of green coffee re-exports are Canada, Germany and Viet Nam, while for soluble coffee they are Canada, Mexico and United Arab Emirates.

While Brazil's Robusta crop is often consumed by the domestic processing industry, Brazil also exports green Robusta, which increased by 15.7% compared to the previous year.

### E.2.6. South America's Arabica production falls while Robusta grows

After increasing by 9.9% to 82.68 million bags, coffee production in South America is estimated to fall by 4.6% to 78.87 million bags in coffee year 2019/20. The region's harvest in 2019/20 would account for 46.6% of global coffee production. This region contains the world's two largest producers of Arabica, Brazil and Colombia. Regional Arabica output typically accounts for 62% of the world total. Brazil is the main producer of Robusta coffee in South America, accounting for 98% of the regional harvest, though Ecuador and Guyana also grow Robusta coffee. In 2019/20, Arabica output is estimated to fall by 6.8% to 57.82 million bags, while Robusta grows by 2.1% to 21.04 million bags.

Regional consumption has grown at an average annual rate of 3.1% from 12.1 million bags in 1990/91 to 21.16 million bags in 2018/19. Demand for coffee in 2019/20 is estimated to decline by 0.9% to 26.91 million bags. Exports from the region in the first ten months of the coffee year reached 46.65 million bags, 7.2% lower than in the same period in 2018/19.

In 2019/20, Brazil's Arabica crop was in an off-year of its biennial cycle, and the total harvest is estimated at 58 million bags, 10.9% less than in 2018/19. Brazil's Arabica output declined by 17.6% to 37 million bags, while its Robusta output rose by 3.4% to 21 million bags. Brazil is the region's largest consuming country and the world's third largest consumer market. In 2019/20, demand is estimated at 22 million bags. Various levels of the Brazilian government have taken measures to mitigate the impact of covid-19, including naming coffee as an essential activity in order to ensure global supplies, providing wage support for up to three months in cases where workers have no or limited work and providing protection to port workers.<sup>65</sup> The harvesting of Brazil's 2020/21 crop, which began in April 2020, has been largely unaffected.

Brazil exported 33.12 million bags in October 2019 to July 2020, which is 7.1% lower than in the same period in the previous year. Brazil exports limited quantities of roasted coffee, typically less than 1% of total shipments. Most of its harvest is exported as green coffee. While its Robusta crop is often consumed by the domestic processing industry, Brazil also exports green Robusta, which amounted to 3.49 million bags in October 2019 to July 2020, 15.7% higher

<sup>65</sup> See <http://www.ico.org/documents/cy2019-20/ed-2338e-measures-brazil-covid-19.pdf>.

<sup>66</sup> See <https://trade.ec.europa.eu/doclib/press/index.cfm?id=2039> and <https://www.cecafe.com.br/en/sustainability/articles/the-mercosur-european-union-trade-agreement-in-the-scope-of-brazilian-coffee-agribusiness-sustainability-20190715/>.

<sup>67</sup> See <https://www.reuters.com/article/us-colombia-coffee/colombia-launches-64-million-fund-to-steady-coffee-prices-protect-farmers-idUSKBN20E0EAand> <https://federaciondecafeteros.org/wp/listado-noticias/se-pone-en-marcha-fondo-de-estabilizacion-de-precios-del-cafe/>.

In 2019/20 Arabica output is estimated to fall by 6.8%, while Robusta grows by 2.1% in South America compared to the previous coffee year.

than in the same period the previous year. Green Arabica shipments in the first ten months of coffee year 2019/20 reached 26.27 million bags, 10.3% lower than in 2018/19. Soluble coffee accounts for around 11% of all exports with the USA, the Russian Federation, Indonesia, Japan, and Argentina as the main destinations.

On 28 June 2019, the EU and Mercosur, of which Brazil is a member, reached a trade agreement, which would remove tariffs on a substantial number of goods traded between the two partners, including processed coffee.<sup>66</sup> Currently the EU accounts for 53% of Brazil's green exports and 12% of its soluble shipments. The date of entry into force of this agreement has still not been determined.

Colombia's output was strong in the first three months of 2019/20, due to high prices at the time as well as replanted trees coming into production. However, falling prices and adverse weather caused harvesting to decline over the next four months, which was further compounded by covid-19. Colombia's total production in 2019/20 is estimated at 14.1 million bags, 1.7% higher than in 2018/19. To protect farmers against price volatility, the Colombian government launched the Coffee Price Stabilization Fund in February 2020.<sup>67</sup>

Domestic consumption is estimated at 1.79 million bags, accounting for 12.7% of the 2019/20 harvest, while the rest is exported. Colombia's shipments from October 2019 to July 2020 reached 10.63 million bags, 5.7% lower than in 2018/19. Green exports generally account for around 93% of Colombia's total shipments, and the main destinations were the USA, Germany, Japan, Canada and Belgium. Soluble exports represent 6% while roasted accounts for 1%. Nearly 90% of roasted coffee was shipped to the USA, Panama and Chile, while 66% of soluble coffee was shipped to the USA, Germany, Mexico, Japan, and the Russian Federation. In July 2020, the National Coffee Growers of Colombia (FNC) launched an initiative to simplify the export process as part of its digital transformation process with the hopes of saving time and money for those involved in exporting coffee.<sup>68</sup>

Peru's production in crop year 2019/20 declined by 8.5% to 3.9 million bags. Adverse weather impacted the yield as well as quality of the coffee. Further, low international coffee prices have led farmers to turn to other crops with better returns. Peru's consumption accounts for around 6% of its production and is estimated at 250,000 bags in 2019/20. In 2019/20, Peru's exports are estimated to reach around 3.56 million bags with most of its shipments consisting of green coffee. However, around 1% of its exports are processed coffee, mainly roasted. The top five destinations for Peru's coffee are the USA, Germany, Belgium, Sweden and Colombia, which account for 70% of shipments.

In July 2020, the National Coffee Growers of Colombia (FNC) launched an initiative to simplify the export process as part of its digital transformation process to save time and money for those involved in exporting coffee.

<sup>68</sup> See <https://federaciondecafeteros.org/wp/listado-noticias/proceso-documental-de-exportacion-de-cafe-de-colombia-se-simplifica/>.

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# ANNEXES

## ANNEX 1

### Country name abbreviations

<b>BDI</b>	Burundi	<b>KEN</b>	Kenya
<b>BOL</b>	Bolivia	<b>LAO</b>	Lao PRD
<b>BRA</b>	Brazil	<b>LKA</b>	Sri Lanka
<b>CAF</b>	Central African Republic	<b>MEX</b>	Mexico
<b>CHE</b>	Switzerland	<b>NIC</b>	Nicaragua
<b>CHN</b>	China (Mainland, Macao and Hong-Kong)	<b>NPL</b>	Nepal
<b>CIV</b>	Côte d'Ivoire	<b>PAN</b>	Panama
<b>COL</b>	Colombia	<b>PER</b>	Peru
<b>CRI</b>	Costa Rica	<b>PHL</b>	The Philippines
<b>DRC</b>	Democratic Republic of Congo	<b>PNG</b>	Papua New Guinea
<b>ECU</b>	Ecuador	<b>RUS</b>	Russian Federation
<b>ETH</b>	Ethiopia	<b>RWA</b>	Rwanda
<b>GHA</b>	Ghana	<b>TGO</b>	Togo
<b>GIN</b>	Guinea	<b>THA</b>	Thailand
<b>GTM</b>	Guatemala	<b>TUR</b>	Turkey
<b>GUY</b>	Guyana	<b>UGA</b>	Uganda
<b>HND</b>	Honduras	<b>VEN</b>	Venezuela
<b>HTI</b>	Haiti	<b>VNM</b>	Viet Nam
<b>IDN</b>	Indonesia	<b>YEM</b>	Yemen
<b>IND</b>	India		
<b>JPN</b>	Japan		

# ANNEX 2

## Determinants of countries' exports in coffee

Variables	(1) Total exports	(2) Exports (green)	(3) Exports (soluble)	(4) Exports (roasted)
(ln) resources rents / GDP	-0.0464*** (0.0104)	-0.0440*** (0.0121)	-0.0450*** (0.0144)	-0.0841*** (0.0267)
(ln) capital / GDP	-0.3454* (0.1878)	-0.4192 (0.2632)	0.5467** (0.2532)	0.9632* (0.5054)
(ln) arable land / GDP	-0.5198*** (0.0565)	-0.6031*** (0.0652)	-0.6034*** (0.0649)	-0.1443* (0.0759)
(ln) distance to processing hubs	-4.8772*** (0.5894)	-4.5202*** (0.6808)	-9.1881*** (1.0479)	-7.6992*** (1.3902)
(ln) domestic industrial capacity	0.4975*** (0.1927)	0.9617*** (0.2174)	1.0556*** (0.3189)	0.6770*** (0.2256)
Tariffs rate (primary)	-0.0081 (0.0174)	-0.0022 (0.0207)	-0.0248 (0.0218)	-0.1761*** (0.0373)
(ln) FDI inflows	0.1546* (0.0902)	0.3906*** (0.1401)	0.2585** (0.1046)	-0.0398 (0.1185)
Political stability index	0.2475* (0.1366)	0.2089 (0.1412)	-0.0185 (0.1066)	0.4730** (0.2236)
Depreciation	-0.0000 (0.0001)	0.0003*** (0.0001)	-0.0002 (0.0008)	-0.0012*** (0.0004)
(ln) GDP p.c.	-1.2588*** (0.1320)	-1.8736*** (0.1746)	-0.4382** (0.1788)	0.9323** (0.3714)
(ln) population	0.8368*** (0.1011)	0.6783*** (0.1489)	0.9252*** (0.1090)	1.0672*** (0.0996)
(ln) consumption p.c. in kg	0.8000*** (0.0696)	0.8231*** (0.0854)	0.5105*** (0.0977)	0.5855*** (0.2003)
Robusta dominates = 1	0.9041*** (0.2185)	1.6028*** (0.3528)	1.3738*** (0.3339)	-0.1557 (0.6997)
Arabica dominates = 1	0.1348 (0.2339)	1.5453*** (0.3370)	-1.5961*** (0.2960)	-2.0685*** (0.1988)
Observations	780	780	780	780
Period dummy	Yes	Yes	Yes	Yes
Pseudo R	0.797	0.825	0.760	0.886
P-value for model test	0	0	0	0

# ANNEX 3

## Determinants of countries' GVC upgrading

Variables	(1) Functional upgrading	(2) Functional upgrading	(3) Product upgrading (green)
(ln) resources rents/GDP	-0.0108*** (0.0022)	-0.0504*** (0.0161)	-0.0415*** (0.0064)
(ln) capital/GDP	0.1747*** (0.0449)	0.6398** (0.2950)	0.4968*** (0.1035)
(ln) arable land/GDP	0.0336** (0.0131)	-0.0984 (0.1051)	-0.4171*** (0.0738)
(ln) distance to processing hubs	0.0784 (0.1857)	-1.9756** (0.9495)	0.4326 (0.3344)
(ln) domestic industrial capacity	0.1722*** (0.0399)	0.8894*** (0.3218)	-0.5773*** (0.1096)
Tariffs rate (primary)	-0.0105** (0.0047)	-0.0737*** (0.0218)	0.0062 (0.0102)
(ln) FDI inflows	0.0122 (0.0196)	-0.4653*** (0.1199)	0.0087 (0.0495)
Political stability index	-0.0947*** (0.0293)	-0.2682* (0.1448)	-0.1086 (0.0771)
Depreciation	-0.0004*** (0.0001)	-0.0005*** (0.0001)	0.0002*** (0.0001)
(ln) GDP p.c.	0.2136*** (0.0432)	1.3130*** (0.1658)	-0.1600 (0.1117)
(ln) population	-0.0058 (0.0185)	0.4598*** (0.1296)	-0.1468** (0.0659)
(ln) consumption p.c. in kg	-0.0314 (0.0197)	-0.1910** (0.0767)	-0.0826*** (0.0251)
Robusta dominates = 1	-1.0747*** (0.1394)	1.2283*** (0.2758)	-0.5459*** (0.1022)
Arabica dominates = 1	-1.5992*** (0.1443)		
Observations	737	244	250
Period dummy	Yes	Yes	Yes
Pseudo R	0.128	0.263	0.640
P-value for model test	0	0	0
Sample		Only coffee growing	Only coffee growing



# ANNEX 4

## Determinants of revenues earned per kg of coffee harvested in Uganda case study

Variables	(1) Average revenues earned per kg of coffee harvested
Participate in GVC	234.2*** (21.12)
Harvest (in kg) baseline	0.0163*** (0.00525)
Altitude (meters)	0.0875** (0.0343)
Pest-disease attack (0-1)	-5,738 (15.31)
Experience with coffee farming (in years)	0.537 (0.563)
Distance to nearest tarmac road (in km)	-1,859 -2,064
HH size	4,415 -3,132
HH head education (in years)	1,717 -1,471
Female HH head (0-1)	-10.49 (21.05)
No. of assets and livestock baseline	-2,055 -2,613
Constant - conventional only	880.4*** (69.73)
Observations	1,275
R-squared	0.117



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